EUROPEAN COMMISSION SERVICE CONTRACT
N°070307/2007/483710/MAR/C3

IMPLEMENTATION AND REVIEW OF DIRECTIVE 2004/42/EC

(EUROPEAN DIRECTIVE LIMITING THE VOC CONTENT IN CERTAIN PRODUCTS – CURRENT SCOPE: DECORATIVE PAINTS AND VARNISHES, VEHICLE REFINISHING PRODUCTS)

FINAL REPORT (2 PARTS)
PART 2: ANNEXES 26-59
10 NOVEMBER 2009

Project co-ordination

Ökopol GmbH
Institute for Environmental Strategies
Nernstweg 32 – 34
DE 22765 Hamburg
info/at/oekopol.de
http://www.oekopol.de

EUROPEAN COMMISSION SERVICE CONTRACT
N°070307/2007/483710/MAR/C3

IMPLEMENTATION AND REVIEW OF DIRECTIVE 2004/42/EC

FINAL REPORT – PART 2: ANNEXES 26-59

DRAFT VERSION: 21 MAY 2009, COMMENTED: 8 JUNE 2009
1ST FINAL VERSION: 21 JUNE 2009, COMMENTED: 17 JULY 2009
2ND FINAL VERSION: 25 AUGUST 2009, COMMENTED: 26/27/28 AUGUST 2009
3ND FINAL VERSION: 28 SEPTEMBER 2009, COMMENTED: 9 OKTOBER, 1/10 NOVEMBER 2009
4TH FINAL VERSION: 10 NOVEMBER 2009

Main Contributors:

Christian Tebert, Susanne Volz
ÖKOPOL, Hamburg/DE, http://www.oekopol.de

Jeroen Terwoert
IVAM, Amsterdam/NL, http://www.ivam.nl

Volker Klotz, Wolf Müller, Jochen Theloke
IER, University of Stuttgart/DE, http://www.ier.uni-stuttgart.de

Daniel Vencovsky, David Fleet
RPA, Loddon/UK, http://www.rpaltd.co.uk

Tamas Kristof Kallay
REC, Szentendre/HU, http://www.rec.org

This report represents the views of Ökopol and its project partners and in no way reflects the views of the European Commission.

The technical background information of this report was supported by Member State authorities and industrial stakeholders, in particular by European industry associations and individual companies related to VOC containing products. We appreciate very much all their contributions to the study.

In particular, we would like to thank CEPE staff and working group members for their input on several types of coating products. Furthermore, we thank AIRC, CECRA and UNIEP for their feedback on coatings regulated under the scope of the current directive, Colipa for information on cosmetics, FEICA for information on adhesives, A.I.S.E. for information on glass cleaners and insecticides, FEA and AEROBAL for information on aerosol products, EURMIG for information on yachts coatings, CEFIC-CES for information on water-repellant impregnation products, and all other associations, individual companies and research institutes for their efforts in support of the project.

CONTENT

ANNEX 26 STAKEHOLDER DOCUMENT (EUROPEAN COATINGS INDUSTRY)

26. CEPE - CEPE ESTIMATE OF RE-LABELLING COSTS FOR THE CHANGES IN 2010 FOR DECORATIVE PAINTS. BRUSSELS, 16.01.2009

ANNEX 27 STAKEHOLDER DOCUMENT (EUROPEAN COATINGS INDUSTRY)

27. CEPE - REVISION OF DIRECTIVE 2004/42/EC – PROPOSED CHANGES AND JUSTIFICATION, VERSION # 9, BRUSSELS, 20.3.2008

ANNEX 28 STAKEHOLDER DOCUMENT (EUROPEAN COATINGS INDUSTRY)

28. CEPE'S POSITION (OPINION AND IMPROVEMENTS) ON REVIEW OF THE PAINTS DIRECTIVE 2004/42/EC, BRUSSELS, 9.4.2008

ANNEX 29 STAKEHOLDER DOCUMENT (EUROPEAN COATINGS INDUSTRY)

29. CEPE - PRODUCT DIRECTIVE 2004/42 (PD) - A CLEAR REGULATION WHEN IT COMES TO IN-SITU APPLIED PAINTS AND VARNISHES. RECOMMENDATION TO IMPROVE THE PD. BRUSSELS, 7.11.2008

ANNEX 30 STAKEHOLDER DOCUMENT (EUROPEAN COATINGS INDUSTRY)

30. CEPE - REVISION OF DIRECTIVE 2004/42/EC - DECORATIVE PAINTS AND VARNISHES - RATIONALE FOR NO FURTHER REDUCTIONS BEYOND THE 2010 VOC LIMITS, BRUSSELS, 22.8.2008

ANNEX 31 STAKEHOLDER DOCUMENT (EUROPEAN PROFESSIONAL PAINTERS)

31. UNIEP - RESPONSE TO REVIEW OF DIRECTIVE 2004/42/EC IMPACT ASSESSMENT OF PROPOSED OPTIONS FOR AMENDMENT AND OF PHASE II FOR DECORATIVE PAINTS, BRUSSELS, 13.05.2009

ANNEX 32 STAKEHOLDER DOCUMENT (EUROPEAN COATINGS INDUSTRY)

32. CEPE - REVISION OF DIRECTIVE 2004/42/EC - VEHICLE REFINISHES PRODUCTS - RATIONALE FOR KEEPING CURRENT VOC LIMITS OR PROPOSED AMENDMENTS TO LOWER VALUES, BRUSSELS, 6.6.2008

ANNEX 33 STAKEHOLDER DOCUMENT (EUROPEAN COATINGS INDUSTRY)

33. CEPE - COMMENTS WITH THE SUPPLY OF VEHICLE REFINISHES DATA TO ÖKOPOL. BRUSSELS, 13.02.2009

ANNEX 34 STAKEHOLDER INTERVIEW (EUROPEAN AND DUTCH VEHICLE REPAIR SHOPS)

34. AIRC/FOCWA INTERVIEW, JENDA HORAK, SASSENHEIM/THE NETHERLANDS, 19.5.2008

ANNEX 35 STAKEHOLDER INTERVIEW (EUROPEAN AND DUTCH VEHICLE REPAIR SHOPS)

35. AIRC/FOCWA INTERVIEW, JENDA HORAK, SASSENHEIM/THE NETHERLANDS, 13.1.2009

ANNEX 36 STAKEHOLDER DOCUMENT (EUROPEAN COATINGS INDUSTRY)

36. CEPE – VOCS AND NON-AUTOMOTIVE PAINT AEROSOLS, BRIEFING PAPER, BRUSSELS, 29.08.2008

ANNEX 37 STAKEHOLDER DOCUMENT (EUROPEAN COATINGS INDUSTRY/ EUROPEAN AEROSOL INDUSTRY)

37. CEPE/FEA – VOCS AND NON-AUTOMOTIVE PAINT AEROSOLS, BRIEFING PAPER (II) – ADDITIONAL INFORMATION, BRUSSELS, 19.11.2008

ANNEX 38 STAKEHOLDER DOCUMENT (EUROPEAN COATINGS INDUSTRY)

38. CEPE – INCORPORATION OF PROTECTIVE COATINGS INTO DIRECTIVE 2004/42/CE, BRUSSELS, 9.10.2008

ANNEX 39 STAKEHOLDER DOCUMENT (EUROPEAN COATINGS INDUSTRY)

39. CEPE – PROTECTIVE COATINGS PROPOSAL, RESPONSE TO OKOPOL QUERIES, BRUSSELS, 14.01.2009

ANNEX 40 STAKEHOLDER DOCUMENT (EUROPEAN COATINGS INDUSTRY)

40. CEPE – IMPACT ASSESSMENT – PROTECTIVE COATINGS PROPOSAL FOR INCLUSION IN DIRECTIVE 2004/42/CE, BRUSSELS, 24.04.2009

ANNEX 41 RESEARCH INSTITUTE INTERVIEW (WOOD RESEARCH INSTITUTE)

41. SHR TIMBER RESEARCH, LUTKE SCHIPHOLT, INTERVIEW WITH JEROEN TERWOERT/IVAM, WAGENINGEN/THE NETHERLANDS, 29.4.2008

ANNEX 42 STAKEHOLDER DOCUMENT (EUROPEAN COATINGS INDUSTRY)

42. CEPE – CEPE'S ACCOMPANYING NOTE WITH THE RESPONSES ON THE IMPACT ASSESSMENT OF OPTION 8, BRUSSELS, 28.04.2009

ANNEX 43 STAKEHOLDER DOCUMENT (EUROPEAN COATINGS INDUSTRY)

43. CEPE - CEPE'S POSITION FOR NON INCLUSION OF THE MARINE PAINTS IN A REVISED PRODUCT DIRECTIVE, BRUSSELS, 11.02.2009

ANNEX 44 STAKEHOLDER DOCUMENT (EUROPEAN RECREATION MARINE INDUSTRY)

44. EURMIG - POSITION FOR NON INCLUSION OF THE PLEASURE CRAFT- AND SUPER YACHT INDUSTRY IN A REVIEWED PRODUCT DIRECTIVE- 2004/42/CE, BRUSSELS, SEPTEMBER 2008

ANNEX 45 STAKEHOLDER DOCUMENT (EUROPEAN RECREATION MARINE INDUSTRY)

45. EURMIG - ADDITIONAL INFORMATION ON REQUEST OF CONSULTANT – ÖKOPOL, BRUSSELS, 5.5.2009

ANNEX 46 STAKEHOLDER DOCUMENT (EUROPEAN SILICONES INDUSTRY)

46. CEFIC-CES, EUROPEAN WATER-REPELLENT IMPREGNATION PRODUCTS - MARKETS AND TECHNICAL REQUIREMENTS, BRUSSELS, 20.03.2009

ANNEX 47 STAKEHOLDER DOCUMENT (EUROPEAN ADHESIVES INDUSTRY)

47. FEICA – POSITION ON THE REVIEW OF THE DIRECTIVE 2004/42/EC, BRUSSELS, OCTOBER 2008

ANNEX 48 STAKEHOLDER DOCUMENT (EUROPEAN ADHESIVES INDUSTRY)

48. FEICA – COMMENTS ON OPTION 11 AND OPTION 6 OF THE OEKOPOL INTERIM REPORT ON THE REVIEW OF DIRECTIVE 2004/42/EC, BRUSSELS, 23.04. 2009

ANNEX 49 STAKEHOLDER DOCUMENT (EUROPEAN ADHESIVES INDUSTRY)

49. FEICA – THE IMPORTANCE OF AN OFFICIAL REFERENCE TO A CALCULATION METHOD IN THE LEGISLATIVE TEXT, BRUSSELS, OCTOBER 2008

ANNEX 50 STAKEHOLDER DOCUMENT (EUROPEAN ADHESIVES PRODUCERS)

50. FEICA – INPUT ON TECHNICAL SPECIFICATIONS OF ALTERNATIVES TO SOLVENT-BASED ADHESIVES, BRUSSELS, 19.05.2009

ANNEX 51 STAKEHOLDER DOCUMENT (EUROPEAN ADHESIVES PRODUCERS)

51. FEICA – INPUT ON STATISTICS ON SOLVENTS IN FLOORING ADHESIVES, BRUSSELS, 19.05.2009

ANNEX 52

52. GOOD PRACTICES FLOOR COVERERS/ KITCHEN & BATHROOM INSTALLERS, JEROEN TERWOERT/IVAM, AMSTERDAM, 2005

ANNEX 53 STAKEHOLDER DOCUMENT (EUROPEAN COSMETICS INDUSTRY)

53. COLIPA – PRODUCT CATEGORIES, ANNUAL REVIEW 2007, BRUSSELS, 2008

ANNEX 54 STAKEHOLDER MEETING (EUROPEAN COSMETICS INDUSTRY, EUROPEAN AEROSOL INDUSTRY)

54. COLIPA/FEA – VOCS IN DEODORANTS/ ANTIPERSPIRANTS AND HAIRSPRAYS, TECHNICAL BRIEFING PAPER, BRUSSELS, 18.12.2008

ANNEX 55 STAKEHOLDER DOCUMENT (EUROPEAN HOUSEHOLD PRODUCTS INDUSTRY)

55. A.I.S.E., RESPONSE TO DECOPAINT REVISION PROJECT, BRUSSELS, 08.10.2009

ANNEX 56 STAKEHOLDER DOCUMENT (EUROPEAN HOUSEHOLD PRODUCTS INDUSTRY, EUROPEAN AEROSOL INDUSTRY)

56. A.I.S.E./FEA - VOCS IN HOUSEHOLD AEROSOL INSECT-CONTROL PRODUCTS, BRIEFING PAPER, BRUSSELS, 02.04.2009

ANNEX 57 STAKEHOLDER DOCUMENT (EUROPEAN ALUMINIUM AEROSOL CAN INDUSTRY)

57. AEROBAL - POSITION PAPER ON ÖKOPOL INTERIM REPORT, IMPLEMENTATION AND REVIEW OF DIRECTIVE 2004/42/EC, BRUSSELS, 03.04.2009

ANNEX 58 STAKEHOLDER DOCUMENT (EUROPEAN SOLVENTS INDUSTRY)

58. ESIG – ESIG COMMENTS ON THE PAINT DIRECTIVE INTERIM REPORT BY OKOPOL AND ITS ECONOMIC IMPACT ON THE SOLVENTS INDUSTRY, BRUSSELS, 15.05.2009

ANNEX 59 - REGIONAL ENVIRONMENTAL CENTRE (REC)

59. DATA COLLECTION IN EASTERN EUROPE

Annex 26 Stakeholder Document (European Coatings Industry)

26. CEPE - CEPE estimate of re-labelling costs for the changes in 2010 for decorative paints. Brussels, 16.01.2009

Cost impact of Directive 2004/42/EC
CEPE estimate of re-labelling costs for the changes in 2010 for decorative paints

CEPE expert group reviewed the costs incurred by companies in the EU to adapt their labels in order to comply with Directive 2004/42/EC.

Following cost elements are identified:

a) Origination and approval for the livery
b) Scrapping of stocks of obsolete labels or pre-decorated containers
c) Generation of stickers/over labels to make existing stock (all through supply chain)
d) Generation and dissemination of modified datasheets
e) Take back and destruction of non compliant product from customer refusing to sell through

All elements are reviewed and cost for the industry is estimated:

a) Origination and approval for the livery:
Basic assumptions (sku = stock keeping units):
- 175€ per sku = cost for design / generation new litho container
- 125€ per sku = cost for design / generation new paper labelled container
It is agreed to take as an average a cost of 150€ per sku as a base of our calculation.
We have typically 4 000 companies in EU with 1 000 to 2 000 sku's each, leading to a total cost between 600 MM€ to 1,2 Bn€ (cost of 150M€ to 300M€ per company).
It is estimated that 50% of the packaging changes linked to VOC compliance would have been planned in the normal product life cycle, leading finally to a total cost between 300 MM€ to 600 MM€. An average of 450 MM€ will be taken into account.

b) Scrapping of stocks of obsolete labels or pre-decorated containers: 25K€ per company leading to total cost of 1 MM€.

c) Re-labelling: Estimate (based on German data) of market size = 25 Bn litres – average can size of 5 litre leading to 5 Bn cans sold in EU /year. Assuming that 5% would have to be relabelled (slow movers at big retailers or own depots) at a cost of 0,5€/can, this is leading to a cost of 125 MM€.

d) Modified datasheets: Basic assumption is that cost for renewing both technical and safety datasheets is 150€ per product range. It is also estimated that a

product range would include in average 20 sku's (total 4,5MM sku's), leading to a total cost of 22,5 MM€.

e) Take back and destruction non compliant products: categories d, e and f products are considered. It is estimated that 20% of these products are slow movers from which 25% will have to be taken back and destructed. Total EU market on these categories is estimated to be 600 MM litres, leading to 30MM litres to be destructed:
   - 500 €/ton destruction = 15 MM€
   - 0,2€/l transportation = 6 MM€
   - Internal book cost = 4€/l = 120 MM€
   - Total cost = 141 MM€

Total re-labelling cost is estimated to be: 740MM€.

CEPE JW/090116

Annex 27 Stakeholder Document (European Coatings Industry)

27. CEPE - Revision of Directive 2004/42/EC – Proposed changes and justification, Version # 9, Brussels, 20.3.2008

Article & Paragraph in Directive 2004/42/EC	Text in Directive 2004/42/EC	Change proposed by CEPE	Justification
Title	Directive 2004/42/EC of the European Parliament and of the Council of 21 April 2004 on the limitation of emissions of volatile organic compounds due to the use of organic solvents in **certain paints and varnishes** and vehicle refinishing products and amending Directive 1999/13/EC	Directive 2004/42/EC of the European Parliament and of the Council of 21 April 2004 on the limitation of emissions of volatile organic compounds due to the use of organic solvents in **architectural paints and varnishes for buildings** and vehicle refinishing products and amending directive 1999/13/EC	To avoid different interpretations by Member States or coating manufacturers
Whereas (14a)		**The applying of paint products is predominantly a final act on a substrate before the first use or re-use of the so coated object. And that such applying of paint products is done at one of the following locations:** **- in situ; where a substrate is a part of a geographically fixed object and is coated for the first time or for maintenance** **- a point of manufacture; where a substrate is coated for the first time as a part of a manufacturing process of a new article that finds its use elsewhere** **- a point of refinish; where a substrate of an article that has left its original point of manufacture is recoated**	To get a clear separation between sectors covered by Directive 2004/42/EC (DECO & VR) and those covered by Directive 1999/13/EC (other coatings).
Whereas (16)	Member States should, nevertheless, be able to maintain or introduce national measures for the control of emissions from vehicle refinishing activities involving the coating of road vehicles as defined in Council Directive 70/156/EEC of 6 February 1970 on the approximation of the laws of the Member States relating to the type-approval of motor vehicles and their trailers (2), or part of them, carried out as part of vehicle repair, conservation or decoration outside of manufacturing installations.	Member States should, nevertheless, be able to maintain or introduce national measures for the control of emissions from vehicle refinishing activities involving the coating of road vehicles as defined in Council Directive **2007/46/EC of 5 September 2007 establishing a framework for the approval of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles**.	Directive 70/156/EEC is replaced by Directive 2007/46/EC.
Whereas (17)	This Directive should not apply to products sold for exclusive use in installations authorised according to Directive 1999/13/EC where emission limiting measures provide alternative means of achieving at least equivalent VOC emission reductions.	**This Directive should not apply to products intended for use in an installation at a point of manufacture.**	To get a clear separation between sectors covered by Directive 2004/42/EC (DECO & VR) and those covered by Directive 1999/13/EC (other coatings).

Article & Paragraph in Directive 2004/42/EC	Text in Directive 2004/42/EC	Change proposed by CEPE	Justification
Article 2.8	"Coating" means any preparation, including all the organic solvents or preparations containing organic solvents necessary for its proper application, which is used to provide a film with decorative, protective or other functional effect on **a surface**	"Coating" means any preparation, including all the organic solvents or preparations containing organic solvents necessary for its proper application, which is used to provide a film with decorative, protective or other functional effect on **the intended substrate**	Clarification
Article 2.9	"Film" means a continuous layer resulting from the application of one or more coats to **a substrate**	"Film" means a continuous layer resulting from the application of one or more coats to **the intended substrate**	Clarification
Article 2.13		**"Building" means a constructed edifice designed to stand more or less permanently, covering a space of land, usually covered by a roof and more or less completely enclosed by walls and serving as e.g. a dwelling, storehouse, factory, shelter for animals, or other useful structure – distinguished from structures not designed for occupancy (as bridges or monuments) and from structures not intended for use in one place (as ships and trailers) even though subject to occupancy .**	To avoid different interpretations by Member States or coating manufacturers
Article 2.14		**"Point of manufacture" means a stationary unit in which articles are coated for use elsewere.**	To get a clear separation between sectors covered by Directive 2004/42/EC (DECO & VR) and those covered by Directive 1999/13/EC (other coatings).

Article & Paragraph in Directive 2004/42/EC	Text in Directive 2004/42/EC	Change proposed by CEPE	Justification
Article 3.1	Requirements 1. Member States shall ensure that the products set out in Annex I are placed on the market within their territory after the dates laid down in Annex II only if they have a VOC content not exceeding the limit values set out in Annex II and comply with Article 4, For determining compliance with the VOC content limit values set out in Annex II, the analytical methods referred to in Annex III shall be used. For products set out in Annex I to which solvents or other components containing solvents have to be added in order for the product to be ready for use, the limit values in Annex II shall apply to the VOC content of the product in its ready for use condition.	Requirements 1. Member States shall ensure that the products set out in Annex I are placed on the market within their territory after the dates laid down in Annex II only if they have a VOC content not exceeding the limit values set out in Annex II and comply with Article 4, For determining compliance with the VOC content limit values set out in Annex II, the analytical methods referred to in Annex III shall be used. For products set out in Annex I to which solvents or other components containing solvents have to be added in order for the product to be ready for use, **according to the supplier's instructions,** the limit values in Annex II shall apply to the VOC content of the product in its ready for use condition.	Manufacturer to supply instructions for use.
Article 3.2	2. By way of derogation from paragraph 1, Member States shall exempt from compliance with the above requirements products sold for exclusive use in an activity covered by Directive 1999/13/EC and carried out in a registered or authorised installation according to Articles 3 and 4 of that Directive.	2.1 **By way of derogation from paragraph 1, Member States shall exempt from compliance with the above requirements products sold for intended use in an installation at a point of manufacture.** 2.2 By way of derogation from paragraph 1, Member States shall exempt from compliance with the above requirements products defined in Annex I.2.1 and sold for exclusive use in an activity covered by Directive 1999/13/EC and carried out in a registered or authorised installation according to Articles 3 and 4 of that Directive. **This only applies for installations where the threshold for VOC consumption, as defined in Annex IIA of Directive 1999/13/EC, is exceeded.**	To get a clear separation between sectors covered by Directive 2004/42/EC (DECO & VR) and those covered by Directive 1999/13/EC (other coatings).

Article & Paragraph in Directive 2004/42/EC	Text in Directive 2004/42/EC	Change proposed by CEPE	Justification
Article 3.4	4. Products falling under the scope of this Directive which are shown to be produced before the dates laid down in Annex II and do not fulfil the requirements of paragraph 1 may be placed on the market for a period of **12** months following the date on which the requirement applying to the product in question comes into force.	4. Products falling under the scope of this Directive which are shown to be produced before the dates laid down in Annex II and do not fulfil the requirements of paragraph 1 **shall** not be placed on the market **for the first time** for a period of **18** months following the date on which the requirement applying to the product in question comes into force. **Products not conforming to the VOC threshold in Annex II shall not be placed on the market 24 months following the date on which the requirement applying to the product in question comes into force.**	The supply chain for architectural paints is quite long, including distributors, retailers, professional painters and consumers. Some low volume products and specialties may stay two years or longer on the shelves. Having to destroy these products would create unnecessary economical and environmental costs to industry and society.
Article 4	Labelling Member States shall ensure that the products set out in Annex I carry a label when they are placed on the market. The label shall indicate: (a) the subcategory of the product and the relevant VOC limit values in g/l as referred to in Annex II; (b) the maximum content of VOC in g/l of the product in a ready to use condition.	Labelling Member States shall ensure that the products set out in Annex I carry a label when they are placed on the market. The label shall indicate: (a) the subcategory of the product and the relevant VOC limit values in g/l as referred to in Annex II; (b) the maximum content of VOC in g/l of the product in a ready to use condition. **For small packaging less than 125 ml or for products that are used for professional application only, the label may make use of a code instead of a full text. For professional application the code is explained in full text in the technical data sheet.** Include footnote with example from CEPE guideline	User information and safety instructions need to be present on the label in several EU languages. In the case of small packaging there is not enough space on the label to include the full text in all languages. These products will emit only low volumes of VOC. A code should be sufficient for inspection purposes.

Article & Paragraph in Directive 2004/42/EC	Text in Directive 2004/42/EC	Change proposed by CEPE	Justification
Article 9.1	Review The Commission is invited to submit to the European Parliament and the Council: 1. by 2008 at the latest, a report based on the results of the review referred to in Article 10 of Directive 2001/81/EC. This report shall examine: (a) the broad scope and potential for making reductions in the VOC content of products outside the scope of this Directive including aerosols for paints and varnishes; (b) the possible introduction of a further (phase II) reduction in the VOC content of vehicle refinishing products; (c) any new element relating to the socio-economic impact of the application of phase II as foreseen for paints and varnishes;	**DELETE**	This article is outdated.
Article 9.2	2. at the latest 30 months after the date of implementation of the VOC content limit values of Annex II phase II, a report taking account, in particular, of the reports referred to in Article 7 and of any technological developments in the manufacture of paints, varnishes and vehicle refinishing products. This report shall examine the broad scope and potential for making further reductions in VOC content of products inside the scope of this Directive, including the possible distinction between paints used for interiors and exteriors in subcategories (d) and (e) of Annex I, point 1.1. and Annex II, section A. These reports shall be accompanied, if appropriate, by proposals to amend this Directive.	**DELETE**	This article is outdated.
Article 11	Adaptation to technical progress Any amendments necessary in order to adapt Annex III to take account of technical progress shall be adopted by the Commission in accordance with the procedure referred to in Article 12(2).	**DELETE**	Change in Annex III.

Article & Paragraph in Directive 2004/42/EC	Text in Directive 2004/42/EC	Change proposed by CEPE	Justification
Article 13	**Amendment of Directive 1999/13/EC** **1. Directive 1999/13/EC is hereby amended as follows:** **in Annex I, in the section entitled "Vehicle refinishing", the following indent shall be deleted:** **"- the coating of road vehicles as defined in Directive 70/156/EEC, or part of them, carried out as part of vehicle repair, conservation or decoration outside of manufacturing installations, or".** **2. Notwithstanding paragraph 1,** Member States may maintain or introduce national measures for the control of emissions from vehicle-refinishing activities deleted from the scope of Directive 1999/13/EC.	Member States may maintain or introduce national measures for the control of emissions from vehicle-refinishing activities deleted from the scope of Directive 1999/13/EC.	This article is outdated. Directive 1999/13/EC will have been amended when revised Directive 2004/42/EC will be adopted.
Annex I	Scope SCOPE 1. For the purposes of this Directive, **paints and varnishes** means products listed in the subcategories below, excluding aerosols. **They are coatings applied to buildings, their trim and fittings, and associated structures for decorative, functional and protective purpose.**	Scope SCOPE 1. For the purposes of this Directive, **architectural paints and varnishes for buildings** means products listed in the subcategories below, excluding aerosols. **Products used in the coating of substrates at their original point of manufacture are excluded.**	To avoid different interpretations by Member States or coating manufacturers. To eliminate unharmonised application through the EU for application on building products performed in installations.
Annex I.1.1	d) "interior/exterior trim and cladding paints for wood, **metal or plastic**" means coatings designed for application to trim and cladding which produce an opaque film. These coatings are designed for either a wood, **metal or a plastic** substrate. This subcategory includes undercoats and intermediate coatings;	d) "interior/exterior trim and cladding paints for wood" means coatings designed for application to trim and cladding which produce an opaque film. These coatings are **primarily** designed for a wood substrate. This subcategory includes undercoats and intermediate coatings;	d) Simplification. Volumes applied on metal and plastic are negligible.

Article & Paragraph in Directive 2004/42/EC	Text in Directive 2004/42/EC	Change proposed by CEPE	Justification
Annex I.1.1	e) "interior/exterior trim varnishes and woodstains" means coatings designed for application to trim which produce a transparent or semi-transparent film for decoration and protection of wood, **metal and plastics**. This subcategory includes opaque woodstains. Opaque woodstains means coatings producing an opaque film for the decoration and protection of wood, against weathering, as defined in EN 927-1, within the semi-stable category;	e) "interior/exterior trim varnishes and woodstains" means coatings designed for application to trim which produce a transparent or semi-transparent film for decoration and protection of wood. This subcategory includes opaque woodstains. Opaque woodstains means coatings producing an opaque film for the decoration and protection of wood, against weathering, as defined in EN 927-1, within the semi-stable category;	e) Simplification. Volumes applied on metal and plastic are negligible.
Annex I.1.1	f) "minimal build woodstains" means woodstains which, in accordance with EN 927-1:1996, have a mean thickness of less than 5µm when tested according to ISO 2808: 1997, method 5A;	f) "minimal build woodstains" means woodstains which, in accordance with EN 927-1:1996, have a mean thickness of less than 5µm when tested according to ISO 2808: 1997, method 5A, **and Annex IV of this Directive.**	f) Clarification is needed how to perform the measurement of film thickness of wood stains.
Annex I.1.1	i) "one-pack performance coatings" means performance coatings based on film-forming material. They are designed for applications requiring a special performance, such as primer and topcoats for plastics, **primer coat for ferrous substrates, primer coat for reactive metals such as zinc and aluminium, anticorrosion finishes**, floor coatings, including for wood and cement floors, graffiti resistance, flame retardant, and hygiene standards in the food or drink industry or health services;	i) "one-pack performance coatings" means performance coatings based on film-forming material. They are designed for applications requiring a special performance, such as primer and topcoats for plastics **and metals**, floor coatings, including for wood and cement floors, graffiti resistance, flame retardant, and hygiene standards in the food or drink industry or health services;	i) Simplification. Volumes applied on metal and plastic are negligible.
	2. For the purposes of this Directive, "vehicle refinishing products" means products listed in the subcategories below. They are used for the coating of road vehicles as defined in Directive 70/156/EEC, or part of them, carried out as part of vehicle repair, conservation or decoration outside of manufacturing installations.	2. For the purposes of this Directive, "vehicle refinishing products" means products listed in the subcategories below. They are used for the coating of road vehicles as defined in Directive **2007/46/EC**, or part of them, carried out as part of vehicle repair, conservation or decoration outside of manufacturing installations.	Directive 70/156/EEC is replaced by Directive 2007/46/EC.

Article & Paragraph in Directive 2004/42/EC	Text in Directive 2004/42/EC	Change proposed by CEPE	Justification
Annex I.2.1	c) "primer" means any coating that is designed for application to bare metal or existing finishes to provide corrosion protection prior to application of a primer surfacer: (i) "surfacer/filler" means a coating designed for application immediately prior to the application of topcoat for the purpose of corrosion resistance, to ensure adhesion of the topcoat, and to promote the formation of a uniform surface finish by filling in minor surface imperfections; (ii) "general metal primer" means a coating designed for application as primers, such as adhesion promoters, sealers, surfacers, undercoats, **plastic primers**, wet-on-wet, non-sand fillers and spray fillers; (iii) "wash primer" means coatings containing at least 0,5 % by weight of phosphoric acid designed to be applied directly to bare metal surfaces to provide corrosion resistance and adhesion; coatings used as weldable primers; and mordant solutions for galvanised and zinc surfaces;	c) "primer" means any coating that is designed for application to bare metal or existing finishes to provide corrosion protection prior to application of a primer surfacer: (i) "surfacer/filler" means a coating designed for application immediately prior to the application of topcoat for the purpose of corrosion resistance, to ensure adhesion of the topcoat, and to promote the formation of a uniform surface finish by filling in minor surface imperfections; "general metal primer" means a coating designed for application as primers, such as adhesion promoters, sealers, surfacers, undercoats, **anti chip coatings**, **underbody sealers**, wet-on-wet, non-sand fillers and spray fillers; (ii) "wash primer" means coatings containing at least 0,5 % by weight of phosphoric acid designed to be applied directly to bare metal surfaces to provide corrosion resistance and adhesion; coatings used as weldable primers; and mordant solutions for galvanised and zinc surfaces;	To include robust definition.
Annex I.2.1	e) "special **finishes**" means coatings designed for application as topcoats requiring special properties, **such as metallic or pearl effect, in a single layer, high-performance solid-colour and clear coats, (e.g. anti-scratch and fluorinated clear- coat),** reflective base coat, texture finishes **(e.g. hammer),** anti-slip, **under-body sealers, anti-chip coatings, interior finishes;** and aerosols.	e) "special **products**" means: (i) coatings designed for application as topcoats requiring special properties: reflective base coats, texture**d finishes, matt** finishes, anti-slip **coatings**. (ii) **fade out repair additives for use with compliant topcoats, plastic adhesion promotors, tyre paints, rim silver paints** and aerosols	To include robust definition. To allow split of this subcategory in two parts with different VOC thresholds in order to better reflect BAT.
Annex IIB	Maximum VOC content limit values for vehicle refinishing products: Product subcategory e: Special **finishes** VOC 840 g/l	Maximum VOC content limit values for vehicle refinishing products: Product subcategory e: Special **products** **(i) VOC 540 g/l** (ii) VOC 840 g/l	New VOC thresholds to better reflect BAT.

Article & Paragraph in Directive 2004/42/EC	Text in Directive 2004/42/EC	Change proposed by CEPE	Justification
Annex III	Test method: ISO 11890-2 Date of publication: 2002	Test methods: ISO **11890-1 and** 11890-2 **Remove last column and add footnote: Use latest version.**	Different ISO methods are recommended for products above and below 15% VOC. Latest update of ISO method should always be used.
Annex IV		**Measurement of film thickness of wood stains** **The film thickness is always to be measured on the wood substrate. Only the film above the wood surface is included. The method to be used is ISO 2808 method 5A that describes:** **- Measurement of dry film thickness by microscopic method** **- Recommended for film substrates of varying profiles** **The replica shall be produced according to description in EN 927-3 with 5 measurements on 3 chips and the mean value in microns is recorded. The film thickness is measured for the total coating system.**	Clarification is needed how to perform the measurement of film thickness of wood stains.

Annex 28 Stakeholder Document (European Coatings Industry)

28. CEPE's Position (Opinion and Improvements) on Review of the Paints Directive 2004/42/EC, Brussels, 9.4.2008

CEPE the European Council of manufacturers of Paint, Printing Inks and Artists' Colours.

Jan van der Meulen
Managing Director CEPE

CEPE
Conseil Européen de l'Industrie des Peintures, des Encres d'Imprimerie et des Couleurs d'Art. Depuis 1951

Product Directive 2004/42

CEPE's position
(opinion and improvements)
Presented 9th of April 2008
to the
Informal Meeting to discuss
the Review of the Paints Directive
2004/42/EC

CEPE

CEPE's overall opinion on the PD

The Product Directive 2004/42

Positive:

- **Created a level playing field for the producers of DECO and VR products**

- **Achieved and will achieve a further substantial reduction in VOCs.**

CEPE's overall opinion on the PD

The Product Directive 2004/42

Other experiences:

- **Interpretation variations on the scope; in some EU member states the small installation holders for wood coating and metal coating are expected to use PD products.**

- **Interpretation differences between MS on some definitions and terms.**

CEPE's overall opinion on the PD

The Product Directive 2004/42

Other experiences:

- **The definition and the length of the transfer period of 12 months was not recognizing the typical length of the supply chain.**
- **Quite an effort for CEPE DECO and VR to clarify which products are in scope of the PD subcategories**
- **The Deco and VR sector had to absorb higher than anticipated costs to reduce VOCs and to comply with labelling requirements.**

CEPE's proposals for improvement of the PD

(1)

A clear separation of the legal instruments for the application of paints 'in situ' and of the application of paints inside an installation.

CEPE's proposals for improvement of the PD

Outside of VR products, the PD should be the unambiguous instrument that regulates paint products which are applied to substrates that are fixed at their point of use.

A similar substrate that is applied not at its point of use but at a point of manufacture should not be ruled by the PD.

This situation needs resolving before considering inclusion of other paint products that would lead to increasing the complexities.

Product Directive 2004/42

CEPE's proposal (1)

- ***Restrict the scope of the PD for 'buildings' clearly to only 'in situ' applied coatings.***

The PD is an adequate instrument for regulating the VOC emissions via the VOC content of paints that are applied at a large variety of points ('in situ', the fixed point where the use of the coated object is).

Without a clear restriction in the PD to 'in situ', the current scope results in un-intended inclusions, complexities and non-harmonized situations in the EU.

The restriction is proposed to be made by excluding the applying of paints at a 'point of manufacture'.

CEPE's proposals for improvement

(2)

Unambiguous definitions and terminologies.

(e.g. 'building'; category description etc.)

Industry and authorities have a lot of costs for the sorting out of differences.

CEPE's position on the VOC levels in the PD

The CEPE sectors for DECO and Vehicle Refinish

Consider it unrealistic for the current product categories to reduce the VOC limits beyond the currently prescribed levels.

Costs for manufacturers (R&D and labelling) as well as for users of paints (increased drying times + reduced performance characteristics) would be disproportionate.

Annex 29 Stakeholder Document (European Coatings Industry)

29. CEPE - Product Directive 2004/42 (PD) - A clear regulation when it comes to in-situ applied paints and varnishes. Recommendation to improve the PD. Brussels, 7.11.2008

PRODUCT DIRECTIVE 2004/42 (PD)

A clear regulation when it comes to in-situ applied paints and varnishes.

CEPE's recommendation to improve the PD.

Summary

The current PD scope for 'paints for buildings' in Annex I, lacks any explicit wording on the location where such products are intended to be applied. This has resulted into un-intended inclusions of product restrictions for small installation holders, into complexities and into non-harmonized situations in the EU. For suppliers of paints it became unnecessarily complex and they were unable to adequately advice the users of products. National authorities had difficulties to monitor the compliance.

CEPE is a strong supporter of clear regulations and would therefore like to propose a clear distinction between regulations for the application of paints on-site and the application of paints at a point of manufacture.

The PD should be an unambiguous instrument when it regulates VOC contents in paint products that are intended to be applied to substrates already fixed at buildings. **The substrates of articles which are intended for buildings but coated at a point of manufacture should not be ruled by the PD.**

An interpretation that leads to problems.

Introduction.

The PD is an adequate instrument for reducing the VOC emissions via the VOC content of paints that are applied to buildings that are situated at a large variety of geographical points. Applying paints at such locations is called 'in situ' or 'on-site'.

The PD describes explicitly: the paint products and their intended use

From the PD (2004/42/CE) the ANNEX1 SCOPE:

For the purpose of this directive, paints and varnishes means products listed in the subcategories below, excluding aerosols. They are coatings applied to buildings, their trim and fittings and associated structures for decorative, functional and protective purposes.

For substrates that are fixed to the building and receive a coating at that location e.g. walls, floors and ceilings the application is on-site.
But the so-called trim, fittings and associated structures
(grouped Categories without further definition in the current PD) are articles that may or may not be fixed to the building at the time of being coated.
These articles can either receive a coating on site of the building or at a point of manufacture (installation) where after they are (as primed or completely finished article) transported to their final location for being fixed to the building.

The PD limits the VOC content for combinations of product description and their intended use or substrate (see Annex I.1 subcategories). Without any description on the location where the coating is applied this combination (product description fixed to intended use) may be interpreted as the ruling for (limits of VOC content for) products which are NOT applied 'on site' but in a production line. If the user of the product (the installation holder) has a VOC consumption which is below the SED threshold or below a national threshold and has the intention to coat trim, fittings or associated structures he would by this interpretation now be forced to use PD compliant paints.

This interpretation is found with some EU member states.

Remark 1:

In precursory versions of the PD the scope did contain the location indication 'in situ' as such or by excluding the 'point of manufacture'. See ANNEX below.

Not until the above described interpretation came to the industry's attention this flaw was observed.

Recognition for industry practice.

When suppliers formulate paints they always take into consideration the intended location and conditions of applying the paint. A paint that is intended for an 'in situ' brush or roller

application is not suited for the application at a point of manufacture where a spray-gun or dipping or curtain coating will be used.
Formulating such different coatings is also the professionalism of different type of suppliers; those concentrating on industrial applications and those concentrating on consumer or professional application of decorative coatings.

An installation holder uses paint products that are of a different composition than the paints used by the 'in situ' applicator. The installation holder's choice for a product is determined by his specific way of application, by meeting the customers combined requirements on aesthetics and durability of the cured coating and by ensuring certain production efficiencies. If at the same time he has to stay within certain VOC limits, he will achieve these via a 'system approach'. He has the freedom to select for example a non-VOC containing primer and a VOC containing topcoat.
The installation holder is most times specialized in coating of certain substrates (wood or metal or plastic) and does not restrict himself to the coating of articles that will be fixed to a building.

Consequences of this problematic interpretation

Enforcing the above interpretation leads to unrealistic business practices:

For the small installation holder.

1. Not being exempted from the PD, he now should switch to PD compliant products as soon as he has the intention to coat articles that fall under trim etc. Such paint products are not tuned to coating applications at an industrial line. He may not be able to get anymore the level of durability and appearance as he has lost an important degree of freedom the choice of product for a coating job.

2. In fact he is assumed to separate this coating job for trim etc. from all other kind of coating jobs. This suggests a self-restriction as he is still allowed to have the non-compliant products in store as long as he can 'claim' these non-compliant products are for other applications than trim etc.

3. He has to be aware of what is understood and covered by the term 'trim and fittings and associated structures' while without 'on site' the term 'trim etc.' becomes wider and open to whatever coated article that is transported into the building and which may have some connection with any interpretation of 'trim etc'. Different member states deal with this differently.

4. He needs to be aware of two totally different Directives. When the amounts of solvents would increase while his business increases, he may fall under an installation regulation (SED) that works totally different than a PD. Equally would a drop in business mean no all of a sudden be forced to use PD compliant products? Both directions would mean costs for coating process and customer approvals.

5. He faces competition from member states where no restrictions exist for the use of paint products for 'trims etc'.

In those member states that have very low VOC thresholds for the small installation, the installation holder has a choice of products while in member states without any obligation for a small installation the installation holder must use PD products when he coats 'trims etc.'.

Remark 2.

Small installation holders were not consulted as stakeholders during the creation of the PD as this interpretation was not considered.

For the paint supplier.

1. If he is a typical supplier of industrial coatings he is pulled into the scope of the PD while articles such as staircases or radiators that were coated at a point of manufacture are now considered as covered by the PD, as these articles will to be fixed to the building. (Most times these industrial paint suppliers have not been aware of this inclusion as they never were involved in the PD coming into being).

Remark 3

The suppliers of industrial paints for such installations were not consulted as stakeholders during the creation of the PD as this interpretation was not considered.

2. He can still place non-compliant products on the market while installation holders with VOC use above the threshold can still use the product as well as the small installation holder if he can claim a use other than the 'trims etc' applications. As a responsible supplier he wants to fulfil the obligation to ensure that his customer (user) is entitled to use the non PD compliant products. He has to single out a restriction of use for the non-compliant product in a very peculiar way. Indicating on the label or datasheet of that non-compliant product for example:

When this product is going to be applied to trims, fittings and associated structures that go into a building it is exclusively to be used in installations that are either registered under the SED(1999/13/EC) or under local regulations. As applicator you have to check your situation with the national authorities if this applies.
The application to non-building articles is not restricted.

Enforcement by authorities.

The above described complexity and the differences between EU member states make the enforcing of this interpretation unrealistic.

A good framework is needed.

The above described problems can be solved if the PD scope explicitly excludes the applying of paints at a 'point of manufacture'. In this way a better regulation would result that could function as a framework that also would work for adding other paint products. We refer here to CEPE's current co-operation for the PD Review on the inclusion of some

Protective Coatings products into the PD. Contrary if this is not solved such addition of new products to the scope of the PD would multiply the complexities.

ANNEX

Text of scope in pre-final versions of the DIRECTIVE 2004/42/EC

- Decopaint Final Report June 2000, by Chemiewinkel, Enterprise Ireland and WIMM, on behalf of EC DG Environment (Tender E1/ETU/980084), page 6: "*Decorative paints and varnishes are products that are applied to buildings, their trim and fittings, for decorative and protective purposes. They are applied in situ by professional or private users. While their main function is decorative in nature, they also have a protective role*."

- CEPE Guide to VOC Reduction in Decorative Coatings (17-09-2001), page 15: "*Decorative Coatings - Coatings that are applied to buildings, their trim and fittings, and associated structures for decorative, functional and protective purposes. They are applied in situ by professional or private users. High performance protective coatings are explicitly excluded."*

- EC Proposal for a Directive 2002/0301 (COD) from 23-12-2002, annex I-1: "*Decorative paints and varnishes means products listed in the subcategories below. They are coatings applied to buildings, their trim and fittings, and associated structures for decorative, functional and protective purpose. Products used in the coating of substrates at their original point of manufacture are excluded*."

- EP position at first reading COM(2002)750 of November 2003, annex I-1: "*Decorative paints and varnishes means products listed in the subcategories below. They are coatings applied to buildings, their trim and fittings, and associated structures for decorative, functional and protective purpose. Aerosols, wood preservatives, high performance coatings and products used in the coating of substrates at their original point of manufacture are excluded*."

- Council Common Position No 17/2004 of 7 January 2004, annex I-1: "*For the purposes of this Directive paints and varnishes means products listed in the subcategories below, excluding aerosols. They are coatings applied to buildings, their trim and fittings, and associated structures for decorative, functional and protective purpose."*

- EC Directive 2004/42/EC of 21 April 2004, annex I.1: "*For the purposes of this Directive paints and varnishes means products listed in the subcategories below, excluding aerosols. They are coatings applied to buildings, their trim and fittings, and associated structures for decorative, functional and protective purpose."*

CONCLUSION: The text adopted by the EP in first reading was clear and unambiguous limiting the scope to decorative paints and varnishes and excluding products used in the coating of substrates at their original point of manufacture. The text from Council Common Position created uncertainty by including within the scope paints and varnishes applied on buildings without explicitly excluding those products applied on substrates at their original point of manufacture. The Council text was adopted as the final text of Directive 2004/42/EC without amendment at the second reading in the EP.

End of Annex

Annex 30 Stakeholder Document (European Coatings Industry)

30. CEPE - Revision of Directive 2004/42/EC - Decorative Paints and Varnishes - Rationale for no further reductions beyond the 2010 VOC limits, Brussels, 22.8.2008

Revision of Directive 2004/42/EC
Decorative Paints and Varnishes

Rationale for no further reductions beyond the 2010 VOC limits

Introduction

Decorative Market Overview

Decorative Paints and Varnishes comprise of resins, pigments and additives which are carried in a liquid phase. Most of the liquid phase evaporates during or shortly after application leaving a film on the substrate. The appearance and properties of the resulting film depend critically upon the formulation of the coating – which is designed to deliver films that meet specific market segment needs.

Users of Decorative Paints and Varnishes apply them to the desired substrate under a wide variety of conditions which are for the most part outside the control of the user and of the manufacturer. It is essential that the desired appearance and performance can be achieved under a broad range of conditions - so that the desired quality can be achieved every time the product is used. The range of conditions (e.g. temperature and relative humidity) that is relevant across the EU is extremely broad.

VOC's and Historic Trends

Volatile Organic Compounds emitted into the atmosphere have been associated with production of tropospheric ozone and of other gases with negative impacts on human health and on agricultural production. In order to reduce these undesired effects, the Coatings Industry has been reducing their use of VOC's over the past few decades. More recently there has also been legislation - imposing specific limits on permissible VOC levels.

In solvent based paints the liquid phase is the main source of VOC's. Over the past twenty years paint manufacturers have developed water based alternatives for many applications, these water based coatings generally have lower VOC contents and their use and adoption has increased as the technology for water based coatings advanced.

CEPE aisbl • Avenue E. Van Nieuwenhuyse 6 • BE-1160 Brussels • T: +32 (0)2 676 74 80 • F: +32 (0)2 676 74 90
secretariat@cepe.org • www.cepe.org

In water based paints the liquid phase is mainly water however VOC's can be present as minor but necessary components of additives and can be added in relatively small amounts to control application and film formation. This control can be critical to the practical workability of application (for example extending the open time of the coating can be vital to get the flow and appearance required) and to the performance of the film (for example ensuring adequate wetting & penetration of substrate and facilitating sufficient integration of the dispersion resins into a strong binder for the film).

Summary Position

The CEPE's members from the decorative coatings sector believe that the 2010 VOC ceilings for Decorative Paints and Varnishes in the Product Directive (2004/42/CE) represent the practical limit of what is technically feasible without compromising quality and choice across the EU. More stringent limits would impact on practical workability and/or film performance and appearance.
Lower quality products have reduced service life before repainting is needed. Shorter repaint cycles will have more environmental impact (for example, increased carbon footprint) and indeed lead to more VOC emission over time.

A more detailed rationale is outlined below.

Rationale For Retaining 2010 VOC Limits

Interior matt walls and ceilings: Cat a) 30g/l:
Whilst there are many examples of matt wall and ceiling paints with lower than 30g/l VOC, it is not possible to achieve the excellent flow, levelling and filling power combined with washability and the open time that many customers require at less than 30g/l VOC. Lower limits would effectively reduce the choice for consumers for such aesthetically pleasing and durable coatings which were originally delivered from solvent based coatings. They would also compromise application and workability of such coatings in climatic conditions that lead to rapid drying of water based coatings.

Interior glossy walls and ceilings: Cat b) 100g/l
It is not possible to achieve the excellent gloss, flow, levelling and filling power combined with washability and open time that many customers require at less than 100g/l VOC. Lower limits would effectively reduce the choice for consumers for such aesthetically pleasing and durable coatings which were

originally delivered from solvent based coatings. They would also compromise application and workability of such coatings in climatic conditions that lead to rapid drying of water based coatings.

Exterior walls of mineral substrate:
Cat c) 40g/l WB
Open time limits usability in warmer countries so this VOC is needed and low temperatures require coalescing solvents to deliver the desired film performance.

Cat c) 430g/l SB
Markets with poor quality masonry substrates and high humidity conditions use special solvent based products which would be very difficult to apply at lower VOC.

Interior/exterior trim and cladding paints for wood and metal: Cat d) 130g/l WB and 300g/l SB
Both these limits have been extremely demanding to formulate workable prototypes with excellent gloss and flow. Such products are not yet widely commercial or accepted by skilled professional users. There is no technically feasible route to lower VOC products with practical workability, excellent appearance and proven high performance.

Interior/exterior trim varnishes and woodstains, including opaque woodstains: Cat e) 130g/l WB and 400g/l SB
Both these limits have been extremely demanding to formulate workable products with excellent penetration and which show the natural appearance of wood. There is no technically feasible route to lower VOC products with practical workability, excellent appearance and proven high performance.
.

Interior and exterior minimal build woodstains: Cat f) 700g/l SB and 130g/l WB
This level of VOC for solvent based products is needed to give excellent penetration, reinforcement and protection. Water based products in this category offer inferior performance and so it is vital to retain solvent based products for high protection.

Primers: Cat g) 30g/l WB and 350g/l SB
Stain blocking and isolation is not possible at lower VOC.

Binding primers: Cat h) 30g/l WB and 750g/l SB
This level of VOC for solvent based products is needed to give excellent penetration and stabilisation. Water based products in this category cannot be

pigmented so solvent based products are required. Such pigmented products reduce the volume of topcoat required.

One-pack performance coatings: Cat i), Two-pack reactive performance coatings for specific end use such as floors: Cat j), Multi-coloured coatings: Cat k) & Decorative effect coatings: Cat l)
The special performance of these low volume products requires these VOC contents.
The performance coatings need them for substrate wetting, application control and high film performance.
The aesthetic coatings need them to control drying and workability in order to deliver the specific and desired aesthetic effect.

CEPE 080822

Annex 31 Stakeholder Document (European Professional Painters)

31. UNIEP - Response to Review of Directive 2004/42/EC Impact Assessment of Proposed Options for Amendment and of Phase II for Decorative Paints, Brussels, 13.05.2009

European Commission
Environment Directorate-General
Mr Fabio Dalan
B-1049 Brussels

RPA Risk& Policy Analysis Ltd
1Beccles Road
Loddon
Norfolk NR14 6LT

Brussels, 13 May 2009

Dear Mr Dalan,
Dear Mr Vencovsky,

As discussed during the stakeholder meeting on 7 May, UNIEP has elaborated a response regarding Directive 2004/42/EC on VOCs.

In summary, the following answer focuses on four key points:

1. UNIEP supports the CEPE response.

2. UNIEP supports the current levels of VOC reduction in principle from the 2004 Directive and our Members are leading improvements to health and safety generally in the trade. UNIEP also encourages improvements to the environment.

3. UNIEP strongly suggests a formal impact assessment on the improvements in health from the 2004 Directive as EU information suggests a geographical difference in improvements (ie Southern Europe). As such, a targeted approach in future may be more efficient and effective.

4. UNIEP is unable to provide answers to the 22 questions due to shortage of consultation time, new materials not being universally available and more importantly the 2004 Directive has not been fully implemented yet. UNIEP will assist in collating further information after 2010 when the impact can be assessed.

Yours Faithfully,

Erik Kruiderink
President

Dr. Ludger FISCHER – UNIEP - Union Internationale des Entrepreneurs de Peinture
4 Rue Jacques de Lalaing, B 1040 Bruxelles, Tel +32 2 2850 724, Fax +32 2 230 78 61 www.uniep.eu l.fischer@ueapme.com

European Commission
Environment Directorate-General
Mr Fabio Dalan
B-1049 Brussels

RPA Risk& Policy Analysis Ltd
1Beccles Road
Loddon
Norfolk NR14 6LT

Brussels, 13 May 2009

Thank you for the opportunity to respond to the ***Review of Directive 2004/42/EC Impact Assessment of Proposed Options for Amendment and of Phase II for Decorative .*** We note that there are twenty two questions covering three areas of Differentiation between interior and exterior paint, Inclusion of protective coatings and Phase II for paints and varnishes. We further note that a response has been previously submitted by the European Council of Producers and Importers of Paint, Printing Ink and Artists' Colours (CEPE). We accept the findings and results of the CEPE response.

The sanctity of life and the quality of everyone's health is paramount and the painting and decorating profession is at the forefront of training and educating its members in all aspects of health and safety to reduce accidents and detrimental health effects. UNIEP Members aim to drive down health and safety risks to individual painters and decorators and the wider members of the community. Similarly, UNIEP encourages all its members to take a responsible approach to caring for the environment by using the most suitable materials, reducing waste and being aware of the impact of its work on the environment.

Following the European Commission adopting its mid-term review of the Sixth Community Environment Action Programme (6EAP) in May 2007, the Environmental Policy Review for 2007 demonstrated that the Urban population exposure to air pollution by ozone had fallen on average across the EU by nearly 50% from around 6000 SOM035 (Sum of Means Over 35 ppb ozone) to around 4000. UNIEP welcomes this improvement in European air quality (Ref 1, page 54).

UNIEP supports the current reduction in VOC limits for interior and exterior paints (Directive 2004/42/EC), which have assisted in improving air quality in parts of Europe. It is very important for the health of Europe's citizens and especially vulnerable children and adults that harmful emissions are controlled and reduced. It may also improve the health of our members' painters and decorators around Europe from less solvent exposure. It is early days though to fully understand the impact and cost benefit given the fact that the 2004 Directive has yet to be fully implemented until 2010. It will take some time following this 2010 deadline to give a detailed, scientific and business assessment of its impact.

From the Europe maps of effects of ozone between 2000 and projected to 2020, it would appear that the major problem of ground level ozone impacts mostly on southern Europe. It would be very helpful to the review of the impact of the 2004 Directive by collating further statistical data to assess the reduction in premature deaths, respiratory hospital admissions and respiratory medication use so that an educated review can be undertaken (Ref 2). It is important to identify geographical areas for further improvement to make efficient use of resources in targeting an improvement in air quality to acceptable levels.

In order to consider the impact upon the painting and decorating profession it is important that a comprehensive cost benefit analysis is undertaken on the 2004 Directive. However since it is not being fully implemented until

Dr. Ludger FISCHER – UNIEP - Union Internationale des Entrepreneurs de Peinture
4 Rue Jacques de Lalaing, B 1040 Bruxelles, Tel +32 2 2850 724, Fax +32 2 230 78 61 www.uniep.eu l.fischer@ueapme.com

2010, there is insufficient data to undertake such a crucial exercise. UNIEP would welcome a new cost benefit consultation after full implementation in 2010 when our members can constructively respond with qualitative and quantative feedback on the impact. However at this stage without the new materials being fully introduced into the marketplace and used, it is not possible to give a qualified response (Ref 3).

It is also important to appreciate the impact of the recession and the increase in unemployment which has now hit 20.154 million; 8.9% of the working population. In the last year, unemployment has increased by over 4 million. Youth unemployment has hit 5 million which has increased by 1 million in the last year (Ref 4). UNIEP's members have been hit hard by falling orders and we are seeking to particularly mitigate the effects on our young apprentices. Due to the shortness of consultation time for this questionnaire, UNIEP Members are not able to provide detailed breakdown of job losses at this time. However, given this poor economic background, UNIEP is concerned about the affects of tighter regulations affecting the painting and decorating sector by increasing Member costs.

As such, UNIEP finds that there is insufficient data available to provide meaningful answers to the twenty two questions of the questionnaire. Given time following the full implementation of the 2004 Directive, UNIEP would be very willing to proactively assess the effects on Members but would strongly urge that before further regulations are imposed, statistically valid surveys and costs benefit analyses are undertaken to fully and accurately evaluate the affects of the 2004 Directive.

Thank you again for giving UNIEP the opportunity to respond to this important issue.

References

1 http://ec.europa.eu/environment/pdf/illust_epr.pdf

2 http://ec.europa.eu/environment/archives/air/cafe/general/pdf/map_ozon.pdf

3 httec.europa.eu/environment/air/pdf/paint_solvents/2002_05_cost_and_benefits.pdfp://

4 http://epp.eurostat.ec.europa.eu/cache/ITY_PUBLIC/3-30042009-BP/EN/3-30042009-BP-EN.PDF

Yours Faithfully,

Erik Kruiderink
President

Dr. Ludger FISCHER – UNIEP - Union Internationale des Entrepreneurs de Peinture
4 Rue Jacques de Lalaing, B 1040 Bruxelles, Tel +32 2 2850 724, Fax +32 2 230 78 61 www.uniep.eu l.fischer@ueapme.com

Annex 32 Stakeholder Document (European Coatings Industry)

32. CEPE - Revision of Directive 2004/42/EC - Vehicle Refinishes Products - Rationale for keeping current VOC limits or proposed amendments to lower values, Brussels, 6.6.2008

Revision of Directive 2004/42/EC
Vehicle Refinishes Products
Rationale for keeping current VOC limits,
or proposed amendments to lower values

SUMMARY CEPE POSITION

With the current limits for VR in the 2004/42/EC directive, a considerable reduction of VOC emissions was achieved. Based on data collected in the CAFÉ project we estimate a reduction of over 60% for the EU-15 MS, compared to 2000. Since some definitions and articles in the current directive are not fully clear, these reductions have not been fully achieved for the whole of the EU. Misinterpretations or even wrong translations during the transposition in the member states are observed. The first target for changes to the Directive should be on solving these issues.
The TC VR has studied the technical feasibility of further reductions. Their conclusions are listed below. The current VOC limits represent demanding targets to meet the broad range of European customer needs. Further reductions would limit the appearance and the performance of the coating. This would reduce both the life and the quality of repaired vehicles, which would be economically unacceptable.

Preparatory and cleaning: Cat a) 850g/l (solventborne) and 200 g/l (waterborne):
With the current limit for solventborne, the remaining options are aliphatic hydrocarbons (which is the most effective choice for the removal of grease), or a mixture of hydrocarbons and oxygenated solvents for gun cleaning.
For waterborne pre-cleaners, some co-solvent is needed to be effective. Further reductions not feasible

Bodyfiller / - stopper: Cat b) 250g/l
The technology for these putties is: unsaturated polyester that reacts in a radical polymerisation (initiated with a peroxide hardener paste) with styrene, used as a solvent. Since most of the styrene reacts during this polymerisation, the actual VOC emissions will be well below 250 g/l, but since there are no adequate test methods to determine the real VOC emissions during the use of these very fast reacting products in practice, it is better to leave it like it is.

Primer:
Surfacer / Filler and General Metal Primer: Cat c) (i) and (ii) 540g/l
Currently there is no technology that allows these to be formulated at 250 g/l. There have been various attempts to put this in legislation since the early 90's, but no products have made it to the market with success in the last 20 years. It is unlikely that this will change in the coming decade too: the most commonly used technology for high build thick layers is polyol isocyanate, which is not possible in waterborne systems (foam). Alternative 2-K technologies fail on other technical reasons, and 1-K products don't allow a "durable" repair of a vehicle. Technically, the limit for these products has been achieved at 540 g/l products.
For anti chip coatings and underbody sealers, currently as specialty products under Cat. e), the state of the art is 540 g/l, so we propose to add them to this category.

CEPE aisbl • Avenue E. Van Nieuwenhuyse 6 • BE-1160 Brussels • T: +32 (0)2 676 74 80 • F: +32 (0)2 676 74 90
secretariat@cepe.org • www.cepe.org

Wash primer Cat c) (iii) 780g/l
Volumes in this market segment are small. There is no alternative technology for these very thin layers that bring excellent adhesion and corrosion protection on bare metal. Therefore 780 should remain as a limit.

Topcoats: Cat d) 420g/l
This category exists of 3 types of products: single stage topcoats, for which the market share for passenger cars is rapidly declining, compared to the other two, basecoats, waterborne since the directive came into force, which are finished with clear coats. The state of the art for the basecoats is waterborne. Although the percentage of organic solvents in these products is really low (100 – 140 g/l paint), the VOC's are only below 420 g/l because of the definitions of VOC for this category (excluding water).
The state of the art for clearcoats is at 420 g/l. Any reduction here would lead to big problems in the market: loss of productivity, extra reworks, etc.
The state of the art for a number of topcoat products that are currently under Cat. e), is today also at 420 g/l. We propose to bring them into this category for simplification

Special Finishes: Cat e) 840g/l
The following products, currently mentioned in this category, could on the basis of today's technology be moved to the Cat d) (Topcoats): metallic or pearl effect in a single layer, high performance solid colour clearcoats (e.g. anti scratch and fluorinated clearcoat).
The under-body sealers and anti-chip coatings should be moved to cat c) (i), at 540g/l.
For the remaining products we propose to separate into two categories:

Reflective basecoats, textured finishes, matt finishes and anti slip coatings are technically closely related and can be formulated with a VOC below 540 g/l. Also reflective basecoat (daylight reflecting coatings used on ambulances, or fire brigade vehicles) can be formulated at 540 g/l.

Products meant for fading out of spot repairs should be added under e), with an upper limit of 840 g/l; the final phase of a spot repair is done with a diluted paint, but the process as such reduces the paint consumption and the solvent emissions considerably (25 – 50%). Therefore we suggest including here the "fade out repair additives for the use with compliant topcoats". Also plastic adhesion promoters, tyre paints and rim silver paints (not covered by the directive today) should be added here with an upper limit of 840 g/l.

Annex III. Methods referred to in Article 3.1
We suggest to include the method ISO 11890-1 also, because, depending on the actual VOC of the product, this may be needed, Together with 11890-2, they cover the whole VOC range. For products containing reactive diluents, the ASTM method 2369 can be used (although for "Cat b: putties" this does not work. See above).

2008-06-06

CEPE aisbl • Avenue E. Van Nieuwenhuyse 6 • BE-1160 Brussels • T: +32 (0)2 676 74 80 • F: +32 (0)2 676 74 90
secretariat@cepe.org • www.cepe.org

Annex 33 Stakeholder Document (European Coatings Industry)

33. CEPE - Comments with the supply of Vehicle Refinishes data to Ökopol. Brussels, 13.02.2009

Comments with the supply of Vehicle Refinishes data to Ökopol.

Date: February 13, 2009.

1. Methodology for establishing volume data according PD categories

The data herewith submitted to the EC consultant, Okopol (document: **Paint - VOC-EU15-090206.xls**) comprise the volumes of Vehicle Refinishes products sold in the various member states of the EU 15 and originate from official CRB statistics (Chemie Revisions- und Beratungsgesellschaft mbH, Rudolf-Breitscheid-Straße 21, D-90762 Fürth). Already for a number of years such data were collected from a sample of VR paint manufacturers, who represent around 80 % of the total VR market in the EU 15. With their expertise of the market the so collected data could be topped with a best estimate for the missing 20 %.

In the new EU countries the sample of companies from the EU 15 statistics has a market share of 35 %. No reliable figures are therefore available for these new member states.

Since the CRB statistics were introduced already long before the Product Directive 2004/42/EC came into force and were set up from a different perspective (different category definitions and the inclusion of markets beyond the actual VR), the CRB results needed re-arranging by industry experts. The method for adaptation was agreed among the CEPE VR members and was performed by an independent consultant on behalf of CEPE.

The volumes of solvents were estimated by the experts on the basis of an agreed average VOC content per category for the 2003 figures and for the 2007 figures the max. allowable VOC contents according the PD were assumed.

2. Interpretation of the results.

In the EU 15 the paint volume sold saw a reduction from 131.577 K litres to 122.579 K litres when going from 2003 to 2007.
This reduction is for the largest part a result of the switch to higher solids products (means less VOC; see below). The experts did not know if the total numbers of repair jobs (influenced by safer driving, bumper sensors etc) had seen a downturn over this period.

The resulting VOC figures are reduced from 59.554 Tons to 53.073 Tons. This VOC reduction of 6.5KT is a minimum figure while the base of the products in 2007 was taken with the max allowable VOC and the practice has many products with lower VOC content than the maximum.

As the pipeline of products in this supply chain is relative short (in comparison with DECO) and also has a less extensive product portfolio, the switch by the industry to PD compliant VR products could be made at a relatively late moment (i.e. close to the year 2007). The members of the VR sector group in CEPE therefore believe that with the current VOC limits a substantial further reduction will be observed in the years after 2007 (emptying pipeline and increasing the % of compliant products brought to market).

The members also believe that not realizing this future potential VOC reduction can only be attributed to suppliers that sell in this market VR products with too high VOC contents while they are not indicating the intended use of Vehicle Refinish in their documentation and labelling.

JvdM 090213

Annex 34 Stakeholder Interview (European and Dutch Vehicle Repair Shops)

34. AIRC/FOCWA Interview, Jenda Horak, Sassenheim/The Netherlands, 19.5.2008

Interview Jeroen Terwoert/IVAM with: **Jenda Horak; Secretary of the European and Dutch vehicle repair associations (AIRC/ FOCWA)**

Topics

1. AIRC´s response to the ENTEC/PRA-study of 2000
2. Compilation of market data
3. Current vehicle refinish market: non-compliant products present?
4. Problems with the Product directive categorization and definitions
5. Experiences in NL and UK with the Product directive VOC-limits
6. Potential for further VOC-limitation (phase II, 2010)
7. Questionnaire among AIRC member associations.

1. AIRC´s response to the ENTEC/PRA-study of 2000

Market statistics

Market statistics are outdated. The reduction of the number of bodyshops has indeed occurred, but much stronger than foreseen by ENTEC. Current EU-number is about 50.000 instead of 60.000 as foreseen by ENTEC. (Focwa now has 1250 members instead of 1400; each year 80 companies cease their activities).

ENTEC predicted an increase in the amount of work (number of repairs & average damage in euro´s). However, the amount of work has *decreased*.

Impact assessment

The economic situation in the sector is much more difficult than described in the ENTEC-study:

- Less car damages, caused by safer cars (e.g. break assistance etc.), and safer roads (worldwide);
- Overcapacity in the sector, thus strong competition;
- More consumers accept small damages and do not have them repaired (because of weak economy, and the effect of claiming repairs on insurance fees);
- Insurance companies have a very strong position. They are in a very competitive market too, want to reduce insurance fees and force bodyshops to reduce costs in many ways:
    - e.g. by making/forcing agreements on costs of car parts, coatings etc., or by buying the parts themselves instead

of by the bodyshop (in the past, bodyshops could get bargains on car parts, which increased their profit margins);
- In the UK, the number of bodyshops has decreased by 50% in a few years, as a result of the insurance companies´ power.
- As a result, profit margins of bodyshops, EU-wide, have dropped until about 1%. *Jenda will try to collect exact data*.
- UK bodyshops have reduced quality as a result of the pressure of insurance companies (e.g. cheaper materials, spraying less coats, no disassembly before coating, to save labour cost). In e.g. NL and Germany, lower quality repairs are not accepted.

Investments in spraying cabins have been underestimated in ENTEC. Simple adaptations, such as an additional fan, and increasing the height of a chimney, costs about 20.000,- already. The investments mainly relate to additional ventilation capacity needed when switching to waterborne basecoats (see pt. 5 as well.). Investments in stainless steel spraying equipment needed; but not too expensive.
Material savings when using waterborne basecoats, as described by ENTEC, did not really occur. ENTEC assumed a switch towards HVLP spraying equipment, which reduces overspray, but that was current practice already.
Additional energy cost estimations of ENTEC are assumed to be right. However, training costs have been *over*estimated by ENTEC. Not too time consuming, and much support from coating suppliers.

Technology
Heating of lacquers before spraying, as described by ENTEC as a means of reducing viscosity – and thus the need for high VOC-content – does not occur in vehicle refinish operations.
Carbon filters to clean exhaust air of spraying cabins can *not* be used when waterbased coatings are applied. The filters ´get blocked by the water vapour´ (*correct ?-JT*).

2. Compilation of market data

AIRC has provided market data of their 13 member associations (baseyear 2006-2007). These include data on number of bodyshops, number of damages, average damage in euro, and cost distribution.
A number of countries do not have an association (Poland, Romania, Bulgaria); while some associations are no member of AIRC.
The other association, SECRA represents only a few car repair associations; it´s mostly a ´general garages´ association. However, in Portugal and Spain SECRA represents car repair companies.
See ´Questionnaire´.

3. Current market; non-compliant products present?

Not in NL. The big vehicle refinish coating suppliers comply with the directive. However, high-VOC ´general industry lacquers´ are on the market. In some countries, these are used by part of the bodyshops for some applications, instead of the specific vehicle refinish coatings. However, this can only be done in countries in which the standards are not very high.

4. Problems with product categorization in the PD

Yes, in particular the category e. “Special finishes”. AIRC agrees with CEPE. No own proposals. Please have a close look, and maybe follow the CEPE proposals.

5. Experiences in NL and UK with the current PD VOC-limits; feasibility in general

General

Netherlands and UK are an exemption in the EU. Vehicle refinishers have had to use the PD-compliant products already since 2002 (occ. health rule in NL), but many of them started earlier (around 1998). Therefore, the Dutch and British companies have had an advantage, because at that time the economic circumstances were much more favourable than now, allowing for the investments needed. At the moment, all over the EU, the economic situation is very difficult. Profit margins are around 1%.

Technically

Within the topcoats, the Basecoat-Clearcoat system now accounts for almost 100%. The ´old´ ´single layer solid colour´ system has become rare. The normal system is:

- (Washprimer on aluminium; < 780 g/l).
- Filler for filling irregularities (polyester fillers, < 250 g/l)
- Primer-Surfacer (SB, < 540 g/l)
    - Either ´sandable´ (i.e. dried and sanded before applying the topcoat), or wet-on-wet application of topcoat.
- Basecoat (coloured; WB, < 100 g/l): 2-3 layers
- Clearcoat (SB, < 420 g/l); 1 layer.

In order to comply with the PD, the Basecoat is waterborne (< 100 g/l); the Clearcoat is high solids (< 420 g/l as required).
Technically, the 2007-limits are no problem. Low-VOC products have strongly improved over the last years. Just a few remarks:

- Colours: only with a few very specific colours, colour matching may be a problem (very rarely);
- Flow/drying: only with very large vehicles (trucks), spraying wet-on-wet with waterborne basecoats is not possible (high solids used in that case);
- Coverage: slightly less with waterborne basecoat. Sometimes, a higher number of (thinner) layers are sprayed, but total film thickness doesn´t have to increase. Only a slight increase in labour time; not significant.
- Gloss: is determined by the clearcoat, which is still a high solids solvent-based coating. Satisfactory.
- Scratch resistance: similar to gloss.
- Adherence is no problem.

Investments

In order to use WB basecoats, the ventilation capacity of the spray cabin should be increased (min. 30.000 m^3/hr.). Eur. 30.000,- per cabin (?). Stainless steel equipment is also needed.
(Germany has worked with ´high speed´ cabins for a longer time already…?).

Currently, with the 1% average profit margin, it´s very hard for bodyshops to do investments. Insurance companies will not accept cost increases, so the bodyshop has to cover them themselves. The number of (small) companies will further reduce (although it has been an ´autonomous´ development already…also by other demands, e.g. high investments in innovative welding technologies).
The investments are mainly a problem for the phase I limits: a shift to waterborne basecoats has to be made. Any further VOC-limitations might be easier, as the adaptations to the spray cabins have been made already to meet the 2007-limits (!).

Energy costs
Increased costs for heating, because of the increased air flow. ENTEC-estimate assumed right.

Production time/ Labour cost
With waterbased coatings (as said: only one part of the entire coating system: the basecoat), production time slightly increases. Even with the adapted drying conditions (higher airflow in spray cabins) drying time is longer. That is the case because a compromise had to be found: if the airflow becomes too high, defects in the paint film may occur. Thus, the currently recommended 30.000 m^3/hr. is a compromise.
The result is, that less damages per week (e.g.) can be repaired. *Jenda tries to find actual figures to this.*
Labour time not really increases; spraying e.g. one additional layer takes very little time.

Material cost
Waterborne coatings (only the basecoat) are considerably more expensive (no figures). Significant material savings have not occurred (see pt. 1).

Waste treatment costs
Jenda Horak does not think waste treatment costs will be higher when waterbased coatings are used. Water is separated from the other ingredients (most waste streams are cured paint).

Cleaning and degreasing
Generally, cleaning should be done more rigorously when waterborne coatings are used. However, in the vehicle refinish case, only the basecoat is waterborne (up to now). The preceding primer-surfacer is solvent-based. In many cases, the basecoat is applied wet-on-wet on the primer-surfacer (i.e. without cleaning in between), even when the primer-surfacer is solvent-based and the basecoat is water-based (!).
(IVAM has made a project on low-VOC cleaning agents, in cooperation with FOCWA, Akzo Nobel and a trailer manufacturer. Some waterborne degreasers worked well, but it´s not yet state-of-the-art on large surfaces in trailer production. However, it´s more common in vehicle repair – on small surfaces).

Acceptance by insurance companies
Insurance companies do not care about coating types as long as costs do not increase. The warranty lies at the bodyshop and the coating supplier.

Standard warranty periods of vehicle repair work in the EU are 2 years; Dutch bodyshops give 4 years (but only if the coating supplier does the same).

6. Further VOC-reduction

As mentioned above, further VOC-limitations might be easier, as the adaptations to the spray cabins have been made already to meet the 2007-limits (!).
Basecoats are now waterborne already, below 100 g VOC/l. However, PD-limit is 420 g/l. for all topcoats. Split up of basecoat (e.g. 150 g/l) and clearcoat (may stay 420 g/l) may provide additional reductions.
Further reductions in other product categories (all still solvent-based) are difficult.

- *Primer-surfacer* (currently 540 g/l): a Dutch authorities´ proposal was, to reduce the limit to 250 g/l in 2003. However, it did not appear feasible. Primers with less than 250 g/l were available but not specifically suitable for vehicle refinish. Problems are: compatibility with other coatings, ´filling´ capability. No real developments since 2003. A small reduction might be possible (´AIRC has no expertise – consult CEPE´).
- *Clearcoats*: experimental WB products, but not yet fit for the market. Difficult to formulate. Production time would further increase.
- *Washprimer*: applied on aluminum parts. Quite often – more and more aluminum parts. Current limit is 780 g/l, while ENTEC proposal was 650 g/l. AIRC cannot advise; CEPE might.

Other developments

- Infrared drying (to increase production time with water-baseds) is upcoming, but far from current practice.
- Alternative repair technologies which reduce VOC (not described by ENTEC):
    - Removing dents without damaging the coatings, i.e. without the need for vehicle refinish coating;
    - ´Spot repair´: small-scale repair, only spraying the exact location of the damage, and not the (e.g.) entire bumper, as is current practice.

General conclusion (AIRC)

According to AIRC, further VOC-reduction potential in vehicle refinish products is marginal, also compared to other product groups, such as cosmetics and cleaning agents. VOC-reduction by alternative technologies, such as spot repair, is more promising.

Annex 35 Stakeholder Interview (European and Dutch Vehicle Repair Shops)

35. AIRC/FOCWA Interview, Jenda Horak, Sassenheim/The Netherlands, 13.1.2009

Interview Jeroen Terwoert/IVAM with: **Jenda Horak; Secretary of the European and Dutch vehicle repair associations (AIRC/FOCWA)**

Topics

1. Issues related to AIRC´s questionnaire response
    a. General additions/ explanations of AIRC
    b. Need of figures of profit margins
    c. Need of cost figures (investments, energy, training)
    d. Reasons for non-feasibility of WB basecoats in truck refinishing
    e. Influence of climatic circumstances on indoor work?
    f. Potential of WB clearcoats after 2010.
2. AIRC's remarks related to the overlap of directives SED and PD.

1. Issues related to AIRC´s questionnaire reponse

1a. General explanations/ issues

- Car refinish companies have not (yet) suffered additionally from the current economic crisis. People and companies have their cars repaired instead of buying a new one. However, companies that have a dealer-department as well as vehicle repair/refinish *do* suffer.

-The big multinational paint manufacturers, which have a strong voice in CEPE as well as in the national associations, have pressed the national associations not to respond anymore to EU-issues. All responses are channeled through CEPE. "The national associations have become regional offices of CEPE".

-'Quality' of the finish is the major issue. Many VR companies provide a warranty period of 4 years on refinish work. Sometimes they even take over the manufacturers' warranty on the paint system, which may be 12 years. Defects in the coating may cause small companies to get bankrupt.

-VR companies do not have large stocks of coatings anymore (i.e., no stocks of old non-compliant coatings). It's too expensive. Moreover, paint deliveries are very fast nowadays.

1b. Profit margins

- *Mr. Horak will try and collect exact figures* per country in which AIRC has members (14). He will try and collect data on a couple of years, in order to show the trend.

-VR companies in many member states have been rather slow in getting aware of the Product Directive. The UK, Netherlands and Germany were ahead of the rest (i.e., they used waterborne basecoats for some years already). Investments

were made in relatively profitable years in those countries, as opposed to the situation in countries that started to switch over in 2007 or 2008 (see 1st interview of 19/5/'08 as well).
- The general trend in all countries is a decreasing market and decreasing profits (safer cars, tough insurance companies,… see 1st interview). E.g., the membership of FOCWA has decreased from 2000 to 1300 in 7-8 years.

1c. Cost figures
-Investments in spray cabins: the cabin itself remains (but it's not the main cost factor). Ventilators and heating systems have to be adapted when the change to water-based basecoats is made (2007-limits). An increase in the ventilation capacity from 15.000 m^3/h to 30.000 m^3/h is necessary.
-Investments in spraying equipment: adaptations of the equipment are not really needed as a result of the switch from SB to WB. Generally, the spray equipment that is used was of high-quality (stainless steel) already. However, because always both SB and WB products will be used, it is necessary to have *extra* spray guns. This involves a small investment. [High-quality spray guns cost about 250,- to 300,- euro].
-Investment in an additional gun cleaning device is needed. One (closed) gun cleaning system for SB products is needed and one separate device for WB products. Investment: 1000,- - 2000,-.
-Energy input: although ventilation capacity doubles, energy consumption may even decrease! Modern ventilation and heating systems are much more energy-efficient. E.g., so-called "direct heating" systems – which are more efficient - are allowed again (in NL). These had been forbidden for some time because of their (assumed) fire risk. However, this appeared not to be a problem. In addition, 'frequency-changers' can be used *[I'm not sure what it is…-JT]*.
-Drying times/ throughput: flash-off time may be slightly longer with WB basecoats. Throughput may decrease. However, accurate data fail at the moment. They may vary from company to company.
-Resulting impact: this is not clear. The associations do not get much accurate data from their member companies. The situation will vary from case to case. It depends on the actual balance between necessary investments, the type of system chosen, resulting energy increase or savings, actual decrease of throughput (if any) etc.
- Very small companies may choose not to invest in adaptations to spray cabins, but accept longer drying times (these will be much longer, which may largely decrease throughput and increase energy cost!).
-Training: generally, VR paint sprayers are very well-trained. They do not need extensive training to get used to the low-VOC products (in fact only the basecoat – one of the 4 layers of the system). Many manufacturers provide training to the end-users, which may be either free of charge (i.e. it's in the price of the paint), or is offered for only a small fee. Very small companies may not receive in-company training. These may have to travel to training centres of e.g. manufacturers or associations. Alternatively, some companies choose to cooperate, and organize a training in one of their companies.
Altogether, training costs are not regarded high.
- Mr. Horak will try to collect as many exact figures as he can.

1d. Reasons for non-feasibility of WB basecoats in truck refinishing?
As assumed: this has to do with the reduced 'flow' of WB coatings, combined with the large surfaces that may have to be coated at trucks. Generally, high solids products are used.
Small damages might be repaired with a WB basecoat. However, in that case, the VR company will have to use 2 different paint systems on one vehicle. Generally that is not preferred. Paint suppliers may withdraw their warranty if more than one paint system is used.

1e. Influence of climatic circumstances on indoor work?
Yes. Not all companies have conditioned circumstances. The main problem is *cooling*, not heating. E.g., small Italian or Greek VR companies (with flat roofs) may have interior temperatures of 35-40°C, instead of 18-20°C in Dutch companies. Thus, climatic conditions do vary. However, temperature mainly influences the viscosity of *solvent*-based products – and not of water-based products. Altogether, the VOC-content of ready-to-use, sprayable SB products may vary with the temperature.

1f. Potential of WB clearcoats after 2010
Some manufacturers do offer water-based clearcoats already, although they do not yet match the performance of SB (or high solids) clearcoats. In any case, there should be more that one or a few manufacturers that are able to supply WB clearcoats, in order to have competition.
If WB clearcoats succeed, this may provide the largest VOC-reduction potential remaining in vehicle refinish.

Low-VOC primer-surfacers (the 250g/l limit aimed at before, and possibly still aimed at in Germany, for 2010…?) is not feasible. See the interim report.
Primers with a VOC-content below 250 g/l that are on the market are (according to Mr. Horak):
-offered by only one supplier;
-"general metal primers" instead of high performing primers, that are specially designed for vehicle refinish (they are used on e.g. garden fences);
-very low performing products.

Another potential area with a high VOC-reduction potential is "preparatory and cleaning" (cat. a). However, low-VOC products that perform well in all applications (including e.g. silicone-removal, the removal of greases etc.) are not yet available.

2. AIRC's remarks related to the overlap of directives SED and PD

Mr. Horak has provided a 4-page document on overlap problems (in Dutch). Major enforcement problems may arise at companies that combine several types of activities: e.g. vehicle refinish as well as original coating of adapted commercial vehicles that are produced in the company. Problems identified include (I'm not sure yet whether everything has been understood properly; the SED-PD overlaps are rather complicated in case of vehicle refinish-JT):

Various coating activities on *one* vehicle may be covered by either SED or PD
Manufacturers of 'custom-made' trucks buy a 'bare' truck from e.g. DAF or Volvo, i.e. only the chassis + the cabin. Subsequently, the company constructs the rest of the truck (e.g. a horse-transportation truck, trucks for refrigerated transport, etc.). The cabin and chassis have been coated in the factory of DAF. The rest of the truck is coated in the company. Frequently, customers desire the truck to be in the 'company colours'. In that case, both the newly built parts and the cabin are coated.
-for the cabin this will be "refinishing" – so PD-products;
-for the rest of the truck it is 'original coating', so the SED applies.
Even if PD products are used for all parts, the SED applies, so the company has to make a 'solvent-registration' (I only know the Dutch term…JT), solvent management plan etc.

Companies carrying out several types of activities – both SED and PD have to be applied
A common combination is: custom-made truck construction & truck repair. Similar types of overlap occur as mentioned above.

General
The use of the term “refinish” is confusing in the SED-directive. In some cases it refers to ‘original coating’.

3. Conclusion of AIRC

The ‘double’ obligations in a number of cases imply an additional administrative burden for the company, but also for the authorities that have to enforce the regulations. According to Mr. Horak, enforcing the SED is more complicated than enforcing the PD. Therefore, it would be more simple to bring all vehicle coating activities other than original manufacture of cars and trucks (in automated production lines) in scope of the Product Directive. This will be possible if all coating activities of custom-made trucks, including refinish, can be done with PD compliant products (e.g. for topcoats it’s 420 g/l, so high solid products have to be used).
In the Netherlands, the authorities already use the PD-scheme for companies that build custom-made trucks. *Check with CEPE the EU-wide feasibility.*

Comment JT:
One disadvantage of this approach is the fact that “heavy users” of coatings (big companies) will not be obliged to (further) reduce emissions when they use PD-compliant products. Some of the PD-compliant products are rather high-VOC (e.g. primers/fillers: 540 g/l). In the current SED approach they may be forced to install additional end-of-pipe technologies….

Annex 36 Stakeholder Document (European Coatings Industry)

36. CEPE – VOCs and non-automotive paint aerosols, Briefing paper, Brussels, 29.08.2008

29 August 2008

VOCs and non-automotive paint aerosols
Briefing paper

1. SCOPE

Paint Aerosols can be divided into two groups based on their application: 'Automotive' and 'Non-Automotive'.
'Automotive' paint aerosols are regulated as 'vehicle refinishing products' under 'special finishes' category (see Annex I § 2.1 e) of Directive 2004/42/EC (Paint Directive), they account for about 50% of all paint aerosols manufactured within EU. Their Volatile Organic Compounds (VOCs) contents are limited to 840 g/l since January 2007.

CEPE and FEA defines further 'non-automotive' paint aerosols as:

> ***Non-automotive aerosols containing paints and varnishes used to decorate and/or protect furniture, accessories, radiators and appliances***.

This document describes the use of VOCs in such aerosol products and the related technical considerations need for ensure product performance.

The non-automotive aerosol paint industry sector is characterised by paint manufacturers ('fillers') who are SMEs. Those small companies have no or low export outside European Union.

2. KEY POINTS

- The use of liquefied gases (VOC) is essential for aerosol paint packaging/application systems. In order to ensure the spraying ability, the paints have to be diluted, which requires a certain amount of VOC solvent.
- 'Non-automotive' paint aerosols are ready-to-use products which do not need application tools.
- 'Non-automotive' paint aerosols are the ideal spray application method for re-coating and touch-up of furniture, accessories, radiators and appliances.
- VOCs used as propellants in 'non-automotive' paint aerosols are the liquefied gases Propane/Butane and Dimethyl Ether. Different solvent mixtures are used with acetone contributing the biggest volume.
- VOC contribution of 'non-automotive' paint aerosols is minor and has been estimated at 19.7 kt per annum (2007 figures).
- Aerosol propellants and the solvent acetone have a low reactivity potential as precursor to create ground-level ozone together with NOx and sunlight under certain weather conditions (POCP = Photochemical Ozone Creation Potential). Their impact to create 'summer smog' is negligible.
- For a vast majority of 'non-automotive' paint aerosols it is not technically feasible to reduce VOCs in retaining product performance at the same time.
- Water-borne technology currently does not offer a feasible alternative to existing products.

29 August 2008

VOCs and non-automotive paint aerosols
Briefing paper

3. NON-AUTOMOTIVE PAINT AEROSOLS AND ITS ADVANTAGES

'Non-automotive' paint aerosols are paints packed in aerosol dispensers.
The use of those paint aerosols has the following advantages:

- Ready to use and convenient products
- Easy application of the product on complex surface profiles
- Permit the application of special effect finishes on small items
- Eliminate the use of solvents for cleaning application equipment
- Hermetically sealed containers, providing a long shelf-life
- Ideal solution for spraying paints without the use of a spray gun.

4. TYPES OF FORMULATIONS AND TECHNICAL CONSIDERATIONS FOR NON-AUTOMOTIVE PAINT AEROSOLS

As explained above 'non-automotive' paint aerosols include aerosols containing paints and varnishes used to decorate and/or protect furniture, accessories, radiators and appliances.

These paint aerosols include primers, metallic and non-metallic topcoats, glitter sprays, fluorescents, hammer finishes, chrome-effects, clear varnishes etc.

'Non-automotive' aerosol paints are formulated to deliver an even coating that dries quickly to leave a smooth finish.

Coating systems need to be dissolved in a carrier solvent for application, these solvents, e.g. acetone, need to be quick drying as well as and are also compatible with both paint resins and propellants.

Common binders are one-pack acrylic, nitrocellulose and alkyd resins, and combination of them.

Paint technologists have developed a number of systems that can be used to reduce the VOC content of paints; unfortunately these are not suitable for 'non-automotive' paint aerosols for the following reasons:

- High solid coatings ('Concentrate products): In order to be applied as an aerosol, the high solids coating has to be diluted thus negating the VOC reduction benefit.
- Water-borne coatings: Industry made attempts to place such water-borne systems on the market but technically they are unsatisfactory and are not viable for the following reasons:
  a) Incompatibility between resins and propellants,
  b) Poor atomisation of water-borne paints when use in aerosol dispensers,
  c) Safety concerns when metallic ingredients are used with water; for example, if zinc is present hydrogen could be formed.

- Two-pack coatings: There are now some two-pack spray-can technologies on the professional/industrial market. However these paint aerosols cannot be used by consumers because of the need for personal protection equipment. Additionally, pot life (product shelf life after first use) is only of several days.

5. REACTIVITY CONCEPT

The recent new U.S. national legislation, based on the California Air Resource Board (CARB) regulation, establishes a reactivity-based (MIR = Maximum Incremental Reactivity) standard for aerosol spray paints.
The emission limits in the U.S. national standard are expressed in terms of the amount of ozone generated from the VOCs per unit of coating material rather than in terms of the amount of VOCs per unit of product, as traditionally has been the case for mass-based standards.

U.S. mass-based VOC legislation exempts substances which have a low potential to create ground-level ozone, for example acetone which is used as solvent in 'non-automotive' paint aerosols.

The main VOCs used in 'non-automotive' paint aerosols have low or negligible Photochemical Ozone Creation Potential (POCP), specifically in comparison to biogenic VOCs.

Based on the facts that VOC emissions from aerosols are low and that those VOC have only a low potential to create tropospheric ozone CEPE & FEA support the continuing exemption of 'non-automotive' paint aerosols from the Paint Directive 2004/42/EC.

Annex 37 Stakeholder Document (European Coatings Industry/ European Aerosol Industry)

37. CEPE/FEA – VOCs and non-automotive paint aerosols, Briefing paper (II) – Additional information, Brussels, 19.11.2008

19 November 2008

VOCs and non-automotive paint aerosols
Briefing paper (II) – Additional information

1. SCOPE

A joint CEPE-FEA delegation met the consultants Ökopol and IVAM on 5 September 2008 and presented a Briefing paper *VOCs and non-automotive paint aerosols* (dated 29th of August 2008) which was circulated to the consultants before the meeting.

In point of view of the consultants some additional questions were raised. This paper provides the additional information requested.

As explained in the previous briefing paper 'non-automotive' paint aerosols include aerosols containing paints and varnishes used to decorate and/or protect furniture, accessories, radiators and appliances.
These paint aerosols include primers, metallic and non-metallic topcoats, glitter sprays, fluorescents, hammer finishes, chrome-effects, clear varnishes etc.

2. ESTIMATED EMISSIONS

The consultants requested explanations how CEPE-FEA have estimated EU-wide VOC emissions from non-automotive paint aerosols.

This following information was already provided by e-mail on 24 September 2008:

"On a confidential base, major 'players' provided their EU production figures (number of aerosols / units) for automotive and non-automotive paint aerosols. Additionally the figures have been split into three different nominal volumes.
The collected data has been extrapolated with the production figures (number of aerosols / units) from the FEA Statistics.
An average density and an average VOC contents have been agreed (expert judgment).

The VOC estimated emissions for non-automotive paint aerosols (2007 figures) is 19.7 kt.

Based on historical production figures (units), forecasts for 2010 and 2020 were respectively estimated to 21.1 and 25.5 kt."

3. RANGE OF VOC CONTENTS

The range of VOC contents in non-automotive paint aerosols, presented at the EC meeting on 9 April 2008 by the consultants, is very wide (436 to 890 g/l) and needs confirmation and further explanation.

19 November 2008

VOCs and non-automotive paint aerosols
Briefing paper (II) – Additional information

IVAM shared the collected data from Safety and Technical Data Sheets available on the Internet from only 2 companies covering all types of paint aerosols and even non-paint aerosols.

For the non-automotive aerosol paints market only, the range of VOC contents is typically between 520 to 840 g/l.
This range is determined by the paint requirements using different solvents and propellants with different densities, and different solids contents.

4. HIGH SOLIDS AND WATERBORNE AEROSOL PAINTS

During the meeting on 5th of September 2008 the consultants asked for further information concerning the technical feasibility of high solid and waterborne aerosol paints.

Paint technologists have developed a number of systems that can be used to reduce the VOC content of paints. These are not suitable for non-automotive paint aerosols for the following reasons:

1. High solid coatings ('Concentrated products'):

VOCs are reduced by increasing the percentage of solid compounds within the paint. These types of coatings need special equipment used in industrial installations for application. These installations consisting of paint containers, pumps, hoses, spray-guns are heated to warm up the paint in order to lower the viscosity of the paint and to insure spray-ability and flow during the application.

High solid coatings (high solid contents, low VOC contents) are too viscous to be sprayed from an aerosol. In order to be applied as an aerosol, the high solid coating has to be diluted to a similar solvent content as conventional aerosol paints thus negating the VOC reduction benefit.

2. Waterborne coatings

Most waterborne coatings are based on emulsions and dispersions.
Waterborne aerosol paints show considerable disadvantages compared to solvent based paint aerosols. Industry made attempts to place such waterborne aerosols on the market but technically they are unsatisfactory and are not viable for the following reasons:

a. Incompatibility between resins and propellants

Most waterborne coatings are not stable once the propellant is added because it will dissolve and destroy the dispersion/emulsion. The choice of raw material is limited because compatibility with the propellant – only DME is possible – has to be assured.
Therefore only a few waterborne coating systems are compatible in paint aerosols but they have not gained acceptance.

19 November 2008

VOCs and non-automotive paint aerosols
Briefing paper (II) – Additional information

b. Poor atomisation of waterborne paints when use in aerosol dispensers

Essential characteristics of the application are inferior compared to solvent based coatings.
The main disadvantages are:
- uneven flow
- lack of gloss
- spitting
- foam formation

c. Poor coating properties

Essential characteristics of the final surface are inferior compared to solvent based coatings.
The main disadvantages are:
- longer drying time
- worse adhesion on most surfaces
- Poor resistance against water and weather, limiting the use to interior applications only
- Less hardness and firmness of the surface against scratches
- Inferior product performance

d. Users' safety.

A substantial part of non-automotive paint aerosol coatings are decorative effect coatings containing metallic pigments. The presence of these metallic pigments in a waterborne paint aerosol would lead to the formation of hydrogen within the aerosol container.
Even if coated metallic pigments are used, the agitation of the aerosol container could destroy the coating of the metallic pigments and form hydrogen. The same applies to primers containing zinc pigments.

As already mentioned CEPE & FEA support the continuing exemption of 'non-automotive' paint aerosols from the Paint Directive 2004/42/EC.

Annex 38 Stakeholder Document (European Coatings Industry)

38. CEPE – Incorporation of Protective Coatings into Directive 2004/42/CE, Brussels, 9.10.2008

INCORPORATION OF PROTECTIVE COATINGS INTO DIRECTIVE 2004/42/CE

This document has been prepared by the Protective Coatings Sector of CEPE in response to a request from the EC consultants for us to consider including Protective Coatings in the Product Directive 2004/42/CE as a separate annex, in order to regulate VOC emissions from PC products used outside installations, which are currently unregulated.

After an introduction on the role of protective coatings in our society, this proposal is presented in 3 parts, as follows:

Part 1 – PC Scope and Product Categories

Part 2 – Opportunities for VOC Reduction, and Associated Costs

Part 3 – Effect of the Proposal on VOC Reduction in the PC Sector.

Date: 9 October 2008

Role and importance of Protective Coatings for our society.

The following quote is taken from the June 2007 edition of 'Materials World', the magazine of the Institute of Materials, Minerals and Mining, and states:

'**The chemical degradation and electrochemical corrosion of structural and functional materials, apart from being an inevitable consequence of thermodynamics, is a huge cost to modern industrialised economies.**

The original cost of corrosion survey, the "Hoar Report" was commissioned in 1971 and estimated that the cost to the UK economy was between *3-4% of GNP* per year. Similar surveys undertaken in the USA and Japan shortly afterwards also arrived at similar annual costs. More recently, a new survey was commissioned in the UK for which the Institute, through the Corrosion Committee, undertook some contractual work. Although more limited in scope this concluded that the cost was still of the order to *2-3% of GNP* per year. The recently concluded "Cost of Corrosion Survey" undertaken by NACE International within the US context also produced a similar figure'.

At the 10th European Symposium on Corrosion and Scale Inhibitors held in Italy in August 2005, a report from the University of Ferrara in Italy presented an even more serious assessment of costs for the EU as a whole, claiming that corrosion costs every EU citizen €250 per year, corresponding to 4.2% of GNP for EU member countries.

Whatever the true figure, there is no doubt about the importance of corrosion of metal structures in modern life, and therefore the importance of effective corrosion control and prevention.

Protective coatings are one of the main methods by which degradation of our modern infrastructure is prevented and/or controlled. The authorities responsible for our highway systems, railways, bridges, power generation facilities, oil, gas and petrochemical installations and water distribution networks all rely on coatings designed and tested to perform critical protective functions. The testing and approval procedures imposed by these authorities reflect the importance of the performance of the coating system. This may not just be an economic importance, but failure of the protective coating can in some instances lead to weakening and even fracturing of the structure, with possibly life-threatening consequences.
Changes in systems and technologies in the protective coatings field cannot therefore be undertaken lightly – often years of exhaustive testing are required to provide the confidence that novel technologies will provide equivalent performance to their predecessors.

The protective coatings market, therefore, perhaps more than any other coatings sector, is very much based on performance testing and approvals.

Once this process has been completed, manufacturers are not guaranteed to recoup their investment in new product development and approval, as the supply of protective coatings is generally a competitive tendering process, with decisions made on a financial basis from a list of approved products.

Despite the importance of the technical performance of the product, cost remains the final arbiter, even though the coating itself typically represents only 5 – 10% of the overall cost of most construction projects.

The importance of the end-use, and the particular dynamics of the Protective Coatings market, are important factors in the recommendations put forward by the PC Sector Group of CEPE

INCORPORATION OF PROTECTIVE COATINGS INTO DIRECTIVE 2004/42/CE

Part 1 - PC Scope and Product Categories

It is proposed that this section should be inserted into Annex I immediately after section 2 – Vehicle Refinish, to form a dedicated section of the Directive for PC.

Draft Wording for New Annex I – Scope – Section 3 – Protective Coatings

3. For the purposes of this Directive, 'Protective Coatings' mean products applied on site and listed in the subcategories below. They are used for chemical resistance, corrosion and fire protection of metal and concrete structures. They are not used for coating of decorative panels and claddings, for decorative applications defined in section 1 above, nor for ships, Floating Production Storage and Offloading Vessels (FPSOs) or other mobile marine craft.

Example applications include – typically but not exclusively – protection of structural framework of steel-framed buildings, designed to provide long-term structural support and integrity. Concrete, steel and other metallic structures such as petrochemical facilities - including oil and chemical storage tanks – offshore structures such as jetties and oil and gas platforms; infrastructures such as bridges, dams, waterworks, and harbour facilities; pipelines, seagoing containers and power generation, including nuclear, hydroelectric, coal, oil and gas powered stations and sustainable energy facilities.

3.1. Subcategories.

a) 'multi-pack primers and intermediates' means chemically curing anticorrosive primers (excluding zinc pigmented primers (see 'b'), prefabrication primers, etching primers, holding primers and sealercoats), for steel and other reactive metals such as zinc or aluminium, including primers formulated for application

onto poorly prepared, contaminated and damp surfaces, and special primers for adhesion to concrete. This category also includes two-pack barrier coats and build coats / undercoats, including those with functional pigmentation, such as micaceous iron oxide, or those formulated purely using opacifying pigments and fillers.

Apart from long term anticorrosive protection, these products are used for a variety of specialised applications, including heavy duty floor and bund coatings for metal and concrete surfaces providing, for example, chemical and abrasion resistance or self-levelling properties. Also primers for immersed surfaces and those used as base coats for high-performance topcoats such as chemical resistant finishes.

b) 'zinc primers' means anticorrosive primers pigmented with sufficiently high levels of zinc to provide sacrificial protection for metallic surfaces. These can be formulated in organic resins – such as epoxies or polyurethanes (including moisture cured polyurethanes) – or in inorganic silicate media. They are generally used in conjunction with a high-performance topcoat where a high degree of corrosion protection, or long term durability, is required. Inorganic zinc primers may also be used for high temperature resistance and in some specialised tank lining systems.

c) 'one-pack primers and intermediates' means the same as for multi-pack primers and intermediates, but the products are formulated on single component resin systems which cure by evaporation, oxidation or reaction with atmospheric moisture.

d) 'tank coatings' means one- or two-pack coatings designed for application in single or multi-coat (primer + topcoat) systems for lining chemical or water storage tanks. These systems are specially formulated to have enhanced water and/or chemical resistance.

e) 'multi-pack finishes' means high performance chemically cured topcoats with good chemical, water and/or weather (UV) resistance, but excluding specialised high temperature resistant finishes. These coatings are normally used in conjunction with two-pack chemically cured primers and intermediates, and they must therefore display good compatibility with and adhesion to, in particular, category (a) and/or (b) products. The particular properties exhibited by these finishes depend on their end use, and range from chemical resistance to immersion or heavy duty non-skid floor finishing.

Multi-pack finishes also include products designed for application directly to the substrate to provide both protective (anticorrosive) and decorative functions in a single application. They may be gloss, semi-gloss/sheen or matt in appearance.

f) 'one-pack finishes' means the same as for multi-pack finishes, but the products are formulated on single component resin systems which cure by

evaporation, oxidation or reaction with atmospheric moisture. They are normally used in conjunction with category (c) or (a) products.

g) 'intumescent coatings' means specialised fire protection coatings which react and intumesce (swell) on heating to create an insulating layer. This restricts the increase in substrate temperature and delays or prevents structural collapse in fire situations. Coatings which do not protect the structural integrity of a building, but which prevent the surface spread of flame through intumescent or other reactions, are excluded.

ANNEX II

C. MAXIMUM VOC CONTENT LIMIT VALUES FOR PROTECTIVE COATINGS

	Product Subcategory		**VOC limit – g/l(*)(from 1.1.2012)**
a	Multi-pack primers and intermediates		290
b	Zinc primers		460
c	1-pack primers and intermediates		420
d	Multi-pack finishes		420
e	1-pack finishes		440
f	Tank linings		370
g	Intumescent coatings	Solvent borne	440
		Water borne	140
(*) g/l ready for use.			

<u>Proposed amendment of 2004/42/CE – Article 3, clause 3.</u>

Some Protective Coatings products are approved for use in highly specialised situations, for example specific nuclear applications. These uses generally involve small quantities of material, but because of the special properties required and the serious consequences of product failure, the testing and approval process may be extremely onerous, lengthy and expensive. The time and costs involved may be out of all proportion to the value of the supply or the environmental benefit that may be obtained, providing little justification for undertaking development and testing of reduced VOC product options.

It is therefore proposed that Article 3.3 of the Directive be amended to allow Member States to grant exemptions from the regulations in such special situations, similar to the situation in the US EPA where provision is included for certain small volume products 'to prevent the elimination of speciality products for niche markets that could not easily be reformulated'.

PC suggest that the wording of Article 3.3 could be amended along the following lines:

'Member States may grant individual licences for the sale and purchase in strictly limited quantities of products which do not meet the VOC limits laid down in Annex II:

- For the purposes of restoration and maintenance of buildings and vintage vehicles designated by competent authorities as being of particular historical and cultural value, and

- For highly specialised end uses where the cost and/or time required for the testing and approval process is disproportionate to the benefit gained, or where the consequences of product failure may compromise safety, health or the environment.

Part 2 – Opportunities for VOC Reduction and Associated Costs

The objective of this document is to set out Best Available Techniques (BAT) for the Protective Coatings industry.
In its preparation, all industry interests have been considered, so that it describes realistic possibilities for reducing Volatile Organic Compounds (VOC's) wherever protective coatings are used outside installations. It also contains a proposal that will produce reductions in VOC emissions that ultimately exceed the scope and targets of the Solvent Emissions Directive as set out in Council Directive 99/13/EC.

This proposal is based on:

- An appreciation of the cost of steel and concrete degradation (through corrosion, fire or other degradation processes) to the EU economy
- A knowledge of current and emerging protective coating technologies
- An understanding of the demanding expectations from the protective and value-preserving functions of protective coatings, and
- A consideration of the different climatic conditions between northern and southern Europe, and the effect of this on product formulation, performance and use.

Non-SED Protective Coatings Applications

Other than for building paints and vehicle refinish products, VOC emissions from the use of paints is regulated through the Solvent Emissions Directive (SED), which applies to paints used in 'installations'. In the case of protective coatings, therefore, total VOCs - expressed as a percentage of total paint and solvent usage - are limited to 37.5% by weight for installations using between 5 and 15 tonnes of solvent per year, and 27.3% for installations using more than this.

However, because of the nature of the steel and concrete protection market, not all product supplied by protective coatings manufacturers will be applied in installations, and a significant volume is applied at site for finish coating or maintenance work. At the moment this usage is unregulated.

Breakdown of the protective coatings market has proved to be very difficult because of the unavailability of factual data, but estimates made by the PC members of CEPE suggest that on-site applications account for between 35 and 40% of total paint volume, the precise proportion varying depending mainly on economic factors, which affect the ratio of new construction to maintenance carried out in the sector.

Protective Coatings are represented primarily by coatings using solvent-borne technologies, although some water-borne and solvent free technologies are also used. Solvent-borne protective coatings in some cases require the addition of solvents or thinners prior to use – particularly in cold conditions where increased viscosities make efficient spraying difficult without thinning - and solvents are usually used for cleaning application equipment and in some cases for the preparation of steelwork, e.g. de-greasing. The solvent used in the products and those used in thinning and equipment cleaning are classed as VOCs.

Water-borne coatings predominantly use water as the carrier, but usually contain small amounts of additives such as materials to aid film coalescence or to retard drying. These are often VOCs but may be essential to achieve the required performance and application properties.

Solvent-borne products play a very dominant role in the PC marketplace and are generally preferred to water-borne products. These preferences are due to considerations such as performance, application and handling characteristics and aesthetic appearance.
Water-borne products are also very often less able to be applied economically at the thicknesses necessary to provide long-term protection to exposed steel structures.

Solvent-borne products generally show the following advantages:
- Higher levels of performance on steel and other metallic substrates.
- Easier application properties and greater film-build capability.
- Higher levels of film performance e.g. mechanical or chemical resistance.
- Increased aesthetic appearance e.g. better gloss and gloss retention.

Although technologies for water-borne products are continually improving, other than for specific applications the PC industry does not believe they will be capable of replacing a significant proportion of solvent-borne coatings, at least in the foreseeable future. Even where replacement is possible, it will predominantly be in facilities where the conditions for application and drying can be controlled – i.e. in SED installations.

Outside such installations, in Northern Europe particularly, unreliable climatic conditions make the general specification of water-borne products, for site application, very risky. For example, conditions which retard drying – such as high or increasing humidity – may give rise to severe flash rusting of steel surfaces, affecting subsequent coating performance. Even storage conditions of paint in the can may cause problems, as

water-borne coatings are particularly susceptible to cold conditions and may be denatured if the container is allowed to freeze.

The difficulty of overcoming adverse environmental conditions, along with the technical disadvantages outlined above, makes a significant use of water-borne technology in the PC market, in non-SED applications, difficult to envisage within the foreseeable future.

VOC Trends in Protective Coatings

Historical data for the VOC content of protective coatings is difficult to find; the best estimate of overall average VOCs comes from data supplied by the British Coatings Federation (formerly the UK Paint Manufacturers' Association) which calculated that the average VOC for this sector in the UK in 1990 was 545gm VOC/litre of paint.

A more accurate assessment of VOC content for the sector, for the EU15 states, was determined by CEPE members and produced figures of 446 gm/litre for 2000 and 433gm/litre for 2005. Both the latter figures take into account the supply of solvent for thinning and cleaning purposes.

The trend of reduction in VOC content of the overall paint usage reflects the influence of national VOC legislation in some Member States and the anticipation by manufacturers of the introduction of the SED from 31st October, 2005.

VOC Reduction Possibilities for On-site Applications

For the reasons outlined above, major VOC reductions through the replacement of current technology by water-borne alternatives is not achievable for on-site applications in the PC sector across the EU. Problems associated with low temperatures, high humidities, surface cleanliness and condensation etc are currently difficult to overcome.

It is, however, possible to produce solvent-borne products with a lower solvent content and modern high solids technology can be used to formulate products that offer many of the attributes of traditional products but with significantly reduced solvent content. There will be challenges for the paint industry – notably in achieving acceptable drying and handling characteristics and in producing coatings capable of application at the lower end of the required dry film thickness range. This is perhaps the greatest challenge for paint and application equipment suppliers jointly – poor control of the thickness of high solids products where low dry film thicknesses are specified leads to wasteful paint usage and excessive applied costs. It can also lead to less-than expected reductions in VOC emissions, if these are determined on the basis of VOC emissions per unit area.
In some areas of the PC sector therefore, high solids coating development and use will be easier than others, and the process of formulating high solids/high build coatings is already well advanced. In other areas, the required changes will take time.

The industry will need to reformulate a large and important part of its existing product range and this can only be achieved over a period of several years. Moreover, achieving further reductions in VOC emissions will entail major changes to many products, to product application techniques and to performance characteristics. Extensive – and expensive – re-testing and re-approval of products will also be necessary in many cases, and as the experience of the Deco manufacturers has shown, disproportionately high costs may be associated with apparently simple 'administrative' consequences such as product withdrawal and re-labelling.
The industry cannot, in many product areas, make low-VOC products that are identical to existing ones. The significant differences that will occur will have to be communicated to the end users and hence will require a detailed and extensive communication and training programme between the coating producers and the coating users. The changes will also have significant economic consequences arising from increased research, development and testing, raw material costs and re-investment in manufacturing equipment.

From the end user's point of view also, technology changes will involve significant re-investment – primarily in application equipment capable of dealing with more viscous, reactive or temperamental products, but also in education and training of operatives to use the new technologies efficiently.

It is therefore essential that in developing the guidelines for VOC reduction, a balance is struck between environmental benefit, cost and practicability – there is little merit in stipulating formulation criteria that make a product impossible to apply efficiently, or that cannot be applied at an economic thickness.

The CEPE proposal is based on detailed input from across European industry and hence utilises a detailed and widespread knowledge of the marketplace, customer requirements and technologies. It is intended to maximise VOC reduction whilst correctly addressing market issues. The proposal also takes into account the technological, disruptive and cost implications of 'staggered' VOC reduction, and is therefore based on a single ambitious reduction target with a slightly delayed implementation timetable to allow manufacturing industry adequate time to re-formulate.

Part 3 – Effect of the Proposal on VOC Reduction in the PC Sector

There is no mechanism at present for collecting accurate data regarding paint and/or solvent usage in the Protective Coatings sector, although CEPE data collated from its membership provides a reasonably representative view of the ratios of different product types used across the EU. However, in order to estimate the overall market size and total VOC emissions of the sector, a considerable amount of extrapolation has to be applied to the data, and the estimates presented below are therefore arrived at on the basis of a number of assumptions.

For example, for some member states of the original EU15 and most of the subsequent 10 accession states, the product volumes are not collated by national associations and are therefore based on CEPE members' best market estimates.

Based on these assumptions, it was estimated that the PC market within the EU15 in 2005 was 171KT of paint + solvent, increasing to 202KT for the EU25.
The estimated VOC emissions produced were 55.3KT for the EU15 and 65.5KT for the EU25.

In determining the likely impact of the current proposal on these emission figures, it has been necessary to make further assumptions regarding the proportions of different sized users in the PC market. As a broad estimate the following market split has been used:

SED Installations using >15 tonnes VOC – 25% of market in terms of product used
SED Installations using 5-15 tonnes VOC – 25% of market

Product used outside installations – i.e. on site or for maintenance, and hence non-SED applications – 40% of market

Therefore, in the EU25, 26.2KT of VOC is estimated to be emitted from on-site application of PC products.

This PC proposal is based on the following motivation:

- To offer significant reductions in the above emission levels, by bringing all on-site PC application – including maintenance painting – into scope of the Product Directive. The recommended VOC limits by product category are designed to deliver a VOC reduction at least equivalent to the strictest requirements of the SED itself.
- To remove the inconsistencies of interpretation from the current situation and eliminate differences between member states in interpretation of the term 'building' (as used in the scope of Annex 1) and whether the PD applies at site, in shop or both etc, in order to provide a more even playing field across the EU.

<u>Product Categories and VOC Limits</u>

A detailed assessment of the PC market, carried out by CEPE membership in 2001, showed the following product mix by volume:

Multi-pack primers and intermediates, including surface-tolerant products	- 34.1%
Zinc primers – mainly zinc silicates, zinc epoxies and polyurethanes	- 5.5%
Single pack primers and intermediates	- 11.5%
Multi-pack finishes	- 18.9%
Single pack finishes	- 20.5%

Tank linings	- 4.7%
Intumescent coatings	- 4.8%

Of the intumescent coatings, half were water borne and represented the only significant on-site use of water-borne products in this sector. In general, these products are applied on building new construction after cladding, so in a partially protected and potentially controllable environment.
Thinning and cleaning solvent was supplied to a volume of 9% that of the total paint supplied.

In addition to the above product categories, the following products are also included in the PC product range, but are not included within the scope of the proposal for the reasons outlined below:

Blast and Pre-fabrication primers – mostly applied in installations, so regulated under the SED. Usage on site is very small.

Tie-coats and sealercoats, and Heat-resistant coatings – their function requires these to be low solids and low film build, so little scope for re-formulation. Volumes sold represent less than 3.5% of the market in total.

The maximum VOC limits proposed for the product categories that make up the PC market are based on consideration of:

- current technology and anticipated advances in technology
- performance requirements of the products
- current best practice in coating application, and anticipated advances in application techniques
- the need for products and specifications to allow and support efficient and productive working practices, especially in application and handling operations.

Benefits of the Proposal

The benefits of the proposal must be measured against the objective of significantly reducing VOC emissions from the PC sector.

By applying the maximum VOC levels per product category to the product mix for the PC market (2001 figures), and reducing the cleaning solvent usage by 2% to allow for greater uptake of solvent recovery techniques in the sector, the overall VOC percentage can be determined. On this basis, the actual VOC usage would become 26.5% by weight of total paint + solvent used in painting operations covered by this proposal – i.e. well below the strictest VOC limit calculated for >15 tonne users under the SED.

This would equate to an actual VOC reduction for on-site PC applications from 26.2KT to 21.0KT, a saving of over 5KT of VOC per annum.

In practice, this reduction is a very conservative estimate because:

- All calculations are based on the **maximum** VOC for each product category. In practice, we know that where a compliant coatings approach has been adopted elsewhere, not all products will actually be supplied at the maximum limit and most will be formulated well below it.
- The VOC limits assume that 5% of solvent supplied is used for thinning and hence emitted. In practice, this is likely to be an overestimate of paint thinning. All products are supplied ready for use, and thinning should normally be required only to aid application in certain circumstances – for example in cold conditions where increases in paint viscosity may be experienced.
- It is likely that product mix will change once the compliance limits are introduced. For example 1-Pack primers at 420gm/litre will lose market share to Multi-Pack primers at 290gm/litre, so reducing overall VOC.
- Specifications will increasingly be based on Compliant Coatings, so that painting in installations will eventually be drawn into using higher solids technologies, even if the regulations do not strictly require them to.

It is therefore anticipated that the PC proposal will bring about a greater than 5KT reduction in VOC emissions from the sector.

Annex 39 Stakeholder Document (European Coatings Industry)

39. CEPE – Protective Coatings Proposal, Response to Okopol queries, Brussels, 14.01.2009

Protective Coatings Proposal to be incorporated into Product Directive 2004/42/CE

Response to Okopol Queries.

Q1 – Reduction potential of the proposal is relatively small.

While in terms of VOC tonnage, a 5KT reduction may appear small by comparison with some other sectors, especially Deco, we would ask you to take into account the following factors, which may help to put this reduction into perspective, and which illustrate the considerable effort which the PC sector are willing to commit to in order to deliver this reduction:

1. The PC sector as a whole is only 4% of the size of Deco, and unlike Deco approximately 50% of PC usage is already regulated under the SED. In this context, a 5KT reduction in emissions is not an insubstantial achievement, even by comparison with Deco.
2. In real terms, 5KT reduction from a sector whose non-SED emissions were estimated to be approximately 26.2 tonnes VOC in 2005, represents almost 20% reduction, which is not insignificant. Unlike DECO, the Protective Coatings sector does not have a large part of indoor applications that could go to waterborne coatings.
3. In calculating the estimated reduction, we have assumed that **all** products will be supplied at the upper limit of VOC content, as reliable figures for average VOC for each product category are not available. In practice, the actual reduction will be related to the average VOC of products supplied, not the maximum, so the true reduction in VOC emissions will be significantly more than our 5 KT estimate. Some additional information regarding this is given in the response to Question 4.
4. We do not believe that splitting steel and concrete coatings would have any significant impact on these projections. Concrete coatings are a relatively small proportion of PC sales and to regulate these separately would create an additional administrative burden for little or no gain. This is because – as you rightly point out – many concrete applications already utilise solvent-free technology and this will not be changed by targeted limits so their effect on the VOC figures, both current and future projections, will be neutral.

Q 2 – Additional Solvents and their use in PC.

Your impression is correct – very little if any solvent will be used in site-applied activities in the PC sector for surface degreasing. Our solvent figures are for thinning and equipment cleaning, **not** surface cleaning. 9% is the 2005 level of solvent supplied for these 2 uses.

In our proposal, we have incorporated 5% of this as thinner to allow product to be adjusted to a 'ready for use' viscosity, which brings our approach into line with other sectors already operating under the Product Directive. In practice, not all products will require the use of this thinner percentage (and it is likely to be seasonal, with little or no thinning being required in warmer weather) so 5% in reality is likely to be an over estimate – hence some additional savings may be obtained here.

Of the remaining 4% currently supplied for equipment cleaning, VR figures – and recent experience of operating under the SED – suggests that solvent use in equipment cleaning can be and is being reduced significantly by the use of solvent recovery etc, so we have reduced our projected 'cleaning' solvent figure from 4% to 2% - which again we believe to be conservative, as trials carried out by VR showed that an 80% reduction in cleaning solvent was achievable by these measures.

Q 3 – Text on exemptions.

We agree with your revised wording being

"For highly specialised end uses of protective coatings as defined in article xxx, etc."

This to prevent new exemptions to be claimed under DECO.

Q 4 – Relationship between current overall average and proposed product VOC limits

We think you are perhaps confusing the relationship between maximum and average VOC figures.

433gm/litre was the overall average VOC figure calculated for the PC Sector as a whole in 2005. Within this figure:

- Some product categories had much higher averages than 433gm/ltr, and some much lower.
- Our product categories are quite broad and – by the nature of the PC business – each includes a range of products whose VOC contents are often dictated by their particular end use. For example, some product applications are met ideally by high solids / low VOC products, but at the other end of the scale some applications require properties that can only be delivered from lower solids technologies.

Therefore, our most accurate industry data from 2001/02 (which we believe will differ only slightly from 2005 figures) show:

Product Category	Maximum VOC from PC Proposal gm/litre	2005 Approximate Data expressed as 'Ready for U	
		Average VOC	Maximum VOC
b	460	480	575
e	440	500	545
g	440	345	465
c	420	505	555
d	420	415	480

As the data shows, it is unfair to compare the overall sector average – or even individual product category averages – with the proposed new limits.

If 2005 actual maximum VOCs are compared with the new proposed limits, it will be seen that the proposed reduction is considerable in every category except 'g'. This is an exception because some types of intumescent paint (for cellulosic fires) require properties related to

thermoplasticity and melting point to be effective, so the scope for re-formulation is very limited. However, even here we are bringing down the maximum VOC limit from its 2005 maximum. Please note also that this product category includes products formulated for hydrocarbon fires, applied at much higher thicknesses for oil industry applications, which are very high solids products and which therefore have a significant effect on the average VOC for this category, which is considerably lower than the maximum for the category, and also much lower than the 2005 overall average of 433gm/litre.

Because our approach is to significantly reduce the maximum VOC limit, this will take a significant range of higher VOC products out of the market. These will be replaced by higher solids products, resulting in an overall significant reduction in the Sector average. The relationship between maximum and average VOCs in the table above demonstrates that in practice the average will be well below the maximum for every product category, so that in real terms the actual VOC reduction we will achieve will be significantly greater than the 5KT we have estimated, because this is based entirely on the maximum figures.

Q 5 – Relevance of cost implications for users of lower VOC products.

Many of our existing higher VOC products are still in use because their applications are specialised and cannot easily be fulfilled using lower VOC alternatives. Our proposal will, in every product category, remove from the market a range of these higher VOC products, and these will have to be replaced.

This may require a variety of solutions, from development of novel technologies in some cases, the use of more sophisticated application equipment in others, and in almost all cases re-training of specifiers and applicators.

One of the common consequences of this proposal – across almost all product categories – will be changes in product properties such as drying and curing, which will create challenges for formulators and applicators and which may require undesirable solutions such as increased use of energy (heat) to reduce productivity problems. All of these challenges must be met and more acceptable solutions found in the time available before this Directive comes into force. The industry is committed to facing up to this challenge.

Another aspect of this question is that even where current technology may be appropriate and will not cause difficulties in one product category, it must be recognised that very few coating specifications are based on products from a single category – usually a specification will involve at least a primer, an undercoat and a finish. In many cases, while we can accept that the proposed VOC limits for finishes may not create serious problems for an applicator, or the need for different application technology, the fact that he first needs to apply a primer with a much lower VOC content might well cause considerable difficulties, requiring re-assessment of equipment, process factors such as drying and overcoating times and re-training of applicators.

We must therefore consider difficulties in the context of a typical specification, not just individual product categories.

Q 6 – Assumptions in market estimates.

The estimates of market size and VOC emissions is based on input from CEPE member companies, since no reliable data have been collated by any other body.

During this study, the Protective Coatings Sector Group of CEPE included representatives of the 9 major manufacturers supplying the EU member states, most of which also supplied the new Eastern European member states.

From their knowledge of the market in each country, members were asked to provide estimates of market size in each. The estimates were supplied in confidence to CEPE, who compared and collated the information to create a 'best estimate' for each country. The most reliable estimates were considered to be those where most member companies were active and could provide data, and figures for some Eastern European countries were therefore probably the least accurate.

The data supplied in this way provided an estimate of total EU market size in litres.

The PC Technical Committee then provided information to CEPE regarding the product split supplied into their main markets. The Committee decided on the product categories that defined the PC market, and identified the information necessary in order to quantify VOC emissions from the sector, which included:

- Volumes supplied in each product category
- Average SG of products in each category
- Average VOC in gm/litre for each product category

Each member company provided its own information in confidence to CEPE, who analysed the data and determined a comprehensive picture of the PC market in the EU, comprising total market size, product split, VOC by product category and in total, and a rough estimate of individual country contribution to consumption and VOC emissions.

It was accepted that the detailed breakdown would include inaccuracies due to the assumptions made – in particular in relation to Eastern European countries – but that the overall estimate would be the best currently available.

The main assumption made was that the product split and average VOC per product category would be the same in each country, except where variations were known to occur. No variations were recognised for Eastern European countries, so the same principles were applied as to the Western states, even though we suspected that in 2005 the overall VOC content of Eastern European products would be higher than in the West.

Although this may have distorted the starting point to some extent, its only effect on the current proposal would be to under-state the VOC reduction tonnage this proposal will achieve.

090114 JvdM

End of document

Annex 40 Stakeholder Document (European Coatings Industry)

40. CEPE – Impact Assessment – Protective Coatings proposal for inclusion in Directive 2004/42/CE, Brussels, 24.04.2009

Impact Assessment – Protective Coatings proposal for inclusion in Directive 2004/42/CE.

090424

1. *Proportion of the protective coatings market that would fall under the scope of the proposal and that is already compliant with the proposed limits as opposed to the proportion of the relevant market that currently exceeds the proposed limits (by volume or by value).*

Industry data collected and analysed in September 2003 identified the maximum VOC levels then in use for each category of protective coatings. These values are presented in the table below, alongside our proposed maximum VOC contents for each category. In each case, the data are presented with 5% solvent added, to provide a comparison of the figures 'as applied'.

Product Category	Maximum VOC in gm/litre as applied (i.e. including 5% thinner)	
	Protective Coatings Proposal	Actual Market Data (Sept 2003)
2-pack Primers and Intermediates	290	445
Zinc Primers	460	570
1-pack Primers and Intermediates	420	550
2-pack Finishes	420	480
1-pack Finishes	440	540
Tank Linings	370	470
Intumescent Coatings Solvent Borne	440	460
Water Borne	140	No data

There has been substantial downward movement in the overall average VOC per product category since late 2003 as a result of introduction of the SED, but we believe that because these are broad categories representing a range of product end uses, there is still a requirement for specialized products at the upper end of the VOC scale.

The reduction in the 2003 maximum figures is therefore likely to be rather less (than the reduction in overall average figures), but we have no data to quantify the proportion of the market that remains above our proposed limits. It is evident from the table, however, that in all categories except intumescents (which are a special technology and hence a special case) the reductions in upper limits that we propose are significant.

2. ***Cost of investment by manufacturers*** *(production equipment, product re-formulation, re-testing and re-approval, stranded assets).*

Most protective coatings manufacturers already have equipment capable of producing the higher solids products required by our proposal. There may be impacts on operating costs and efficiency (see question 3 below), but the cost of re-equipping is estimated to be minimal.

The greatest effect is likely to be the cost of re-formulating and, particularly, the cost of re-testing and re-approval of compliant products and specifications.

The bulk of re-approval costs is likely to fall on the major manufacturers – see question 5 below – but all manufacturers will face the re-formulation of at least part of their product range.

3. ***Operating costs*** *(changes in costs of raw materials or production processes, other impacts on operating costs and profitability).*

Raw material costs for higher solids technologies will inevitably be higher, even on a solids : solids basis. Therefore both costs per litre and per square metre covered will increase.

Higher solids generally also mean higher viscosity products, so pigment dispersion becomes more difficult and speed of manufacture is likely to suffer as a consequence. There may therefore be some impact on process costs (energy utilization etc) and also on productivity in terms of litres produced per hour.

While all of these factors will impact on manufacturing costs and pricing to the customer, an indirect effect of the changes is that lower volumes of paint will be required to coat the same surface area, so consumption is likely to fall, with a consequential effect on profitability.

4. ***Competitiveness of EU companies*** *(import penetration of EU market, impact on exports to non-EU countries).*

CEPE propose that the Product Directive should apply only to site (or 'in situ') application and excludes coatings applied at point of manufacture, so there is no possibility that articles can be coated outside the EU and imported. Therefore, provided that this proposal is accepted, and that border controls are effective in preventing the importation of non-compliant coating products, the impact of imports should be neutral.

The effect on exports would also be minimal, except that global suppliers will need to maintain a wider product range to cope with different requirements within and outside the EU.

5. ***Competition and impact on SMEs*** *(companies having to leave the relevant market sector or cease operation altogether as a result of the proposal, changes in start-up costs for new companies, any impacts specific to SMEs).*

The main costs of changing to lower VOC products and/or technologies are those incurred in product re-formulation, testing and re-approval. SME's are likely to be affected to a greater extent than larger companies because they are likely to be slightly less prepared for change, hence our suggestion that the implementation date is delayed to allow time for smaller companies to carry out any necessary re-formulation.

SMEs will also face greater challenges because they have lower sales volumes to justify and compensate for the investment required in re-formulation.

However, re-approval costs are less likely to affect them, as few SMEs have traditionally been able to afford the high costs of customer or market-specific approval procedures anyway. Oil and utility company approved lists, for example, are dominated by the leading multinational paintmakers, who can afford to undertake expensive test programmes and maintain the rigorous quality and surveillance procedures required by the approval bodies.

In the PC market, the need for SMEs to comply with and/or be approved to ISO, Norsok and other performance standards will generally have a greater impact than will re-approval of VOC compliant products.

The impact of the proposed Product Directive on startup costs for PC companies is considered to be very slight. The only possible effects are the increased raw material and processing costs, but as the Directive should ensure a 'level playing field', these factors should be competitively neutral.

6. ***End-users*** *(cost of additional application equipment, changes in application techniques, product end-price, product performance characteristics - durability of coating, labour time needed for application).*

End users will see an initial increase in price, and in some cases will require training of operatives to avoid excessive and wasteful product use. This will be particularly important where low thickness specifications are switched to higher solids products, which will be more difficult to apply consistently at the low end of their thickness range.

In terms of application equipment, many contractors already have suitable spray equipment, but a minority will be faced with upgrading to more robust technology. Depending on the particular product and end use, the upgrade may be modest (<€12K) to high (>€30K).

No manufacturer should knowingly downgrade product performance and we would envisage that durability and service life of PC systems will not in general be affected, although a few speciality applications may need consideration – hence our request for provision to be made within the Directive for 'exceptions' that cannot be accommodated within the new limits.

Perhaps the greatest difficulty for end-users will be getting used to new products and technologies - in particular ensuring that they can be applied efficiently (as referred to above) and that processes are modified to cope with changed characteristics. For example, some of the higher solids technologies will be slower drying than their current counterparts, so there may be impacts on productivity, 'dead time' etc.

7. *Impacts on* ***employment in the EU*** *and impacts that may disproportionately affect particular* ***Member States or regions****.*

Provided that the CEPE proposal for the Product Directive to apply only to on site application is accepted, the vast majority of the structures coated will be fixed and within the EU. Therefore local or EU labour should be mainly used and the impact on employment should be minimal. If the 'on-site' proposal is rejected, the converse would be true as any items that are not coated at site may be preferentially coated elsewhere and then imported.

We do not anticipate any disproportionate regional effects, other than those associated with the general movement of labour within the EU.

8. ***Environmental impacts*** *other than VOC reduction (energy consumption, waste and recycling, discharges into the soil and water, fuel consumption and vehicle emissions, use of renewable and non-renewable resources).*

There are likely to be both positive and negative environmental impacts; these are difficult to quantify but overall the impact will probably be close to neutral.

Examples of positive impacts are that less volume of paint will be used and less solvent therefore unnecessarily transported from manufacturing plants to sites of application, so fuel consumption and vehicle emissions will be reduced accordingly.

Energy consumption during manufacture could itself be neutral – less product will be manufactured but more energy is likely to be expended per litre produced.

There is unlikely to be any change in impact on discharges to soil and water.

9. ***Any other costs*** *(product withdrawal, re-labelling, cost of training end-users on new products – proportion of this cost to be paid by manufacturers and what proportion by end-users).*

As already indicated, there is likely to be a need for operative training as new technologies and products are introduced. This is likely to focus most heavily on the efficient and cost-effective application of compliant products, and hence on technique rather than just on the introduction of new application equipment.

Much of this training will be undertaken by the supply industry, as they introduce new products into the market, but inevitably some end users may also need help from outside training providers.

Product withdrawal is a potentially significant cost, especially as the 12 month transition period imposed on Deco products is too short to allow all stocks to be used up through the supply chain and/or on large projects, which will create inevitable obsolescence for a proportion of product manufactured immediately before the Directive comes into force.

Similarly, re-labelling of stock already in the supply chain could create a very large cost impact, as determined by Deco when the Directive was first introduced in 2007. This cost could be minimized by increasing the transition period to 24 months, as suggested previously by CEPE.

10. *Wherever you may have information/data available on the above impacts, we would also welcome if you could indicate what geographical area such data relate to (EU15, EU27, etc.).*

Most of our information comes from National Associations within the EU15, and we have very limited reliable feedback from the newer member states. However, most of the multinational manufacturers have expanded into the Eastern countries of the EU so technologies that are available in the EU15 will also be accessed more widely. Perhaps the greatest difference is that the impact on local SMEs in some Eastern member states is likely to be more pronounced so the time to implementation should take this into account.

11. *In addition, we would be grateful if you could elaborate on the applications that are likely to fall under the proposed exemption for speciality products.*

Our main reason for requesting the exemption clause is that some protective coatings ‘speciality’ products are approved for specific applications after exhaustive and expensive testing, but the volumes of product involved would not really justify either the time or cost of re-testing. In some cases, the requirement is urgent, so insufficient time may be available for re-testing anyway. Some of the examples discussed are products with special properties for the nuclear industry, where testing can take anything up to 12 – 15 months, and where the consequences of introducing replacements without proper testing and approval could be very serious. The ‘LOCA’ or ‘Loss of Coolant Accident’ test would be an example.

Other examples will also no doubt arise from time to time, but we expect them to be rare and wherever possible – within time and cost constraints - we would support replacement with compliant products.

Obviously we would therefore agree the need to control approval of any such exemptions, so we would endorse a procedure that requires strict justification.

End of document

CEPE aisbl • Avenue E. Van Nieuwenhuyse 6 • BE-1160 Brussels • T: +32 (0)2 676 74 80 • F: +32 (0)2 676 74 90
secretariat@cepe.org • www.cepe.org

Annex 41 Research Institute Interview (Wood Research Institute)

41. SHR Timber Research, Lutke Schipholt, interview with Jeroen Terwoert/IVAM, Wageningen/The Netherlands, 29.4.2008

Interview 'SHR Timber Research'; Wageningen, the Netherlands

29-04-'08

spoken to: Niels Lutke Schipholt; project leader wood coating research.

Focus: Supporting information concerning the feasibility of water-based coatings in the timber industry (= the production of window-frames, doors, stairs etc, incl. coating).

Background:

- Variable interpretation of the Decopaint directive in the member states, some of them applying the directive to small wood coating installations (< 15 ton VOC/yr.).
- In The Netherlands, the timber industry has to comply with using wood coatings that contain at maximum 150 gr. VOC/litre (i.e., water-based coatings), since 2004.

SHR (www.shr.nl)
SHR is the main research institute in the field of technical research on timber products, including coating performance. SHR has carried out most of the background studies on the feasibility of low-VOC (mainly waterborne) coatings in the timber industry and has developed quality standards for timber products and for coatings used in the timber industry.

Summary of Niels' opinion

- The Decopaint directive is much too soft, because it leaves open the opportunity to use solvent-borne coatings (with only slightly lower VOC-levels).
- Waterborne coatings perform *at least* as well as solvent-borne in the timber industry. They perform incomparably better than the WB products of 10 years ago. However, there are large differences in quality in *both* water-borne and solvent-borne products.
- Water-borne coatings are feasible – technically as well as economically – in **all** timber companies; large and small, in each member state. Companies may either choose for investments in drying equipment (i.e. have a shorter production cycle), or accept longer drying times (with less investments). Both options provide high-quality finishes (details below).

Various (3) 'production systems' for the production of timber for the construction industry

- In order to understand information on the feasibility of waterborne coatings in the timber industry, one has to understand more about the production systems:

Name of system	**Coating applied in the factory**	**Coating applied at construction site**
Primer system	Primer	2 layers topcoat
Undercoat system	Primer + Undercoat	1 layer topcoat
Topcoat system	Primer + Undercoat + Topcoat	none

- Until recently, the 'Primer system' was most common in the Netherlands, i.e. relatively much coating activity on the construction site by housepainters. In many other countries (e.g. Germany) it was more common to apply the Undercoat or Topcoat systems, i.e. to supply the construction site with 'ready-to-install' window-frames etc.
- However, it is not allowed (in the certification schemes involved; see below) to apply *transparent* coatings at the construction site, so these have always been applied in the factory.
- In the Undercoat and Topcoat systems, the timber factory has a greater responsibility for the durability of the product (reflected in the warranty periods).
- Now there's a shift towards 'more coating in the factory', because drying circumstances, and therefore quality, can be more controlled. Also partly as a result of the Decopaint directive which will force housepainters to use lower-VOC topcoats.

Feasibility of waterborne coatings in the timber industry

- "Waterborne coatings are no problem anymore in the Dutch timber industry. They perform ever better. Waterborne coatings should be no problem in the *European* timber industry."
- All coating activities in the Dutch timber industry have been strictly certified. The branch association (NBvT, Dutch Union of Timber Manufacturers), research and certifying institutes SHR and SKH, and paint manufacturers have cooperated closely in this matter.
- Certifying schemes include BRL 0801 on "Requirements for timber", BRL 0814 on "Requirements for primer systems used in the timber industry", and BRL 0817 on "Requirements for Undercoat and Topcoat systems used in the timber industry" (under development).
- Major aspects assessed include:
    - thickness of the coating film
    - outdoor durability (against UV radiation, water etc.) and gloss retention
    - water vapour permeability.
- The requirements also include certain design aspects, e.g. specific design aspects of a window-frame which reduce the possibilities of the entrance of water.
- Timber factories have a number of options, in order to achieve the required product quality with the prescribed waterborne coatings (max. 150 gr. VOC/l). These have been described in two Annexes (4 & 5) to the certification scheme BRL0801. Annex 4 describes, for each of the 3 'production systems':
    - The required number of topcoat layers and the film thickness of the topcoat applied at the construction site (the total paint system should have at least 3 layers).
    - Various application options, e.g. spraying or flow-coating.
    - Maximum water-permeability required (in gr/m^2).
    - Durability demands (no scaling, no cracks etc.).
- Annex 5 provides requirements and guidelines for:
    - The required film thickness and the number of layers of the total coating system and its components (i.e. primer – undercoat – topcoat).
    - The **Drying conditions** in the factory, in order to achieve the required quality. The drying conditions differ for the Primer system and the Undercoat/Topcoat systems:

*Drying conditions prescribed for waterborne coatings – **until March 2008***

		Primer system	**Undercoat & Topcoat Systems *(old!)***
Flash off (evaporation of water; per layer)	Temperature Relative Humidity % Time	> 15°C > 70% 10- 20 min.	> 15°C > 70% 10 – 20 min.
Initial drying (per layer)	Temperature Relative Humidity % Time Air velocity	15 – 35 °C < 75% consult supplier > 0,2 m/s	***> 23°C*** < 50% > 4 hours > 0,2 m/s
Complete curing	Time Temperature	> 48 hours > 15°C	> 60 hours > 15°C

Remarks:

- During flash-off, the relative humidity should be *larger* than 70% to prevent a too quick evaporation of the water – this improves film-formation.
- During initial drying and complete curing, the humidity should be lower, to enhance curing.

Note w.r.t. investments feasibility of water-borne coatings!

- The drying conditions for the 'Primer system' were feasible for every company, without many specific investments.
    - However, with waterborne coatings, *stainless steel spraying equipment* should be used
    - *Water-evaporators* should be bought, in order to achieve the minimum 70% RV.
- The drying conditions for the 'Undercoat' and 'Topcoat' systems described above (> 23°C, RV< 50%) would imply investments in *drying equipment* (heaters & separated drying room).

Some companies have opted for that, but not all of them could make the investment. Therefore, the demands have been adapted. Now, **9** specific options for drying conditions (temperature, humidity, time) have been specified in a draft guideline of March 2008.
    - e.g. one option is: spraying 2 layers on one day, then an overnight drying period and subsequently spray the 3rd. layer – for some small companies this is very efficient.
    - e.g., when a company opts for drying at (e.g.) 20°C, the investment is low: a few heaters and a few curtains are sufficient.
- Coating manufacturers state for which drying conditions their products can be used.
- Timber companies now can very flexibly choose for:
    - Either investing in drying tunnels etc.
    - Or allow longer drying periods.
- In this way, waterborne coatings are feasible for every company, including very small SMEs.
- Waterborne coatings can also be used for 'bleeding' wood types. The employers' association themselves have asked the Dutch authorities to abolish the exception in the substitution rule for bleeding wood types.

Product types included

Solvent-borne products are mostly silicone-modified alkyds.
Major waterbased product types include:

- Alkyd emulsions (many times modified with acrylate) – these perform very well.
- Polyurethane-acrylate dispersions or pure polyurethane dispersions (the latter are still a little too expensive, but they are upcoming).

Acrylate-modification of alkyd-emulsions improves outdoor durability.
Many waterbased products in the Netherlands now perform better than the solvent-based products.
Other EU-countries may take advantage of the experiences built-up in the Netherlands.

Frontrunners

Frontrunners in this market are not the big companies such as Akzo or Sigma, but smaller niche players such as Anker Stuy, Drywood. In addition, PPG is a major player (now merged with Sigma).

New developments

For some years, a few other developments have been taking place as well:

- the use of UV-drying coatings (waterborne available as well);
- the use of 2-pack polyurethanes
- the use of powder coatings.

Companies that have to invest now in new low-VOC technologies might opt for these instead of the 'normal' waterborne coatings.

Other remarks on the Decopaint directive

A classification in 'paint types' is not useful. Classifications should be made according to the application (which has been largely done in the current PD).
Suppliers may sell one and the same product as a 'primer' and a topcoat'.

Furniture coating

In a number of cases, the feasibility of waterborne coatings in the furniture industry is less than that in the timber industry. High demands w.r.t. gloss, scratch resistance, chemical resistance (cleaning agents), and specific wood types (e.g. oak) reduce the feasibility in some cases.

Final

There are much more documents, certificates, guidelines etc. Many of them in Dutch. I have attached one document in English, which describes testing methods for coating performance.

Annex 42 Stakeholder Document (European Coatings Industry)

42. CEPE – CEPE's accompanying note with the responses on the impact assessment of option 8, Brussels, 28.04.2009

CEPE's accompanying note with the responses on the impact assessment of option 8.

Date: April 28, 2009

This impact assessment takes as propositions:

- Every installation not covered by SED (1999/13/EC) or a national similar rule (with lower thresholds than 15 Tons of VOC/year) is held to use PD compliant products for wooden substrates.

- To use in the PD only the term 'wood substrates' in general. There would be no longer a reference to 'trims, fittings and associated structures'. This broadening to all wood would simplify the work for installation holders as they no longer need to split their coating jobs between building products and 'other wooden articles'. They just use PD products for all wooden articles.

- Such challenging VOC limits for wood coatings that only 100% solids materials (UV curable) and Waterborne (WB) coatings could comply.

CEPE comments

The highest impact from these propositions will be felt by the installation holders as they are the ones that apply the wood coatings. As far as CEPE knows this highest impacted group is not being consulted in this impact study.

But as these installation holders form the customers of our members since many years, CEPE can make some quantitative remarks on these propositions. CEPE recommends Oekopol to check these CEPE comments with this group.

Impacts for small installation holders in member states that have no national rules for small installations.

- Their coating activity for wooden substrates (an industrial process) is herewith becoming subject to a Directive that is working via a description of a product with an intended use and substrate (in Annex I of PD). The Product Directive does not describe their 'coating activity'. They are not affected by the legal text but impacted by the consequences. This Product Directive was adopted for the application of coatings 'in situ' (by a professional painter or by a Do It Yourself-er).

- Their pallet of coating aspects they can offer to their customer (the furniture manufacturer) such as gloss, range of colours and chemical resistance, will be drastically limited as these aspects are not to be obtained via the coatings that are meeting the VOC levels as proposed(UV and WB).

- Their competitive position will be weakened against those who can still use this broad choice of products to obtain every requested coating aspect. These

are the large installation holders that fall under the SED and the small installation holders in EU member states that have small installations covered under a national kind of SED and installation holders outside of the EU where no VOC reducing regulations may exist.

- Their suppliers (the coating producers) will implicitly being held responsible for discriminating the small installation holder from their competitors with larger installations. The suppliers may continue to offer the broad choice of products to the large installation holders and 'are expected' to only supply PD compliant coatings to the small installation holders.

- For these above reasons the small installation holder may be tempted to increase his consumptions of VOCs in order to fall under the SED's VOC threshold.

CEPE's position

CEPE strives for 'better regulation' via a clear distinction between SED and PD and therefore recommends:

- do not let a product based regulation rule the activities of a small industrial application of wood coatings.

- when small industrial coating activities should be regulated on VOCs, then this should be based on the principles of the SED so that these small installation holder can maintain their competitive position.

- Enforcement is therewith made via the user and not via a kind of control of the dealings of the 'placer on the market' who is expected to discriminate between his customers.

The problem of overlap as mentioned in the Interim Report chapter 6.4.4

... the same activity may be under PD in one country and under SED in another country.....

is a result of making a claim for the use of a product in the PD without making any differentiation on where the coating is applied. Hence obliging every type of application (industrial, professional and Do It Yourself) that deals with the 'intended use and substrate' to use the product with the restricted VOC content.

It would greatly clarify the situation when an application at 'a point of manufacture' would be excluded from the scope of the Product Directive.

Annex 43 Stakeholder Document (European Coatings Industry)

43. CEPE - CEPE's position for Non Inclusion of the Marine Paints in a revised Product Directive, Brussels, 11.02.2009

CEPE's position for Non Inclusion of the Marine Paints in a revised Product Directive – 2004/42/CE

General

Overall CEPE considers the Product Directive (PD) an effective tool to reduce VOCs in those paint segments where a high proportion of paints are applied 'in situ' and where the Solvent Emission Directive (Directive 1999/13/EC) (SED) is not the suited instrument.

CEPE's Marine Coatings sector group

The members of this sector have made motivated estimations of the amount of VOCs that are not covered by the SED. Making VOC reductions in these marginal quantities would be disproportionate against the costs for industry. The motivation is given in this document.

Marine Coatings Sector characteristics.

The sector of Marine Coatings covers the application of paints on ships with a length over 25 meters and with a commercial purpose. The coatings in the Marine Coatings scope are applied either on newly built craft or for maintenance and repair purposes. Typically a coating system on a ship's hull comprises the build up with 3 different paint types (primer, mid-coat and top-coat).

The sale of paints is only business to business and the application of paints in this sector is done only by professional applicators.

Pleasure boats e.g. yachts are another market segment and differ by the people that apply the paints and by the types and functions of the paints.

The main reasons to NOT include Marine Coatings into the Product Directive 2004/42:

1. Uneconomical cost / benefit ratio in terms of size of market.

- In the EU 27 there are approximately 450 ship yards. 85 % of these shipyards have a yearly VOC consumption that makes them fall under the provisions of the SED. They will therefore already have to control their overall VOC emissions in accordance with the limits specified in this SED. Without having official numbers the best estimate is that there are no more than 70 Marine shipyards outside the SED and thus with a VOC consumption below the 5 T/y. Not counting Italy, Slovenia or Austria (where an installation threshold of 500 kgs of VOC is applicable). Even with an assumed maximum use of 5 Tons of VOC per yard (just below the SED threshold) the total annual VOC outside of SED installations would not be more than 350 Tons. These 350 Tons of VOC would originate from maximum 750 T paint (assuming the typical solids content of 50 %).

Technically feasible VOC reductions per type of product would therewith lie in the order of several tens of Tons. Product development and market introduction activities for such products are in the magnitude of 500 k€ per one type of paint (see table below). If reductions over all 3 types of paints have to be made this would be 1,500 k€. The relevant paint volumes via which these costs will have to be paid back are too small to make this investment economical.

2. **Market Effects on SMEs. Danger of further delocalization of the small yards for ship building and maintenance.**

- 'Marine' is a global, rather than a national business. Ships can dry dock in any country in the world, so product-related restrictions on VOC content of ships' paints could lead to significant competitive disadvantage and a loss of business to non-EU shipyards.

Table: Typical product development and market introduction costs for one type of product.

ACTIVITIES	COSTS
Development Time	4 years
Chemist Cost	~ 80k € pa
Development Cost	320k €
Test & Trials	70k€
Certification	40k€
Register New Raw Material. *	-
Introduction; Marketing/Advertising etc.	70 k€
Total:	**500 k€**

* Registration of a new RM could be in the order of several k € s but not many new RMs are introduced so have not included.

090211 JvdM

Annex 44 Stakeholder Document (European Recreation Marine Industry)

44. EURMIG - Position for non inclusion of the Pleasure Craft- and Super Yacht Industry in a reviewed Product Directive- 2004/42/CE, Brussels, September 2008

European Union Recreational Marine Industry Group

Rue Vautier 54
Brussels
Belgium
B-1050
Tel :+32 2 227 0771
E-mail: eurmig@icomia.com

EURMIG position for non inclusion of the Pleasure Craft- and Super Yacht industry in a reviewed Product Directive- 2004/42/CE.

September 2008

Purpose of this Document

The European Union Recreational Marine Industry Group (EURMIG) representing the European leisure boating industry, would like to use this document to explain its rationale as to why the leisure boat- and Super Yacht industry should not be included within the extended scope of the Product Directive 2004/42/CE.

Introduction

EURMIG represents 37,200 businesses with at least 272,000 direct employees generating revenue in the region of 23.4 billion EUR. Approximately 98% of these businesses are Small and Medium-sized Enterprises (SMEs). The types of businesses include boat builders (large manufacturers to craftsmen in scale), marine engine manufacturers, marine and yacht paint manufacturers, high technology electronics companies and equipment manufacturers. EURMIG's members are the 17 Recreational Marine Industry Associations (MIAs) from EU and EEA Member States.

EURMIG is a committee within ICOMIA, the International Council of Marine Industry Associations. ICOMIA is the worldwide trade association of the International Recreational Marine Industry Associations (MIAs) with members in 29 countries including 17 in the EU/EEA.

EURMIG and ICOMIA have a specific interest in a number of European directives which affect our businesses including Environmental and Health & Safety directives. The recreational marine industry in the EU is a success story with sustained growth over the last 14 years, which other industries with higher profiles are hard pressed to match. It has not only retained its global leadership in many sectors but has also improved in others.

Sector characteristics

- The European leisure boating industry covers **37200 businesses**, including **boat and yacht builders** and the **repair and maintenance sector** which services vessels up to 24 meters in length.

- **Super yachts** are usually defined as recreational vessels greater than 25m in length and up to 500 tonnes in weight, registered either for private use or charter. The Super Yacht building sector is enjoying a growth rate of more than 70% since 2003 and European production is booming with **13 of the world's top 20 Super Yacht Builders located in Europe.**
- **European shipyards are an absolute worldwide market leader** with over 280 projects currently under construction for yachts over 40 meters in length. This totals more than 19200 km of hull length generating a revenue of 1.5m EUR per meter produced (the total value of those projects alone is around 29,000bn EUR).
- There are today around 10,000 yachts in the world representing a **large market for refit, repair and maintenance services** for European companies in the recreational marine sector.

VOC use in the leisure boat- and Super Yacht industry

EU Super Yacht builders

Almost all (more than 95%) Super Yacht Builders within the EU have a yearly VOC consumption which **includes them within the scope of the SED** (1999/13/EC).

Yards with VOC consumption below 5 tonnes a year

Remaining yards in the EU with VOC consumptions **below 5 tonnes a year**, and not situated in Italy, Slovenia or Austria where a threshold of 500 kg of VOC is applicable for an installation. As professional users they will fall under **regional or local regulations** and emissions will be controlled through the yard's **environmental permit**.

Do It Yourselves (DIY) activities

The DIY market for Yacht is very small. Based on the EU CAFÉ study figures[1], VOC emissions from the DIY sector for Yacht equate to only 4.05% relative to the total for Marine and Yacht combined. Of this 4.05% it can be estimated that 50% of the DIY market is regulated by National, regional and local rules therefore **regulated within boatyards and marinas** in which they are applied. The un-regulated proportion of emissions from DIY equates to a figure more like 2% relative to emissions from all of Marine and Yacht .

EURMIG recommendation regarding the scope of the reviewed Product Directive

EURMIG believes the European leisure boating industry should continue to be exempt from the scope of the Product Directive, 2004/42/CE.

EURMIG recommends that the SED continues to be the rule which regulates the VOC emissions from its industry to ensure that customer demand for the highest quality paint finishes to meet the highest quality standards can continue.

EURMIG envisages severe market effects on the European leisure boat- and Super Yacht industries if they are included within the scope of the revised Product Directive.

The EU leisure boating industry and Super Yacht Builders differentiate from their commercial rivals in China and Russia etc due to the quality of the finished article

[1] Source: IIASA survey; VOC figures related to the 6th Environment Action Plan of CAFÉ.

they produce. EURMIG is concerned that including the European leisure boating and Super Yacht Builders industry in the Product Directive will prevent European boatyards from maintaining this differentiation, thus seriously compromising the attractiveness of their products vis-à-vis their competitors.
It is vital that products which deliver the high aesthetics associated with the very highest quality in this industry can continue to be used: if the quality of finish decreases, clients would place their orders outside the EU.
At present the averaging approach in the SED allows yards to use a combination of high and low VOC containing products within a solvent reduction scheme. This way, high VOC containing topcoats which give extra high gloss and levelling (critical areas demanded by the owners), can continue to be used successfully as the emissions from these are offset by other products containing lower VOC content. Higher VOC content is also required in certain specialized pleasure craft coatings because of the variety of application methods that are used (brush, spray, roller). Indeed the highest quality of the super yachts demands a different application to those applied to commercial ships. EURMIG believes imposing a Product directive approach would be too restrictive, preventing this from being possible.

Conclusion

EURMIG is not opposed to EU legislation containing high environmental standards. On the contrary, EURMIG was supportive during the implementation of the SED and developed a special reporting tool for the European Leisure Boat Industry which is also available for use by the National Authorities of Member States.
The leisure boating and Super Yacht industry is a global business. Super Yachts can dock in any part of the world, and an unfavourable change in environmental legislation could lead to a very hard, competitive disadvantage and loss of business to EU shipyards.
EURMIG and ICOMIA wish to continue to work with the EC in development of any rule that affects paints and coatings for the recreational marine and Super Yacht industry. We would be happy to share our recent experience including collection and evaluation of solvent emission values from our super yacht industries' yards and other work with the European Commission (DG Environment) on the SED. We hope you will take serious note of this industry's objections and exempt this industry from the revision of the Product Directive.

For information regarding solvents and marine coatings please contact ICOMIA and EURMIG Environment Executive, Albert C. Willemsen, 0031 6 21893603 or by Email awbbv@vodafone.nl or albertw@icomia.com

Annex 45 Stakeholder Document (European Recreation Marine Industry)

45. EURMIG - Additional information on request of Consultant – Ökopol, Brussels, 5.5.2009

European Union Recreational Marine Industry Group

Rue Vautier 54
Brussels
Belgium
B-1050
Tel :+32 2 227 0771
E-mail: eurmig@icomia.com

Additional information on request of Consultant - Ökopol

Purpose of this Document

The European Union Recreational Marine Industry Group (EURMIG) representing the European leisure boating industry, has presented in September and November 2008 the EURMIG Position paper and Motivation document for non inclusion of the Pleasure Craft- and Super Yacht industry in a reviewed Product Directive - 2004/42/CE. The purpose of this document is to supply Consultancy Ökopol with more information regarding the National rules related to VOC emissions with regards to the DIY activities.

In the Position paper and the Motivation document was explained:

- As agreed with the EC (DG Environment), ICOMIA and her European committee EURMIG developed in close cooperation with one of the members of CePe a special SED Reporting tool. Authorities and Industry can down load this tool from ICOMIA Website, www.icomia.com .
- The EURMIG documents explained its rationale as to why the Leisure boat- and Super Yacht industry should not be included within the extended scope of the Product Directive 2004/42/CE.
  The Motivation document explained, based on figures from IIASA survey (VOC figures related to the 6th Environment Action Plan of CAFÉ): "Super Yacht builders and the Refit/R&M Yards have a yearly VOC consumption which includes them within the scope of the SED. The paint volume usage of these two major groups within the EU Yacht/Boating Industry is 35% of the total Yacht volume used. (new trends of VOC usage of these major groups will be presented during the special Stakeholders meeting, 7th May 2009)"
- Companies/facilities situated in Italy, Slovenia or Austria where a SED threshold of 500 kg of VOC is applicable for an installation are excluded from the PD – 2004/42/CE
- Smaller Yacht Builders compared to Marine:
  - More than 60% of the smaller Yacht Builders in the EU are consuming more than 5000 kg VOC a year, which includes them within the scope of the SED.
  - The remaining 40% of the smaller Yacht Builders, **compared to Marine and Yacht total it is 1,731% and they will fall as professional users under regional or local regulations and emissions will be controlled through the yard's environmental permit.**

- **Do It Yourself (DIY):**
  - DIY compared to professional users is 30% DIY and 70% Professional
  - Yacht compared to Marine (in usage of paints; quantities/volume) is 15,46% (based on Cafe 2005 figures) minus the special threshold of the MS's Italy, Slovenia and Austria (20% of Yacht) it will be 12,37%.
  - DIY compared to Marine is 30% of the 12,37% = 3,71%. relative to emissions from all of Marine and Yacht
  - 50% of DIY is regulated by National and Local rules, which mostly follow an SED approach. Can be compared with those of the Smaller Yacht Builders, Yacht Clubs with Marinas and R&M.
  - 25% is regulated by special environmental permits for Yacht Clubs.
    The 25% un-regulated proportion of emissions from DIY equates to a figure which can be estimated at less than 0,93% relative to emissions from all of Marine and Yacht .

Request Consultant Ökopol:

Ökopol Consultancy requested ICOMIA/EURMIG – EE to supply more detailed information related to the National rules and Environmental permits of the Marine Leisure and Super Yacht Builders Industry:

1. Facilities situated in Italy, Slovenia and Austria where a SED threshold of 500 kg of VOC is applicable for an installation are excluded from the PD – 2004/42/CE
2. Germany: A National regulation is integrated in the environmental permits, which affect facilities with threshold above the 15.000 tonnes a year;
   "All facilities with a threshold of more than 15.000 a year besides the SED requirements must use vents and filters".
3. Example of a general environmental permit (Activiteiten Besluit) in The Netherlands related to smaller facilities (VOC regulations for larger facilities are more stringent tailor made, and under the umbrella of SED integrated in the environmental permit)
   a. The NER (Dutch Emission Guidelines) is/will be used for harmonization of environmental permits. It is a result of a cooperation between Authorities and Industry, and is some occasions consumer organizations (for example Marina's Yacht Clubs with R&M facilities)
   b. The NER is also used for tailor made solutions with regards to environmental permit, mostly for larger facilities.
   c. Within the environmental permits for Marinas and Yacht clubs with R&M - and Winter storage facilities has to implement special regulations related to the DIY activities. Informing and guiding the boaters related to the R&M – DIY activities. *(an example will be presented during the meeting, it is cooperation of the Authorities, Industry and Consumer organizations, and implemented in environmental permits)*
4. The guidelines related to DIY within Marinas and small R&M yards are implemented in other MS as well, examples the UK, France, Germany, Finland etc.
5. There are also several tailor made environmental permits regarding the Boat builders, Refit Yards, R&M Yards and Super Yacht Builders which contains compared

to SED and IPPC more stringent rules related to VOC emissions. ICOMIA – EE received these permits from the Yards with restrictions to publication.

Conclusion:

- Although the 25% proportion of emissions from DIY, equates to a figure which can be estimated at less than 0,93% relative to emissions from all of Marine and Yacht is not regulated by a EC Directive in some occasions it is controlled by National regulations which are integrated in the environmental permits. These guidelines are a result of cooperation between Authorities, Industry and Consumer organizations.
- For the remaining 40% of the smaller Yacht Builders, compared to Marine and Yacht total it is 1,731% they will fall as **professional users** under regional or local regulations and emissions will be controlled through the yard's environmental permit.

Note:
ICOMIA is involved in a few surveys related to VOC emissions within Industry.

0000000000000000000000000000000000000000
00000000000000000000000000000000
00000000

Annex 46 Stakeholder Document (European Silicones Industry)

46. CEFIC-CES, European Water-repellent Impregnation Products - Markets and Technical Requirements, Brussels, 20.03.2009

- Centre Européen des Silicones

www.silicones.eu

Mr. J. Terwoert
IVAM UvA BV
Plantage Muidergracht 14
P.O. Px 18180
NL-1001 ZB Amsterdam
The Netherlands

20 March 2009

Dear Mr. Terwoert,

Re: Waterproofing Products – Product Directive – Your email of 25 February 2009

In response to your questions, CES members representing the major European silanes and siloxanes manufacturers active in the water-repellent impregnation products market, would like to provide the following information.

In summary:

- Silane and siloxanes are essential to protect our historical heritage, private and public buildings and to the sustainability of infrastructure (bridges, etc.);
- Due to high market demand for low-VOC products, water-based impregnation products are usually the first choice of the end-user; higher VOC products (especially solvent-based formulations) are used to obtain the required performance, particularly for the preservation of our heritage;
- Including the active components of impregnation products and their reaction products into the VOC definition would result in a lowering of the concentration of actives and therefore an increase in application rate; the required performance is reached based on a minimal application rate of the active component;
- Based on nearly 50 years of experience, the required product function cannot be achieved according to the current state of art if VOCs (not counting the alcohols and the active components) are lowered below the following concentrations:
    - Solvent based impregnating products: 98 %
    - Water based impregnating emulsions: 20%
    - Cream based impregnating products: 60%
    - Cream based impregnating products for highly alkaline mineral substrates: 10 %
- CES members and other formulators are continuing research to develop low-VOC impregnation products;

You will find in the Annex more detailed answers to the questions you raised.

With respect to your additional email of 9 March, at the time of writing I have not yet received feedback from the members. I will keep you advised.

Please do not hesitate to contact me should you have other questions.

Sincerely,

Dr. M. De Poortere
Secretary General, CES

Cc: C. Tebert, Ökopol
CES Members

Annex:
European Water-repellent Impregnation Products
Markets and Technical Requirements

1. Introduction

Directive 2004/42/CE applies to paints, varnishes and vehicle refreshing products. Masonry water-repelling compositions are intentionally formulated to penetrate mineral surfaces and do not form surface films; therefore they are excluded from the scope of the present Directive. CES has previously provided information from its members concerning the annual volumes or organic solvents used in the context of water-repelling impregnation products in the EU. CES understands that Ökopol and IVAM are investigating the feasibility of extending the scope of the Directive to include impregnation products on request by the European Commission.

It is therefore necessary to complement the information provided by:

- addressing additional questions raised by IVAM
- providing information on the technical requirements for the application which are met by different formulations containing variable amounts of organic solvents
- concluding by recommendations on the scope of further VOC reductions in impregnation products

2. Definitions

According to Directive 2004/42/CE:

Art. 2(5): 'Volatile organic compound (VOC)' means any organic compound having an initial boiling point less than or equal to 250°C measured at a standard pressure of 101,3 kPa;

Art. 2 (6): 'VOC content' means the mass of volatile organic compounds, expressed in grams/litre (g/l), in the formulation of the product in its ready to use condition. The mass of volatile organic compounds in a given product which react chemically during drying to form part of the coating shall not be considered part of the VOC content;

Therefore, according to the last sentence of Art. 2(6), the "active" component of the formulation that reacts with the substrate to confer the water-repelling properties shall not be considered part of the VOC content. The alcohol (generally methanol or ethanol) generated during the reaction with the substrate is an integral part of the active component and should continue to be excluded from the determination of the VOC content.

3. Water Repellents – Different Classes for Varying Applications

Protection of the historical heritage is one of the largest markets for impregnation products. For the preservation of historical buildings, statues and other works of art only organic solvent borne products can be used. They strengthen and add water repellency and "breathability" to natural material. In this way, they restore strength and permeability to crumbling façades and weakening structures without compromising the integrity of the original material. Because the treatment does not seal the pores, moisture that has accumulated inside can escape while water is prevented from penetrating the material from outside.

Water-repellent treatments are particularly effective in normal and reinforced concrete, aerated concrete, natural stone, limestone, brickwork and sand-lime brick.

Silane based water repellency treatments have a critical influence on the lifetime of bridges[1] and other key infrastructure, contributing to safety and environmental sustainability.

Over the last decades silicone based water repelling impregnation products for external applications have gone through a constant process of change driven by performance, legislative and commercial aspects.

In the 1960s high molecular weight silicone resins dissolved in organic solvents were developed for waterproofing application, followed by lower molecular weight oligomeric siloxanes and monomeric silanes in the 1970´s. For the protection of concrete, the use of pure alkoxysilanes gave the best results and they were commercially available for this application since approximately 1980.

Later on, compounds based on combinations of silanes and low molecular weight siloxanes were introduced. For the preparation of ready-to-use products these compounds often had to be diluted with white spirits or alcohols.

Water based emulsions of silanes and siloxanes as actives for the protection of private and public buildings were available since the 1990´s. These water based impregnation products required major research for suitable actives to replace solvent dilutable products in special applications (e. g. for the treatment of bricks). Since the mid 1990´s pastes, gels and creams allowed a more convenient application on certain substrates. Also for these formulations significant developments had to be achieved on the raw material side. Additionally, water borne products have been made available during the last decade. However none of these water dilutable products are yet able to reach the performance of available solvent based impregnation products.

4. Products and applications

4.1. Markets

4.1.1. Introduction

4.1.1.1. Categories of water-repellent impregnation products

There is not one single water repellent which serves all requirements for all specific applications and substrates. For each application and targeted performance the best suitable water repellent has to be selected[2].

Depending on the substrate, water repellents based on different chemistries, with or without solvents, water based or emulsified in water, in liquid or cream form, achieve different performance in terms of penetration, efficiency and durability. Substrate properties can vary e.g. in terms of pH value from neutral (e.g. natural stones) to alkaline (e.g. concrete) or porosity (e.g. dense or open porous concrete).

Creams, pastes, gels, as well as emulsions, are usually based on the known chemistry of silanes and/or siloxanes as active ingredients[3]. Under suitable conditions these formulations may be used for an easier application. Since they are based on known chemistry, the performance achievable is equal to other water repellents.

The active ingredients are silanes or silicones, which act as precursors for the protective silicon resin network structure. Some of these precursors need to split off a certain amount of low molecular weight alcohol groups, in order to react with the silicate matrix within the capillaries and pores of the substrate and thus achieve a durable performance. All types are listed in the table below and described in more detail.

Silicone type	Solvent	Substrate
Alkali siliconates (water solution)	Water	Neutral to low alkaline natural or artificial stones, red bricks, ceramic roofing tiles
Solvent based products Mainly silicone resins	White spirit	Neutral to low alkaline natural or artificial stones, red bricks. Pre-treated substrates

Alkoxysilanes (neat substances)	Neat	Dense substrates as concrete
Emulsion (oil in water) concentrates based on alkoxysilanes/ alkoxysiloxanes	Water	Neutral and weakly alkaline substrates Concrete, red bricks, natural stones, siliceous limestone
Pastes / Creams (oil in water) based on alkoxysilanes/ alkoxysiloxanes	Water	Neutral and alkaline substrates Concrete, red bricks, natural stones, siliceous limestone

4.1.1.2 Alkali siliconates

Alkali siliconates are water soluble alkali salts of silanes. They are reactive precursors for silicone resins. When the material has penetrated into the pores of the mineral substrate it will react with itself and with the silicate pore surface and turn into a chemically tightly bonded silicone resin system which does not migrate. Siliconates are generally efficient for neutral mineral and fired clay products. Siliconates formulations contain no VOC, because they are exclusively applied as aqueous solutions and they don't contain organic solvents or surfactants. Therefore this product class will not be discussed in more detail throughout this manuscript. Their use is limited to specific applications.

4.1.1.3. (Compounds for) Solvent based products

These systems provide excellent penetration behaviour, especially for dense substrates. They can also be used for pre-treated substrates (where aqueous systems often fail). In addition they can also be used with high efficiency on neutral substrates (e.g. limestone, natural stone, granite).

Before applying them to the substrate, these compounds are diluted with organic solvents, such as white spirit, to reach an active content typically in the range of 2-10 %. As long as reactive components and all alcohols released by cleavage of alkoxy-functional silanes or siloxanes are not considered as a VOC – and therefore are not added to the total VOC amount – the minimum amount of solvent needed technically required to allow the actives to perform as intended is therefore 98 % expressed as VOC.

4.1.1.4. Pure silane systems (alkoxysilanes)

These products – having a long alkyl chain to render the material alkaline stable – are applied in pure form mainly on concrete. They have a very high penetration depth and very good performance even on dense substrates. For technical reasons depending on the method of the synthesis these silanes contain up to 4 % of excess alcohol. Provided that reactive components and all alcohols released by cleavage of alkoxy-functional silanes are not considered as a VOC – and therefore are not added to the total VOC amount – it is technically possible with comply with a VOC limit for pure silane systems of 5 %.

4.1.1.5. Emulsion concentrates

Siloxane or silane emulsions concentrates are used for the production of aqueous water repellents. They work highly efficient on neutral and weakly alkaline substrates e.g. brick or siliceous limestone.

Final dilutions in water contain active concentrations in the range of 5 - 10 %. There is a growing market for these formulations.

4.1.1.6. Pastes / Creams

Pastes or creams are applied without further dilution in solvent or water. Due to their paste like consistency they exhibit extraordinary rheological behaviour and excellent workability. The category of creams can actually be divided in water and solvent dilutable systems. This category also includes creams for special applications such as highly alkaline substrates.

4.1.1.6.1. “Oil in water” creams for mineral substrates:

“Oil in water” based creams consist of an “oil phase” (80 % by weight including silane/siloxane active agents and organic solvents) and a “water phase” (roughly 20 % by weight including surfactant, biocides, water). The oil phase contains alkoxy-functional silanes and siloxanes as active agents, which are commonly diluted in an organic solvent. This organic solvent is extremely important to achieve a high penetration depth and an optimal distribution of the active agents throughout the capillaries and pores and thereby ensures high durability and performance of the impregnation product.

Because all mineral substrates have differently sized capillaries and pores, silanes and siloxanes exhibiting a broad range of molecular weights must be used. Larger molecules can not penetrate deeply into the mineral substrate by themselves. They require organic solvents

to ensure a sufficient penetration depth. Thus the solvents prevent the paste or the creams from concentrating on the surface forming an undesirable change of appearance, rendering the surface glossy and dark. Furthermore a too highly concentrated silane/siloxane product can significantly reduce the breathability of the mineral substrate, which causes damage to building structures. However as they are “oil in water” based materials they are soluble in water, which poses certain advantages in handling and application (e.g. excess material can easily be cleaned with water).

Provided that reactive components and all alcohols released by cleavage of alkoxy-functional silanes or siloxanes are not considered as a VOC – and therefore are not added to the total VOC amount – it is technically possible with comply with a VOC limit for creams for neutral and low alkaline mineral substrates of 60 %.

4.1.1.6.2. Water in oil creams for mineral substrates:

Water in oil creams, are not as common as oil-in-water products. They are soluble in organic solvents and thus can not be washed away by rain. However the this technology has some handicaps: first of all the time to penetrate into the mineral substrate is rather long, therefore the product remains at the surface and makes it sticky. Dust, dirt and insects can easily be picked up during this time. More important as these products are only soluble in organic solvents all application devices (such as brushes, spreading knifes or spraying equipment) must be cleaned using organic solvents. Moreover when excess material contaminates other areas, like window frames, it can only be removed using organic solvents.

4.1.1.6.3. Impregnation products for alkaline mineral substrates, e.g. concrete – special creams and undiluted silanes

For an effective and durable hydrophobic impregnation of highly alkaline mineral substrates, the use of an alkaline stable material (special alkoxy-functional silanes or siloxanes) is required. The material can either be applied in the form of a cream or as a pure silane liquid (for pure silanes see section: 4.1.1.4). In contrast to natural mineral substrates a concrete has much smaller pore structure. Therefore all impregnation products for this application must have a high silane content (60 % or higher) to assure a deep penetration depth, which is essential for a high performance.

Concrete impregnation products must comply with European standard EN 1504-2. Any loss of performance will exclude the water repellants from the concrete impregnation market.

These creams additionally contain emulsifiers and biocides, which are essential to the formulation. However these additives can also contribute to the total VOC content. Provided that reactive components and all alcohols released by cleavage of alkoxy-functional silanes or siloxanes are not considered as a VOC – and therefore are not added to the total VOC amount – it is technically possible with comply with a VOC limit for Creams for highly alkaline mineral substrates of 10 %.

4.1.2. Volumes

The following information representing the total volume sold in the EU of impregnation products in 2007 and the corresponding volumes of alcohols released in the applications, and of solvents contained or added were provided in November 2008 to Ökopol and IVAM:

Total Volume	**Methanol Released**	**Ethanol Released**	**Solvent Contained**	**Solvent Added**
Tons	Tons	Tons	Tons	Tons
2.995	214	524	120	11.083

4.1.3. Market shares of water repellent formulations

In principle, it would be more accurate to characterize the impregnation products market according to the categories listed above. However, a rough estimate of the relative market shares of the three categories defined by EVAM can be tabulated as follows:

Impregnation Product Category	**EU Market Share (%)**
Solvent based products	25
Water-based products	65
Cream-type products	10

We cannot explain the differences from figures in the document sent by IVAM[4] other that it may represent the market share of a limited number of formulators.

Furthermore, it should be realized that the categories as proposed by IVAM are not directly related to VOC content. Indeed, some of the different classes of impregnation products as listed in section 4.1.1 can be formulated as creams. Creams are used for convenience.

It was not possible to investigate this question further within the timeframe requested.

4.1.4. Variability of market shares across EU member states

CES members sell impregnation products directly to the market, through national and multinational distributor channels and through second-tier formulators. Providing detailed country-by-country figures would require considerable effort and is beyond the scope of this document within the timeframe requested.

Due to country to country variability in construction materials, the markets in Northern Europe do tend to be different compared to Southern Europe. It is estimated that relatively more solvent-based formulations (55-60%) are used in Southern Europe primarily because of limestone impregnation, whereas water-based formulations are relatively more acceptable technically in Northern Europe such as the Netherlands due to the prevalence of brick, and therefore their relative share is greater (45-50%). Cream formulations are less sensitive to geography.

4.1.5. Market trends

Increasing awareness of VOC regulations, particularly in the paint and coatings industry, has resulted in water-based impregnation products being the first choice for a given application. However, due to the technical deficiencies of these formulations, solvent based products are used as a last resort to achieve the desired level of performance.

This has important implications since the trend to low-VOC products is not determined by cost or tradition but by the rate of technical progress. Under the current state of research it is not technically feasible to develop low-VOC impregnation products that offer the same performance level as high-VOC products.

5. Impact of VOC level on water repelling impregnation products

5.1. VOC considerations

To achieve a desired level of water repellency it is necessary to apply a certain amount of active ingredients on the substrate. The VOCs released are therefore not only linked to the chemical nature of the active but also to dosage rates in these applications.

This has to be taken into account to describe a realistic scenario of VOC emissions from the use of water repellents.

If the VOC emissions resulting from the reaction of the active component with the substrate are taken into account, to achieve potential VOC reduction goals it will be necessary to consider reducing the application rate of the active component (the application rate is a function of the concentration of active component in the formulation and of the amount of formulation applied by unit surface).

5.2. Feasibility of reducing VOC levels in solvent-based impregnation products

A reduction of organic solvent in solvent-based impregnation products is not technically feasible due to the following reasons:

To further enhance the reaction with the substrate, it is necessary to use catalysts and that is only possible in the presence of organic solvents. This is especially important in regions with fast changes in the weather to impart an early weather resistance. Emulsions on the contrary can be removed by washing (especially by rain) resulting in a significant decrease of the available active content. This is extremely important for vertical or horizontal applications.

Typically the active components of impregnation products react with the silica present in most substrates to form long-lasting covalent chemical bonds. However, limestone and marble do not contain silica and can only be protected by using organically dilutable products. Therefore special adhesion promoting agents must be applied in combination with the impregnation products. These promoters are only soluble and stable in organic solvents. Not using such adhesion promoters causes the active content to be washed out by weathering.

Solvent based water repellents exhibit extremely high durability by deep penetration depth and optimized distribution of the active content within the capillaries and pores of the mineral substrate[5]. Emulsions on the contrary contain a high amount of water that prevents a deep penetration of the active content.

Furthermore water based products can cause efflorescence, because the water washes salts out of the mineral substrate. When building up the silicone resin network from an emulsion, these salts will be encapsulated at the surface and become visible by ugly and non removable stains. This effect can only be prevented by using products soluble in organic solvents.

A reduction of organic solvent in solvent-based impregnation products would result in highly concentrated formulations, which cannot be used for these purposes. Due to the high

concentrations, the actives remain at the surface resulting in an undesirable change of appearance, rendering the surface glossy and dark. Furthermore a too highly concentrated silane/siloxane product can significantly reduce the breathability of the mineral substrate, which may cause damage to building structures. The only possibility is the definition of selected exempt solvents for this application (boiling point > 180 °C by ASTM D 445) such as white spirits, because unreactive solvents are essential for this application.

5.3. Feasibility of reducing VOC levels below 20 % in impregnation products

To discuss the feasibility of reducing the VOC levels below 20 % the following three cases have to be considered separately:

5.3.1. Reducing the VOC level of solvent dilutable products below 20 %:

For solvent based material it is not possible to reduce the VOC level at all. Solvents are essential for these products, because to the reasons stated in section 5.2.

Removing solvent-based impregnation products from the market entirely would not lead to substitution with low-VOC alternatives because the latter cannot meet the technical requirements of the application, especially for heritage structures. The outcome would be the accelerated degradation and irreparable loss of historically and culturally significant works of art.

5.3.2. Reducing the VOC level of cream type products below 20 %:

For a discussion of the VOC level of cream type products this category has to be divided in two product classes. The first refers to creams for neutral to low alkali mineral substrates; the second to creams for highly alkaline substrates (e.g. concrete).

5.3.2.1 Creams for neutral to low alkaline mineral substrates

As already stated in section 4.1.1.6, solvents are a must to ensure a high penetration depth and an optimal distribution of the actives (silanes and siloxanes) throughout the capillaries and pores. The solvents prevent the paste or the creams from being concentrated on the surface forming an undesirable change of appearance. A too highly concentrated silane/siloxane product can significantly reduce the breathability of the mineral substrate, which causes damage to building structures. Provided that reactive components and all alcohols released by cleavage of alkoxy-functional silanes or siloxanes are not considered

as a VOC – and therefore are not added to the total VOC amount – it is technically possible with comply with a VOC limit for creams for neutral and low alkaline mineral substrates of 60 %

5.3.2.2 Creams for highly alkaline substrates (e.g. concrete)

In contrast to mineral substrates concrete generally has a much smaller pore structure. To ensure a wide distribution and a deep penetration these creams have a high silane content (75 % or larger) without additional organic solvents. For technical reasons depending on the method of the synthesis the starting materials contain up to 4 % of excess alcohol. These creams additionally contain emulsifiers and biocides, which are essential to the formulation. However they can contribute to the total VOC amount. Provided that reactive components and all alcohols released by cleavage of alkoxy-functional silanes are not considered as a VOC – and therefore are not added to the total VOC amount – it is technically possible with comply with a VOC limit for creams for highly alkaline substrates of 10 %.

5.3.3. Reducing the VOC level of water dilutable products below 20 %:

For this product class it is feasible to reach a VOC level of 20 % and below. Most water dilutable products are emulsions having silanes or siloxanes are reactive components. For technical reasons depending on the method of the synthesis the starting materials contain up to 4 % of excess alcohol. The emulsions additionally contain emulsifiers and biocides, which are essential to the formulation. However they can contribute to the total VOC amount. Provided that reactive components and all alcohols released by cleavage of alkoxy-functional silanes are not considered as a VOC – and therefore are not added to the total VOC amount – it is technically possible with comply with a VOC limit for water based products of 20 %.

5.4. Impact of VOC level below 1 %

Reducing the VOC level below 1 % is not technically feasible for any product category. For solvent based impregnation products and creams used in neutral and low alkaline substrates this is due to the above stated arguments (please cf. sections 4.1 and 5.3). Creams for highly alkaline substrates and water dilutable products always contain excess alcohol carried over from their manufacturing processes as well as emulsifiers and biocides, which all contribute to the total VOC amount. Therefore it is not technically feasible to reach a VOC level below 1 %. A VOC content below 1 % will imply that no sufficient and durable waterproofing for any substrate can be achieved.

1 R. Cooke, *Bridge Durability, Current Practice Sheet n° 2,* undated
2 Walter Noll – *Chemie und Technologie der Silicone* – Verlag Chemie GmbH - Weinheim/Bergstraße
3 Wacker Chemie AG*, Water Repellent Treatment: Reliable Protection Against Moisture,* Master Builders, pp83-99, 1Q 2007
4 Information obtained from a major player in hydrophobing products – to be confirmed IVAM/Ökopol, 24 February 2009
5 A.H. Gerdes, *Transport und Chemische Reaktion Siliciumorganischer Verbindungen in der Betonrandzone*, Abhandlung, Diss. ETH Nr. 14317, Dissertation ETH Zürich, 2001.

Annex 47 Stakeholder Document (European Adhesives Industry)

47. FEICA – Position on the review of the Directive 2004/42/EC, Brussels, October 2008

FEICA position

on the review of the Directive 2004/42/EC
on the limitations of emissions of volatile organic compounds due to the use of organic solvents in certain paints and varnishes and vehicle refinishing products and amending Directive 1999/13/EC

October 2008

INDEX

VOC reduction in Europe 2
Adhesives and VOC reduction 2
Small installations and the scope of the directive 2004/42/EC 4
The scope of possible restrictions for VOCs in adhesives 4
The role of VOCs in adhesives 4
Solvent based adhesives and their alternatives 5
VOC categories and limits 6
Products/Applications without alternatives 7
Primers and adhesives 7
Pipe adhesives 8
Spraying adhesives 8
Shoe manufacturing/repair adhesives 8
Conclusion 9

FEICA, the European Adhesive & Sealant Manufacturing Association, is a multinational association representing the European Adhesive and Sealant Industry. With the support of 15 national associations and several direct and affiliated members, FEICA coordinates, represents and advocates the common interests of our industry throughout Europe. In this regard FEICA aims at establishing a constructive dialogue with legislators in order to act as a reliable partner to resolve issues affecting the European Adhesive and Sealant Industry.

FEICA is pleased to have been contacted regarding the review of the Directive 2004/42/EC on the limitations of emissions of volatile organic compounds due to the use of organic solvents in certain paints and varnishes and vehicle refinishing products and amending Directive 1999/13/EC. Following the meeting with the European Commission, member states and Oekopol on 9 April 2008 FEICA would like to contribute to the discussion on review of the scope of the directive 2004/42/EC with the present paper.

VOC reduction in Europe

VOC reduction for environmental reasons has long been a subject of concern in the European Union and there are two main directives in this area, the so-called VOC Directive 1999/13/EC and the so-called DecoPaint Directive 2004/42/EC.

Both directives aim at reducing ozone formation. To this end the first directive, the 1999/13/EC regulates VOC emissions from installations, which typically have control mechanisms that prevent emissions to be released directly into the environment.

The 2004/42/EC aims at regulating emissions that are not covered by the 1999/13/EC, namely emissions from uncontrolled environments such as from open (in situ) air uses. It was developed mainly to help member states to comply with the directive 2001/81/EC on national emission ceilings for certain pollutants (NEC Directive) in which target ceilings for emissions from several pollutants, including VOCs are set for 2010.[1]

The *NEC (National Emissions Ceiling) Scenario Analysis Report Nr. 6* (SNAP 6July 2008)[2] which provides the expected NEC for 2020 based on the 2008 *Climate & Energy Package*, reports that the VOC emissions in 2020 will be 6146 kt for EU-27 and thus stay even below expectations. The Commissions Thematic Strategy on Air Pollution (TSAP) set a target of 6072 kt for EU-27 by 2020. The report states there is no need for new legislative measures in the solvents sector (SNAP 6) to meet the TSAP environmental objectives.

The goal of the 2004/42/EC is to improve the environment by reducing ozone formation. From the *NEC Scenario Analysis Report no. 6* (July 2008) can be concluded that further VOC reduction in Europe will not bring about a considerable improvement for the environment.

Adhesives and VOC reduction

Notwithstanding the conclusions of the NEC Scenario Analysis Report, FEICA acknowledges that it is important for both industry and regulators to work together on the review of the 2004/42/EC to ensure that the emission ceilings will be kept in the future.

It is estimated that solvent based adhesives account for more than 80% of the solvent usage in the adhesives industry.[3] Any discussion on introducing legislative measurements to further reduce the VOC content in products has to take into account the cost-benefits relation and the efficiency of those measures. Therefore, the scope of any possible VOC restrictions in adhesives should focus on solvent based adhesives only.

[1] OJ L 143, 30.4.2004, whereas (1) – (6)
[2] Report can be found on the IIASA website (www.iiasa.ac.at)
[3] Excerpt from FEICA statistics report that was sent to Oekopol 8 September 2008

For several years the demand of solvent based adhesives for certain applications has reduced significantly due to the availability of alternatives. The adhesives industry is constantly investing time and money into research to further improve the environmental performance of our products.

The 2004 total demand for solvent based adhesive systems in Western European Countries was estimated at 413.000 tonnes (see figure 1)[4]. The 2004 total demand for solvent based adhesives systems in Central and Eastern Europe was estimated at 130.000 tonnes (see figure 2)[5]. Thus the sum of solvent based adhesive systems sold in Western and Eastern Europe mounts up to 543.000 tonnes.

Figure 1:

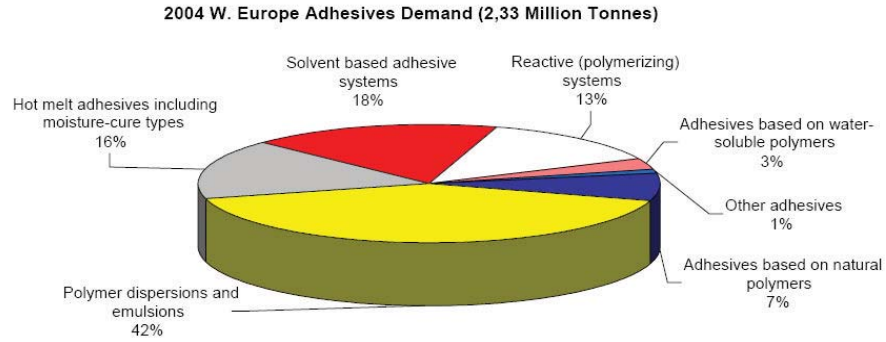
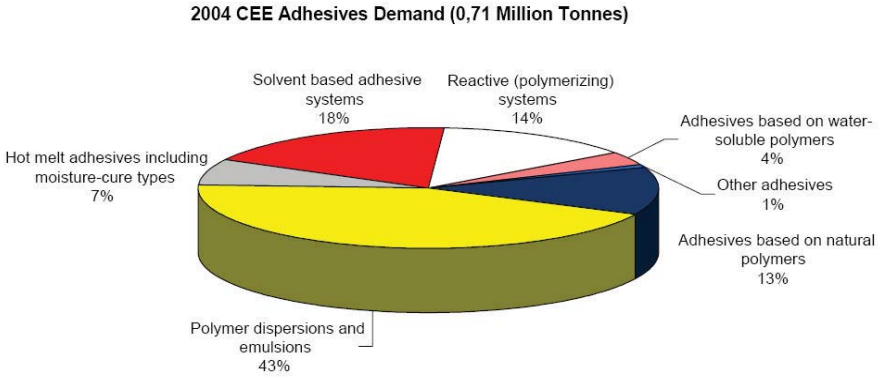


Figure 2:

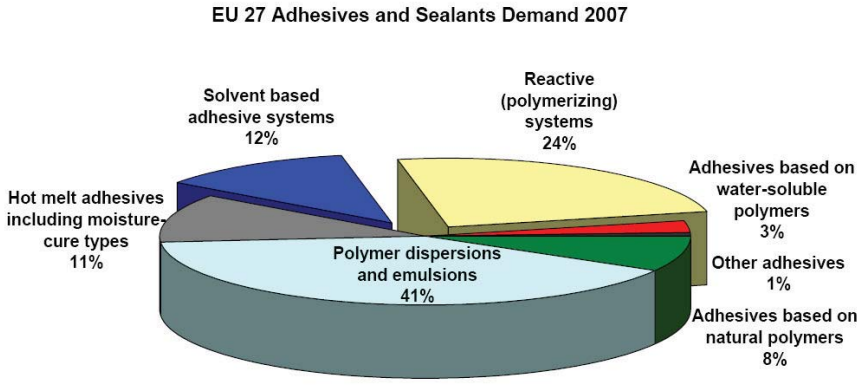


[4] "European Adhesives & Sealants Market 2004-2007"; CHEM Research GmbH – Western Europe Country Focus: Austria, Benelux Countries (Belgium, Luxembourg, The Netherlands), France, Germany, Great Britain, Italy, Nordic Countries (Denmark, Finland, Norway, Sweden), Spain, Portugal, Switzerland, Others (Greece, Ireland, Malta)

[5] "European Adhesives & Sealants Market 2004-2007"; CHEM Research GmbH – Central and Eastern Europe (CEE) Country Focus: Czech and Slovak Republics, Hungary, Poland, Russia, Turkey, Others (Albania, Baltic States, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Macedonia, Moldova, Romania, Serbia and Montenegro, Slovenia and Ukraine)

In 2007 the overall demand for the EU 27 and surrounding countries[6] for solvent based adhesive systems was estimated at 380.000 tonnes (see figure 3)[7].

Figure 3:



Therefore, It can be roughly estimated that the demand of solvent based adhesive systems decreased from 2004-2007 by 163.000 tonnes which accounts for a reduction of 30%. From the remaining 380.000 tonnes the majority is used in installations and covered by directive 1999/13/EC.[8]

Small installations and the scope of the directive 2004/42/EC

The scope of directive 2004/42/EC and the boundaries towards directive 1999/13/EC must be precise and clear. The EU Commission has issued a FAQ[9] on DG Environment webpage, regarding among other things, the boundaries between the two VOC-directives.

This FAQ clearly states that installations authorised/registered according to national law in line with the provisions of Article 3 and 4 of the VOC Solvents Directive with VOC consumption below the threshold levels laid down in annex IIA of directive 1999/13/EC, do not fall under the provisions of directive 2004/42/EC. If smaller companies would fall under 2004/42/EC, they would be forced to use other types of products than their bigger competitors. This would result in a skewed competitive situation, since the solvent based adhesives are developed for these industrial applications and often have a higher performance than the waterbased alternatives.

It is essential to clarify the boundaries of the 2004/42/EC towards the 1999/13/EC and include it into the review of the directive. This safeguards the competitive edge of SMEs, which would have a very hard time coping, if they had to use different products with lower performance or higher prices compared to bigger companies.

The scope of possible restrictions for VOCs in adhesives

The role of VOCs in adhesives

[6] (It has to be taken into account that the statistics for 2007 do not include the same countries as in 2004 for example Russia is missing. Furthermore, the 2004 statistics included adhesives for tapes whereas these are excluded from the 2007 statistics. In the 2007 statistics sealants were added)
[7] "European Adhesives & Sealants Market Report 2007-2010"; CHEM Research GmbH
[8] Some national associations will be able to provide more detailed statistics for their own country
[9] The FAQ can be read at:
http://ec.europa.eu/environment/air/pollutants/stationary/solvents/faq_en.htm

In adhesives (see BiPRO study[10]), VOCs almost exclusively play the role of a solvent, i.e. they reduce the viscosity of the mixture, the drying time and the need to pre-treat the surfaces to be bonded, etc.

Solvents have the unique property of being able to evaporate from between two relatively impermeable surfaces and generally enable fast drying. For example roofing applications rely on the difference in permeability between water and solvents. The bonding waterproofing materials such as roofing felt use solvent based adhesives which are both water resistant and capable of being used in wet, damp or humid conditions, an essential characteristic in many EC countries.
Solvents also promote the flow and wetting[11] (i.e. the application of the adhesive) and they have specific solubility relationships with the rubbers and resins used for the manufacture of many adhesives. They can also have an effect on the surface to which the adhesive is applied. Furthermore, they may soften or dissolve the surface. At one extreme, the process of adhesion is to dissolve the two surfaces to permit them to weld together.

A reduction of VOCs in solvent based adhesive systems will bring about such a decrease in quality that the adhesive becomes ineffective for most applications. Only in some cases it could be substituted by a water based system.

Solvent based adhesives and their alternatives
When talking about adhesives there are various types of adhesive systems (for definitions see EN 923:2006**)** in the market such as

- solvent-born adhesives[12]
- water-based adhesives
- hot melts
- reactive systems
- pressure sensitives
- cement based adhesives

All of those adhesive systems have their specific role and field of application in adhesive bonding technology and cannot simply be substituted by another adhesive system. E.g. pressure sensitives on adhesive tapes guarantee not only an easy use but also a high tack, and reactive systems perform superior durability and highest bond strengths as needed in aircraft and car industry. As explained before VOC reduction in an already optimized solvent based adhesive will result in a loss of quality. Therefore a better solution to reduce VOC would be to switch to a different adhesive system such as water based systems - if possible.

Although these alternative systems often still contain VOC the VOC content of any other system is already considerably lower than in the solvent based products. Most of the alternatives are solvent free or contain little amounts of solvents with regard to the definition in EN 923:2006 ("*Note: in practice solvents used for solvent-borne adhesives have boiling points below 170 °C at 101,3 kPa and a vapour pressure greater than 50 Pa at 20 °C and, if flammable, a flashpoint below 55 °C"*).

When a solvent is used to dissolve a rubber the solvent content required is likely to be 80 to 85% to achieve a flowing solution. The addition of resins, which dissolve in the solvent, and

[10] "Screening study to identify reductions in VOC emissions due to the restrictions in the VOC content of products", February 2002 – Final Report – BiPRO for the European Commission
[11] Wetting is the contact between a liquid and a solid surface when the two are brought together. A good wetting ability of an adhesive is one requirement for a good adhesion.
[12] **EN 923:2006; 2.1.7 Solvent-borne adhesive; solution adhesive; solvent based adhesive**
Adhesive in which the binder is dissolved in a volatile organic solvent (Note: in practice solvents used for solvent-borne adhesives have boiling points below 170 °C at 101,3 kPa and a vapour pressure greater than 50 Pa at 20 °C and, if flammable, a flashpoint below 55 °C.)

fillers will reduce this to anything from 15 to 75 %. Water based adhesives on the other hand only use a very small amount of solvent to dissolve only the resin or to soften the polymer in the emulsion, typically only a few % is required. This means that with fillers and the water in the product the solvent content of water based adhesives is likely to be less than 10% of the total product including water. The VOC/solvent reduces the viscosity of the polymer resin mixture around the time of application, enhancing the tack. Loss of the VOC then allows the drying adhesive, already in its final position, to gain cohesive strength.

The solvent content of water based adhesives is likely to be less than 10% of the total product including water as opposed to 80-85% in a solvent based adhesive.

The current definition of a VOC in the 2004/42/EC (initial boiling point ≤ 250°C at 101,3kPa[13]) raises concerns in the adhesives industry that not only solvents will be classified as VOCs but also other compounds that are typically found in alternatives to solvent based systems such as water based systems.
These VOC (which are not "solvents" as mentioned above) are substances like film building agents with a boiling point between 200 - 250°C. Those "additives" are necessary to achieve an optimised performance but the total VOC content is small and usually below 10 %. (For a list of examples please see annex I)

Therefore, FEICA believes that any possible VOC limits for adhesives products should be valid only for solvent based adhesives.[14] Other systems need to stay unrestricted so that they can be used as alternatives. In this respect "other system" refers to the complete adhesive bonding process including the adhesive as well as all necessary pre-treatment steps.

VOC categories and limits

On 19 June 2008 FEICA received a proposal for VOC limits in adhesives from Oekopol. FEICA discussed the proposal and came to the conclusion that these limits and categories needed to be adjusted for several reasons. As we understand it, the Oekopol proposal emanates from a list of applications and adhesives utilised in Canada and the United States of America. It should be based in mind that their definition of VOC is different than in the 2004/42/EC and that some solvents that are included under the definition of the 2004/42/EC are exempt under the definitions of Canada and the US as they do not contribute to ozone formation. Therefore their VOC limits cannot be directly translated to the EU. The list also differentiates between architectural applications and specialty applications. There is however no need to restrict VOC-content in adhesives used solely in installations regulated by directive 1999/13/EC. The environmental benefit, albeit small, that could be gained from restricting VOC content in adhesives must be aimed at "open" applications where the means to otherwise deal with the emissions are lacking. The latter includes various types of adhesives used in uncontrolled environments such as construction sites or "architectural" applications, performed in situ at the buildings location. For this reason, the specialty applications in the Oekopol proposal is already addressed in installations covered by directive 1999/13/EC and need not be in the revision of directive 2004/42/EC.

Furthermore, a proposal of this kind needs to be transparent across the member states of EU and work just as well in Portugal as Finland when it comes to interpreting which adhesives are within the scope. The VOC g/l limits on the adhesives need to be in compliance with what is technologically possible, both in the manufacture of the adhesive, but also in the application, in order to achieve a strong bond that the customer can trust. A technologically inferior adhesive will produce an inferior bond that may result in a premature bond failure, thus resulting in the need to expend more resources to mend the bond (or in worst case, injuries to humans).

[13] Directive 2004/42/EC Article 2 § 5
[14] See footnote 7

It has to be ensured that possible regulatory measures bring about genuine long term benefits for the environment. To promote improvements to both performance and the environment, the industry will adjust the Oekopol proposal and simplify the categories in accordance with the types of adhesives that are used on the European market today. These categories will include solvent based application used in situ where FEICA believes there might be environmental benefits to be gained. FEICA will provide the results of this discussion to Oekopol and the European Commission.

Products/Applications without alternatives

There are areas where the solvent content in the adhesive is so important that it will not be possible to reduce it at all without compromising on the quality of the results. As the below listed applications can not be replaced by alternatives that achieve comparable results they should be exempt from any restriction.

Primers and adhesives

When bonding two surfaces (substrates) it is very important, to generate good adhesion between the substrate and the adhesive. The strength of the adhesion has to be equal or higher than the strength in the adhesive itself (the cohesion). For some materials, this can be very difficult, mainly due to two problems commonly occurring during the bonding processes: first the substrates having a too low surface tension or second the substrate being to porous.

Substrate with a low surface tension

A primer with a lower surface tension than the substrate and/or a low viscosity can be applied to the substrates before bonding to create a kind of coupling agent between the substrate and adhesive. When wetting a surface, it is important that the surface tension of the liquid (adhesive or primer) is as low as possible, at least lower than the surface tension of the substrate. Primers have a much lower surface tension than adhesives. When the solvent evaporates, the primer transforms to a film, with a higher surface tension than the substrate, thus creating a 'new' surface with a very high surface tension which is easier to work with.

Porous surfaces

Through application of a primer on a porous surface, the primer penetrates with its low viscosity into the porous surface. After the drying process, the solvent has evaporated and the solid has filled the porous surface, the surface gets smooth. On the smooth surface the adhesive comes into contact with the surface more easily. The contact between the surface and the adhesive is essential for the degree of adhesion.

VOCs help to lower the surface tension in the primer and at the same time also reduce its viscosity. Other systems such as water based adhesive cannot achieve the same low surface tension and the same low level of viscosity. Therefore, if the solvent content in primers was to be lowered, many materials could simply not be bonded together by adhesives anymore. In some cases, it might be possible to use adhesives with a much higher amount of VOC (and thus lower the surface tension), however, the result is likely to have a low quality and the impact on the environment would only increase as the solvent content of the adhesive itself would have to be increased significantly in order to achieve satisfactory results.

As primers are usually applied in very thin films, the total evaporated amount of VOC from an adhesive system (adhesive with primer) is lower than that of the alternative use of an adhesive which contains a high amount of VOC. The VOC content of primers should not be restricted as they are part of alternative systems to solvent based adhesives.

Pipe adhesives
Pipe adhesives for plastic pipes are normally used to transport water or aggressive chemicals from one point to another. Therefore it is very important, that the adhesive line is at least as resistant to the chemicals, as the pipes themselves. It is also important to have the same physical properties in the adhesive line as the surroundings, which is why the optimal bonding of two pipes is when the ends of the pipes are bonded together with the same material as the pipes themselves and the result is in principle one pipe. This means that the same chemical resistance, the same strength and other physical properties that can be found in the material of the two pipes can be achieved in the adhesive lining also.

To achieve this, the adhesive formulator has to incorporate the specific plastic type of the pipes into the adhesive. This plastic is incorporated due to its filling properties, i.e. it will fill out the space between the two pipes during the bonding process. However, the plastic can be incorporated in the adhesive only by use of solvents, which dissolve the plastics. When the solvent evaporates the pipes are dry and effectively welded into one piece.

Solvents in pipe adhesives could never be substituted by water-based systems as the water cannot dissolve the plastic. Therefore, the VOC content in solvent based adhesives for pipe bonding should not be subject to restrictions.

Spraying adhesives
Spraying adhesives are a small market. Nevertheless, there are some applications that can not do without this type of adhesive which includes aerosol adhesives and self-contained, self pressurized containers. This is mainly the case where uneven surfaces or awkward shapes are difficult to wet or where porous or other absorbent materials demand an adhesive with a low soak-in ability. Another advantage of spraying adhesives is their speed in both the application as well as in the drying (as the film is generally very thin). In addition, spray adhesives allow very controlled dispensing and application, hence over use and therefore exposure to VOCs is minimised.

There are various kinds of spraying adhesives specially designed for certain needs such as the bonding speed, and whether the bond is permanent, semi-permanent, or temporary. Artists' adhesives for example are made for exploratory work with lightweight material. It can be lifted and repositioned, and is therefore often chosen for applications such as layouts, design creation, photocomposition, and other situations in which a permanent bond is not sought.

VOCs are essential in spraying adhesives in order to dilute and dissolve the adhesives and ensure their spraying ability. The VOCs are used as propellants and a reduction of VOCs in spray adhesives would bring along a significant decrease in product performance. Lowering the VOC content would exacerbate stability problems including valve clogging and would require use of less solids, resulting in an adhesive product with less adhesive. Customers would therefore have to use more of the product to achieve the same coverage and protection; as such, VOC emissions would not be reduced.

Given the rarity of the application (i.e. the small amount of VOC emissions) and the difficulty in replacing VOCs in spray adhesives by another technology, FEICA advocates not to restrict the VOC content in these products.

Shoe manufacturing/repair adhesives
Smaller businesses such as footwear manufacturing or repair shops need the flexibility to still be able to bond a large variety of substrates and different surfaces and therefore use solvent based adhesives. These companies are specialized in the production and repair of small lot sizes in short time and need the use of solvent based adhesives for this kind of application.

What is more solvent based adhesives can be used for all kinds of adhesion in footwear manufacturing and repair whereas dispersion and other adhesives systems are limited in their respective application field and need specific adjustment before being applied. Also, these businesses have limited capacities to put various kinds of adhesives in stock, keeping in mind that adhesives have only a limited shelf life.

The use of solvent based adhesives, performing well in a wide range of application, makes it possible to use a diverse range of materials for shoe production and repair and assures the long term adhesion between sole and upper.

Finally FEICA would like to repeat that SMEs such as footwear production and repair shops should be kept outside the scope of the 2004/42/EC review (as mentioned in the FAQ of the Commission on the boundaries of the directive 1999/13/EC and 2004/42/EC / see footnote 9).

Conclusion

The *NEC (National Emissions Ceiling) Scenario Analysis Report Nr. 6* (July 2008) showed that further VOC reduction in Europe will not bring about a considerable improvement for the environment. Nonetheless, FEICA believes that industry and regulators should work together to ensure that emission ceilings can be kept also in future with a growing industry. In fact, FEICA members investigate a significant amount of time and money into developing ever more environmentally friendly products and the demand of solvent based adhesive systems has thus seen a steady decline over the years.

It would be most important that any additional regulatory measures would be considered under a cost benefit analyses and as regards to their effectiveness. This means that any new legislative restriction should help to bring the goal a step closer, which is to reduce ozone formation to a minimum. Given the size of the adhesive sector, VOC restrictions will not bring about a significant change for the environment.

If nonetheless, the Commission wants to introduce additional regulatory measures to reduce the VOC content in adhesive products, FEICA strongly recommends distinguishing between solvent based adhesives which account for 80% of the solvent usage and 'other' adhesive systems. Not only have other systems a considerably lower solvent content but also, they are used as alternatives to solvent based adhesives. In order to encourage industry to develop alternatives it is essential that these will stay (unrestricted) in the market for the years to come.

Oekopol has sent FEICA a first proposal of VOC limits in adhesives. However, these seem to be based on legislation outside Europe, such as Canada and the US. As these countries have different definitions of VOCs and different requirements for exemptions, their limits cannot be accepted as EU levels. FEICA is in the process of reviewing these internally and will respond to this separately.

Finally, there are several product and application areas where the adhesives being used are so specialised that a reduction of VOCs would render them inoperative. As these are at the same time products/applications without acceptable alternatives, FEICA advocates that these should be exempt from any possible restriction.

For more information please contact: Jana Cohrs (j.cohrs@feica.eu)

Annex 48 Stakeholder Document (European Adhesives Industry)

48. FEICA – Comments on option 11 and option 6 of the Oekopol interim report on the review of directive 2004/42/EC, Brussels, 23.04. 2009

European Commission
Fabio Dalan
DG Environment
Avenue de Beaulieu 5
B - 1160 Brussels
Belgium

Oekopol
Christian Tebert
Institut fuer Oekologie und Politik
Nernstweg 32-34
D-22765 Hamburg
Germany

RPA – Risk Policy Analysts
Daniel Vencovsky
1 Beccles Road
Loddon, Norfolk, NR14 6LT
United Kingdom

Electronically to: Fabio.DALAN@ec.europa.eu; tebert@oekopol.de; daniel@rpaltd.co.uk

Brussels, 23 April 2009

Comments on option 11 and option 6 of the Oekopol interim report on the review of directive 2004/42/EC

FEICA has been involved in the review of the 2004/42/EC since the beginning and submitted a first position to the Commission as well as to the consultant, Oekopol, on 8 October 2008. FEICA also provided comments about the Calculation method. Oekopol has reflected on much of FEICA's input in the interim report that was sent on 17 February 2009.

The Oekopol interim report about the revision of the 2004/42/EC includes several options for the reduction of VOCs in different sectors. Option 11 proposes reducing VOCs from solvent-based adhesives for floor coverings. The consultant Risk Policy Analyst/RPA has now contacted FEICA to ask for assistance in conducting an impact assessment for Option 11.

The FEICA position, set out below, is a reaction to both Options 6 and 11 in the Oekopol interim report as well as to the RPA impact assessment.

Option 11
The Oekopol recommendation is based upon the Dutch Law 'Arbeidsomstandighedenregeling betreffende werkzaamheden met vluchtige organische stoffen'. This law sets the limit for adhesives for floorings used indoors at 5g VOC/kg. FEICA would like to point out that this legislation was put in place to protect workers rather than the environment and therefore, any benefit for the environment has not been evaluated.

As already explained in our first position from 8 October 2008, the goal of the 2004/42/EC is to improve the environment by reducing ozone formation. From the *NEC Scenario Analysis Report no. 6* (July 2008)[1], it can be concluded that further VOC reduction in Europe will not bring about any considerable improvement for the environment. The sector that would potentially be restricted by option 11 is so small that no further benefits can be expected.

[1] Report can be found on the IIASA website (www.iiasa.ac.at)

FEICA Aisbl.

Association of European Adhesives & Sealants Manufacturers

Avenue E. van Nieuwenhuyse 6
B-1160 Brussels
Belgium

phone
+32 26767321
fax
+32 26767399

Internet:
http://www.feica.com

Assuming that the aim of Option 11 is to prohibit the use of solvent-based adhesives for floor coverings, it is unclear to FEICA why a VOC limit has to be set.

The danger of setting a VOC limit, and especially such a low one, is that even some water based and reactive systems may contain more VOC than the 5g/kg recommended. This in turn can then be misinterpreted, as it does not seem logical that a limit for solvent-based adhesives is so low, that the alternatives cannot comply with it. FEICA believes that this may cause confusion and even criticism about the alternative systems. It therefore strongly recommends the use of the official EN 923 2.1.7 definition.

Furthermore, although for some indoor floor-covering applications, alternatives to solvent-based adhesives exist, the alternatives are designed to work in typical indoor environments (ca. 20℃ and low humidity). Furthermore, these alternative systems are only used for large scale operations, meaning those, where no immediate stress is applied to the joints as may happen when covering the curved nosing of a staircase with carpet and where the substrates are air-permeable. Any restrictions would therefore, need to allow for exceptions where, solvent-based adhesives remain the only viable solution.

Therefore, FEICA would like to suggest:

- To use the official EN definition of solvent-based adhesives (EN 923 2.1.7);
- To limit the restrictions to non-humid environments at 20℃ and
- To provide for exemptions for certain applications as explained below.

Indoor flooring applications without alternatives to solvent-based adhesives
Notwithstanding the existing alternatives to solvent-based adhesives for bonding floor coverings indoors (ca. 20℃ and no humidity), there are certa in applications in which these alternatives present problems. These problems are mainly related to the slow drying of the alternative systems, which becomes even more problematical when the substrates are not permeable to air, and/or where there is no immediate tack.

The applications concerned include:

- Curved floorings, such as staircases with curved step nosing
    - Because the flooring will not stay in place until the adhesive is dry; (i.e. stress is applied to the joints);
- Skirting and cove bases
    - Because they will not stay in place long enough for the adhesives to dry (i.e. stress is applied to the joints);
- Rubber or PVC baseboards homogeneous-heterogeneous PVC, cushion vinyl and non porous substrate like metal
    - Because these are non air-permeable substrates and the baseboards will not stay in place long enough for the adhesives to dry and

Option 6: Assessment of inclusion of ISO11890-1:2007 for VOC content determination in Annex III
FEICA would also like to comment on option 6 of the Oekopol Interim report which relates to the inclusion of the ISO 11890-1:2007 method for VOC content determination.

It is understandable that, wherever possible, the least expensive method of accurately determining the VOC level is desirable. Annex 3 of Directive 2004/42/EC prescribes only ISO 11890-2 for the determination of the VOC content of all coatings not containing reactive diluents. ISO 11890-2 itself provides additional information and states that 11890-2 is preferred if the expected VOC content is greater than 0,1 % by mass and less than about 15 % by mass.

It then goes on to say that when the VOC content is greater than about 15 % by mass, the less complicated method given in ISO 11890-1; may be used. One could therefore infer that this was also already applicable for Directive 2004/42/EC, even though it is not directly referred to.

It is important to understand that ISO 11890-1 is only applicable for products with a VOC content > ca. 15% by mass and is not suitable for lower VOC products. Even then, it is given as an optional test procedure. If ISO11890-1 is to be included directly in Directive 2004/42/EC, it should be written in an identical format to the reference given in ISO11890-2. There should be no suggestion that as it is a lower cost method, then it could be used for all products and ISO11890-2 should still be the preferred recommended method.

In fact a calculation method would be the preferred lower cost option, as any measurement can only be a snapshot and does not give any data regarding the reliability of the measurement. A calculation method would clearly set out the worst case scenario regarding the VOC content of a product. Article 4 sets out requirements for labelling, specifying that the maximum content of VOC in g/l of the product in a ready-to-use condition, should be stated. This can only be done by calculation. It might be more useful to have this detailed in the revised directive.

Therefore, FEICA would like to see the calculation method formally included in the 2004/42/EC, as a safe option for industry to choose to calculate the worst case scenario.

Conclusion

The 2004/42/EC is aiming to reduce the impact of VOCs from uncontrolled environments to prohibit ground ozone formation. Whilst this is an important objective, the possible benefits have to be set against the feasibility of success and the arising costs of such action. As stated above, the environmental benefits from restricting a small sector such as flooring adhesives are negligible.

However, if restrictions are to be made, in order to reach maximum reduction, while respecting the limits of alternatives to solvent-based adhesives and keeping costs to a minimum; FEICA proposes to:

- Limit the scope of option 11 to the official EN definition of solvent-based adhesives (EN 923 2.1.7) and to non humid environments at 20℃ an d
- Provide for exemptions, for certain applications, as explained above.

Furthermore, FEICA would like the 2004/42/EC to refer to the calculation method, as a possible option to calculate the worst case scenario.

Yours sincerely,

Bernard Ghyoot
Secretary General

Annex 49 Stakeholder document (European Adhesives Industry)

49. FEICA – The importance of an official reference to a calculation method in the legislative text, Brussels, October 2008

FEICA input to the review of 2004/42/EC

The importance of an official reference to a calculation method in the legislative text

October 2008

Further to our first paper on the review of the 2004/42/EC sent on 8 October 2008, FEICA the European Adhesive & Sealant Manufacturing Association would like to provide further input related to the calculation of VOC emissions.

The Directive 2004/42/EC partially overlaps with the 1999/13/EC. An interim report attempted to define VOCs (Volatile Organic Compounds)[1] recommended the definition "any organic compound having an initial boiling point less than or equal to 250°C measured at a standard pressure of 101,3 kPa." which is different from the original definition in the 1999/13/EC.

The 2004/42/EC Directive permits two test methods, ISO 11890-2, analysis by GC, which requires identification and knowledge of the VOCs analysed and ASTMD 2369, gravimetric analysis where reactive diluents are present, which presumes no knowledge. The latter method can only be roughly related to the VOC definition. For the purposes of labelling the manufacturer needs to 'adjust' the results to take into account potential variations due to the raw materials, manufacture, fill and possibly use if the product is diluted with additional VOC. In practice the analytical techniques are, arguably, only used for compliance.

An accompanying FAQ[2] to the VOC Solvents Directive 1999/13/EC provide guidance by suggesting how certain provisions of the Directive should be understood and include. In question 9, the calculation method with a worked example, demonstrates that it is an accepted technique but is accompanied with the statement: "The guidance does not represent an official position of the European Commission and cannot be invoked as such in the context of legal proceedings."

Recently, the Environmental Protection Department, Hong Kong, completed a consultation exercise[3] on a Proposal for Control of Volatile Organic Compound Emissions from Adhesives and Sealants from Vehicle Refinishing Paints, Marine Vessel Paints, and Pleasure Craft Paints.
The adhesive application categories in Oekepol (RPA) appear to correspond to some of the categories in the EPD Hong Kong proposal. The EPD Hong Kong proposal closed 30th June 2008 and appeared to follow the US Environmental Protection Agency (EPA) approach by including EPA test method m-24 following ASTM D 2369 and (in 11.3.2) to measure water content using either ASTM D 3792-79 or 91, by Direct Injection into a Gas Chromatograph or to ASTM D 4017-81, 90, or 96a, by the Karl Fischer Titration Method. Neither of these methods are particularly reproducible with an earlier report[4] suggesting an accuracy of approximately 3 to 5% for both D3792 and D 4017 with the obvious implications for reporting VOC levels as minor ingredients in water borne products.

The 2004/42/EC Directive recognizes the difficulty of measurement but does not acknowledge degrees of harm associated with different VOCs. "To guarantee citizens the right to a clean

[1] DECOPAINT Study on the Potential for Reducing Emissions of Volatile Organic Compounds (VOC) Due To The Use Of Decorative Paints and Varnishes for Professional and Non-professional Use
http://ec.europa.eu/environment/air/pdf/paint_solvents/decopaint.pdf
[2] http://ec.europa.eu/environment/air/pollutants/stationary/solvents/faq_en.htm#q2
[3] http://www.epd.gov.hk/epd/english/environmentinhk/air/pub_consult/air_consult.html
[4] **Environmental coating problems : Difficult VOC/HAP issues concerning electrocoating;** *Metal Finishing, Volume 94, Issue 9, September 1996, Pages 72-73*; Ron Joseph

and healthy environment", is a stated requirement in 1999/13/EC. For this, other standards permit an exclusion which inevitably invokes partially using the calculation method, for example see annex 3 of the EPD, Hong Kong proposal, above, and the USA California rules.

Compared to the high uncertainties of the different test methods, the calculation method provides a greater level of confidence with a known degree of error. If reasonable interpretation is permitted to the actual wording of the existing standards, then the methods could be used to assist in calculating VOC contents for adhesives.

Conclusion

ISO 11890-2) 2002 gas chromatography method

- Presumes knowledge of the components (or access to data base of known ingredients)
- Compliance testing
- Tests the sample presented, cannot predict worst case condition of the product

ASTMD 2369 2003

- Pragmatic test with limited practical relationship to stated VOC definition
- The scope only specifies coatings and does not refer to adhesives
- The procedure is unsuitable for testing many adhesives, and high viscosity pastes.
- Potential for assisting calculation method for most volatile components
- Tests the sample presented, cannot predict worst case condition

Calculation method

- Requires knowledge of components and manufacture
- Overestimates the VOC content if simple data for boiling point (BP) is used
- Suitable for worst case scenarios
- Supplier data required or practical test if inadequate data is available
- Enables exclusions to be incorporated

The current legislation refers to two test methods ISO 11890-2 and ASTMD 2369. As these test methods require considerable time and resources and as they are in no way more correct than the alternative calculation method, FEICA advocates including an official reference to a calculation method into the legislation.

Annex 50 Stakeholder document (European adhesives producers)

50. FEICA – input on technical specifications of alternatives to solvent-based adhesives, Brussels, 19.05.2009

FEICA has questioned members and received a great variety of answers. The practices in countries differ greatly. What is explained below tries to take all input into account but it has to be understood that there may be different practices still.

Indoor conditions
The term "indoor conditions" has been introduced by FEICA in order to clarify that we are talking about work places (building sites) with more or less defined climate conditions (steady temperatures of at least 15° C (floor), 18-20° C (air temperature) and 65-75% rel. humidity. These conditions are necessary for both, floor coverings and water-based adhesives! Low temperatures and humid environments also have adverse effects on reactive systems and can impact on the curing characteristics of reactive systems, although there are catalysts that can be used to speed up the drying process.

Alternatives other than water-based systems
The most common alternatives for solvent-based adhesives in carpet bonding are water-based systems. Where these cannot be used reactive systems are used, but they tend to be more expensive. The same goes for parquets, just that the reactive systems are used more often since the wood often does not support the water-based systems.

According to the input of some members the problem with reactive systems still is that unfortunately they do not give the required level of initial grab (enabling the floor covering to remain in permanent contact with the floor) especially if intending to adhere floor coverings with a degree of memory i.e. certain carpets, Linoleum which tend to curl back if they have previously been stored on rolls etc. Special catalysts need to be used when using reactive systems. As mentioned above disadvantage for the consumer is the higher price of reactive systems but also that the workers need to be trained to use the ‘new’ alternative systems. This know-how is common in some countries where training may even be offered in cooperation of the national association but not in many others.

The use of hot melt adhesives in the application of floor coverings seems uncommon (or thought impossible) in most countries due to a number of reasons including the need for heat and open time restrictions. Also the installation of floor coverings requires a holohedral coating which is difficult to achieve with hot melts.

Dual use
We do not see a danger for dual use here. To our knowledge these adhesive are usually sold as flooring adhesives.

Annex 51 Stakeholder document (European adhesives producers)

51. FEICA – Input on statistics on solvents in flooring adhesives, Brussels, 19.05.2009

FEICA input on statistics on solvents in flooring adhesives

19 May 2009

Whilst the overall statistics of FEICA are well aligned with the national associations, some of them have a different sector break down of national statistics (this is mainly due to the fact that some of them collect national statistics on a more detailed level, whereas others do not). Therefore, we suggest, that were national statistics on this issue exist, they should be taken into account (namely Germany and UK).

United Kingdom

In the UK BASA conducted a short survey of its members to get the necessary information to complete the RPA questionnaire on this subject and can offer the following figures on the current UK market, which were presented to RPA in response to questions 2,6 & 7 in their questionnaire.

- The market in the UK for flooring adhesives is estimated to be **a maximum** of approximately 36,000 tonnes per annum of which a maximum 8% (2,880 tonnes) are solvent based adhesives. This is declining in use year on year.
  Note that this UK market figure expresses the upper limits declared and **does not** include adhesives for ceramic floor tiles.
- However, the green agenda (e.g. BREEAM (Building Research Establishment Environmental Assessment Method) and LEED (Leadership in Energy and Environmental Design), which are in response to government & market direction in an attempt to improve sales and rental prices for these types of buildings) is accelerating and is leading to the specification requirement of more environmentally friendly low VOC products.
- Flooring adhesives have a content of 300 – 800 gms of VOC per litre. Using the worst-case calculation of 800g of VOC per litre, for the figures given above, this could remove a maximum of 2,300 tonnes of VOC emission per annum. However, exemptions will be necessary, and taking into account the expected decline in solvent based

Germany

From Germany the IVK would like to contribute the following data:

Solvent-based Adhesives in for Flooring Installation in Germany in 2007/8

178 metric tonnes for textile floorings and Linoleum / average content of solvents: 15% / emission factor: 100% / **emission: 26,7 metric tonnes**

4.423 metric tonnes for parquet floorings & hard wood / average content of solvents: 20% / emission factor: 100% / **emission: 884,6 metric tonnes**

492 metric tonnes for precoating, primers, Neoprene / average content of solvents: 80% / emission factor: 100% / **emission: 344,4 metric tonnes**

Total: 5.093,0 metric tonnes consumption of solvent based adhesives for flooring installation

Total: 1.255,7 metric tonnes of emitted solvents from adhesives in flooring installations

FEICA - European level

As apparent from the above, we found that the input from different countries varied and many national associations simply do not have the required statistics.

Therefore, FEICA is trying to estimate as best as we can an average solvent amount in flooring adhesives in Europe. For this purpose we make 2 assumptions

- firstly that 100% of all solvent based construction adhesives are flooring adhesives (which is a worst case scenario and unrealistically high as seen by the examples of UK and Germany)
- secondly that there are 40% solvents in those adhesives

In 2007 we had according to FEICA statistics a consumption of 66.72 tonnes of construction adhesives in Europe. With the above mentioned assumption of 40% solvents in these adhesives this would mean that in the worst case scenario there were 26.69 tonnes of solvents used in flooring applications.

However, since we have better data from the UK and Germany we suggest only taking into account the rest of the countries, which (with the same assumptions as above) would amount to a solvent consumption of 14.35 tonnes. Adding to this the 2.3 tonnes from the UK and the 1.3 tonnes of Germany, a total of 17.9 tonnes of solvents consumption in flooring adhesives can be estimated as the worst case scenario.

Annex 52

52. Good Practices floor coverers/ kitchen & bathroom installers, Jeroen Terwoert/IVAM, Amsterdam, 2005

Good Practices Wonenbranche (Good Practices with low-VOC products for floor covering workers and kitchen/bathroom installers), Terwoert, J., IVAM, 2005.

1. Summary

2. Details of recommendations for low-VOC products for wooden floor, ´soft´ flooring (carpets etc.) and kitchen installers

1. Summary

Introduction

On behalf of the sectors of floor coverers (parquet, i.e. wooden floors as well as 'soft' flooring: carpets, vinyl, cork etc.), kitchen and bathroom installers and furniture installers, an inventory was made of Good Practices in relation to using the low-VOC products that are prescribed because of the Dutch occupational health rule of January 2000. The rule forces companies in these sectors to use:

- Coatings (primers and lacquers) for wooden floors with max. 100 gr VOC/litre
- adhesives for wooden floors and other floor coverings with max. 5 gr. VOC/litre
- 'additional products' with max. 100 gr. VOC/litre (e.g. fillers for seals in wooden floors).

By means of interviews, literature and product information, information was gathered on technical and non-technical problems occurring with low-VOC products, and recommendations were made on how to use the products to get an optimal result.

General summarized conclusions

Parquet layers (wooden floor installers) generally are satisfied with the available alternative *adhesives*: waterbased dispersions (with varying water content), 1-pack and 2-pack polyurethanes and (1-pack) MS Polymer. With the available variety of products, a suitable product for every application can be found (underflooring, cork, laminates, ´massive´ wood, high and low swelling wood types etc.). All alternatives are almost VOC-free, and do meet the maximum of 5 gr./litre.

With respect to waterbased lacquers for wooden floors, differences in opinion exist. Technically, the WB lacquers perform well, i.e. with respect to adherence, scratch resistance and durability. However, about the ease of application and the aesthetic aspects, *part* of the users still have complaints. Apart from that, many parquet layers experience problems with the application of low-VOC fillers, in particular when large seals or holes in wooden floors have to be filled (long drying time).

Among the soft flooring installers (carpets etc.), the problems with low-VOC adhesives focus on covering *stairs*. Because of the bended surfaces, the so-called 'initial tack' is very important, as well as drying times. With the alternative waterbased dispersions, the workers have to use self-adhesive tape and/or additional staples or nails, or laths. This increases working time. Hotmelts (sprayable) are technically a good alternative, but some workers feel they are difficult to use. Investments in melting and spraying equipment is needed. Allover, part of the users are satisfied with the alternatives, while others still use the high-VOC 'contact adhesives' on stairs (polychloroprene).

The use of adhesives or coatings by kitchen and bathroom installers appeared to be very limited. Joining PVC-pipes by 'PVC-welding' (very high VOC adhesives, which partly dissolve the PVC) is practically the only application. Used amounts are very low.

Furniture installers, as far as they use coatings and adhesives, show a variable picture. Some of them like waterbased lacquers, others do not like the appearance at all. A few wood types do not allow waterbased coatings (e.g., oak is difficult). Low-VOC dispersion adhesives are much used for connecting wooden parts. For bended surfaces, high-VOC contact adhesives are used as well. Low-VOC adhesives may be used when the parts can be fixed (pressed) together for some time. For installing foam furniture parts, both high-VOC contact adhesives as waterbased sprayable adhesives appeared to be used.

Many companies reported 'unfair competition' by 1-person businesses not obeying the regulations.

2. Details of recommendations for low-VOC products for wooden floor, ´soft´ flooring (carpets etc.) and kitchen installers

All groups (wooden floor/ soft floor/ kitchen installers):

-Tell consumers that by law, only specific products (low-VOC) are allowed, and tell them which quality they can expect, as a consequence.

Adhesives for wooden floors (parquet)

General aspects

-Achieved quality with low-VOC adhesives is better than with the ´old´ high-VOC "alcoholglues" according to most companies - the latter tend to get harder and harder over time, leading to wooden floors ´breaking off´ from the floor.

-The available alternatives cover all applications, and meet the limit value of 5 gr. VOC per litre (and VOC-free according to TRGS 610). However, the company has to know which alternative to choose for which specific application.

-Variations in relative humidity of the air or the substrate are crucial: they let wood swell or shrink, and influence curing time of waterbased, 1-pack polyurethane (PU) and MS polymer adhesives.

Communication with the customer

-Consumers should know that large variations in the relative humidity in the house may lead to problems: swelling and shrinking of wood (in all cases; not only when low-VOC products are used).

-Tell consumers that installing wooden floors may take more time than anticipated when circumstances are unfavourable: e.g. weather with high humidity in summer (no heating on).

Preparation of installing wooden floors

-Always measure the humidity of the substrate. Maximum humidity of a cement floor is 2%; and of an anhydrite or gypsum floor 0,5%.

-In case of a higher humidity, use a ´moisture shield´ (WB) – usually an epoxy – or a ´moisture shielding adhesive´ (MS Polymer base).

-Bring the wooden floor and the adhesive in the room 48 hours before starting the work.

-Measure relative humidity of the air before starting.

-Ideal is: RH between 55% and 65% (also because of swell/shrink of the wood)

-RH < 45%: be aware of short ´open time´ of waterbased dispersions, and of elongated curing time of 1-pack polyurethane and MS Polymers (both are ´moisture-curing´).

-RH > 70%: be aware of condensation of water vapour, and of elongated curing time of waterbased dispersions and MS Polymer adhesive.

-Measure the temperature before starting.

-Ideal is: temperature between 18 and 21 °C.

-Temp. > 25°C: be aware of short open time (all adhesives).

-Temp. < 15°C: be aware of condensation of water vapour, and long curing times.

-Tell the consumer that in case of high humidity in winter, the room should be heated.

-Always vacuum clean the substrate (floor); otherwise no adhesive will adhere well.

Choice of adhesive type

-Consult your supplier in order to choose the proper product for each application.

-All low-VOC adhesives remain flexible, and tolerate swell and shrink of the wooden floor. The ´old´ high VOC ´alcohol glue´ did not.

-Some rough guidelines for product choice are:

*Waterbased dispersions for narrow strips of not-massive wooden parquet, not moisture-sensitive wood types and intermediate floor (e.g. chipboard).

*Polyurethanes (1-pack or 2-pack) or MS Polymer for massive parquet, broad strips etc.

*Polyurethane or MS polymer for very moisture-sensitive wood types (e.g. beuk, maple).

*Polyurethane or MS polymer for anhydrite (gypsum) substrates.

*MS polymer for cement and gypsum substrates with a high humidity (but max. 4%).

-When pre-coated parquet is used in combination with a moisture-shield, one cannot use waterbased dispersions, 1-pack polyurethane or MS polymer (water vapour needs to escape or enter for curing).

-When waterbased dispersions are used directly on the cement or gypsum substrate, a primer (water-based) and a moisture-shield should be applied first.

-In case of waterbased dispersions directly on an anhydrite substrate, follow these steps: 1) abrasing (sanding), 2) vacuum clean, 3) apply primer, 4) apply moisture shield.

Applying the adhesives

-Use a coarse toothed trowel – e.g. B5, consult product information sheet – for the application of polyurethane or MS polymer products directly on the substrate.

-Use a more fine toothed trowel for applying these adhesives on an intermediate (plywood) floor.

-MS polymers usually come with a special toothed trowel which make application lighter (MS polymer adhesives are rather viscous).

-Use a stainless steel toothed trowel for waterbased dispersions.

-In case of 2-pack polyurethanes:

-Use strictly the exact mixing ratio!

-Mix thoroughly, with a mixer on a drill, for min. 5 minutes.

Finishing the floor (e.g. application of coatings)

-Wait for at least 24 hours before sanding the wooden floor, or filling seams, when a waterbased dispersion has been used. Be aware of longer drying times at high humidity.

Health

-Use gloves when polyurethanes, and especially 2-pack polyurethanes, are used.

Installing skirting boards

-Install skirting boards preferably mechanically: with nails, screws etc.

-MS polymer adhesives can be used. However, the (plint) should be pressed against the wall for a few minutes then.

The use of low-VOC sealant for holes and seams (waterbased dispersions)

(the sealant is a waterbased dispersion to which the wooden floor installer adds wood dust from the floor that should be filled, before use).

-When waterbased adhesives have been used, wait until the additional water has been fully evaporated from the wood (at least 24 hours).

-Vacuum-clean the floor before filling seams and holes (improves adherence of sealant).

-Take care for good ventilation and heat the room; otherwise waterbased sealants may dry slowly. Ideal is: temp. > 18°C; RV < 65%.

-With small nailholes, or very narrow seams, WB sealants may be dry after 30 to 60 minutes; with somewhat wider seams still the same day.

-Do not underestimate drying times when large holes or seams have to be filled (at least one day). Closely follow instructions for use.

-Use parquet in which very large holes have been filled by the manufacturer already.

-Use a 2-pack epoxy filler for very large holes.

-Apply WB filler twice, because it always shrinks.

-Do not use too little wood dust (that increases shrink) but not too much as well (that would decrease adherence). Follow closely the advised mixing ratio.

-Use fine wood dust only (use a sieve); this partly reduces shrink and improves adherence.

-Try to alternate gluing and filling; this reduces waiting times.

-When moisture-curing (1-pack polyurethane) lacquers will be used afterwards, let the sealant dry very well first.

Use of waterbased parquet lacquers

See separate document

Use of low-VOC adhesives for installing carpet, vinlyl etc. on stairs

General advice

-Tell the customer that labour time may be a little longer than with the old high-VOC adhesives (polychloroprene ´contact´ adhesive, 700-800 gr. VOC/l.) – and costs a little higher.

Choice of product

Choose for (a combination of) one of the following solutions to cover all properties of the old high-VOC adhesives:

-Waterbased contact adhesive on the flat surface and (special) self-adhesive tape on the bended side;

-Hotmelts (sprayable) – all applications.

-Installing carpet with the use of nails and laths/slats – the ´old-fashioned´ way.

The use of waterbased dispersion (contact-) adhesives on stairs

-Apply the adhesive in a very thin layer, preferably with a roller (polyethylene or fur) - not a brush).

-Press or ´knock´(hammer) well. (“goed aankloppen”)

-Minimum temperature is 15°C, relative humidity preferably < 65%.

-Follow the suppliers´ advice concerning the ´waiting time´. Advised waiting times may vary considerably.

-Be aware that the waiting times that are advised by suppliers do apply to ´ideal circumstances´, i.e. a temperature of 20°C and a relative humidity of 60%. At higher humidity, the waiting time may be much longer (sometimes even a few hours).

-When stairs are coated or when old layers of adhesive are present, waiting times can be longer as well.

-The waiting time of a waterbased contact adhesive may be shortened by using a föhn.

-During the waiting time, the worker may carry out other tasks (e.g. cutting the carpet, glueing the next step etc.).

-In case of very long waiting time because of unfavourable circumstances (high humidity, low temperature): first glue the complete carpet (after cutting); then come back later to install the carpet on the stairs.

-When stairs have been lacquered: first make the surface more rough by sanding with coarse sanding paper.

-Example of a working instruction (product: Eurostar Contact):

-Apply the adhesive on the step of the stairs (the substrate)

-Press the carpet in this layer of glue and remove it immediately. In this manner, the required very thin layer of adhesive is obtained.

-Let the adhesive dry for 7-10 minutes (the ´waiting time´) – this waiting time applies to a temperature of 20° and a RH of 65%.

-Then press/hammer the carpet to the stairs.

-During the waiting time: prepare the next step.

The use of Hotmelt adhesives for installing carpets on stairs

-Spray as thinly as possible

-Attach the carpet within the timeframe as advised by the supplier.

-In case the hotmelt solidifies too quickly: ask the supplier for a more ´slow´ product type (various types are available).

-In case of a smoothly lacquered stairs: first make the surface more rough by sanding with coarse sanding paper.

The use of self-adhesive tape for installing carpets on stairs

-Use a broad type of tape, this has a higher bonding strength.

-In case of a smoothly lacquered stairs: first make the surface more rough by sanding with coarse sanding paper.

Kitchen and bathroom installers – the use of PVC-adhesives (´cold welding´) to attach PVC-pipes

-Use mechanic attaching methods (e.g. ‘clip fittings’) as much as possible.

-When PVC-adhesives are needed: use a low-viscous product (which can be applied more thinly) and apply them as thinly as possible.

Annex 53 Stakeholder Document (European Cosmetics Industry)

53. Colipa – Product categories, Annual review 2007, Brussels, 2008

Cosmetics product categories [Colipa, 2008a]:

ANNEX 1 PRODUCT CATEGORY NOMENCLATURE

I. PERFUMES AND FRAGRANCES (women, men, unisex and children)

1.1 Extracts, perfumes

1.2 Eau de parfum, eau de toilette, eau de cologne, eau de lavande, parfum de toilette (unisex)

1.3 Eau de cologne, eau de toilette for men

1.4 Eau de toilette for children

1.5 Pre- and aftershave lotions (not aftershave balms and creams - see 3.12)

1.6 Moisturized tissues forming part of a perfume product line

1.7 Boxed sets (mainly alcoholic perfumes)

II. DECORATIVE COSMETICS

2.1 Facial makeup products (foundation, blusher, loose and compact powders, etc.)

2.2 Lip products (lipsticks, lip protection and non-coloured foundation, pencils, glosses, etc.)

2.3 Nail products (nail varnish and nail varnish removers, foundation, protection, "hardener". NOT artificial nails)

2.4 Eye products (eye-care lotions, products for eyelashes (mascara etc.), eye makeup and eye makeup removers, eyeliners (pencils, NOT false eyelashes)

2.5 Boxed sets (mainly decorative cosmetics)

III. Skin Care (men, women and babies)

3.1 Face care products

3.11 Day creams, night creams, masks, exfoliation, anti-wrinkle and anti-ageing creams for men and women, treatment series, anti-blackhead creams, etc.

3.12 Aftershave balms and creams

3.2 Face cleansers and after cleansers (toners), makeup removers, (NOT eye makeup removers - see 2.4)

3.3 Hand care products (including hand creams, mixed products for hands and nails, anti-skin discoloration cosmetics, etc.)

3.4 Body creams and lotions (firming creams, slimming creams and lotions, NOT sport massage products)

3.5 Sun care products (with or without sun, before or after sun, sun care sticks, baby sun care products, sun blocks, etc.)

3.6 Baby care products (only creams, lotions, and milks, NOT soaps, shampoos, foams, sun care)

3.7 Boxed sets (mainly skin care products)

IV. Hair Care

4.1 Shampoos (including two-in-one (shampoo/conditioner) and hair and body shampoos, baby shampoos, NOT shower gels - see 5.52)

4.2 Hair conditioners

4.3 Hair lotions (daily & special treatments) and hair tonics (also alcoholic)

4.4 Hair sprays

4.5 Setting lotions and setting mousses

4.6 Hair creams, brillantine, hair gels, etc.

4.7 Colouring shampoos, hair dyes, bleaches

4.8 Perms

4.9 Other Hair Care products (treatments, masks, etc.)

4.10 Boxed sets (mainly Hair Care products)

V. TOILETRIES

5.0 Toilet soaps and syndets, wash lotions, including dermatological soaps (syndets), baby soaps, etc.

- 5.01 Soaps and syndets (non-liquid)
- 5.02 Soaps and syndets, wash lotions (liquid)

5.1 Oral hygiene

- 5.11 Toothpastes
- 5.12 Mouth washes (before and after brushing)
- 5.13 Other dental products which are in contact with the mouth (sprays etc.)

5.2 Shaving products (foams, creams, gels, soaps)

5.3 Talcum powders (including baby powders, etc.)

5.4 Products for intimate hygiene (deodorants, detergents, talcum powders, etc.)

5.5 Bath and shower products

- 5.51 Bath foams, salts, bath oils, bath and shower gels, etc.
- 5.52 Shower gels, two-in-one (for body)

5.6 Deodorants and antiperspirants (roll-ons, sprays, creams, sticks)

5.7 Depilatories (including post-depilatory creams)

5.8 Foot care (salts, powders, sprays, creams, gels, treatments)

5.9 Boxed sets (containing different toiletries)

Annex 54 Stakeholder meeting (European Cosmetics Industry, European Aerosol Industry)

54. Colipa/FEA – VOCs in deodorants/ antiperspirants and hairsprays, Technical Briefing Paper, Brussels, 18.12.2008

18 December 2008

VOCs in deodorants/antiperspirants and hairsprays
Technical Briefing Paper

1. Scope of the Joint Colipa/FEA Briefing Paper

The VOC "Paints" Directive 2004/42/EC is currently under review. The European Commission (EC) has appointed a consortium of consultants to carry out a study on potential VOC reductions, beyond the original scope of the "Paints" Directive. The scope of the study is extended to consumer products, which include cosmetic products. A joint Colipa[1]/FEA[2] Working Group with industry experts has met the consultants Ökopol and IVAM. The meeting was held on the 5th of September 2008.

In this meeting it was agreed that Colipa/FEA will provide further technical information on hairsprays and deodorants / antiperspirants in aerosol dispensers.

The EC consultants' study should be finalised by summer 2009 and could be followed by an EC proposal on the review of the VOC Paints Directive by the end of 2009, if appropriate.

This Briefing Paper describes the use of VOCs in deodorants/antiperspirants and hairsprays, and the related technical considerations needed for ensuring product performance.

2. Introduction

In an industry where consumption is closely linked to healthful hygiene, lifestyle and consumer acceptance, the role of research and development is vital in order to respond to an increasingly sophisticated consumer demand. The cosmetic industry is therefore committed to the continual development of safe, innovative and effective products and to meeting the demands of consumers through intensive market research and enhanced product information.

The cosmetic industry sector is characterised by cosmetic manufacturers who include both multi-national companies and SMEs.

A. VOC definition

Currently, there are several ways of defining VOCs in the scientific and the regulatory world. In Colipa's and FEA's view, the most appropriate approach is to combine consideration of a chemical's volatility with its capacity to produce ground level ozone.

[1] Colipa is the European Trade Association representing the interests of the cosmetic industry in Europe. Its membership consists of 23 national associations of the EU Member States and beyond, 21 major international companies and 8 associated members. Colipa represents more than 2000 companies throughout the EU via the active representation of its member national associations. For further information about Colipa please visit its website: www.colipa.eu

[2] FEA is the European Aerosol Federation, representing the aerosol industry in 18 European countries. Its membership consists of 530 companies, ranging from multi-national corporations to Small and Medium-sized Enterprises. FEA also has corresponding members worldwide. For further information about FEA please visit its website: www.aerosol.org

Therefore, Colipa and FEA support the VOC definition included in the European National Emission Ceilings Directive (NEC, 2001/81/EC):

- " .. VOCs are all organic compounds arising from human activities, other than methane, which are capable of producing photochemical oxidants by reactions with nitrogen oxides in the presence of sunlight…"

The aim of the NEC Directive was to limit emissions of acidifying and eutrophying pollutants and ozone precursors by establishing national emission ceilings by 2010.

Other pieces of legislation (e.g. SED 1999/13/EC) related to VOCs (excluding methane) are generally based on the total mass of VOCs. This approach does not take into account the differences between VOCs with regard to their ability to contribute to ozone formation (see also Chapter 6).

Main VOCs used in cosmetic products are:

- Ethanol, Isopropanol
- Propane / Butane / Isobutane (liquefied gases)
- Pentane, Isopentane
- Dimethylether (liquefied gas)

Fragrances and preservatives can be VOCs but contribute very little to the VOC emissions.

For the paint industry only, the 'VOC Paints Directive' (2004/42/EC) uses the following VOC definition:

- " … 'VOC' means any organic compound having an initial boiling point less than or equal to 250°C measured at a standard pressure of 101.3 kPa…"

However, Colipa and FEA support the VOC definition included in the European National Emission Ceilings Directive based on the Photochemical Ozone Creation Potential (POCP) approach (see also Chapter 6).

B. Use of VOCs in Cosmetic Products

Cosmetic products cover of a wide variety of types, most of them having numerous sub-categories. Their functions range from human hygiene (shampoo, shower gel, toothpaste, etc.), personal care (skin creams, deodorants, etc.), aesthetically enhancing products (make-up, hair dyes, etc.) to products contributing to the well-being of consumers (spa products, etc.). As cosmetics come into contact with the human body, consumer demand, acceptance and preference are vital factors influencing market penetration. Product performance (quality and efficacy) is crucial for consumer acceptance. Geography and culture are also essential factors in this context. The success of a marketed product depends largely on how well it meets each of these considerations.

Water is one of the most important ingredients in cosmetic formulations due to its broad range of properties (e.g. water functions as a solvent and as a moisturizer). Therefore it is used in cosmetic products to the highest extent possible.

Specific VOCs used in cosmetic products help to meet requirements and consumer expectations. They are typically used:

- as solvents for mixing the other ingredients,
- as propellants for delivering the product (liquefied propellants are also co-solvents),
- as preservatives (alcohol also supports product preservation purposes),
- as fragrance raw materials for scenting the product[3].

A solvent broadly used by the cosmetic industry is ethanol. Ethanol used in cosmetics is often of agricultural origin and is, therefore, a renewable raw material.

Any estimation of the quantities of VOCs emitted from the usage of cosmetic products needs to take into account the following aspects:

- there is a wide range of different product categories,
- the emission factors are different for each category of cosmetic products,
- the environmental compartment to which products are emitted after use (e.g. waste water, air).

C. Use of VOCs in Cosmetic Aerosol Products

The VOC ingredients in cosmetic aerosols perform a number of functions:

- **VOCs act as a solvent, carrier (e.g. for suspensions) and co-solvent (liquefied gases).**
  VOCs are a crucial part of the formula to achieve the intended high-level performance. Any alternative propellant like compressed gases would not dissolve the active ingredients properly therefore a larger amount of solvent would be required. This would negate any VOC reduction from the propellant substitution.
- **VOCs help the product dry quickly.**
  Hairspray and deodorant / antiperspirant work only if they dry quickly on contact with the hair or skin. VOCs are solvents that evaporate quickly leaving dry product on the surface.
- **VOCs break up the product-stream into particles as it leaves the container.**
  Cosmetic aerosol products rely on specific droplet sizes to work effectively. By rapid vaporisation as the product leaves the container, liquefied gases ensure the right distribution of the formula on the hair or skin respectively. Thus for hairsprays it will guarantee the required performance as a fine “net” of hold on the hair once the style fixation is done. An uneven distribution or too big droplets would damage the hair style due to strong wetting effect instead of fixation and quick drying (see above). For deodorants it provides an excellent sensory performance on skin.
- **VOCs ensure a constant pressure in the container.**

[3] In the USA, fragrances in concentrations below 2% in finished fragrance products are exempted from the definition of VOCs.

The liquefied gases that are used in most cosmetic aerosols maintain an equilibrium pressure within the container and thus ensure that the pressure in the container remains constant throughout the aerosol's life-time. Therefore, the performance of the aerosol is the same at the end of the pack's life as at the beginning. Compressed gases such as nitrogen remain as a gas in the container. There is no equilibrium between liquefied phase and vapour pressure. Hence the spray characteristics change while the pressure drops.
As described earlier, droplet size and a constant pressure form the basis for constant product behaviour that delivers a satisfying result.
Products that are not affected by the change of physical characteristics – like sun care products – started to use compressed gases.
The potential second alternative – pump sprays – suffers the same technical problem, that its spray pattern – evenness and distribution of spray droplets – is far inferior to aerosols.

Colipa and FEA presented in the meeting 5th of September 2008 a live demonstration of various formulations in the hair spray and the deodorant/antiperspirant product categories, as follows:

- hairspray (aerosol) with 90% VOC
- hairspray (pump) with 94% VOC
- hairspray (aerosol) with 80% VOC content (also used as reference for an 80% VOC deodorant)
- setting lotion (used on wet hair before drying) with 37% VOC
- deodorant (aerosol) with 95% VOC (typical European frame formulation)
- deodorant (pump) with 95% VOC
- deodorant (test product, not available on the market due to unacceptable quality) with 20% VOC content (compressed gas plus water, as proposed by BIPRO)
- antiperspirant (aerosol) with 94% VOC content (typical European frame formulation)
- antiperspirant (test product, not on the market) with reduced VOC content (90%)

The demonstration showed that products with reduced VOC levels have drastically different spray behaviours than those with higher VOC levels, with characteristics that are rejected by consumers (e.g. wetness, see pictures in Annex 1).

D. Technical considerations related to the use of VOCs in cosmetic aerosol products in comparison to alternatives mentioned

Liquefied gas
(see Chapter 2, sections B and C).

Use of HFCs gas
The use of HFC as propellant alternative results in aerosol products with a product performance which is accepted by the consumers. However, due to the Global Warming Potential of HFCs the FEA Code mentions that HFCs should only be used in the aerosol industry in applications where there are no other safe, practical, economic or environmentally acceptable alternatives i.e. in a few technical (non-cosmetic) aerosols.

Some important markets, e.g. in USA, permit the use of HFCs in consumer products.

VOCs in deodorants/antiperspirants and hairsprays
Technical Briefing Paper

In 2002, the FEA launched on a voluntary base a monitoring/reporting system of HFCs use in aerosol production and agreed on a FEA *Code of Practice on HFCs use in Aerosols* which includes the reported figures. Today this FEA *Code of Practice* is publicly available from the database of the *Single Market Observatory* (SMO) of the *European Economic and Social Committee* (EESC) as one example of best practice in self-regulation.

Use of Water

Water is used to the highest extent possible as long as product performance and safety (corrosion) are guaranteed.

Compressed gases

For a few cosmetic aerosol products, liquefied gas propellants have been replaced with compressed gases. However, this costly option can only be used for cream applications, such as sun protection spray, where a fine and regular spray pattern is not required.

In many other cosmetic aerosol products it is not yet technically or economically possible to remove liquefied VOCs and retain product performance. By maintaining a constant pressure throughout the aerosol's life-time, liquefied gas propellants ensure that the pack performance is the same at the end of life as at the beginning. Compressed gas such as N_2 cannot do this because as the product is used up the pressure within the can reduces and the spray rate varies.

Furthermore, aerosol products also require solvents and in many cases the liquefied propellants also act as solvents. Replacing the liquefied propellants by compressed gases is often technically possible, but in many cases the proportion of liquefied propellant acting as the solvent has to be replaced by additional solvent ethanol. Therefore, the overall effect is often a very marginal contribution to VOC reduction, in many cases even nil.

Compressed gases do not have the ability to break down the product into fine particles (as liquefied propellants do), therefore the particle size distribution is always significantly higher. The consequence of these is poor performance or poor sensory perception on skin, both key drivers for aerosol preference.

Theoretical (since there are no such sprays currently on the market) VOC concentration in hairsprays with compressed gases would be around 94% w/w.

Pump Sprays

Spray products offered in both package forms (aerosols and pumps) do exist but are often designed for different types of application. Pump spray products are available and have existed even longer than aerosol products. Both packages are offered to consumers and some pump spray products are widely used in other areas, especially in the field of household and automotive care products where different expectations of consumers exist. However, pump spray products are less able to deliver controllable, constant spray patterns and as a result pump spray particles sizes tend to be larger than for aerosols. Thus for those product applications where particle size is critical or where drying time is critical, pumps give sprays that have a poorer performance than aerosols.

In terms of VOCs, pump spray products are similar to aerosols using compressed gases. The propellant gas is replaced by the pumping action which expels product, replacing it with air. When a liquefied propellant-based product is reformulated into a pump spray product, the amount of liquefied propellant *(gas = co-solvent)* has to be compensated by additional liquid solvent (alcohol). The overall VOC reduction contribution will, therefore, be very marginal or even nil.
Typical VOC concentration in hairsprays (as pump sprays) is around 95% w/w, as the liquefied propellant is replaced with alcohol. A typical concentration of a deodorant pump spray could be around 70% w/w driven by presence of alcohol.

Cosmetic aerosol products can contain ingredients which are sensitive to air and to humidity in air (active ingredients, perfumes). Such ingredients influence the shelf life and the stability of products. One of the major advantages of the aerosol is that it is a sealed pressurised package (i.e. hygienic); this is not the case for pump spray packages, where air is introduced into the pack during use.

Broadly speaking, the use of pump sprays represented around 10% of all cosmetic aerosol applications at the beginning of the '90s. Within the last 15 years, the use of pump sprays decreased continuously. Nowadays the use of pump sprays is around 5% of all cosmetic aerosol applications.

3. Deodorants and Antiperspirants

These products are part of the daily hygiene routine which is an important social factor and their main function is to reduce the body odour and the wetness originating in the underarms. All of these products are formulated with fragrances to provide consumers with a pleasant feeling and smell.

There are two distinct product categories: deodorants and antiperspirants.

- Deodorants are designed to counter malodour generated in the underarms. These products can also be applied in other parts of the body (i.e. neck, chest, etc) to deliver the pleasant smell of the fragrances.
- Antiperspirants not only counter malodour generated in the underarms but also combat the wetness produced by sweat. These products should only be applied in the underarms.

All these products are offered through different product formats. The most familiar ones are 'Aerosols', 'Roll-ons', 'Sticks' and 'Pump Sprays'. Despite the fact that all of these formats are available in the market, consumers demonstrate clear preferences. Taking into considerations figures published by IGA (German Aerosol Association) on its website, market sales data for the different applicator forms are approximately: ~ 63% aerosols, 25 % roll-on, 5% cream/stick and ~7% pump spray (see Table 1). Although these figures reflect the situation in Germany, they are not too far from the wider European ones. Based on expert judgement, European figures may reflect a slightly higher incidence for roll-ons and lower one for Pump Sprays.

VOCs in deodorants/antiperspirants and hairsprays
Technical Briefing Paper

Table 1: IGA figures

	Deo/Antiperspirant Market
Deo/antiperspirants (aerosol)	63 %
Roll-on	25 %
Stick / cream	5 %
Deo as Pump spray	7 %

As mentioned above, the different product formats are widely available across Europe. However, aerosols are by far the preferred format. Experience shows that consumers tend to stay within one product format and do not switch between them. This is driven by consumer experience when using the products (product performance and application aesthetics). Due to the very different nature of the form of application and the types of formulations used, not only across but also within formats, clear preferences can be established once products have been tried. The deodorant and antiperspirant market has matured and preferences on products formats were established many decades ago.

Aerosols

Two distinct technologies are predominant across aerosols: alcoholic deodorants and alcohol-free antiperspirants. In both cases, the preferred propellants are hydrocarbons. These two technologies have to contain significant amounts of VOCs to achieve the previously described performances.

Roll-ons

Two types of distinct technologies are available in the roll-on market, alcoholic solutions and water-based emulsions. They both mainly work as antiperspirants. As expected, VOC levels are high in alcoholic solutions, while water-based emulsions may contain low VOC solvent levels but they are perceivably wetter in the underarm area and so need longer to dry.

Sticks

There are different formulation technologies offered for each product category. Deodorant sticks usually contain propylene glycol (and glycol derivatives) or ethanol, while antiperspirant sticks are mostly formulated with volatile silicones (which are not considered as VOCs under the NEC Directive, but are VOCs under the VOC Paints Directive). Thus, only deodorant sticks may contain high amounts of VOCs. However, sticks are not the application form preferred by the consumer (see Table 1).

Pump sprays

There are different formulation technologies offered for each product category. Deodorants are usually formulated with alcohol, while antiperspirants can either be formulated with alcohol or with water. All suffer reduced market acceptance as their low market share demonstrates.

4. Hairsprays

In hairspray formulations the use of water is strongly limited due to product and/or application performance. For example with the current technology, a fixing hairspray cannot contain substantial amounts of water because water influences the viscosity, droplet size and drying time of the formulation on the one hand and the shape and design of hair on the other. In finishing hairsprays it is important that the product dries very quickly to preserve the hair style. If the style becomes too wet the hair style may drop.

Typical European hairspray formulations contain 95% VOC based on alcohol as solvent and liquefied gases as propellant(s) with co-solvent function.

Aerosol hairsprays are preferred by consumers. For Germany, IGA (German Aerosol Association) together with a market research institute found that ~ 60% of all styling products are hairsprays and ~18% are mousses. Gel and waxes as styling products are around 22% (see Table 2).

Table 2: IGA figures

	Styling market
Hairsprays (aerosol)	58 %
Mousse / foam (aerosol)	18 %
Gel and Waxes	22 %
Liquid Lotions	3 %

The different product forms serve different consumer needs and habits, which could for example be determined by the hair length or the hair style.

Typically women prefer hair sprays due to their – on average – longer hair where gels/creams/waxes are less efficacious. Gels and waxes are different styling product applications and cannot replace the function of a hairspray. Gels and waxes in most cases are appropriate for short hair, or just single hair strands for consumers with hair shine demand.

A finishing hairspray preserves the volume and the shape of the hairstyle without stickiness. Hair-spray consumers favour “strong” hold with “natural” style for the rest of the day. Hairsprays with different strengths of hold ranges exist on the market.

To meet consumer demands the product performance of a hairspray is based on a short drying time with small particle sizes during the whole using phase. Product performance which is accepted by consumer is the main factor for driving market penetration.

History of Alternatives that have failed in the past:
a) The Cosmetic Industry has always been a sustainable and innovative industry. Various product launches followed the principle of delivering the consumers a best alternative to the existing technology. One alternative to a cosmetic aerosol was launched on the market in the mid 90s for

hairsprays and hair styling mousses. The alternative for hairsprays ("Airspray" system) was not accepted by the consumer as such products are less easy to use and have a poorer performance.

b) Within the Professional Hair Care market (hairdressers) at the beginning of the 90s several alternatives to aerosol products were launched without success as in all cases the product performance was not accepted by the hairdressers. Pump sprays failed due to the bigger droplet sizes, decrease in pressure; the finger pump is not seen as workable in the hair styling process.

5. LABELLING

Cosmetic products have to meet all labelling requirements of the European Cosmetics Directive (76/768/EEC). Furthermore, cosmetic products in aerosol form have to fulfil all labelling requirements which results from the European Aerosol Dispenser Directive (75/324/EEC).

In addition to these legal requirements, voluntary labels can be used by industry. Based on the experience acquired by the cosmetic aerosol industry, such labels are not always successful in influencing consumer choice, especially if product performance and price are not accepted by the consumer.

Labelling requirements of the Cosmetics Directive:

Article 6 of the Cosmetics Directive requires that the following information be printed on the label of cosmetic products:

- the name and address of the manufacturer or of the person responsible for placing the product on the market;
- the nominal content at the time of packaging;
- information on the product's minimum durability / period after opening, as and where applicable;
- precautionary information;
- batch number or reference for identifying the product;
- the function of the product, unless clear from its presentation;
- the list of ingredients, in descending order of weight.

In addition to these labelling requirements, the Cosmetics Directive provides for public access to information on product composition (including quantitative composition for those ingredients that are classified as "dangerous" under Directive 67/548/EEC) and on undesirable effects resulting from the use of cosmetic products. The consumer can access this information with the help of a dedicated website, www.european-cosmetics.info.

Labelling requirements of the European Aerosol Dispenser Directive:

<u>European Aerosol Dispenser Directive Article 8</u>
1. Without prejudice to other Community Directives, in particular to Directives on dangerous substances and preparations, each aerosol dispenser or, where particulars cannot be put on the

aerosol dispenser due to its small dimensions (maximum capacity of 150 ml or less) a label attached thereto must bear the following particulars in visible, legible and indelible characters:

(a) the name and address or trade mark of the person responsible for marketing the aerosol dispenser,

(b) the symbol '3' (inverted epsilon) certifying conformity with the requirements of this Directive,

(c) code markings enabling the filling batch to be identified,

(d) the details referred to in points 2.2 and 2.3 of the Annex,

(e) the net contents by volume.

1a. Where an aerosol dispenser contains flammable components as defined in point 1.8 of the Annex but the aerosol dispenser is not considered as 'flammable' or 'extremely flammable' according to the criteria set out in point 1.9 of the Annex, the quantity of flammable material contained in the aerosol dispenser must be stated clearly on the label, in the form of the following legible and indelible wording: 'X % by mass of the contents are flammable'.

2. Member States may make the marketing of aerosol dispensers in their territory conditional on the use of their national language or languages for the wording on the label.

<u>European Aerosol Dispenser Directive - Annex: 2.2. Labelling</u>

Without prejudice to the Directives relating to the classification, packaging and labelling of dangerous substances and preparations, particularly as regards danger to health and/or the environment, any aerosol dispenser must visibly bear the following legible and indelible marking:

(a) Whatever its contents: 'Pressurized container: protect from sunlight and do not expose to temperatures exceeding 50 °C. Do not pierce or burn, even after use.';

(b) Where the aerosol is classified as 'flammable' or 'extremely flammable' according to the criteria of point 1.9:

— the flame symbol, in accordance with the model in Annex II to Directive 67/548/EEC;

— the indication 'flammable' or 'extremely flammable', depending on the classification of the aerosol as 'flammable' or 'extremely flammable'.

<u>European Aerosol Dispenser Directive Annex: 2.3. Special statements concerning use</u>

Without prejudice to the Directives relating to the classification, packaging and labelling of dangerous substances and preparations, particularly as regards danger to health and/or the environment, any aerosol dispenser must visibly bear the following legible and indelible wording:

(a) Whatever its contents, any additional operating precautions which alert consumers to the specific dangers of the product; if the aerosol dispenser is accompanied by separate instructions for use, the latter must also reflect such operating precautions;

(b) Where the aerosol is classified as 'flammable' or 'extremely flammable' according to the criteria of point 1.9, the following warnings:

— the safety phrases S2 and S16 laid down in Annex IV to Directive 67/548/EEC;

— 'Do not spray on a naked flame or any incandescent material'.

Potential indication of VOC content on the label of cosmetic products

It was suggested by Ökopol/IVAM that indication of the VOC content on the label of cosmetic products could be considered.

As explained above, comprehensive legal requirements already exist for cosmetic products in general, and for cosmetic aerosols in particular. Any additional requirements – such as printing the VOC content on the product label – would need to be:

- based on a life-cycle analysis approach,
- linked with adequate agreed methods of chemical analysis for the determination of VOCs;
- demonstrably a tool for influencing consumer choice;
- economically assessed i.e. costs related to re-labelling and, possibly, additional leaflet, etc.

If all these parameters are not taken into account, there is a real risk that a comparison of products based on the mere indication on the label of a product's VOC content would be misleading.

6. THE REACTIVITY CONCEPT

Each individual VOC has a different ability to evaporate and to form ground-level ozone. Its ability to form ground-level ozone is commonly referred to as its *Photochemical Ozone Creation Potential* (POCP) value.

Dr. Derwent (Meteorological Office, UK) has developed the POCP[4] concept in Europe, using a scale standardized by the POCP of ethene.

POCP is a reactivity index. The POCP concept provides a measure of "reactivity" or "ozone forming potential", and has most commonly been applied as a method of ranking VOCs by their ability to form ground-level ozone together with nitrogen oxides in the presence of sunlight.

Reactivities can be calculated towards ozone maxima, average ozone concentrations or the exceedance of certain ozone levels, for example for 1 or 8 hour intervals. The possibilities for weighting are *numerous*. In this way reactivity scales tailored to specific conditions can be derived.

In the meantime, few scientific data on POCP ranges have been published in the European literature. Nevertheless, propellants and solvents used in the aerosol industry, compared to other VOCs, consistently show a potential reactivity which is located on the lower scale (placement on the lower continuum).

[4] Photochemical Ozone Creation Potentials for Organic Compounds in Northwest Europe Calculated with a Master Chemical Mechanism, R Derwent, M Jenkin, S Saunders, M Pilling, Atmospheric Environment, Vol 32, No 19, 1998.

Table 3: POCP ranges of used VOC taken from the literature

Used VOC	(1)	(2) ranges, average ozone production	(3) ranges, average ozone production	(4)	(5)	(6)
DME	17	18 – 48	18 – 48	18,9	18,9 a)	19,8
n-butane	35	53 – 92	53 – 92	35,2	35,2	36,3
Isobutane	31		47 – 69			
n-pentane		73 – 116	73 – 116	36,6	39,5	36,6
Isopentane		25 – 65	25 – 65		40,5	
Propane	18	39 – 71	39 – 71	17,6	17,6	18,3
1-propanol				56,1		
2-propanol				18,8		
Isopropanol			37 – 43			
Ethanol / Alcohol	39	44 – 63	44 – 63	39,9	39,9 a)	39,7
Acetone	9,4	35 – 53	35 – 53	9,4	9,4 a)	
Ethene (reference)	100	100	100		100	100

(1) Derwent. R.G.: Jenkin, M. E.; Saunders, S.M.: Pilling, M.J. Atmos. Environm. 1998, 32, Issues 14-15, 2429 – 2441
(2) POCP for individual VOC under European conditions; Johanna Altenstedt and Karin Pleijel; Swedish Environmental Research Institute Göteburg, IVL – Report Sept. 1998.
(3) An Alternative Approach to Photochemical Ozone Creation Potentials applied under European Conditions; Johanna Altenstedt and Karin Pleijel; Swedish Environmental Research Institute Göteburg, Journal of the Air and Waste Management Association, Vol. 50, June 2000.
(4) Specification of UK emissions of non-methane volatile organic compounds; AEAT / ENV / R / 0545 Issue 1; N.R. Passant; Feb. 2002.
(5) Integrated Pollution Prevention and Control (IPPC) – Environmental Assessment and Appraisal of BAT, Scottish Environmental Protection Agency; IPPC H1; Version 3.1; July 2002.
(6) Draft by D. Poppe, F. Kirchner, B. Vogel; chapter V: Scientifically sound operationally useable chemical modules for multi-phase atmospheric chemistry.

a) Values are sourced from reference (2) and Jenkin, ME; Hayman, DH; Photochemical Ozone Creation Potential for Oxygenated Volatile Organic Compounds: Sensitivity to Variations in Kinetic and Mechanistic Parameters, Atmospheric Environment Vol. 33, 1999 Elsevier Science Ltd.

The POCP table indicate large differences in the O_3 production between individual VOCs, which justify the use of this ranking scale instead of treating all VOCs as a homogeneous group of species in abatement strategies.

The US commonly employed reactivity scale is that of “Maximum Incremental Reactivity” (MIR), developed by Dr. Carter (University of California, Riverside) which is used by the California Air Resources Board (CARB) in their aerosol coating regulations. CARB continues to regulate VOC content of household products and personal care products using a mass-based approach. Discussion about a MIR concept for other consumer products is on-going.

USA climate conditions can be very different from those in the EU and the reactivity findings are not directly transferable from MIR to POCP.

The US EPA has assigned VOC-exempt status to some chemicals which are thought to make only a limited contribution to the formation of ground level ozone.

The European Commission and Member States experts have examined the reactivity concept (as embodied by POCP) as an option for ozone control, some years ago. At the time, it was concluded that although the concept has merits, the state of the science was insufficiently developed to make legislative use of the concept, and so an overall mass-based reduction method has been used (e.g. in the Solvent Emissions Directive 1999/13/EC).

There are some advantages using the POCP concept:
- Comparison between individual VOCs based on their POCP is possible. For example, authorities already have a lot of experience in using single consideration of substance with the computed value of Global Warming Potential (GWP) for Greenhouse Gases (GHG).
  POCP is also a calculated value which could be used by authorities. Nevertheless POCP ranges have to be considered.
- Biogenic emissions of VOCs (from vegetation) have all a high POCP value. Due to the fact that biogenic emission in summer is higher than during the winter their contribution in the former can become the major contribution.
  VOCs used in the aerosol industry have in comparison lower POCP values (or ranges) and lower impact.

Any VOC control measure of anthropogenic emissions should take these facts into account.

Any option to control the ground-level ozone formation by reducing the impact of main precursors (NOx and VOCs) should take into account the reactivity concept to:
- exempt substances which do not contribute or only weakly contribute to ozone formation;
- concentrate on those substances that have the greatest effect upon ground-level ozone formation;
- provide an effective and expected ground-level ozone abatement despite the biogenic emissions, the transboundary pollution, the NOx/VOCs ratio, etc.
- allow flexible approaches.

Studies also confirmed that VOCs could travel several thousands of kilometres. One of the reasons that the level of ozone and its effects are projected to fall only slightly is the global increase in background ozone levels attributable to long-range transboundary air pollution. European and national efforts to decrease ground-level ozone would therefore be ineffective if no control measures are additionally taken at global level.

Industry continues to follow developments in this scientific field.

7. Main Comments on the Dutch IVAM report (2005)

The study *VOC emissions from cosmetics and cleaning agents* (IVAM, 2005) commissioned by the Dutch *Ministry of Spatial Planning, Housing and the Environment* (VROM) dealt primarily

with the situation in the Netherlands but was proposed as a contribution to European initiatives for research for the review of the Directive 2004/42/EC.

VOCs used in cosmetic products can be organic solvents, aerosol propellants, fragrances or; however the majority of VOC emission from cosmetic products can be attributed to the use of solvents and propellants.

The IVAM report properly covers theoretical VOC reduction options. Only technical considerations and exchangeability with the conventional product were considered without taking into account market considerations. Product performance and consumers' acceptance are key parameters that were "consciously" omitted from the analysis in order to simplify it.

As requested during the meeting of 5 September 2008, the following points can be also highlighted:

- the VOC content of pump sprays is not lower than of aerosol applications (e.g. hairsprays) because the removal of liquefied gases with co-solvent function have to be compensated by additional alcohol;
- the technical feasibility of using compressed gases is quoted in the report as "high" as an alternative to liquefied gases. Again, the VOC content in a formulation with compressed gases is the same due to the same effect mentioned with regard to pump sprays. Additionally the product performance is lower due to reasons explained in this Technical Briefing Paper ;
- Appendix II refers to VOC substances used in cosmetic products with literature references from 1993 to 2002. Some of the ingredients mentioned are no longer used in the cosmetic industry and are therefore not relevant;
- the replacement of all aerosol deodorants and antiperspirants by roll-ons and sticks is quoted as "technically feasible". Again, these considerations do not contain market considerations and consumer acceptance. The consumer by choice and habit prefers aerosol applications which are seen as absolutely hygienic and highly effective.

The IVAM study has shown that the product categories contributing most to VOC emission from cosmetic products are hairsprays and deodorants but the potential emission reduction in those product applications appeared to be limited.

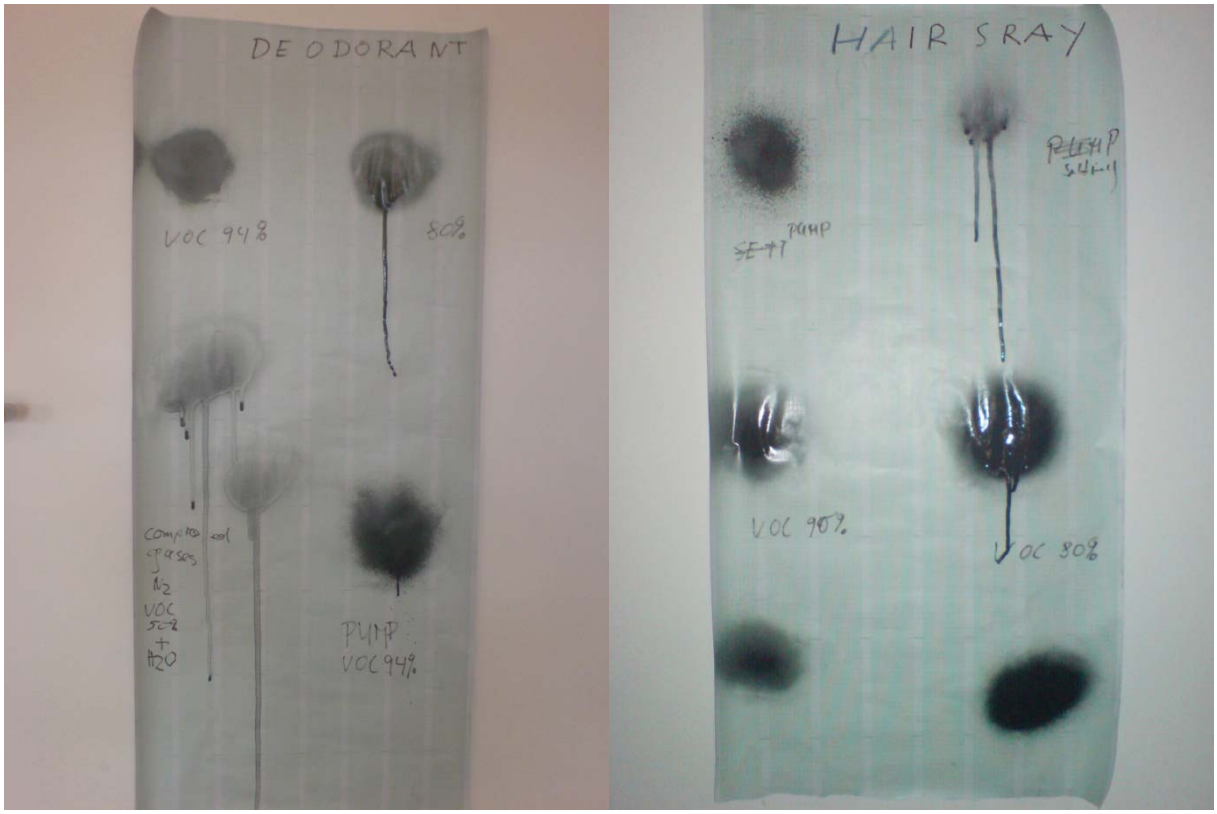
8. Conclusion

Based on the above technical considerations, it can be concluded that a reduction of VOCs in cosmetic products:

- is not technically feasible whilst maintaining the current level of product performance, and
- would not achieve any significant VOC and ground- level ozone reductions.

VOCs in deodorants, antiperspirants and hairsprays
Technical Briefing Paper

Annex 1



Annex 55 Stakeholder Document (European Household Products Industry)

55. A.I.S.E., Response to Decopaint Revision Project, Brussels, 08.10.2009

A·I·S·E

Association Internationale de la Savonnerie, de la Détergence et des Produits d'Entretien
International Association for Soaps, Detergents and Maintenance Products

8 October 2008

Dear Mr Tebert,

Re: Decopaint revision project

In your e-mail of 21 May 2008 you request statistical data of products in the cleaners industry with regard to VOCs. You further indicate in your e-mail that car window cleaners, methylated spirit/glass window cleaners, hand cleaners and air fresheners are product categories with priority for collection of data.

A.I.S.E. has collected data via our direct member companies. We are able to provide you with an estimated total tonnage of VOCs for air fresheners, non-aerosol glass and window cleaners and aerosol insecticides. These figures cover more than 95 % of the European market (EU 27).
The product categories can be described as follows:

- Air fresheners. These include:
  - Sprays (double phase and single phase)
  - Pumps sprays
  - Perfumed candles
  - Liquid wick
  - Gels
  - Electrical devices
  - Car fresheners
- Glass and window cleaners only in non aerosol form as the aerosol form only has a negligible part of the market.
- Insecticides in aerosol form as this is the most relevant form.

Please keep in mind that certain parts of the mentioned VOC contents will end up according to the intended use to waste water treatment plants, will be degraded and hence will never reach the air compartment.

With regard to the other product categories for which you have requested data, this has not been possible to collect due to the very diffuse markets and the fact that these categories are not covered by A.I.S.E. (for example methylated spirit)

The contribution of VOCs for our sector to ozone creation is in the overall negligible; according to the *Annual European Community LRTAP Convention emission inventory report 1990-2006*, the total NMVOC emission was of 9391kT in 2006 for EU27, the contribution of our products therefore only represent around 0.5% of the total VOC emissions. We do therefore not believe that further VOC reduction for our products would deliver any measurable environmental benefit.
Furthermore, our industry has already done what is in its power to reduce the content of VOCs in their products whilst not affecting product performance. Any further reduction is technically questionable.

In annex, please find the estimated total figures of VOCs for the European market (EU27) of 2007 for the above mentioned product categories.

Please don't hesitate to contact me if you have any questions regarding the data submitted.

Yours Sincerely,

Cathrine Pedersen
Scientific Technical Affairs Coordinator

Annex: AISE VOC data collection 2008 3oct08_final.xls

A.I.S.E. VOC data collection

3 October 2008	A.I.S.E.

Product category	**Annual tonnage VOC of 2007, EU 27**
Air fresheners	35635
Glass and window cleaners (non aerosol)	6612
Insecticides (aerosol)	4842

Annex 56 Stakeholder Document (European Household Products Industry, European Aerosol Industry)

56. A.I.S.E./FEA - VOCs in Household Aerosol Insect-Control Products, Briefing Paper, Brussels, 02.04.2009

2 April 2009

VOCs in Household Aerosol Insect-Control Products
Briefing Paper

1. SCOPE OF A JOINT A.I.S.E./FEA BRIEFING PAPER

With the VOC Paints Directive 2004/42/EC currently under review, the European Commission has appointed a consortium of consultants to carry out a study to identify further potential VOC reductions including those beyond the scope of the original Directive. The consortium will also carry out an impact assessment of any proposals.

The Ökopol Interim Report[1] on this study contains some brief information on aerosol insecticides. Unfortunately this information includes some incorrect assumptions and no information on the technically feasibility of VOC reductions.

Despite this Section 8.2 of the Interim Report includes in its list of possible options for an extension of the scope of Directive 2004/42/EC, the following option:

> **Option 14: Assessment of an extension of the scope to insecticides**
> First evaluations have shown that a ban of aerosol-type insecticides would reduce VOC emissions of this product group.
> It is proposed quantify the VOC reduction potential, to assess the impacts of such a ban and to assess the feasibility of the technical alternatives, with a specific focus on health impacts of the systems.

In addition, Section 7.10.3.4 of the report states that:

> One far-reaching option to consider may be a ban of aerosol-type insecticides for consumer use. This might be justified by their hazardous nature as well.

This last statement raises the concern that the consultants have not understood how the EU market for household aerosol insect-control products is regulated.

This Briefing Paper describes why VOCs are used in household aerosol insect-control products, the related technical considerations needed for ensuring product performance and efficacy, the strict regulatory controls to which they are subject, VOC emission estimations and address, as far as possible, questions received by FEA from RPA on option 14.

This technical briefing paper explains why household aerosol insect-control products should continue to be excluded from the scope of any Directive placing limits on VOC contents of products.

2. INTRODUCTION

Insect-borne diseases such as malaria, Lyme disease and chikungunya can present a severe health threat that can lead to serious illness and even death. Eliminating and repelling these pests are some of the best preventative measures against these risks.

[1] Implementation and review of Directive 2004/42/EC
European Commission Service Contract N°070307/2007/483710/MAR/C3
Interim Report – 16 February 2009 (v2) (1st draft: 30 November 2008; Commented: 14 January 2009)

2 April 2009

VOCs in Household Aerosol Insect-Control Products
Briefing Paper

Within the home, cockroaches, moths and other pests are aggressive and can do significant damage to the home and belongings. Flies carry disease and can contribute in a large way to food spoilage. Along with good hygiene practices, aerosol based insect-control products are one of the most effective ways of preventing or overcoming infestations

Household aerosol insect-control products are aerosol dispensers supplied ready for use to the general public to either: destroy, render harmless or prevent the action of insects.

Such products play an important role in the health of people and in the protection of the home and by increasing the quality of their lives through the reduction of annoyances and fears caused by insects.

Household aerosol insect-control products cover a wide variety of different uses, they include products specifically designed to:

- control flying insects (e.g. flies, mosquitoes, moths, or gnats),
- control crawling insects (e.g. cockroaches, ants),
- control house dust mite products (mites which feed primarily on skin cells shed in the home by humans and pets),
- control fleas and ticks (designed for use against fleas, ticks, their larvae, or their eggs),
- treat infestations (designed to release all or most of its content, as a fog or mist, into indoor areas during a single application),
- control wasps and hornets (designed to allow the user to spray from a safe distance by directing a stream or burst at the intended insects, their nests or their hiding place),
- repel insects (in these insect-control products the active substance comes directly into contact with the human body).

Consumer preference, demand, acceptance, safe-use and product quality are all vital factors to be considered for effective pest control. Proving the efficacy of such products with validated test-data is one of the key requirements of the Biocidal Products Directive 98/8/EC; all household aerosol insect-control products have to fulfil the extensive obligations of this Directive before they can be marketed to the general public.

Aerosol dispensers are an ideal product format for insect-control products because they are convenient and easily used; they are typically fast-acting and considered a very ‘clean’ way to deliver the insect-control active. The lack of direct contact with the hands means there is less concern about hand to mouth contact with the insect-control active substance. The aerosol dispenser is thus the delivery system of choice for many consumers for the many insect-control activities.

For personal insect repellents application via an aerosol dispenser is also the preferred option for many consumers because the pressurised spray gives a more even application on the skin and the added benefit that they can be easily applied all over the body and to clothing.

2 April 2009

VOCs in Household Aerosol Insect-Control Products
Briefing Paper

3. BENEFITS OF HOUSEHOLD INSECT-CONTROL PRODUCTS

Household insect-control products play an important role in the health of the home, helping to protect people from insects that can carry diseases such as malaria, Lyme disease and chikungunya plus helping to provide a clean and hygienic home for the family.

The importance that the WHO places on the increasing incidence of insect-borne disease was reflected in the 2008 World Health Day which focused heavily on protecting health from climate change. The introductory comments of WHO Secretary General, Ms. Margaret Chan, highlighted the spread of disease vectors as one of the five major health consequences of climate change. Whilst much of the debate around climate change and public health has understandably focused on the expected impact on the developing world, there is also compelling evidence that increasing global temperatures will also lead to an increased incidence of insect-borne disease in many parts of Europe.

Taking the example of chikungunya, an infectious disease spread by the tiger mosquito, the WHO points out that this particular insect has substantially extended its range in Europe over the last 15 years leading to a highly-publicised outbreak in Italy in August 2007 affecting over 250 people.

The WHO report also points out that the risk of local malaria transmission is expected to rise slightly across Europe in the coming decades with Portugal, in particular, projected to show an increase in the number of days suitable for the survival of malaria vector. A number of EU Member States, including Belgium, have also reported a dramatic increase in cases of Lyme disease and other tick-borne illnesses in recent years, with recent ECDC figures suggesting that the number of human cases of tick-borne encephalitis (TBE) in all endemic regions of Europe has increased by almost 400% in the last 30 years.

A variety of separate sources advise the use of insect repellents as part of a wider series of measures to minimise the risk of contracting vector-borne diseases, including advice from the WHO, the ECDC and a number of Member State Health authorities.

Such advice was reflected in the recent European Parliament resolution of 4 February 2009 on "2050: The future begins today – Recommendations for the EU's future integrated policy on climate change" (2008/2105(INI)) where point 159 of this document states that:
Stresses the coordinating role of the EU and the European Centre for Disease Prevention and Control in providing advice to the general public on avoiding insect-borne disease through the use of, in particular, protective clothing, bed nets and insect repellent and control products.

Further statistics gathered from the UK shows the potential harm insects can cause, and hence the need to control them effectively to reduce such problems. Data obtained from the National Health Service Hospital's Admission Statistics for 2007-08 shows that:

- 3424 people were admitted to UK hospitals due to being stung or bitten by a non-venomous insect or non-venomous arthropod, or following contact with a hornet

The UK Mortality Statistics for 2007 (the last date to be published) also shows that:
- 4 people's deaths were attributed directly to contact with a wasp, hornet or bee.

Control of flies is important because such pests are highly mobile, frequently visit unsanitary locations and have sponging mouthparts that pick up and can easily transfer pathogenic organisms and diseases from waste-rubbish, sewage and other sources. They are known to carry and transmit pathogens which result in diseases such as dysentery, diarrhoea, salmonella, typhoid and cholera.

Clearly the control of insects plays a vital role in the health of the home and providing a clean and hygienic home for the family. Household aerosol insect-control products are a safe, effective and often preferred way of carrying out such control.

4. VOCs IN HOUSEHOLD INSECT-CONTROL PRODUCTS

VOC's in household insect-control aerosols perform a number of different functions:

- **VOCs breakdown insect waxy-coats**
  Many crawling insects such as cockroaches have a waxy coating on their outer shells that protects them from water loss and external 'pollutants' in their environment. This coating also protects them from insecticides. VOC solvent cuts through the wax thereby speeding delivery of the insect-control active and improving the overall performance.

- **VOCs ensure a constant pressure in the container.**
  The liquefied hydrocarbon propellants that are used in most household insect-control aerosols maintain a constant equilibrium pressure within the container through-out the aerosol dispenser's life time and thus ensure that the performance of the spray is the same at the end of the product's life as at the beginning.

  Maintaining a constant pressure from the aerosol dispenser is also important for products such as the control of wasps and hornets, where the consumer wants to aim a direct spray at the insect from a safe-distance in a controlled way. Fast action against these insects is extremely important for the safety of the user and others in the immediate area.

  Compressed gases such as nitrogen exist as a discrete gas sitting above the product in the aerosol container. As the product is used up the space above the product will increase causing the pressure to drop (c.f. Boyles's Law). The fall in the internal pressure of the aerosol dispenser results in lowered discharge rates, which can also lead to increase particle sizes, and the loss of the required efficacy from the product.

- **VOCs act as a solvent to solubilise the insect-control active substance**
  VOCs are solvents and so a crucial part of the formula to achieve the intended high-level performance and required efficacy. As well as acting as a propellant, liquefied hydrocarbon propellants acts as co-solvents helping to solubilise the active substances.

Alternative propellants, like compressed gases, are not co-solvents and so larger amounts of solvent are required. The need for additional solvents would negate any VOC reduction from the propellant substitution. This co-solvent feature of liquefied propellants has also allowed aerosol insect-control products to move away from the older paraffin-oil type bases to modern water-based formulations.

- **VOCs break up the product-stream into appropriate particle sizes as it leaves the container**

  Flying-insect sprays need small sized particles to keep the active substance airborne long enough for the insects to fly through and pick up the insecticide. By rapid vaporisation as the spray leaves the aerosol dispenser, liquefied gas propellants help create a fine spray. This control of particle size allows optimisation of the product so that the least amount of the insect-control active is used whilst still providing the required efficacy and product performance. Non-aerosol sprays and compressed gas propelled aerosols do not have this control of particle size resulting in sprays with larger particles. The consequence is both an increase the amount of insect-control active ingredient used and a less effective product because less of the spray remains airborne long enough for the insects to fly through and pick up the insecticide.

  The small particle size of aerosol spray possible with a liquefied gas propelled aerosol dispenser means that they are also ideal for indoor actions dealing with infestations. In these cases the active substance needs to be presented in a sweeping or fogging technique for effective product performance. The larger spray droplets produced by alternative spray dispensers cannot achieve this area coverage and cannot match the particle impingement on the insect's body achieved by liquefied gas aerosols.

  A small particle size is also important for sprays designed to penetrate cracks and crevices and other deeper (but exposed) areas where crawling insects can spend up to 75% of their time. Treatment of such areas is critical for the treatment of pest-problems such as cockroaches – aerosolized particles under pressure can penetrate deeper into these voids and be far more effective that alternative liquid-spray droplets.

5. TECHNICAL CONSIDERATIONS RELATED TO THE USE OF POSSIBLE ALTERNATIVES TO VOCs IN HOUSEHOLD AEROSOL INSECT-CONTROL PRODUCTS

- **Compressed gas**

  Aerosol insect-control products require solvents to disperse the active ingredients to the required concentrations and achieve the required product performance. These solvents need to be volatile to ensure that the active ingredients are transferred to the target insect rapidly. In aerosol insect-control products the liquefied propellants also act as either the main solvent or co-solvent. Alternative propellants such as compressed gases remain discrete from the insect-control product formulation and do not dissolve the active

ingredients (refer to Section 4 above). Therefore, larger volumes of VOC solvents are be required in the formulation, thereby negating any potential environmental benefits from propellant substitution

By maintaining a constant pressure throughout the aerosol's life-time, liquefied gas propellants ensure that the product performance is the same at the end of pack life as at the beginning. Compressed gas such as nitrogen (N_2) cannot do this because as the product is used up the pressure within the can reduces and the spray rate varies. This impacts the product efficacy and performance which are essential to maintain for a household aerosol insect-control product (see also Section 4).

Liquefied gas propellants are an intimate part of the product formulation, when the aerosol dispenser is used; some of the propellant is expelled as part of the product. As this liquefied propellant exits the dispenser, it evaporates breaking down the product into a spray of small particles. Compressed gas propellants remain in the dispenser during use and so do not have the same ability to assist in the spray formation. Consequently, the particles are always larger which is decreases product efficacy and increased the use of insecticide active substances resulting in a generally poorer performance.

- **Water**
  For economic reasons aerosol dispenser insect-control products currently use water to the highest extent possible without compromising product performance, efficacy and container safety (corrosion). Hydrocarbon propellants actually play a very important role in water-based formulations; by solubilising the active substances and providing sufficient 'oil' to form stable emulsions they make it possible to replace other solvents with water. Thus these propellants play a dual role, acting as both solvent and propellant.

- **Pump Sprays**
  Pump spray insect-control products are available and are often designed for specific applications. However, pump spray products are less able to deliver the controllable, constant spray patterns needed for some applications. Further, pump spray particles tend to be larger than aerosol dispenser spray particles and so for those product applications where particle size is critical, pumps give sprays that have a poorer performance than aerosol dispensers.

  In terms of total VOCs, pump spray products are similar to aerosols using compressed gases. In this case the propellant gas is replaced by the pumping action which expels product, replacing it with air. When a liquefied propellant-based product is reformulated into a pump spray product, the amount of liquefied propellant has to be compensated by additional liquid solvent to aid the solubilisation of the insect-control active. As many aerosol dispensed insecticides already contain significant amounts of water, often the overall VOC reduction contribution will be very marginal or even nil.

- **Mats or Liquid Electric Heaters**
  Whilst mats or electric heaters are products that can and are used for delivery of some insect-control actives, they have limitations including:
  - They are not instantaneous in action
  - Not as effective for flies
  - Cannot achieve a high-enough dose for many applications
  - Many actives cannot be used in such devices

6. VOC EMISSION ESTIMATIONS

The figures presented in the Ökopol interim report can be improved. The figures below, estimated by FEA, show that the total annual VOC usage for aerosol insecticides and plant protection products is 28.8 kt.

European production (2006): 232,956 million units

Product	Average VOC content (%)	Average density (kg/l)	Average content (ml)	'market split'	VOC emission estimated (kt)
Insecticides and plant protection products (solvent-based)	90	0.60	250	0.35	11.0
Insecticides and plant protection products (water-based)	45	0.90	290	0.65	17.8
				Total	**28.8**

These figures include all aerosol insecticides (not only those for the general public) and all aerosol plant protection products. It has not been possible for FEA to collect market data only related to household aerosol insect-control products.

However, figure obtained from A.I.S.E. on the production of household aerosol insect-control products shows that of the 28.8 kt given above the total annual VOC usage from such products is approximately 4.8 kt.

7. AUTHORISATION OF INSECT-CONTROL PRODUCTS

The Ökopol report, section 7.10.3.4 states that:

> One far-reaching option to consider may be a ban of aerosol-type insecticides for consumer use. This might be justified by their hazardous nature as well.

Any potential hazardous nature of such household aerosol insect-control products as described here refers to the biocidal active substance and not to the VOC constituent. All such products are already regulated under the extensive requirements of the Biocidal Products Directive 98/8/EC

and its implementation by Member States. This statement suggested that the consultants do not understand how biocides are regulated in the EU.

For a household aerosol insect-control product to be allowed to be used by the general public, it has to go through an extensive authorisation and registration process within each Member State where it is placed on the market. This process includes an extensive assessment of the safety (both human health and environmental) and efficacy of the actual product, including the delivery system. All such products will get a registration number before they can be marketed.

Furthermore, since such insect-control products are essential, if there were to be a ban on aerosol dispensed products, all replacement products would have to go through another extensive assessment and authorisation before they could be marketed. Such a process would involve new efficacy testing (and as explained above many alternatives would not be sufficiently efficacious), new safety testing (including the possibility of additional animal testing) and would be extremely costly in both financial and resource to both industry and the Member State authorities

Because the assessment of the potential risk of such products to the general public is already made under the extensive requirements of the Biocidal Products Directive 98/8/EC, suggesting a *"...ban...might be justified by their hazardous nature as well" is* unwarranted and should not be included in a report on the review of the VOC Paints Directive 2004/42/EC.

8. CONCLUSION

Household aerosol insect-control products play a vital role in the health of the home providing a clean and hygienic environment for the family. Under the Biocidal Products Directive 98/8/EC, the benefits and potential risks of these products are already evaluated thoroughly and reviewed before being placed on the market. For certain uses, insect-control products are often marketed in aerosol form because consumers find them a particularly efficient form of product delivery.

Banning household aerosol insect-control products would not achieve any significant reductions in VOC emissions because emissions from these products are already low. Further as described above, for many applications alternative technologies cannot deliver the required levels of efficacy and product performance.

Consequently, A.I.S.E. & FEA urge the continued exemption of household aerosol insect-control products from the VOC Paint Directive 2004/42/EC and other regulations setting limits on VOC content.

Annex 57 Stakeholder Document (European Aluminium Aerosol Can Industry)

57. AEROBAL - Position Paper on Ökopol interim report, Implementation and review of Directive 2004/42/EC, Brussels, 03.04.2009

AEROBAL

International Organisation
of Aluminium Aerosol
Container Manufacturers

Secretariat:
Am Bonneshof 5
40474 Düsseldorf
Germany
☎ +49 211 4796-144
Fax +49 211 4796-25141
e-mail: aerobal@aluinfo.de
website : http://www.aerobal.org

AEROBAL position paper
Ökopol interim report
Implementation and review of Directive 2004/42/EC

1. Background

The Ökopol interim report was elaborated in the context of a contract between the European Commission and a project consortium lead by Ökopol, analysing the first year of implementation of Directive 2004/42/EC and providing technical services to the Commission for the preparation of a Directive's review. Directive 2004/42/EC concerns the limitation of emissions of volatile organic compounds (VOC) from the use of organic solvents in certain paints, varnishes and vehicle refinishing products. It was adopted in 2004 by the Council and European Parliament and includes limits on the maximum VOC content for various products and a labelling obligation for these products. These obligations entered in force on the 1st January 2007.

According to the report two studies have indicated that VOC emissions from aerosols contribute significantly to VOC emissions. Therefore the technical feasibility of substituting aerosols e.g. in household products like deodorants and hairsprays as well as in paints has been analysed. Three Member States (Austria, Belgium, Lithuania) propose an extension of the scope to aerosols.

In chapter 8.2.5 the extension to cosmetics products is considered. The report says:

“The project team will assess the technical feasibility of VOC reduction of hair sprays, limiting the VOC content with 90 %. The project team will also assess the technical feasibility of VOC reduction from deodorants by limiting the VOC content of these product with 10 %. At present, this would mean that only emulsion-based rollers and sticks would be allowed on the market, as technical alternatives to high-VOC aerosol or pump-sprays are not available yet. The project team will also assess the impact of an extension of the scope to all cosmetic products by introducing the obligation to have a clearly visible label on the front stating the VOC content, to raise consumer awareness and to facilitate consumers’ choice when preferring VOC-reduced products.”

2. Information on the aluminium aerosol can market

In Europe about 3 billion aluminium aerosol cans are produced. About 20 percent of this production is used in the hair care market (e.g. hair sprays, hair mousses) and 50 percent are used for deodorants. All in all about 80 percent of the aluminium aerosol can production goes into the cosmetics market which is the key market for aluminium aerosol can producers.

The production volume of 3 billion aluminium aerosol cans amounts to a turnover of around 510 million EUR. The industry consists of 18 small and medium-sized companies (SMEs) all across Europe which employ roughly 3.500 employees.

The aluminium aerosol can industry's focus and dependence on hair care and cosmetics products underlines that the Ökopol recommendations which could finally result in a ban of aerosols in these markets, would very heavily affect the business and even threaten the existence of aluminium aerosol can producers.

Apart from the job losses in the aluminium aerosol can industry, thousands of additional jobs in hundreds of European SMEs will be lost which are part of the connected supply chain (e.g. contract fillers, slug, machinery and coating suppliers as well as service providing businesses for transport and maintenance).

Finally, a ban of aerosols in the cosmetics market will even have a negative impact on the performance of those brand owners in the cosmetics industry who are currently successfully marketing aerosols being a key element of their product portfolio.

3. Need for an impact assessment

The EU Commission has rightly stressed that any proposal for extension of the scope shall be based on the technical feasibility for VOC reduction and on the outcome of the related impact assessment.

In this context the EU Commission's impact assessment guidelines (http://ec.europa.eu/governance/impact/docs/key_docs/iag_2009_en.pdf) shall ensure that Commission initiatives and EU legislation are prepared on the basis of transparent, comprehensive and balanced evidence because they may have intended and unintended impacts, both inside and outside the EU, on fundamental rights, certain economic sectors, on economic actors, groups of citizens, on businesses, SMEs, or on regions, cultural goods, species or habitats.

In this context economic, social or environmental impacts of legislative initiatives have to be taken into account.

In the present case it would be a "cross-cutting" legislative action, because a Directive is concerned which addresses broad issues and is likely to have significant impacts in at least two of the three pillars (economic, environmental and social) and on a wide range of stakeholders across different sectors.

AEROBAL would like to point out some of the main economic, social and environmental impacts which would be linked to the legislative implementation of Ökopol's recommendation to replace aerosols by other products such as sticks and roll-ons

Economic impacts

The legislative implementation of these recommendations, which would exclusively hit SMEs, would lead to an improper functioning of markets because it would lead to

- a reduction of consumer choice and confidence when the aerosol as established product system is banned
- an impact on the quality and availability of the goods consumers buy because aerosols have properties which roll-ons or sticks cannot provide
- less competition. Currently aerosols are competing with alternatives such as pump systems, roll-ons or sticks. This competition would be phased out, if aerosols were banned from the market. It is not possible for aerosol producers to simply switch to the

production of roll-ons or sticks because it is a completely different production technology. Barriers to entry would be extremely high and therefore impeding competition.
- higher prices due to less competition.
- a negative impact on the global competitive position of the affected EU SMEs in the field of aerosol can production. Many aluminium aerosol can producers are also exporting their products to other countries outside the EU. If the marketing of aerosols was banned in Europe, this would also heavily affect the company's chances to do business outside Europe.
- cross-border investment flows, including relocation of economic activity.
- a loss of SME's property. Production machinery cannot simply be sold to other investors because the European market for aerosols would be completely lost.
- closing down of businesses. If aerosols were banned from the market, many companies, including those which are not exclusively involved in the aluminium aerosol business, would be forced to close down businesses.
- trade barriers for non EU aerosol producers. Also those non-EU producers of aerosols which are exporting their products to European countries would be seriously affected by a ban of aerosols. Such a measure would therefore hamper the world trade of these products. It has to be checked how this might affect EU trade policy and its international obligations, including in the WTO.

Social impacts

Relevant social impacts of legislative initiatives along the lines of Ökopol recommendations would be:

- Massive losses of jobs in the aerosol can industry and the connected supply chain would be unavoidable.
- The quality of products in this market and access of European consumers to these high-quality products would be hindered. Aerosol products have a completely different functionality than sticks or roll-ons. European consumers like aerosols for many reasons. They are easy and convenient to use, they have a cooling/refreshing effect and they allow a hygienic and exact application of the product.
- Consumer protection could be negatively affected because of an increase of the likelihood of health risks. Aerosol cans have functions which are vital for many cosmetics products. There are great differences between roll-ons or sticks compared to aerosols. The cosmetics industry knows that the application of a cosmetic product plays a vital role when it comes to protecting the consumer against micro-organisms. For example, a roll-on or a stick allow germs to invade into the deo product. This allows the presence of many skin germs in the deodorant and leads to a repetitive application of unwanted germs on the skin. The application with a deodorant is more hygienic because there is no direct contact of the product with the skin. Therefore also the use of preservatives in the formulations can be avoided.
- The ban of aerosol products in the cosmetics market would mean a strong impact on cultural habits and user preferences which does not take into account the different functionalities of the banned product and its substitutes.
- Banning the core products of the aluminium aerosol can industry (deodorants and hair care products) would also mean that pharmaceutical aerosol applications, which contribute to the health and well-being of European citizens, would be dramatically restricted in their formulations' innovation and development potential and disappear from the market.

Environmental aspects

In general AEROBAL doubts that the Ökopol recommendations on aerosols will bring any significant impact on ground level ozone building.

A ban on the use of aluminium aerosol cans for hair sprays or deodorants would phase out an environmentally sustainable packaging because

- bauxite, the natural resource for aluminium production, is abundantly available
- they are infinitely recyclable without loss of quality, with aluminium aerosols reaching a recycling rate in Europe of about 50 %.
- they have an intrinsic material value which makes recycling economically attractive.
- aluminium recycling requires much less energy than the primary aluminium production from its ore. For the production of secondary aluminium up to 95 % of the energy can be saved compared to the production of primary aluminium (aluminium aerosol can as energy bank).

However, sustainability is more than looking at one environmental indicator (VOC emissions). So it has to be scientifically examined whether other packaging options lead to more sustainable production and consumption taking into account all three pillars of sustainability (economic, social and environmental aspects).

The aluminium aerosol can industry is applying good manufacturing practices and producing in accordance with existing environmental legislation.

Since many years aluminium aerosol can producers have been working on process optimization leading to less VOC emissions in their production processes. For example, can producers have improved the environmental performance by light-weighting and using new and more environmentally friendly coating systems. Together with suppliers and customers technological improvements along the entire supply chain have been achieved to the benefit of the environment. In this context aluminium aerosol cans offer a powerful technological potential. For example, thanks to new valve systems it is possible to pack the same amount of active ingredients in a smaller can because less propellants and solvents can be used. Also water-based formulations, which have a better environmental performance than alcohol-based systems, are increasingly used in the market. Aluminium cans because of their excellent performance against corrosion are well suited to water-based systems. Another good example for the aluminium aerosol can's technological performance is the bag-on-valve system which is using compressed gas such as air as propellant. These systems are tailor-made for formulations where the active ingredient has to be separated from the propellant, e.g. for pharmaceutical applications.

4. Conclusions

If the Ökopol recommendations in the field of cosmetics were implemented into European legislation in the framework of a revision of Directive 2004/42/EC, this would lead to a ban of aluminium aerosols in this sector. As a consequence the aluminium aerosol can business will almost disappear.

This measure would jeopardize a whole innovative industry branch (including hundreds of companies in the supply chain) which is characterized by SMEs with all negative economic, social and environmental impacts mentioned above. Aluminium aerosol can producers have always undertaken many activities to continuously improve the economic and environmental performance of their production process and of the aerosol system as such in close cooperation with customers and suppliers.

A comprehensive impact assessment by the EU Commission is needed reflecting true sustainability which is based on economic, social and environmental impacts. There is no justification at all to punish an industry which is already acting along the lines of sustainability and complying with existing environmental legislation.

Functionality-wise aerosols cannot be fully compared with alternatives such as sticks or roll-ons because of different properties and performances which are appreciated by European consumers.

Since the Ökopol interim report touches the vested interest of the aluminium aerosol can industry in and outside Europe, AEROBAL would like to ask the EU Commission to maintain contact with the aluminium aerosol can industry throughout the impact assessment process and to provide feedback.

3 April 2009

Annex 58 Stakeholder Document (European Solvents Industry)

58. ESIG – ESIG Comments on the Paint Directive Interim Report by Okopol and its Economic Impact on the Solvents Industry, Brussels, 15.05.2009

ESIG COMMENTS ON THE PAINT DIRECTIVE INTERIM REPORT BY OKOPOL AND ITS ECONOMIC IMPACTS ON THE SOLVENTS' INDUSTRY

PREFACE

The European Solvents Industry Group (ESIG) represents the major European producers of oxygenated and hydrocarbon solvents, amongst them big multinationals as well as smaller and medium-sized companies. Our mission is to promote compliance with legislation and sustainable, safe and responsible use of solvents along the value-added chain by developing and sharing information and best practices.

INTRODUCTION

The solvents' industry contributes substantially to the economic and social welfare in Europe: it directly employs more than 10,000 people in Europe, but indirectly accounts for more than 10 million jobs, with more than half a million European companies using solvents in a range of very diversified application segments. More than 80% of these companies are small and medium-sized enterprises (SMEs).
Solvents' manufacturers across Europe have an estimated combined turnover of about €5 billion. Companies using solvents have an estimated combined turnover of more than €200 bn.

Since mid-1990s, the European solvents' sector has been subject to a series of air quality regulations such as the IPPC Directive in 1996, the Solvents' Emission Directive in 1999, the NEC Directive in 2001, the Gothenburg Protocol in 2001 and the DecoPaint Directive in 2004. All these legislative acts aimed at reducing ozone by applying strict VOC controls.

As a result the solvents' sector reduced VOC emissions by more than 1.3 m tons between 1990 and 2005 in EU 15 alone - a reduction of more 30%. Given the strong economic growth during this specific time period in EU 15, the actual decrease is in the range of some 50%, which means that every second ton of VOC emissions from solvents has been eliminated. According to ESIG calculations, the solvents' share in the total VOC emissions has fallen from 23% in 1990 to an estimated 19% in 2010, while at the same time the proportion of biogenic VOC emissions rose from 24% in 1990 to 41% in 2010. Every new assessment of biogenic emissions shows a further substantial increase in VOCs from natural sources and a corresponding decline in the proportion of man-made VOCs.

REPRESENTING THE HYDROCARBON & OXYGENATED SOLVENT PRODUCERS OF

cefic

Avenue E.Van Nieuwenhuyse4, bte2
B-1160 Brussels
Tel 32 (0) 2 676 7373
Fax 32 (0) 2 676 72 16
T.V.A. 538.183.516
www.esig.org

ENVIRONMENTAL IMPACTS OF THE PROPOSED PAINT DIRECTIVE REVIEW

The independent Harwell Trajectory Model used in the United Kingdom clearly revealed that the impact of further VOC reductions from the solvents' sector by an extension of the Directive's scope or new limits would have a close-to-zero impact on ozone: 0,2 ppb. (For details please see ESVOC position paper "The Ozone Challenge", posted on the circa homepage and on www.esig.org). It should be noted that the precision of ozone measurement is plus or minus 2 ppb.

This result is consistent with 2 previous air quality studies which ESIG commissioned in 2006: independently from each two other renowned air quality models – the Dutch LotosEuros Model of TNO and the French Chimère Model of Ineris – testified that any additional VOC reduction from solvents within the boundaries of technical feasibility will deliver an ozone reduction of < 1%, expressed as $\mu g/m^3$. The results clearly show that the solvents' sector has given its best to comply with the legislation and played its full part.

At the same time the enviromental impacts of solvent-free products have not been thoroughly examined in the sense of an environmental optimum. For example, water-borne products – and water will definitely be *the* scarce resource of the future as stated in the most recent WHO Water Forum – need more energy to drive the water off after application.

ECONOMIC IMPACTS OF THE PROPOSED PAINT DIRECTIVE REVIEW

The above substantial VOC reductions from the solvents' sector are not only due to abatement techniques being applied in the entire value-chain and reformulation substituting high-VOC-emitters by solvents with lower VOC contents , but also to a profound and intensely ongoing substitution process on the part of solvent users, who are employing more and more alternative products.

All possible cost-efficient measures have already been adopted by solvent producers and users or are in the process of being employed. Further steps like the extension of scope or new, stricter VOC limits as proposed by Okopol will be a costly exercise for the entire value-chain for a negligible decrease in ozone well below 1 ppb. Since solvents are commodities by nature, the industry and its downstream users will lose even more competitiveness with the consequence of ultimate delocalization to other parts of the world.

Regulatory certainty is fundamental for investment planning, and while the environmental achievements are visible in terms of VOC reductions from solvents, solvent producers and users are continuously confronted with more detailed and more complex legislation, with every time stricter limits and extended product scopes. Especially for SMEs constituting more than 80% of the market this is equivalent to higher costs, less choice of products and more efforts and resources required for following and complying with regulatory developments.

REPRESENTING THE HYDROCARBON &
OXYGENATED SOLVENT PRODUCERS OF

cefic

Avenue E.Van Nieuwenhuyse4, bte2
B-1160 Brussels
Tel 32 (0) 2 676 7373
Fax 32 (0) 2 676 72 16
T.V.A. 538.183.516
www.esig.org

Along the value-added chain the ongoing pressure particularly on solvents triggers off the impression that the EU authorities seek the ultimate phase-out of solvents from the market. As a matter of fact, the consultants' intense and detailed research work in this specific sector was interpreted by key solvent users and the European trade press as paving the way in this direction, and it is not only the wide-spread journal "Adhesion", which reported this trend to their readership (see "Adhesion" 9/2008) – to one of the biggest sales' segments for solvents. If this negative market influence continues, solvent producers will be confronted by a total loss of the accessible market with only those application segments remaining where solvents cannot be replaced.

In the specific case of the Paint Directive Review it should be mentioned that its phase 2 will not start before 2010. Although the full picture is not yet available, the EU bodies are already examining even more complex regulation, where less complexity and better implementation would justify EU regulations.

CONCLUSION

The solvents' industry – producers and users, the latter in its vast majority SMEs – act in a genuine commodity business with fierce competition from other parts of the world with lower cost levels and regulatory standards, such as Asia. The Paint Directive Review proposals by Okopol as compiled in their draft report jeopardise the survival of the entire solvents' sector in Europe, which has contributed substantially to achieve VOC and ozone reductions and continues to stay committed to more effective EU regulations.

The EU authorities need to ensure that Europe will not suffer from both ends: on one hand by a loss of its traditional industry and 10 million jobs from delocalization and cease of business for environmental improvements close to zero and on the other hand by importing transboundary air pollution and products with lower safety and enviromental standards from high-growth regions like Asia.

Dorothee Arns
ESIG Secretary General

May 2009

REPRESENTING THE HYDROCARBON & OXYGENATED SOLVENT PRODUCERS OF

cefic

Avenue E.Van Nieuwenhuyse4, bte2
B-1160 Brussels
Tel 32 (0) 2 676 7373
Fax 32 (0) 2 676 72 16
T.V.A. 538.183.516
www.esig.org

Annex 59 - Regional Environmental Centre (REC)

59. Data collection in Eastern Europe

Regional Environmental Center for Central and Eastern Europe

REPORT ON DATA COLLECTION REGARDING PRODUCTS

REGULATED BY OR POTENTIALLY INCLUDED IN THE SCOPE OF THE

DECOPAINT DIRECTIVE

(DIRECTIVE 2004/42/EC)

17.11.2008

Table of contents

Estonia 2
Latvia 3
Lithuania 3
Poland 3
Czech Republic 5
Slovakia 6
Hungary 6
Slovenia 8
Romania 9
Bulgaria 10
Croatia 13
Turkey 14
Annex (Data collection results) 20

Estonia

Phase 1

Annex 1.1 of the report contains the list of producers from Estonia, their contact data, product list, the VOC content of different products and national sales of one company. The list was received from Estonian Environment Information Center but modified based on the feedbacks from the producers (two companies were removed from the original list and one was added, resulting in 13 companies). During the data collection it turned out that some of them do not deal anymore with VOC containing paints, varnishes and vehicle refinishing products anymore. The producer were not keen on publishing their national sales, as this is confidential, considered as business secret. Only one company – VKG Resins AS provided the requested information. The Estonian Consumer Protection Board and Health Protection Inspectorate were contacted for more data, but their information system consisted of only the violations concerning the labeling of VOC containing products. The Inspectorate did not have any information about the products that are covered by the Directive or about the national sales of these products.

The data on average VOC content were found on the product safety cards of certain products from the web pages of different producers and also from the report done by The Estonian Environmental Research Centre (EERC) – Control measurements of VOC in paints and varnishes according to Directive 2004/42/EÜ (Margus Kört - chairman of the board, Erik Teinemaa - Head of the Department of Air Quality Management and Katri Saare – technician, Tallinn 2007).

Phase 2

As associations and governmental bodies could not provide the relevant information all the data was compiled from the internet. There are only a few companies that produce the items in question. Most adhesives, cosmetics, protective coatings etc. sold in Estonia are imported. *Annex 1.2* contains the related information.

Latvia

Phase 1

Annex 2.1 of the report contains data regarding three producers from Latvia, (their national sales and data regarding average VOC content of the products).

Phase 2

(No information obtained yet.)

Lithuania

We have no data regarding Lithuania, as the producers are not obligated to provide detailed information t consultants about their national sales as they do not provide this information to governmental agencies yet. The National Environmental Agency has only a report to the EU, which is very general.

Poland

Phase 1

In *Annex 3.1* you can find the list of producers and their contact details. The producers do not make accessible their data, especially on sale as this is confidential. The only institute that collected similar information was the Institute for Ecology of Industrial Areas (IETU) that made a research in cooperation with the Polish Ministry of Environment (Ministry was responsible for collecting data from producers). They estimated the production covered by Directive 2004/42 at 2007 on 350.000 tons. The estimation made on the basis of the growth of the production of that products (3,55 %) gives the result of production in the year 2006 – 338.000 tons.

The data on detailed production/sale data on products (subcategories) are not accessible but seems to be not known even by producers. They recognize product for subcategories only when the VOC limit is needed to know but they do not categorize in that way production/sale data. The problem is that the Directive do not cover products according to any coding system for classifying products for statistical purposes (EU coding system). *Annex 3.1* contains the main actors that cover around 80-90% of market for products under the Directive. The remaining 10-20% is very spread production of small producers.

During data search the following organizations were contacted:

- Institute for Ecology of Industrial Areas (IETU),
- The Institute for Ecology of Industrial Areas (Instytut Ekologii Terenów Uprzemysłowionych w Katowicach),
- Ministry of Environment, Department of Climate Change and Sustainable Development; Division of Air Protection,
- National Emission Centre.

Phase 2

During data collection it was difficult to obtain concrete figures on sales of products from each of the product groups because producer companies were unwilling to disclose such information.

In addition some of the products, particularly adhesives, are often classified as belonging to very different groups of use, which made it hard to draw any overall conclusions.

Therefore, REC employees had to look into existing data, gathered by other institutions that have conducted similar research before, as well as into general statistical data regarding national industrial development.

The data is structured by classifications that do not match the given breakdown.

Annex 3.2a includes lists of producers for different product groups. *Annex 3.2b* contains production and sales data.

Czech Republic

Phase 1

Annex 4.1 of the report contains the list of producers, their contact details and the mass of products for year 2007 in Czech Republic. The latter data was received from the Ministry of Environment, from the responsible person for the directive 2004/426EC Ing. Vodička (Department of Air Protection). As the Directive entered into force from 1st January 2007, the data from 2006 is not available. In Czech Republic nobody is monitoring the average VOC content of the products (nor the Ministry of Environment, Ministry of Industry and nor the Statistical Office). Estimation of the production and supply was made by the company SVUOM (It continues and follows up the expert activities of the National Research Institute for the Protection of Materials (SVÚOM)). The categorization according to the Directive in Czech Republic does not exist. In *Annex 4.1* the data regarding mass of products is from the ČHMÚ (Czech Hydrometerological Institute) and some update in the future is possible. The REC collected the list of producers independently from ČHMÚ and we collected 31 producers, although they have 48. Their database it is not an open source, they provided for us just the table of estimates.

Annex 4.1 contains also information regarding products which could be included in the scope of the Directive. Unfortunately the statistics about production and sales are not available, there exists only some general data about production of chemicals, but nothing in detail. The estimates of total products regarding 2004/42/CE were made on request by the Czech Ministry of Environment.

Phase 2

As associations and governmental bodies could not provide the relevant information all the data was collected from the internet. *Annex 4.2* contains the list of producers and their contact details. Producers were not willing to provide with statistics on production and sales.

Slovakia

Phase 1

Annex 5.1 contains the list of producers/importers and data regarding their annual production, the VOC content of the annual national sale for year 2007 in Slovakia.

Phase 2

(No information obtained yet.)

Hungary

Phase 1

Annex 6.1 contains the list of registered producers and importers in Hungary (92 producers), their contact details, and the VOC content of the national sales based on the categorization of the Directive and the cumulative national sales. As the national producers because of competitiveness among them they did not reveal their data regarding national sales, the data included in *Annex 6.1* contains also the importers, because otherwise we would not be able to provide any information regarding national sales.

During data collection the following authorities/institutions were contacted:

- Hungarian Association of Packaging and Materials Handling: there are Members of the Association who are producing paint aerosols, cosmetics, adhesives. Unfortunately they do not have detailed information regarding the products.

- **Hungarian Chemical Industry Association (HCIA):** they are representing only their Members (apr. 50 Companies), members which are not producing products which are regulated by DECOPAINT Directive. They advised to contact the Hungarian Cosmetic and Home Care Association

- **National Institute of Environmental Health:** They do not have the list of producers and products which are under this Directive, they advised to contact HCIA and the National Institute of Chemical Safety

- **National Institute of Chemical Safety** –-they did not have any data regarding the national producers, they advised to contact HCIA

- **Ministry of Environment and Water:** the MoE contributed to the development of the „Government Decree 25/2006. (II.3.) on the limitation of organic solvents certain paints and varnishes and vehicle refinishing products" which is the implementation of the Directive in the Hungarian law. The MoE is not responsible about the implementation of the Decree as this is referring to product control. The MoE is responsible only in matters related to VOC emissions. According to the Decree the Consumer Protection Inspectorate is responsible for the monitoring of the products and prepares the report for the EC. Responsible person for the report is Vincze Tibor and Zsitva Mária.

- Hungarian Trade Licensing Office: According to the above mentioned Decree the Hungarian Trade Licensing Office keeps record about the national paint and varnish producers. On the website of the authority we could find the list of producers which are registered. They are collecting data also regarding the national sales and VOC content of the products and based on the decree they provide this data to the Consumer Protection Inspectorate. They are not authorized to reveal this data to third persons, so they advised to contact the Consumer Protection Inspectorate.

- **Consumer Protection Inspectorate –** provided the data regarding national sales in kg for the year 2007 by categories and subcategories of the Directive.

Phase 2

The Hungarian Cosmetic and Home Care Association provided us with the list of the producers of cosmetics. However taking into consideration the legislation is applied on European level the required data on production and sales is provided by Colipa (European Cosmetics Association) and not by the Hungarian Cosmetic and Home Care Association.

Regarding adhesives and protective coatings, as associations and governmental bodies could not provide the relevant information, all the data was collected from the internet.

Annex 6.2 contains the list of producers and their contact details. Producers were not willing to provide with statistics on production and sales.

Slovenia

Phase 1

During data collection several relevant national institutions and Slovenian producers were contacted:

- The Ministry of Environment and Spatial Planning, Directorate of Environment,
- Custom Administration of Republic Slovenia,
- Slovenian producer of certain paints, varnishing and vehicle refinishing products.

National Regulation on max of emissions of volatile organic compounds due to the use of organic solvents in certain paints and varnishes and vehicle refinishing products, came in force in year 2006. Labeling the product with VOC data came into force on January 1st 2007. From January 1st 2008 Slovenian producer are obliged to report to Custom Administration of RS the relevant VOC information and paid environmental tax. Information system is still under construction. In preparation phase is Regulation on implementation monitoring of VOC in organic solvents within certain paints and varnishes and vehicle refinishing products put on market

Custom Administration started to collect information of VOC from producers in year 2008. Producers are obliged to report to the Custom the next scope of information: the categories, subcategories and types of their products, and their anticipated national sales of their products in kg. To prepare informative calculation of environmental taxes for year 2008 the Custom collected from the producers their figure of national sales of products in year 2007. During the year those figures are going to be corrected with figures of national sales in year 2008. According to the information from the representative of Custom the collected VOC Regulation related data from producers are still under construction. After the system construction will be done, some of the data will be open to the public. Public share information will be the list of produces / tax payer and the national sales of the product of the year 2008 only by categories and only for the whole country together. *Annex 7*.1 contains the list of Slovenian producers and their products.

The only known rough figure of national sales of the products till is for year 2007 together for all 14 Slovenian producers, and it is 4.872.954 kg (data from National Report to EC). The figure for year 2006 is not available. Producers are unwilling to give their figures for 2006, due to competition among them.

Phase 2

As associations and governmental bodies could not provide the relevant information all the data was collected from the internet. *Annex 7.2* contains the list of producers and their contact details. Producers were not willing to provide with statistics on production and sales.

Romania

Phase 1

Annex 8.1 contains the list of producers in Romania, their contact details and the VOC content of their products.

Phase 2

As associations and governmental bodies could not provide the relevant information all the data was collected from the internet. *Annex 8.2* contains the list of producers, their contact details and the VOC content of their products.

Bulgaria

Phase 1

Main activities carried out

The first phase of the research addressed already regulated product groups (paints, varnishes and vehicle refinishing products) **and was combined with the second phase** of the research in relation to the possible extension of the scope of the Directive**.**

During the survey the following activities were carried out:

1. As a first step of the research was realized a contact with Elena Yakimova (Air Pollution Control) from the Ministry of Environment and Waters to advise us about possibilities to collect the needed information. A personal contact with the all fifteen Regional Inspectorate of Environment and Waters (RIEW) was recommended.

- A list of VOC experts from the Regional Inspectorates was compiled;
- A personal call to the experts and explanation about the project objectives was made;
- An official letter with a request for Access to Public Information was sent to all RIEW asking for a list of producers of paints, varnishes and vehicle refinishing products and information on the national sales of products for 2007, where available;
- The following RIEW were connected: REIW Blagoevgrad, RIEW Varna, RIEW Veliko Tarnovo, RIEW Vratsa, RIEW Montana, RIEW Pazardjik, RIEW Pleven, RIEW Plovdiv, RIEW Ruse, RIEW Smolian, RIEW Sofia, RIEW Stara Zagora, REIW Shumen, REIW Shumen, RIEW Burgas;
- The information about the national sales in the region and a list of the local producers of paints, varnishes and vehicle products was collected against small payments to the state budget and often associated with certain delays in the provision. In some cases the information from the RIEW was not complete and did not contained the respective data needed for the study, which necessitated additional contacts and discussion.
- A contact with Bulgarian Industrial Association was established in order to exchange information on available information and previous research in this field.

2. As a second step of the survey all the listed producers were contacted and requested data for the products, the average of the national sales for 2007 and the VOC content of the products included in the Annex 2 of the Directive.

- A personal call to the managers and ecology experts of the identified companies was made. The project objectives was explained well;
- An official letter and a supportive table with the detailed content of the major groups of paints listed in Annex 2 of the directive were sent to the producers. We needed one week to receive all the information sent by the companies.

3. In the final phase of the research an excel table was compiled with all data collected from the producers and the RIEW. Complementation of the table with data from RISW. The following producers were very kind to provide us with the needed data:

- AGLAYA IVAN OOD - Vidin
- DAL OOD - Mizia
- ORGAHIM - Ruse
- KOLORA AD – Sofiq
- UNIVERSALSTROI OOD - Dalbok Dol
- KUPRO 94 EOOD - Gorna Oriahovitsa
- TOPLIVO AD - Shumen
- HBG - KOMERS EOOD - Shumen
- LAKPROM – Sofia
- CHIMATECH – Sofia

Companies that refused to give us information

- VECTOR OOD –Troian
- BORO - BOGOMIL DACHEV ET
- MEGAHIM AD – Ruse
- BULMAT EOOD – Gabrovo
- LEKTRA – Haskovo
- BAUMIT BULGARIA EOOD - Elin Pelin

Main challenges and problems

There were some difficulties with the various ways of requesting information from the RIEW. In general the experts requested an official application for an Access to Public Information, which requires 10 days to be sent by post according to the law and the bureaucracy. This fact has prolonged the process of the research and the necessity to combine the two stages of the study. A few experts from the inspectorates have provided the information by phone. It looks that it depends on the good will for cooperation of a single expert to summarise and provide the needed data. Most of the experts relegated REC employees to the MOEW to search for information and MOEW relegated them back to the experts. Finally a list of producers was received by each Inspectorate.

As a general principle the data requested by the research is not collected in the same details and forms by the state nor by producers and traders. The state authorities strictly follow the requirements of the Directive without attempting to analyse or streamline the process of information collection and dissemination.

Speaking with the producers revealed that the requested data for the national sales of paints and the average of VOC in the products were provided to the RIEW. The managers of the companies did not understand why they have to provide it again and thus some of them refused.

Main Achievements

- A list of Bulgarian producers was completed containing its names and contact details.
- Data of the national sales for 2007 and the average VOC content was completed (*Annex 9.1 - data regarding regulated products by the Directive and Annex 9.2 - data regarding products which could be included in the scope of the Directive*)
- REC CO accumulated important contacts and experience in communicating with RIEW, MOEW and other institutions concerning VOC in the country. A personal experience was gained as regards working with state authorities and the Directive 2004/42/CE in particular.

Phase 2

Concerning the second phase of the research in relation to the extension of the scope of the Directive (*Annex 9.2*) REC employees could not find relevant information because the products listed **(**paint aerosols, protective coatings, adhesives, cosmetics and cleaners) are not included in the Directive 2004/42/CE and so the RIEW experts did not control the VOC content and most of the companies refused to provide with such information.

Croatia

Phase 1

During data collection in Croatia the following authorities/institutions were contacted: Croatian Environment Agency, Croatian Chamber of Economy, Ministry of Environmental Protection, Physical Planning and Construction, Directory of Chemical Industry. The list of producers was received from Ms. Pehnec Pavlović from Croatian Chamber of Economy.

The producers are not informed about the Decopaint Directive and because of competitiveness among them they did not reveal any data regarding their national sales.

Annex 10.1 contains the list of producers and detailed data regarding the national sales of two companies.

Phase 2

As associations and governmental bodies could not provide the relevant information all the data was collected from the internet. *Annex 10.2* contains the list of producers and their contact details. Producers were not willing to provide with statistics on production and sales.

Turkey

Phase 1

General Overview of Turkish Paint Industry

Turkey is one of the biggest paint producers in Europe considering the total production capacity (Bektaşoğlu, 2006, SPO, 2007 and BOSAD, 2008). Several research findings show that the total production capacity of the paint industry in Turkey is 800,000 ton/year (Bektaşoğlu, 2008, SPO, 2007 and BOSAD, 2008). Paints that are used for *decorative purpose* in construction sector *represent approximately 60% of this total production capacity* (BOSAD, 2008). 61% of decorative paints are water-based and the rest of them are solvent-based which is the main source VOCs in this sector (BOSAD, 2008).

There are approximately 600 registered facilities available which 20 of them are big firms and 400 of them are small-medium sized enterprises (BOSAD, 2008). Considering the amount of unregistered facilities, the number of paint producers is predicted to be more than 1000. Top 15-20 manufacturers account for 75% of Turkey's annual paint production (Bektaşoğlu, 2008). 80% of manufacturers are located in Marmara Region of Turkey (Bektasoglu, 2008). One of the leading NGOs in paint industry in Turkey is The Society of Paint Producers' (BOSAD). The Society has 51 members and these members are responsible to produce 80% of total production capacity of Turkey. Names, contact information and production type of members are given in *Annex 11.1* This association has many technical studies and projects which are conducted in collaboration with different governmental institutions. These studies and projects are mainly concentrated on improving technical background of paint industry and facilitation of EU accession process of the sector with organization of different capacity building activities. The Society of Paint Producers together with Turkish Ministry of Environment and Forestry (MoEF) have been recently established a working group to evaluate the existing situation of Turkish paint industry regarding the Directive 2004/42/CE to present the main problems which affect efficient implementation of related Directive and to create a comprehensive inventory and calculation system considering the categories and subcategories of the Directive. The next meeting of the working group will be held on September, 2008.

Considering the annual paint production, different institutions indicate different amounts for production. According to the 2007 report of Specialization Commission of State Planning Organization (SPO) of Turkey in Chemical Industry, depending on the demand, average annual paint production in Turkey is 300,000 ton/year. **Table 1** represents *annual production predictions* of Association of Paint Industrialists' from 2003 to 2008.

Table 1 Annual Paint Production Prediction of Society of Paint Producers' (BOSAD, 2008)

Year	Annual Paint Production (ton/year)
2003	452,000
2004	500,000
2005	528,000
2006	550,00
2007	Estimated to be 580,000
2008	Predicted to be more than 600,000

VOC content of Turkish paint industry

It is not possible to present a rough figure for VOC content of product categories and sub-categories that are represented in Annex I of the Directive 2004/42/CE. Based on the communication with the Association of Paint Producers (BOSAD), Ministry of Environment and Forestry (MoEF), General Directorate of Environmental Management, Department of Air Management and Turkish Statistical Institute, there is not enough information available about VOC content of this sector.

What is more important about paint industry in Turkey is the lack of basic information about this sector. Not only VOC contents but also production amounts are not very well defined for this sector. MoEF have been conducting technical studies in collaboration not only with Society of Paint Producers but also with other sector representatives from business and other governmental institutions to improve data quality of paint industry. These studies include effective harmonization of the Directive 2004/42/CE to current legislation by informing the sector representatives about related directives of EU, preparing strategies to harmonize the Directive and preliminary studies to set paint standards. During these studies, MoEF and BOSAD emphasized inadequacy of current available data and information about Turkish paint industry. Recently, MoEF have been

in contact with different institutions to gather related information and they expect to have related data by the end of 2008. All these findings strongly emphasized the need for a comprehensive inventory for this sector and need for a comprehensive capacity building studies to raise the awareness of manufacturers.

Most of manufacturers which are listed in *Annex 11.1* of this report have official websites and they clearly define some of their product information in their websites in Turkish and partly in English such as suggestions for preparing the surfaces for application, application and after application precautions, storage conditions, storage temperature, relative humidity and flash point of their products but VOC content of their solvent based products are not defined. This fact means that manufacturers are not informed about the calculation methods comprehensively. It shows a necessity to establish a comprehensive calculation system for VOC.

Turkish paint industry sales data

Decorative paints have the top priority considering as an export product. Paints that are used in construction sector have a considerable importance in Turkish export as well (BOSAD, 2008). Major exported products are paints and varnishes. The paints and coatings industry products were mainly exported to neighboring countries and countries which have a dynamic construction sector such as the Russian Federation, Azerbaijan, Romania, Georgia, Ukraine, Iraq, China, Kazakhstan, Iran and Bulgaria (Bektasoglu and Esen, 2008). Export values for Turkey's paint industry are given in **Table 2** It should be noted that products coded as 3201, 3202, 3203, 3204 and 3206 are mostly textile paints and pigments. Like VOC contents of regulated products, there is not any information available regarding national sales data of products other than products stated in **Table 2** (Bektasoglu and Esen, 2008).

Table 2 Turkey's Paint Industry Exports by Products (1000 $) (Undersecretariat of Foreign Trade, Turkey)

Product Code	Products	2005	2006	2007
3201	Vegetable tanning and extracts; tannings and their salts	1,327	1,525	1,724
3202	Synthetic organic and inorganic tanning substances; tanning preps	32,068	38,423	46,097
3203	Vegetable/animal origin coloring matter	24	116	104
3204	Synthetic organic coloring matter and preparations	17,967	19,217	26,627
3205	Colour lac and preparations based thereon	116	771	1,073
3206	Other coloring matter, inorganic products used as luminophores	9,002	9,421	13,213
3207	Pigments, opacifiers, colors, enamels and glazes, engobes, liquid lustre	12,695	19,541	27,856
3208	Nonaqueous solution of paint and varnish	53,647	63,862	74,808
3209	Aqeous solution of paint and varnish	24,242	30,386	35,052
3210	Other paints and varnishes	15,139	17,093	20,726
3211	Prepared driers	5,392	5,505	6,955
3212	Pigments, nonaqeous media (liquid, paste) for paints and dyes	3,966	4,492	5,28
3213	Artists' color, modifying tints and amusement colors	1,548	1,386	1,160
3214	Glaziers putty, grafting putty, resin cements, painters fillings	41,644	55,008	70,304
3215	Printing, writing or drawing inks and inks nes	15,920	20,998	25,899
32	**TOTAL**	234,697	287,745	356,879

References

Society of Paint Producers (BOSAD), Turkey, http://www.bosad.org/Default.aspx?bolum=38, Last date accession: July 2008.

Society of Paint Producers (BOSAD), 2008 Report, http://www.bosad.org/Default.aspx?bolum=38, Last date accession: July 2008.

Turkish Prime Ministry State Planning Organization (SPO) Ninth Development Plan (2007-2013), Specialization Commission Report on Chemical Industry, 2007.

Bektaşoğlu, S. (2006). *Paint Industry,* Turkish Prime Ministry Undersecretariat of Foreign Trade Export Promotion Center of Turkey.

Bektaşoğlu, S. (2008). *Paint Industry,* Turkish Prime Ministry Undersecretariat of Foreign Trade Export Promotion Center of Turkey.i

Bektaşoğlu, S. and Esen, B. (2008). *Paints and Dyes Industry,* Turkish Prime Ministry Undersecretariat of Foreign Trade Export Promotion Center of Turkey.

Annex 11.1: list of producers (names, contact information and production type of 38 members of Society of Paint Producers' are given in the excel sheet.) and exports by products. The Society has a total number of 51 members. 38 members are responsible for paint and varnish production, the rest of them are responsible for raw material and chemical productions for different industries.

Phase 2

For the second phase of the research, REC Turkey communicated with Ministry of Environment and Forestry (MoEF) and Paint Producers' Association (BOSAD in Turkish) to collect necessary information about the production of specific products.

During Phase 2 data search REC Turkey completed following activities:

- REC Turkey sent an official request letter to MoEF to collect information about protective coatings and adhesives producers. The letter involved a short explanation of the project, REC Turkey's responsibilities in the project and a short explanation about what kind of information has to be collected at the second phase. Furthermore, as an attachment to this official letter, REC Turkey sent the first phase report to MoEF.
- After this official request letter, as a response, MoEF requested a detailed official explanation of the project from REC HQ or project partners. In this period, again, they strongly indicated that MoEF is the implementing institution for Directive 2004/42/EC. They did not get any official information from the project leader or partners after the realization of the project. They once again repeated their request that they would like to

get more detailed information on the developments of the project (e.g.; about the project activities and their purpose, outputs, etc.)
- REC HQ sent an informative letter to Turkish MoEF through fax and postal service.
- REC Turkey sent the first phase report to BOSAD and requested information about the second phase report. At the first phase report, we collected producers' information from their websites. As we indicated at the first phase report, one of the main deficiencies of the paint industry in Turkey is the lack of a comprehensive inventory system.

In spite of the efforts described above the Turkish country office did not find and/or get a specific list about the information of producers from the above mentioned institutions.

Annex (Data collection results)

	Producer	Address	Telephone No	e-mail	web
1.	Alsant Plus OÜ	Läänemere 36-55, 13914 Tallinn	53.442.035	info@alsantplus.eu	http://www.alsantplus.ee/
2.	Ecostil OÜ	Lao 10, Maardu 74114, Harjumaa	6.063.282		www.ecostil.ee
3.	Elastra Kattematerjali AS	Akadeemia tee 19, 11216 Tallinn	6.590.070	info@elastra.ee	http://www.elastra.ee/
4.	ES Sadolin AS	Tobiase 8, 10147 Tallinn	6.305.299	es@sadolin.ee	http://www.varvimaailm.ee/default.asp
5.	Eskaro AS	Fosforiidi 20, 74114 Maardu	6.007.779		http://www.eskaro.com/
6.	Hermseal AS	Piiri põik 8, 71020 Viljandi	4.349.637		
7.	Kermet RV OÜ	Kastani 3, 79514 Rapla	4.856.271	kemet.rv@neti.ee	
8.	Saaremaa Lubjatööstuse OÜ	93301 Põlluküla	4.576.344	kalle@saarlane.ee	
9.	Tikkurila-Vivacolor AS	Liimi 5, 10621 Tallinn	6.501.100	jaana.parn@vivacolor.ee	www.vivacolor.ee
10.	Vekker AS	Kopli 103, 11712 Tallinn	6.102.337	vekkerest@hot.ee	
11.	Vivikoop AS	Masina 22, 10144, Tallinn	6.300.777		
12.	VKG Resins AS	Järveküla tee 14, 30328 Kohtla-Järve	3.375.183	liimid@vkg.ee	www.vkg.ee/liimid
13.	AS Kemiflora	Laki 3A Tallinn 10621	6.563.491		http://www.kemiflora.ee

Company	Products	VOC content	National sales
VKG Resins AS			
	"Esmol"	50%	31 895 kg
	Primer " Esmol krunt",	50%	31 895 kg
	Epoxy paint "VR-9"	12%	320 kg
	Epoxy primer	12%	320 kg
	Epoxy filler "Epirex"	12%	320 kg
Eskaro AS			
Wooden surfaces			
	KANTRI, glossy oil paint for coating exterior wooden surfaces	300g/l	
	Falu red paint	130 g/l	
	Veranda Primer	400g/l	
Interior works			
Paints for ceilings	Primo 2	15 g/l	
	Syphpatia	29 g/l	
Paints for ceilings and walls	Akrit 12	26 g/l	
	Akrit 20	26 g/l	
	Akrit 4	29 g/l	
	Akrit 7	27 g/l	
	Akzent	70 g/l	
	Mattilda	28 g/l	
Paints for windows, doors and interior details	Floor	500 g/l	
	Windoora	120 g/l	
	Accord 30	400 g/l	
	Accord 90	400 g/l.	
	Accord Metall	500g/l	
Special paints	Accord Krunt	400g/l	
Structural paints	Structura	70 g/l	
	Windoora	120 g/l	
Primers			
Exterior works	Aquastop Waterproof S	750 g/l	
Varnishes			
Floors	Parketilakk SE30	500 g/l	
	Parketilakk SE60	500 g/l	

Company	Products	VOC content	National sales
Wooden surfaces	Marine lakk 40	500 g/l	
	Marine lakk 90	500 g/l	
	Puidulakk 45	500 g/l	
	Puidulakk 90	501 g/l	
Wood protection products			
Solvent based paints	Protect Brown	750g/l	
Aura	AURA BALANCE	650g/l	
	Aura Biostop	750 g/l	
	Aura Lasur	4500g/l	
	TOP WOOD	500 g/l	
Exterior paints	Veranda	14g/l	
Tikkurila-Vivacolor AS			
VIVACOLOR			
Interior paints			
Walls, ceilings, floors	Uniplast	33g/l	
	Robitix	450 g/l	
	Latex Ceiling paint	2g/l	
	Avant Plus White ceiling paint	2g/l	
	Avant wall paint	32 g/l	
	Dekor solvent free wall paint	75 g/l	
	Interior wash-proof wall and ceiling paint	75 g/l	
	Interior Extra moisture proof wall and ceiling paint	100 g/l	
	Vivatop wall and ceiling paint	400 g/l	
	Vivafloor Floor paint	500 g/l	
	Vivaplast Primer	33g/l	
	Vivaplast 2 ceiling paint	32g/l	
	Vivaplast 5 wall paint	32 g/l	
	7 acrylate paint for walls	58g/l	
	Vivaplast 12 solvent free wall paint	32g/l	
	Vivaplast 20 moisture proof wall and ceiling paint	37g/l	
Windows, doors, furniture	Fenestra thixotropic window paint	400 g/l	
	Radiator paint for radiators	400g/l	
Exterior paints			
Wooden facades	Vivaprotekt	750 g/l	

Company	Products	VOC content	National sales
	Kolorex	700 g/l	
	Kolorex Akva	130 g/l	
	Ultima	130 g/l	
	Villa Akva	130 g/l	
	Villa Primer	300 g/l	
	Villa	300 g/l	
Plaster and concrete surfaces	Hansa Noobel Primer	40 g/l	
	Hansa Noobel	40g/l	
	Hansa Silicat	6g/l	
	Hansa Silicat	40 g/l	
	Hansa Sokkel	45g/l	
Metallic and wooden surfaces	Korrostop	500g/l	
	Korrostop Plus	500 g/l	
Varnishes			
	Akvalak	130g/l	
	Extralak	500 g/l	
	Olympia	140 g/l	
AS KEMIFLORA			
Car paints			
	Primer 2K Nexa	250g/l	
	Filler Nexa	2%	
	Cleanser 1402 Nexa	100%	
	Varnish 0535 Nexa	56%	
	Paint Nexa	61%	
ES Sadolin AS			
Facade paints	Sando F	28g/l	
Wood protection products	Pinotex Ultra	490g/l	
	Pinotex Interior	10g/l	
Varnishes	Celco Aqua	3g/l	
	Celco Terra	140g/l	
Decorative paint	Metallic Silk	60g/l	
Primers	Master Base	438g/l	

REC Data collection **Phase 2 [Other products]** **List of Producers and VOC content [Estonia]**

	Producer	Address	Telephone No	e-mail	web
1.	As Flora Kadrina	Laki 5, 10621 Tallinn	3726599440	info@flora.ee	http://www.flo.ee/
2.	AS Orto	Suur-Sõjamäe 30, 11415, Tallinn	3.726.164.180	info@orto.ee	http://www.orto.ee/

Company	Products	VOC content	National sales in 2006
As Flora Kadrina			
	Glue for rubber items	80%	1,57 t
	Glass cleaner	25%	1,65 t

List of producers

N°	Producer	Address	Telephone	WEB address	E-mail
1	SIA "Antikors S"	Miera iela 34, Salaspils, Latvia, LV- 2169	(+371) 67944791	no	antikors@one.lv
2	SIA "Coat Pro"	Pils rajons 44, Jekabpils, Latvia, LV-5202	(+371) 29417828	no	andas@apollo.lv
3	SIA "Rigas laku un krasu rupnica"	Daugavgrivas iela 63/65, Riga, LV	(+371) 67459117	www.rlkr.lv	rlkr@apollo.lv
4	SIA "Biolars"	Rupnicu iela 3, Olaine, LV-2114	(+371) 67964101	www.biolars.lv	kalnach@biolars.lv

Nr.	Type of product	National sales data, kg	Average VOC content, g/l	Detailed categorie
1	Interior primer	1135	1	Primers
2	Completely matt interior aqueous dispersion paint	1157	58	Interior matt walls and ceilings (Gloss <25@60°)
3	Matt interior aqueous dispersion paint	3444	53	Interior matt walls and ceilings (Gloss <25@60°)

REC Data collection **Phase 1 [Decopaint products]** **Company: SIA Coat Pro [Latvia]**

Nr.	Type of product	National sales data, kg	Average VOC content, g/l	Detailed categorie
1	Aluminium paint	6000	816	Two-pack reactive performance coatings for specific end use such as floors
2	Bronze paint	2000	816	Two-pack reactive performance coatings for specific end use such as floors
3	Epoxy glue	3000	104	Two-pack reactive performance coatings for specific end use such as floors
4	Epoxy primer-enamel	400	78	Two-pack reactive performance coatings for specific end use such as floors
5	Epoxy floor paint	300	104	Two-pack reactive performance coatings for specific end use such as floors
6	Epoxy primer	300	156	Two-pack reactive performance coatings for specific end use such as floors
7	Protecting composition	3000	454	One-pack performance coatings
8	Hydroisolation mastic	14000	212	One-pack performance coatings
9	Hermetic	200	129	One-pack performance coatings
10	Automastic	4000	206	One-pack performance coatings

REC Data collection **Phase 1 [Decopaint products]** **Company: SIA Biolars [Latvia]**

Nr.	Type of product	National sales data, kg	Average VOC content, g/l	Detailed categorie
1	Interior water based emulsion	50000	55	matt coatings for interior walls and ceilings
2	Paints for fasade	30000	440	coatings for exterior walls of mineral substrate
3	Universal alkyd paints	210000	430	interior/exterior trim and cladding paints for wood, metal or plastic
4	wood varnish	8000	530	interior/exterior trim varnishes and woodstains
5	Wood protective mean	5000	700	minimal build woodstains
6	Background color for mineral surfaces	1500	740	binding primers
7	Background color for metal, floor paint, varnish for walls	320000	500	one-pack performance coatings
8	two-pack performance coatings	28000	550	two-pack performance coatings

	Name	web site	Tel/fax	Adress	
1	SigmaKalon Cieszyn S.A.	http://www.sigmajoinery.pl/?id=9	tel. +48 (033) 851 71 01, +48 (033) 851 71 00 fax +48 (033) 851 71 62 fax +48 (033) 851 71 07	ul. Chemików 16	43-400 Cieszyn
2	SigmaKalon Deco Polska Sp. z o.o.	http://www.dekoral.pl	Tel. +48 800113311	ul. Kwidzyńska 8	51-416 Wrocław
3	Fabryka Farb i Lakierów SNIEŻKA S.A.	www.sniezka.pl	Tel. +48 (014) 680-54-17 Fax +48 (014) 680-54-28	39-102 Lubzina 34a	
4	Polifarb Dębica, TBD S.A. (TIKKURILA POLSKA S.A.)	http://www.polifarb-debica.pl	Tel. +48 (14) 680 56 00	ul. Ignacego Mościckiego 23	39-200 Dębica
5	Akzo Nobel Coatings sp. z .o.o.	http://www.akzonobelcoatings.pl; http://www.nobiles.pl	Tel. +48 54 23 00 000, +48 54 41 14 000	ul. Duninowska 9	87-800 Włocławek
6	FFiL Polifarb Piława S.A. (grupa ICI)	www.dulux.pl	Tel. +48 800 120 277	ul. Przemysłowa 3	08-440 Piława
7	Altax sp. z .o.	http://www.altax.pl/	Tel/fax +48 (61) 822 17 03	ul. Jasielska 7a	60-476 Poznań
8	Zakłady chemiczne ANSER sp. z o.o.	http://www.anser.pl/	tel. +48 (46) 856 73 40 fax. +48 (46) 856 73 50	ul. J. Conrada 7	01-922 Warszawa
9	Atlas sp. z o.o.	www.atlas.com.pl	tel. +48 (42) 631 88 00, 631 89 55 fax +48 (42) 631 89 99	ul. Kilińskiego 2	91-421 Łódź
10	BOLIX S.A.	www.bolix.pl	Tel. +48 (33) 4750600	ul. Stolarska 8	34-300 Żywiec
11	Fabryka Farb, Lakierów i Klejów ''CHEMSTAL" sp. z o.o.	www.chemstal.pl	Tel. +48 (14) 6760005	ul. Wiśniowa 15	39-200 Dębica
12	Dyrup sp. z o.o.	www.dyrup.pl	Tel. +48 (42) 649 29 39	ul. Dąbrowskiego 238	93-231 Łódź
13	Farby KABE Polska sp. z o.o.	www.farbykabe.pl	tel.: +48 32 204 64 60 fax: +48 32 204 64 66	ul. Śląska 88	40-742 Katowice
14	FEIDAL Polska sp. z o.o.	www.feidal.com.pl	Tel. +48 32 262 46 56-57	ul. Starocmentarna 12A	41-300 Dąbrowa Górnicza
15	Haering Polska sp. z o.o.	www.haering.pl	Tel: +48 52 370-80-80 Fax: +48 52 370-80-81	ul. Toruńska 304	85-880 Bydgoszcz
16	Zakłady Chemiczne HAJDUKI S.A.	www.hajduki.com.pl	tel: +48 (032) 77-25-101 fax: +48 (032) 77-25-107	ul. Stalowa 17	41-506 Chorzów

	Name	web site	Tel/fax	Adress	
17	HIRSCH-POL sp. z o.o.	www.hirsch-pol.com.pl	tel. +48 52 360 55 00, fax +48 52 360 55 01	Myślęcinek, ul. Krucza 30	86-031 Osielsko
18	LAKMA SAT sp. z o.o.	www.lakma.com	tel: +48 33 852 66 01 +48 33 852 67 66 fax: +48 33 852 67 63 +48 33 852 66 03	ul. Frysztacka 173	43-400 Cieszyn
19	Fabryka Farb i Lakierów MALCHEM sp. z o.o.	www.malchem.com.pl	tel: +48 (48) 66 14 332 +48 (48) 66 14 333 fax: +48 (48) 66 14 572	Sułkowice 4	05-650 Chynów (koło Grójca) woj. mazowieckie
20	Malfarb sp. z o.o.	www.malfarb.pl	tel. +48 (062) 733 82 00 fax. +48 (062) 733 82 31	Lewkowiec 68	63-400 Ostrów Wielkopolski
21	P.P.H. MATRES REVCO sp. z o.o.	www.matresrevco.pl	tel.+48 (58) 536 28 03-05 tel./fax +48(58) 536 27 25	ul. 22 Lipca 6	83-132 Morzeszczyn
22	NOVOL sp. z o.o.	www.novol.pl	tel. +48 (61) 810 98 11	ul. Żabikowska 7/9	62-052 Komorniki
23	Polifarb Kalisz S.A.	www.polifarb.kalisz.pl	tel. +48 (62) 766-02-30 fax. +48 (62) 766-02-38	ul. Dobrzecka 64	62-800 Kalisz
24	Polifarb-Łódź sp. z o.o.	www.polifarb.lodz.pl	tel. +48 (42) 633-23-90 fax. +48 (42) 633-50-26	ul. 6 sierpnia 100/102	90-646 Łódź
25	Przedsiębiorstwo Farb Przemysłowych ''Prochem'' sp. z o.o.	http://prochem.polandtrade.pl/	Tel : +48 (34) 325 29 34 FaX: +48 (34) 328 10 68	ul. Nieznaniecka 57	42-270 Kłomnice
26	Radomska Fabryka Farb i Lakierów RAFIL S.A.	www.rafil.pl	tel.: (+48) 48 36 71 900 fax: (+48) 48 36 71 990	ul. Czarna 29	26-600 Radom
27	Sto-ispo sp. z o.o.	http://www.sto.pl	Tel +48 22 5116-100 / 102 Fax +48 22 5116-101	ul. Zabraniecka 15	03-872 Warszawa
28	Zakłady Tworzyw i Farb sp. z o.o.	www.zlotystok.com.pl	tel.: +48 74 81 63 200 fax: +48 74 81 75 167	Rynek 1	57-250 Złoty Stok
29	KREISEL - Technika Budowlana Sp. z o.o. Poznań	www.kreisel.pl	tel.: +48 61 846 79 00 fax: +48 61 846 79 09	ul. Szarych Szeregów 23	60-462 Poznań

	Name	web site	Tel/fax	Adress	
30	CHEMMOT spółka jawna DECO COLOR	http://www.chemmot.com.pl/	tel.: +48(12) 276 75 45, fax: +48(12) 276 78 20	ul. Piłsudskiego 59,	PL-32050 Skawina, P.O. Box: 112 PL-30956 Kraków 47
31	Polifarb Becker Dębica S.A	www.polifarb-debica.pl	tel. +48 (22) 310 95 00 fax +48 (22) 310 95 75	ul. Ignacego Mościckiego 23	39-200 Dębica
32	HAYA Sp. J.	http://www.haya.pl	tel: +48 (95) 7288305 fax: +48 (95) /7288307	66-431 Górki 5A gm. Santok	

	Company name	web site	contact data
1	SigmaKalon Cieszyn S.A.	http://www.sigmajoinery.pl/?id=9	tel. +48 (033) 851 71 01, +48 (033) 851 71 00
2	SigmaKalon Deco Polska Sp. z o.o.	http://www.dekoral.pl	Tel. +48 800113311
3	Fabryka Farb i Lakierów SNIEŻKA S.A.	www.sniezka.pl	Tel. +48 (014) 680-54-17 Fax +48 (014) 680-54-28
4	Polifarb Dębica, TBD S.A. (TIKKURILA POLSKA S.A.)	http://www.polifarb-debica.pl	Tel. +48 (14) 680 56 00
5	Akzo Nobel Coatings sp. z .o.o.	http://www.akzonobelcoatings.pl; http://www.nobiles.pl	Tel. +48 54 23 00 000, +48 54 41 14 000
6	FFiL Polifarb Piława S.A. (grupa ICI)	www.dulux.pl	Tel. +48 800 120 277
7	Altax sp. z .o.	http://www.altax.pl/	Tel/fax +48 (61) 822 17 03
8	Zakłady chemiczne ANSER sp. z o.o.	http://www.anser.pl/	tel. +48 (46) 856 73 40 fax. +48 (46) 856 73 50
9	Atlas sp. z o.o.	www.atlas.com.pl	tel. +48 (42) 631 88 00, 631 89 55 fax +48 (42) 631 89 99
10	BOLIX S.A.	www.bolix.pl	Tel. +48 (33) 4750600
11	Fabryka Farb, Lakierów i Klejów ‘’CHEMSTAL” sp. z o.o.	www.chemstal.pl	Tel. +48 (14) 6760005
12	Dyrup sp. z o.o.	www.dyrup.pl	Tel. +48 (42) 649 29 39
13	Farby KABE Polska sp. z o.o.	www.farbykabe.pl	tel.: +48 32 204 64 60 fax: +48 32 204 64 66
14	FEIDAL Polska sp. z o.o.	www.feidal.com.pl	Tel. +48 32 262 46 56-57
15	Haering Polska sp. z o.o.	www.haering.pl	Tel: +48 52 370-80-80 Fax: +48 52 370-80-81

	Company name	web site	contact data
16	Zakłady Chemiczne HAJDUKI S.A.	www.hajduki.com.pl	tel: +48 (032) 77-25-101 fax: +48 (032) 77-25-107
17	HIRSCH-POL sp. z o.o.	www.hirsch-pol.com.pl	tel. +48 52 360 55 00, fax +48 52 360 55 01
18	LAKMA SAT sp. z o.o.	www.lakma.com	tel: +48 33 852 66 01 +48 33 852 67 66
19	Fabryka Farb i Lakierów MALCHEM sp. z o.o.	www.malchem.com.pl	tel: +48 (48) 66 14 332 +48 (48) 66 14 333
20	Malfarb sp. z o.o.	www.malfarb.pl	tel. +48 (062) 733 82 00 fax. +48 (062) 733 82 31
21	P.P.H. MATRES REVCO sp. z o.o.	www.matresrevco.pl	tel.+48 (58) 536 28 03-05 tel./fax +48(58) 536 27 25
22	NOVOL sp. z o.o.	www.novol.pl	tel. +48 (61) 810 98 11
23	Polifarb Kalisz S.A.	www.polifarb.kalisz.pl	tel. +48 (62) 766-02-30 fax. +48 (62) 766-02-38
24	Polifarb-Łódź sp. z o.o.	www.polifarb.lodz.pl	tel. +48 (42) 633-23-90 fax. +48 (42) 633-50-26
25	Przedsiębiorstwo Farb Przemysłowych ‘’Prochem’’ sp. z o.o.	http://prochem.polandtrade.pl/	Tel : +48 (34) 325 29 34 FaX: +48 (34) 328 10 68
26	Radomska Fabryka Farb i Lakierów RAFIL S.A.	www.rafil.pl	tel.: (+48) 48 36 71 900 fax: (+48) 48 36 71 990
27	Sto-ispo sp. z o.o.	http://www.sto.pl	Tel +48 22 5116-100 / 102 Fax +48 22 5116-101
28	Zakłady Tworzyw i Farb sp. z o.o.	www.zlotystok.com.pl	tel.: +48 74 81 63 200 fax: +48 74 81 75 167
29	KREISEL - Technika Budowlana Sp. z o.o. Poznań	www.kreisel.pl	tel.: +48 61 846 79 00 fax: +48 61 846 79 09
30	CHEMMOT spółka jawna DECO COLOR	http://www.chemmot.com.pl/	tel.: +48(12) 276 75 45, fax: +48(12) 276 78 20

	Company name	web site	contact data
31	Polifarb Becker Dębica S.A	www.polifarb-debica.pl	tel. +48 (22) 310 95 00 fax +48 (22) 310 95 75
32	HAYA Sp. J.	http://www.haya.pl	tel: +48 (95) 7288305 fax: +48 (95) /7288307

Company name	web site	contact data
P.p.h.u. Tack	www.tack.pl	48 42 652 30 81, tack@tack.pl
Proxima NTR	www.ntr.com.pl	48 44 632 34 08, ntr@ntr.com.pl
Skała Sp. z o. o.	www.skala.com.pl	48 32 217 07 44, skala@skala.com.pl
Dekol	www.dekol.com.pl	48 48 612 07 63, decol@decol.com.pl
LAB Sp. z o. o.	www.lab.org.pl	48 32 616 24 59, lab@lab.org.p
Milar Sp. z o. o.	milar.pl	48 22 755 85 21, milar@milar.pl
Izolbet	www.izolbet.com.pl	48 24 269 79 42, informacja@izolbet.pl
Elevax	www.elevax.com	48 22 811 82 42, info@elevax.com.pl
Atlas	www.atlas.com.pl	48 42 631 88 00, atlas@atlas.com.pl

Company name	website	contact data
Avon	www.pl.avon.com	0801353303 or a contact form on the website
Barwa	www.barwa.com.pl	48126370176 +48126623800 +48126623833
Betasoap	www.betasoap.pl	48225297750, office@betasoap.com
Colgate-Palmolive	www.colgate.pl	0 801 116611, or a contact form on the website
Starwax	www.starwax.pl	48717827956, 48717827970, 48717827969, biuro@starwax.pl
General Fresh	www.polhun.pl	48 44 7143811, polhun@polhun.pl
Glancos	www.glancos.net	48 91 4186274, info@glancos.net
GlaxoSmithKline	www.gsk.com.pl	48 61 8601200, 48 22 5769000,
Henkel Poland	www.henkel.pl	48 22 5656000 or a huge number of contact forms on the website
McBride Polska	www.intersilesia.com.pl	48 77 4049100 mcbride@mcbride.pl
Inco Veritas S.A.	www.inco-veritas.com.pl	48 22 586 51 00, kontakt@inco-veritas.pl
JagoPro Aerosol	www.jagopro-aerosol.pl	48 32 614 30 50, jago@jagopro-aerosol.pl
S.C. Johnson	www.scjohnson.com	48 22 874 53 90
Johnson Diversey	www.johnsondiversey.com/Cultures/pl-PL/Corporate+Information/Contact+Us/	48 22 328 1000 dok.poland@johnsondiversey.com
Procter&Gamble Polska	www.procter.pl	48 (22) 670 8500 0 801 25 88 25 konsument.im@pg.com
Libella	www.libella.com.pl	48 22 8465724, newsletter@libella.com.pl
Polin Sp. z o. o.	www.polin.com.pl	48 61 28 22 011, 44 61 28 22 526, polin@polin.com.pl
PZ Cussons Polska S.A.	www.pzcussons.com.pl	48 22 852 86 00, (fax) 48 22 852 86 01
Reckitt Benckiser Poland (S.A.)	www.reckittbenckiser.pl/	48 22 33 33 100
Sara Lee	www.saralee.com	48 22 860 68 40
Pollena - Savona Sp. z o.o.	www.pollenasavona.pl	48 32 2545077, 48 32 2544855, 48 32 2546274 (sales dep.), pollena@pollenasavona.pl, zbyt@pollenasavona.pl

Company name	website	contact data
Unilever Polska S.A.	www.unilever.pl	contact form on the website
Vivendi Sp. Z o.o.	www.vivendi-lab.pl	48 22 85333 42, vivendi1@o2.pl
VVF Sp. Z o.o.	www.vvfltd.com	
Wiromix	www.wiromix.com.pl	48 22 774 45 57, 48 600 98 44 52, wiromix@wiromix.com.pl
WKP	www.wkp.com.pl	48 25 681 51 21, (fax) 48 25 682 31 87, wkp@neostrada.pl

REC Data collection **Phase 1 and 2 [Decopaint products, cosmetics and cleaners]** **National production [Poland]**

PRODUCTS	*Measurement unit*	2000	2004	2005	2006
Paints and varnishes, based on acrylic or vinyl polymers dispersed	t hl	176183 1366733	262267 1828666	331873 1897276	288300 1988315
Soap, organic surface-active products and preparations	t	40772	59365	56815	59986
of which soap and organic surface-active products and preparations	t	35056	25085	26149	21508
Washing preparations and cleaning preparations even containing soap	t	354270	508034	549120	572421
Surface-active preparations even containing soap; not packaged for	t	7796	8040	12951	16831
Hair care products (excl. preparations used as soap)	t	70449	82633	102025	108671
Glues based on natural rubber	t	1405	1529	1426	4441
Glues based on synthetic rubber	t	2712	7053	7503	4433
Glues based on synthetic resins	t	20446	30637	19373	23527

REC Data collection **Phase 1 and 2 [Decopaint products, cosmetics and cleaners]** **Sales in percent [Poland]**

PKWIU	Specification	*Indices of sold production in percent previous year = 100*			*Structure of sold production in percent*		
		2004	2005	2006	2004	2005	2006
1	2	3	4	5	6	7	8
24.3	*Paints, varnishes and similar coatings, printing ink and mastics*	115,7	105,8	105,3	0,5	0,5	0,4
24.5	*Glycerine, soap, detergents, cleaning and polishing preparations; perfumes and toilet preparations*	90,4	133,9	100,6	0,9	1,1	1,0

REC Data collection **Phase 1 and 2 [Decopaint products, cosmetics and cleaners]** **Sales in Zloty [Poland]**

PKWIU	*Specification*		*Value of sold productioni n thous. zł*	*Percentage in value*	
				division	*group*
24.3	*PAINTS, VARNISHES AND SIMILAR COATINGS, PRINTING INK AND MASTICS*	2005	2.764.052,6	7,2	100,0
		2006	2.909.576,9	6,6	100,0
24.5	*GLYCERINE, SOAP, DETERGENTS, CLEANING AND POLISHING PREPARATIONS; PERFUMES AND TOILET PREPARATIONS*	2005	6.645.138,3	17,3	100,0
		2006	6.682.938,1	15,1	100,0
24.52	*Perfumes and toilet preparations*	2005	3.925.615,9	10,2	59,1
		2006	3.837.241,1	8,6	57,4
24.62	*Glues and gelatines*	2005	376.447,2	1,0	22,9
		2006	433.609,9	1,0	22,4

REC Data collection **Phase 1 [Decopaint products]** **List of producers [Czech Republic]**

	name	street	city	zip	phone	web
1	Akzo Nobel Coatings CZ, a.s.	Podvihovská 12	Opava 9 - Komárov	747 70	+420 553 692 120	www.balakom.cz
2	AQUA obnova staveb, s.r.o.	Grafická 15	Praha 5	150 00	+420 257 312 636	www.aquabarta.cz
3	Atemi s.r.o.	Velvarská 45	Praha 6	160 00	+420 233 326 510	www.ispektra.cz
4	Austis, a.s	K Austisu 680	Praha 5 - Slivenec	154 00	+420 251 099 111	www.barvy-eternal.cz
5	Barvy - laky - Tomášek	Nádražní 219	Prachatice	383 01	+420 388 318 882	www.bl-tomasek.cz
6	Barvy a laky Hostivař, a.s.	Průmyslová 14	Praha 10 - Hostivař	102 19	+420 271 084 211	www.bal.cz
7	Barvy Tebas, s.r.o.	Poděbradská 195/7	Praha 9	190 05	+420 266 727 813	www.barvytebas.cz
8	BKP group, a. s.	1. května 333	Uherský Brod 3 - Těšov	687 34	+420 572 610 061	www.bkp.cz
9	Building Plast, spol. s r.o.	Nádražní 786	Chlumec nad Cidlinou	503 51	+420 495 485 819	www.barvy-sokrates.cz
10	Color expert štorch CZ, s.r.o.	Matějkova 2267	Pelhřimov	393 01	+420 565 327 582	www.colorexpert.storch.cz
11	Colorcity	Domažlická 33/1113	Plzeň	318 02	+420 377 382 033	www.colorcity.cz
12	Colorlak, a.s.	Tovární 1076	Staré Město	686 02	+420 572 527 121	www.colorlak.cz
13	Colorwest, s.r.o.	Čelakovského /1051	Rokycany	337 01	+420 371 519 401	www.colorwest.cz
14	Coris	Lhotsko 80	Lhotsko	763 12	+420 577 454 598	
15	Detecha, chemické výrobní družstvo	Husovo náměstí 1208	Nové Město nad Metují	549 01	+420 737218117	www.detecha.cz
16	Disper, s.r.o.	Domanín 4	Domanín	379 01	+420 384 722 656	www.disper.cz
17	Distrimo s.r.o.	Maříkova 32	Brno	621 00	+420 541 420 855	www.distrimo.cz
18	Ekolak, s.r.o.	Bílovice 497	Bílovice u Uherského Hradiště	687 12	+420 572 587 597	www.ekolak.cz
19	HET, s.r.o.		Ohníč u Teplic	417 65	+420 417 810 111-3	www.het.cz
20	Hexion specialty chemicals, a.s.	Tovární 2093	Sokolov	356 80	+420 352 614 100	
21	Impress, a.s.	Tovární 67	Skřivany	503 52	+420 495 490 36	
22	Kittfort Praha s.r.o.	provozovna Horňátky 1	Neratovice	277 11	+420 315 687 592	www.kittfort.cz
23	Nátěrové hmoty, s.r.o.	U Fotochemy 448	Hradec Králové	500 02	+420 495 215 614	www.nhhk.cz
24	Precheza, a.s.	Nábřeží Dr. E. Beneše 24	Přerov	750 62	+420 581 252 260	www.precheza.cz
25	Primalex, a.s.	Břasy 223	Břasy	338 24	+420 371 791 081	www.primalex.cz
26	Severochema, družstvo pro chemickou výrobu	Vilová 333/2	Liberec	461 71	+420 485 150 368	www.severochema.cz
27	Spolek pro chemickou a hutní výrobu, a.s.	Revoluční 86	Ústí nad Labem	400 32	+420 472 762 000	www.spolchemie.cz
28	Stachema Kolín, spol. s r. o.	Zibohlavy 1	Kolín	280 02	+420 321 737 666	www.stachema.cz
29	Synpo, a.s.	S.K. Neumanna 1316	Pardubice	532 07	+420 466 067 202	www.synpo.cz
30	Synthesia, a.s.	Pardubice čp. 103	Pardubice – Semtín	532 17	+420 466 824 000	www.synthesia.cz
31	Teluria, s.r.o.	Skrchov 1	Skrchov	379 65	+420 516 474 925	www.teluria.cz

category	nr. of producers	nr. of producers inspected in 2007	mass of products regarding directive 2004/42/ES
production	*48*	*3*	***140 kt***
import	*95*	*0*	***60 kt***
other	*4300 1)*	*110*	***n/a***

1) sum of various painthops with organic solvents usage over 0.6t/y

city	*zip*	*phone*	*web*	*solvent/water based*
Znojmo	671 81	+420 515 268 270	http://www.technokem.cz	
Uherský Brod 3 - Těšov	687 34	+420 572 610 061	www.bkp.cz	
Staré Město	686 02	+420 572 527 121	www.colorlak.cz	
Brno - Židenice	615 00	+420 774 226 504	http://www.xpert-autolaky.cz	

city	*zip*	*phone*	*web*	*solvent/water based*
Opava 9 - Komárov	747 70	+420 553 692 120	www.balakom.cz	
Jablonec nad Nisou	466 01	+420 483 311 580	http://www.atotech.cz	
Praha 5 - Slivenec	154 00	+420 251 099 111	www.barvy-eternal.cz	
Praha 10 - Hostivař	102 19	+420 271 084 211	www.bal.cz	
Uherský Brod 3 - Těšov	687 34	+420 572 610 061	www.bkp.cz	
Chlumec nad Cidlinou	503 51	+420 495 485 819	www.barvy-sokrates.cz	
Roudnice nad Labem	413 01	+420 416 831 922	http://www.chemweld.cz	
Ústí nad Labem	400 32	+420 472 762 000	www.spolchemie.cz	
Kolín	280 02	+420 321 737 666	www.stachema.cz	
Pardubice	532 07	+420 466 067 202	www.synpo.cz	
Skrchov	379 65	+420 516 474 925	www.teluria.cz	

city	*zip*	*phone*	*web*	*solvent/water based*
Staré Město	686 02	+420 572 527 121	www.colorlak.cz	both
Praha 6 - Bubeneč	160 00	+420 224 313 303	http://www.arnaud.cz	water
Praha 9	190 05	+420 266 727 813	www.barvytebas.cz	water
Uherský Brod 3 - Těšov	687 34	+420 572 610 061	www.bkp.cz	both
Ústí nad Labem	400 32	+420 472 762 000	www.spolchemie.cz	solvent
Kolín	280 02	+420 321 737 666	www.stachema.cz	solvent
Pardubice	532 07	+420 466 067 202	www.synpo.cz	solvent

city	*zip*	*phone*	*web*	*solvent/water based*
Pardubice – Semtín	532 17	+420 466 824 000	www.synthesia.cz	solvent
Skrchov	379 65	+420 516 474 925	www.teluria.cz	solvent

city	*zip*	*phone*	*web*	*solvent/water based*
Praha 6 - Bubeneč	160 00	+420 224 313 303	http://www.arnaud.cz	
	384 72	+420 388 402 911	http://www.citoplast.cz	
Praha 10	101 00	+420 296 814 111	http://www.druchema.cz	
Jaroměř-Josefov	551 02	+420 491 421 692	http://www.chemcosmetic.eu	
Kolín IV	280 02	+420 321 727 858	http://www.jp-cosmetics.cz	
Velké Březno	403 23	+420 475 209 916	http://www.lancil.com	
	282 01	+420 321 672 122	http://www.marcacz.cz	
Olomouc-Lazce	779 00	+420 585 228 381		
	285 04	+420 327 543 655		
Ústí nad Labem-Střekov	400 03	+420 475 291 111	http://www.setuza.cz	
Liberec	461 71	+420 485 150 368	www.severochema.cz	
Český Krumlov-Domoradice	381 01	+420 380 708 111	http://schwancosmetics.cz	
Praha 4 - Michle	140 00	+420 261 063 420	http://www.stylvd.cz	
Praha 8 - Karlín	186 00	+420 224 071 111	http://www.unilever.cz	

city	*zip*	*phone*	*web*	*solvent/water based*
	739 43	+420 558 660 145	http://www.adregroup.cz	
Říčany	251 01	+420 323 631 950	http://www.alfaclassic.cz	
Letovice	679 61	+420 516 476 808	http://www.alfachem.cz	
Hradec Králové	500 03	+420 495 545 004	http://www.alter-hk.cz	
Jablonec nad Nisou	466 01	+420 483 311 580	http://www.atotech.cz	
	285 33	+420 736 677 125	http://www.benasonet.cz	
Klatovy III	339 01	+420 376 316 241	http://www.bilgram.cz	
Zlín	760 01	+420 577 211 012	http://www.biomio.cz	
Starý Plzenec	332 02	+420 377 965 760	http://www.metaflux.cz	
Bohumín-Nový Bohumín	735 81	+420 596 091 111	http://www.bochemie.cz	
Chlumec nad Cidlinou	503 51	+420 495 485 819	www.barvy-sokrates.cz	
Břeclav	690 02	+420 519 346 144	http://www.cistici-prostredky.cz	
Moravská Třebová-Předměstí	571 01	+420 461 318 074	http://www.dochema.cz	
Valašské Klobouky	766 01	+420 577 320 641	http://www.dubrava.cz	
Zlín	760 01	+420 777 585 043	http://www.sweb.cz/duelplus	
Šumperk	787 01	+420 583 212 454	http://www.sweb.cz/eco-central	
Šumperk	787 01	+420 583 301 070	http://www.everstar.cz	
Rožmitál pod Třemšínem	262 42	+420 318 666 247	http://www.freeway.cz	
Praha 7 - Holešovice	170 00	+420 220 101 101	http://www.henkel.cz	
Brno-Zábrdovice	615 00	+420 545 425 111	http://www.hlubna.cz	
Karlovy Vary-Drahovice	360 01	+420 353 220 334	http://www.kranzle.cz/chemfuture	
Rychnov u Jablonce nad Nisou	468 02	+420 483 388 916	http://www.chemiko.cz	
Vestec	252 42	+420 244 913 137	http://www.chemoform.cz	
	763 12	+420 577 452 228	http://www.cheport.cz	
Kolín IV	280 02	+420 321 727 858	http://www.jp-cosmetics.cz	
Odry	742 35	+420 556 731 111	http://www.lceodry.cz	
Sušice II	342 01	+420 376 526 505	http://www.lorito.cz	
Vratimov	739 32	+420 596 541 194	http://www.lpefekt.cz	
	282 01	+420 321 672 122	http://www.marcacz.cz	
Olomouc-Lazce	779 00	+420 585 228 381		

city	*zip*	*phone*	*web*	*solvent/water based*
Rakovník II	269 01	+420 313 513 961	http://www.mpd.cz	
Nymburk	288 02	+420 325 531 111	http://www.pepito.cz	
Ústí nad Labem		+420 475 221 614		
Rakovník II	269 01	+420 313 522 533	http://www.pg.com	
	270 35	+420 313 250 311	http://www.qalt.cz	
Olomouc-Hejčín	779 00	+420 585 751 790	http://www.raypath.cz	
Ořech	252 25	+420 257 961 418	http://www.volny.cz/re-le	
Všetaty	277 16	+420 315 696 333		
Ústí nad Labem - Střekov	400 03	+420 475 291 111	http://www.setuza.cz	
Liberec	461 71	+420 485 150 368	www.severochema.cz	
Praha 4 - Michle	140 00	+420 261 063 420	http://www.stylvd.cz	
	696 13	+420 518 624 518	http://www.tatrachema-cz.cz	
Praha 2 - Vinohrady	120 00	+420 244 910 922	http://www.trixpraha.cz	
Vysoké Mýto-Litomyšlské Předměstí	566 01	+420 465 423 891	http://www.tomil.cz	
Klíčany	250 69	+420 284 891 698	http://www.trixpraha.cz	
Slušovice	763 15	+420 577 982 138		
Hodonín	695 01	+420 518 366 001	http://www.valtechtors.cz	
Čáslav-Nové Město	286 01	+420 327 313 688	http://www.zenit-caslav.cz	

List executed inspections in private companies, which are producers or importers of regulated products according to para 18. part 10 of the Air act.

No.	*The list of controled companies (year 2007)*	*Company (producer/importer)*	*Annual production/import (2007)*	*Annual national sale (2007)*
1	*Chemolak a.s. Smolenice*	*P*	*5 368 904 [kg]*	*5 368 904[kg]*
2	*Novochema družstvo, Levice*	*P*	*1 173 564[kg]*	*1 198 248 [kg]*
3	*Faladro s.r.o Stupava*	*I*	*137 959 [kg]*	*149 006 [kg]*
4	*Technocolor s.r.o B.Bystrica*	*I*	*no records*	
5	*Hempel/Czek s.r.o Zvolen*	*I*	*914 950 [l]*	*no records*
6	*Bal Slovakia s.r.o B.Bystrica*	*I*	*1 495 891 [l]*	*1 543 392 [l]*
7	*Primalex s.r.o Dolný Kubín*	*P*	*14 420 758 [kg]*	*12 751 126 [kg]* *1 186 791 [l]*
8	*Primalex s.r.o Dolný Kubín*	*I*	*661 336 [kg]* *1 532 910 [l]*	*670 607 [kg]* *1 419 110 [l]*
9	*Marpin Farby s.r.o Kysucké Nové Mesto*	*P*	*92 317 [kg]*	*108 683 [l]*
10	*Helvet, s.r.o Považská Bystrica*	*P*	*975 800 [kg]*	*951 115 [kg]*

No.	The list of controled companies (year 2007)	Company (producer/importer)	Annual production/import (2007)	Annual national sale (2007)
11	Polytex s.r.o. Žilina	P	92 632 [kg]	92 632 [kg]
12	Finalit, s.r.o. Žilina Budatín	P	146 373[kg]	146 373[kg]
13	SlovZink a.s. Košeca	P	555 692[kg]	533 608 [kg]
14	Color Company s.r.o Dubnica nad Váhom	P	95 100 [kg]	86 700 [kg]
15	Auto Color Slovakia s.r.o. Prešov	I	53 112 [l]	53 112 [l]
16	Renojava s.r.o Prešov	I	72560 [l]	72560 [l]
17	Barvy Tebas Slovensko s.r.o Košice	I	371 313 [kg]	371 313 [kg]
18	Color Centrum SH Košice	I	5 830 [kg]	5 830 [kg]
19	FK Industrial Coatings s.r.o Košice	I	114 123 [kg]	114 123 [kg]
20	Color Max s.r.o Košice	I	3 656 [l]	3 656 [l]

The list of companies which submitted report about the amount and type of regulated products according to para 18. part 10 of the Air act.

No.	*List of others companies based on reporting in year 2007*	*Company (producer/importer)*	*Annual production/import (2007) of regulated products*	*Annual national sale (2007)Regulated products*
1	*PJ Colours, Dolné Otrokovce*	*P*	*933 860 [kg]*	*907 120 [kg]*
2	*PAM Čierna Voda*	*P*	*532 456 [kg]*	*532 456 [kg]*
3	*Prima Pneu s.r.o Bratislava*	*I*	*16 480 [kg]*	*16 069 [kg]*
4	*Het Slovakia s.r.o Galanta*	*I*	*3 563 978 [kg]*	*823 984 [kg]*
5	*Silvi Nova Slovakia s.r.o B.Bystrica*	*I*	*123 567 [l]*	*102 894 [l]*
6	*Lankwitzer Slovensko s.r.o Hnúšťa*	*I*	*839 628 [kg]*	*839 628 [kg]*
7	*Slovacolor s.r.o Prievidza*	*I*	*41 653 [kg]*	*41 653 [kg]*
8	*Hasta s.r.o Žilina , Považský Chlmec*	*I*	*266 751 [l]*	*263 744 [l]*
9	*ROKO group s.r.o Nové Mesto n. Váhom*	*I*	*1 000 [kg]*	*1 000 [kg]*

No.	List of others companies based on reporting in year 2007	Company (producer/importer)	Annual production/import (2007) of regulated products	Annual national sale (2007)Regulated products
10	Balakom Slovakia s.r.o Žilina	I	264 531 [kg]	264 531 [kg]
12	Helios Slovakia s.r.o Žilina	I	1 238 482 [l]	1 219 134 [l]
13	Helvet, s.r.o Považská Bystrica	I	139 356 [kg]	112 192 [kg]
14	Jozef Demčák ČAKOV	P	48 200 [kg]	48 200 [kg]
15	Novatic SK s.r.o Smolenice, prev. Prešov	P	86 145 [kg]	86 145 [kg]
16	BLISS a.s. Košice	I	102 451 [l]	102 451 [l]
17	Tradix Slovakia s.r.o Košice	I	138 620 [l]	138 620 [l]
18	Clou Slovakia s.r.o Prešov	I	3259 [l]	3259 [l]
19	Lankwitzer Slovensko Prešov	I	1 129 000 [kg]	1 129 000 [kg]
20	Tatrametal, s.r.o Košice	I	156 300 [kg]	156 300 [kg]
21	Jub Kastaco Košice, s.r.o	I	126 504 [kg]	126 504 [kg]

List of registered producers and importers

Name of producer	Telephone	e-mail
Győrlakk Rt.	0036-96-516-530	gyorlakk@hu.inter.net
Celli-Festék Kft.	0036-95-421-841	celli-festekkft@mail.globonet.hu
Color Service Kft.	0036-1-411-3252	info@colorservice.hu
Tekla Kft.	0036-85-510-644	festek@teklamarcali.axelero.net.hu
Festékipari Kutató Kft.	0036-1-432-8831	fki@festekkutato.hu
Magyar-Lakk Kft.	0036-27-541-200	magyarlakk@magyarlakk.hu
Egrokorr Rt.	0036-23-521-270	maram@egrokorr.hu
Poli-Farbe Kft.	0036-78-453-130	bocsa@polifarbe.hu
Renovo'82 Kft.	0036-94-322-619	titkarsag@renovo82.hu
Autocolor Festékgyár tó és Forgalmazó Kft.-	0036-23-311-080	autocolor@autocolor.hu
Akzo Nobel Coatings Zrt.	0036-49-521-674	nora.radai@tvr.akzonobel.com
Budalakk Innova Kft.	0036-1-369-7406	festekudvar@budalakkinnova.hu
Teknocolor Kft.	0036-93-311-120	info@teknocolor.hu
Trilak Kft.	0036-1-421-6100	trilak@trilak.hu
Motip Dupli Hungária Kft.	0036-1-476-0200	a.molnar@motipdupli.hu
Dunamenti Tűzvédelem Zrt.	0036-27-345-217	godcenter@Dunamenti.hu
Hempel Magyaro.-i Fióktelepe	0036-1-411-0990	ler@hu.hempel.com
Euró-higiénia Kft.	0036-1-383-8367	info@eurohigienia.hu
Henelit International Kft.	0036-22-514-510	info@henelit.hu
Servind Budapest Kft.	0036-1-390-3140	servind@vservind.hu
Medikémia Zrt.	0036-62-592-777	info@medikemia.hu
Milesi Kft.	0036-24-525-400	milesi@milesi.hu
Schuller Eh'klar Kft.	0036-72-539-100	office@schuller.hu
Hagentaler Hungária Kft.	0036-94-509-013	hagentaler@hagentaler.hu
Procolor Kereskedelmi Kft.	0036-1-370-1721	procolor@enternet.hu
Akzo Nobel CR Kft.	0036-1-206-1027	ferenc.egri@akzonobel.com

List of registered producers and importers

Name of producer	Telephone	e-mail
Medelkon Bt.	0036-1-424-0093	medelkon@interware.hu
Sefra Hungária Kft.	0036-99-544-650	sefra@externet.hu
Carsystem Hungária Kft.	0036-96-517-624	vida.csaba@carsystem.hu
Szecolor Kft.	0036-62-244-436	n/a
Okker Kereskedőház Kft.	0036-88-412-600	okker@festekaruhaz.hu
Golda Kft.	0036-1-218-1092	golda@golda.hu
Nógrádi Erdőkémia Kft.	0036-35-350-190	nek@wnet.hu
Car Color 2000 Kft.	0036-1-348-0324	carcolor@axelero.hu
Würth Kft.	0036-23-418-130	vevoszolgalat@wuerth.hu
Dukkó-205 Kft.	n/a	n/a
Materiál Vegyipari Szövetkezet	0036-1-286-0363	info@material.hu
Piktor Zrt.	0036-1-432-0908	gyorgy.ildiko@piktor.hu
Hornyák Józsefné vállalkozó	0036-79-563-500	festek@hofix.hu
Szolnok-Helios Kft.	0036-56-413-585	szolnokhelios@externet.hu
Kaméleon Mix Kft.	0036-56-511-140	info@kameleon-mix.hu
Génius MBT Kft.	0036-48-512-346	geniuskm@hu.inte.net
Neptun-Color Kft.	0036-20-928-570	iparifestek@iparifestek.hu
Ergolakk Kft.	0036-1-288-6620	glasuritlakk@axelero.hu
Mäder Bevonatrendszer Kft.	0036-29-310-061	mader@monornet.hu
Lindab Kft.	0036-23-531-100	info@lindab.hu
Novomix Color Kft.	0036-28-453-551	geza@invitel.hu
Kemikál Zrt.	0036-1-215-7370	info@kemikalrt.hu
Helio-Zala Kft.	0036-92-510-712	helioz@mail.datanet.hu
Lukács János vállalkozó	0036-68-381-700	n/a
Vaxil Kft.	0036-62-556-650	n/a
Pyrmo Hungária Kft.	0036-1-291-4484	pyrmo@dinitrol.hu
Hexán Kft.	0036-23-551-125	hexan@T-online.hu

List of registered producers and importers

Name of producer	Telephone	e-mail
Alami Kft.	0036-27-540-880	alami@spieshecker.hu
Colorama Kft.	0036-96-542-631	colorama@colorama.hu
Zebra Fess Kft.	0036-94-313-130	info@zebrafess.t-online.hu
Caparol Hungária Kft.	0036-1-264-8914	caparol@caparol.hu
Chemi-to Bt.	0036-1-403-1089	n/a
Zorka Color Kft.	0036-62-313-323	n/a
Sika Hungária Kft.	0036-1-371-2020	infio@hu.sika.com
Totál Lux Kft.	0036-26-340-350	info@totallux.hu
Tikkurila Kft.	0036-1-348-3040	info@tikkurila.hu
ICI Paints Hungary Kft.	0036-1-436-7660	commenda@commenda.hu
Piktor Kft.	0036-96-511-860	piktor@piktorfestekbolt.hu
Piktor-Depo Kft.	0036-40-556-556	info@piktordepo.hu
Nyers és Joó Bt.	n/a	n/a
Fritz Kft.	0036-46-412-062	tikkurila.miskolc@fritzkft.online.hu
Interchemi Kft.	0036-27-334-266	n/a
Müller Kft.	0036-93-320-982	mullerfesteklaz@citromail.hu
Autolackfarben Kft.	0036-1-233-0709	autolackfarben@vipmail.hu
Nyírspec 2000 Kft.	0036-42-500-267	nyirspec2000@invitel.hu
Mi-Ki Kft.	0036-62-210-850	mikikft@vnet.hu
Jub Kft.	0036-95-525-720	jub@jub.hu
Biocorp Kft.	0036-1-387-8227	istvan.patocskai@biocorp.hu
Mixtura Kft.	0036-88-567-150	mixtura@mixtura.hu
Murexin Kft.	0036-1-262-6000	murexin@murexin.hu
Feba 2000 Kft.	0036-36-427-979	n/a
Casati Color Kft.	0036-30-9492086	casati@casati.hu
Polyplan Kkt.	0036-1-319-2420	ellakorr@t-email.hu0
Kemorg Kft.	0036-88-506-840	kemorg@informax.hu
Duplakk Kft.	0036-1-240-2125	info@duplakk.hu

List of registered producers and importers

Name of producer	Telephone	e-mail
Henkel Magyarország Kft.	0036-1-372-5555	henkelhungary@hu.henkel.com
Sto Építőanyag Kft.	0036-24-510-210	sto.hu@stoeu.com
Decora Color Kft.	0036-62-273-320	decora@invitel.hu
Mipa-Color Kft.	0036-22-500-348	mipa@mipacolor.hu
Anda Kft.	0036-72-518-710	info@anda.hu
Orange 6 Term. Otthon Kft.	0036-1-403-1683	n/a
Agria-Color' 98 Kft.	0036-36-414-405	n/a
Sándli Fivérek Kft.	0036-34-382-165	sandlifiverek@vivamail.hu
Csorba és Társai Bt.	0036-32-431-460	csorbajanos@chello.hu
Ard Color Kft.	0036-27-535-090	berta@ardcolor.hu
Autó-Color Gold Bt.	0036-88-424-354	n/a
Lasselsberger-Knauf kft.	0036-88-590500	n/a

National sales for the year 2007				
Category according to the Directive	*Products from own production*	*Products from outside the EEA*	*Products imported from EEA countries*	**Total**
A) Paints and varnishes	70.571.227	111.248	14.944.074	85.626.549
B) Vehicle refinishing products	1.251.656	3.364.550	2.245.058	6.861.264

VOC content of national sales of producers and importers for the year 2007	
A. Paints and varnishes	
Product Subcategory:	**VOC-content (kg)**
a)	1.024.015
b)	249
c)	219.789
d)	2.433.072
e)	1.222.272
f)	227.119
g)	133.854
h)	454.774
i)	1.880.608
j)	534.077
k)	5.395
l)	1.406
Total:	8.136.630

B. Vehicle refinishing products	
Product Subcategory:	**VOC-content (kg)**
a)	
i)	188.050
ii)	31.856
b)	45.814
c)	
i)	183.576
ii)	324.046
iii)	29.781
d)	
i)	500.091
ii)	102.598
e)	583.271
Total:	1.989.083

REC Data collection **Phase 2 [Adhesives]** **List of producers [Hungary]**

	Company name	Address	Contact	producer / trader	solvent / water based
1	HUNGAROCOLL Kft.	5000 Szolnok, Nagysándor József út 31.	+36 56 420 494	producer	water
2	Mapei Kft.	2040 Budaörs, Sport u. 2.	+36 23 422 621	producer	both
3	Plastdur Vegyianyagokat Gyártó és Forgalmazó Kft.	1224 Budapest, Dózsa György út	+36 1 362 3980	producer	water
4	Schomburg Hungária Kft.	1117 Budapest, Hunyadi János út 162.	+36 1 204 3392	producer	
5	Akker-Plus Kft.	6200 Kiskőrös, Dózsa Gy. u. 67.	+36 78 413 993, +36 78 413 955	trader	both
6	ARDEX Építőanyag Kft.	2045 Törökbálint, Torbágy utca 15.	+36 23 511 370	trader	both
7	Baumix Kft.	7400 Kaposvár, Kanizsai út 56.	+36 82 317 922	trader	both
8	Emfi-Trade Francia-Magyar Ipari Kereskedelmi Kft.	1239 Budapest, Ócsai út 1-3.	+36 1 287 3584	trader	water
9	Eurotrade 21 Kft.	8000 Székesfehérvár, Seregélyesi út 113.	+36 22 329 841, +36 22 329 842	trader	both
10	Syntex-Ker Kft.	1097 Budapest, Gubacsi út 6/c	+36 1 476 8465	trader	both
11	Superplast Kft.	6763 Szatymaz, II. körzet 112.	+36 62 283 102	trader	water
12	Tem-To Kft.	1026 Budapest, Riadó u. 6/a	+36 1 200 0873	trader	both

	Company name	Address	Contact
1	Bodycare Kozmetikai Gyártó és Kereskedelmi Kft.	8200 Veszprém Juhar u. 8.	+36 88 420 488
2	CFA Hungária Kft.	7833 Görcsöny, Kültelek 1	+36 72 372 511
3	Colgate-Palmolive Magyarország Termelő Kft.	1117 Budapest, Hauszmann Alajos u. 3/a.	+36 33 513 300
4	Dymol Kft.	2143 Kistarcsa, Raktár krt. 1.	+36 28 470 500
5	EVM Zrt.	1172 Budapest, Cinkotai út 26.	+36 1 253 1500
6	Gironde Kft.	3333 Terpes, Petőfi út. 2-4.	+36 36 561 312
7	Herbária Zrt.	1134 Budapest, Dózsa Gy. ú.144.	+36 1 288 6700
8	Naturland Kft.	1106 Budapest, Csillagvirág u. 8.	+36 1 431 2000
9	Sara Lee Hungary Zrt.	1132 Budapest, Váci út 22-24.	+36 1 237 9100
10	SCENIA Kft.	8230 Balatonfüred, Mikes Kelemen u. 19.	+36 87 343 524
11	Unilever Magyarország Kft.	1067 Budapest, Teréz krt. 27.	+36 1 465 9300

	Company name	Address	Contact
1	Agrikon-Alfa Kft.	6000 Kecskemét, Külső Szegedi út 136.	+36 76 482 382
2	Alpikum Építőipari és Kereskedelmi Kft.	1028 Budapest, Piszke utca 50.	+36 1 376 9090
3	Alpin-Salewa Rt.	4400 Nyíregyháza, Család utca 69.	+36 42 508 290
4	Antikorr Kft.	6721 Szeged, Juhász Gyula utca 20/a	+36 62 421 029
5	Dinox-H Nemesacéltermék Gyártó Kft.	2800 Tatabánya, Dembinszky utca 5/a	+36 34 513 310
6	Érdi Építő Szak- Szerelőipari és Korrózióvédő Kft.	2030 Érd, Fehérvári út 63-65.	+36 23 365 161
7	GRP Plasticorr Fejlesztő, Szolgáltató és Kivitelező Kft.	1097 Budapest, Illatos út 7.	+36 1 280 7347
8	Molnár Acél Kft.	1165 Budapest, Bökényföldi út 46.	+36 1 407 4106
9	Nocado Szerelvénygyártó és Kereskedelmi Képviseleti Kft.	1015 Budapest, Batthyány utca 3.	+36 1 355 1934
10	ORKÁN Levegőszűrő és Granulátumszóró Berendezéseket Gyártó Kft.	6060 Tiszakécske, Szolnoki utca 42.	+36 76 441 388
11	Orszak-2000 Szakipari, Korrózióvédelmi és Állványozó Kft.	1239 Budapest, Ócsai út 1-3.	+36 1 287 0253
12	Secco Kft.	2510 Dorog, Hőerőmű utca 15.	+36 33 331 883

No.	Slovenian Producer Name	Telefon number	List of product with HOS data	National sales of the products in year 2006
1.	Belinka-Belles d.o.o.	**00386 1 588-62-99**		n.a.
			Belton Super-OT-EU VOC (kat. A/e), max.: 500 g/l (2007) / 400 g/l (2010), Belton super max. 495 g/l VOC	
			Beltop-OT-EU VOC (kat. A/e), max.: 500 g/l (2007) / 400 g/l (2010), Beltop max. 495 g/l VOC	
			Beltop UV plus-OT-EU VOC (kat. A/e), max.: 500 g/l (2007) / 400 g/l (2010), Beltop UV plus max. 470 g/l VOC	
			Belinka interier-VO-EU VOC (kat. A/e), max.: 150 g/l (2007) / 130 g/l (2010), Interier max. 75 g/l VOC	
			Belinka Interier sauna-VO-EU VOC (kat. A/e), max.: 150 g/l (2007) / 130 g/l (2010), Interier sauna max. 75 g/l VOC	
			Belinka Exterier-VO-EU VOC (kat. A/e), max.: 150 g/l (2007) / 130 g/l (2010), Exterier max. 85 g/l VOC	
			Belinka Impregnant-VO-EU VOC (kat. A/h), max.: 50 g/l (2007) / 30 g/l (2010), Impregnant max. 20 g/l VOC	
			Aqua email - temelj za les-VO-EU VOC (kat. A/d), max.: 150 g/l (2007) / 130 g/l (2010), Aqua email - temelj za les max. 130 g/l VOC	
			Aqua email - pokrivna barva za les in kovino-VO-EU VOC (kat. A/d), max.: 150 g/l (2007) / 130 g/l (2010), Aqua email - pokrivna barva max. 130 g/l VOC	
			Aqua email baze-VO-EU VOC (kat. A/d), max.: 150 g/l (2007) / 130 g/l (2010), Aqua email baza xx max. 110 g/l VOC	
			Belles-OT-EU VOC (kat. A/h), max.: 750 g/l (2007) / 750 g/l (2010), Belles max. 740 g/l VOC	
			Podlaga za vodni parketni lak-VO-EU VOC (kat. A/i), max.: 140 g/l (2007) / 140 g/l (2010), Podlaga za vodni parketni lak max. 20 g/l VOC	
			Vodni parketni lak-VO-EU VOC (kat. A/i), max.: 140 g/l (2007) / 140 g/l (2010), Vodni parketni lak max. 140 g/l VOC	
			2K vodni parketni lak-VO-EU VOC (kat. A/j), max.: 140 g/l (2007) / 140 g/l (2010), 2K Vodni parketni lak: max. 140 g/l VOC	
			Kislinski parketni lak-OT-EU VOC (kat. A/j), max.: 550 g/l (2007) / 500 g/l (2010), Kislinski parketni lak max. 500 g/l VOC	
			Belinka Poliuretanski parketni lak-OT-EU VOC (kat. A/j), max.: 550 g/l (2007) / 500 g/l (2010), Poliuretanski parketni lak max. 540 g/l VOC	
2.	Chemcolor Sevnica d.o.o.	**00386 7 816-35-50**		n.a.
			Lesoton - IIA(f), 700 g/l (2010); max. 610 g/l	
			Lesoton Aqua - IIA(e), 130 g/l (2010); max. 30 g/l	
			Laneno olje - IIA(f), 130 g/l (2010); max. 0 g/l	
			Laneni firnež - IIA(f), 130 g/l (2010); in product: max. 20 g/l	
			Temeljni alkidni premaz - IIA(d), 400 g/l (2007); in product: max. 400 g/l	
			Grund kolor- IIA(i), 600 g/l (2007); in product: max. 600 g/l	
			Shop primer-IIA(i), 600 g/l (2007); in product: max. 600 g/l	
			Agro primer- IIA(i), 600 g/l (2007); in product: max. 500 g/l	
			Primo kolor- IIA(i), 600 g/l (2007); in product: max. 600 g/l	
			Cink antikor - IIA(i), 500 g/l (2007); in product: max. 420 g/l	
			Epoxy kolor primer - IIA(j), 550 g/l (2007); in product: max. 520 g/l	
			Alkidkolor- IIA(d), 400 g/l (2007); in product: max. 400 g/l	
			Starkolor - IIA(i), 600 g/l (2007); in product: max. 550 g/l	
			Nitrokolor - /	
			Alkidkolor metalik emajl- /	
			Epoxy kolor emajl - /	
			Purkem 2K emajl- IIA(j), 500 g/l (2010); in product: max. 450 g/l	
			Metalik dvoslojni emajl - /	

No.	Slovenian Producer Name	Telefon number	List of product with HOS data	National sales of the products in year 2006
			Vinilacryl emajl - IIA(i), 600 g/l (2007); in product: max. 600 g/l	
			Avto emajl krasnokolor- /	
			Alukolor - IIA(i), 500 g/l (2010); in product: max. 480 g/l	
			Sikolor SE - IIA(i), 600 g/l (2007); in product: max. 590 g/l	
			Betonkolor - IIA(c), 75 g/l (2007); in product: max. 60 g/l	
			Hydroepoxy - IIA(j), 140 g/l (2010); in product: max. 2 g/l	
			Betondekor - IIA(), g/l (); in product: max. g/l	
			Distempera - IIA(a), 30 g/l (2010); max. 1 g/l	
			Natur kolor - IIA(a), 30 g/l (2010); max. 1 g/l	
			Biobel - IIA(a), 30 g/l (2010); in product: max. 30 g/l	
			Fasadakolor - IIA(c), 40 g/l (2010); in product max. 40 g/l	
			Eko fas - IIA(c), 40 g/l (2010); in product: max. 2 g/l	
			Acrilfas - IIA(c), 430 g/l (2010); in product: max. 360 g/l	
			Antinikotin - IIA(g), 450 g/l (2007); in product max. 450 g/l	
			Akrilna emulzija - IIA(c), 40 g/l (2010); izdelek vsebuje: max. 4 g/l	
			Hard lak- IIA(j), 550 g/l (2007); in product max. 550 g/l	
			Extra hard lak dd - IIA(j), 550 g/l (2007); in product max. 550 g/l	
			Simple lak- /	
			Ekokril - IIA(i), 140 g/l (2010); in product max. 140 g/l	
			Pirochem - /	
			Termostabil - IIA(i), 600 g/l (2007); in product max. 600 g/l	
			Bazenkolor - /	
			Barva za ceste - /	
3.	Color d.d.	**00386 1 362-91-00**		
			Please see Sheet - COLOR products.	
4.	Helions tovarna barv, lakov in umetnih smol Količevo d.o.o.	**00386 1 722-40-00**		
			SPEKTRA akrilna impregnacija - IIA(h), 30 g/l (2010); izdelek vsebuje: max. 1 g/l	
			SPEKTRA akrilna impregnacija koncentrat - IIA(h), 30 g/l (2010); izdelek vsebuje: max.1 g/l	
			SPEKTRA akrilna impregnacija antiluščilec starih slojev - IIA(h), 30 g/l (2010); izdelek vsebuje: max. 1 g/l	
			SPEKTRA globinska impregnacija - IIA(h), 750 g/l (2010); izdelek vsebuje: max.750 g/l	
			SPEKTRA notranji kit -/	
			SPEKTRA notranja zidna barva za neglajene površine - IIA(a), 30 g/l (2010); izdelek vsebuje: max. 4 g/l	
			SPEKTRA notranja zidna barva - IIA(a), 30 g/l (2010); izdelek vsebuje: max. 1 g/l	
			SPEKTRA notranja zidna barva Extra - IIA(a), 30 g/l (2010); izdelek vsebuje: max. 9 g/l	
			SPEKTRA 2000 notranja zidna barva - IIA(a), 30 g/l (2010); izdelek vsebuje: max. 22 g/l	

No.	Slovenian Producer Name	Telefon number	List of product with HOS data	National sales of the products in year 2006
			SPEKTRA zaščita pred plesnijo - /	
			SPEKTRA Plus + - IIA(a), 75g/l (2007); izdelek vsebuje:max.20g/l	
			SPEKTRA Sunny Colours - IIA(a), 30g/l (2010); izdelek vsebuje: max.0,1 g/l	
			SPEKTRA notranja pralna zidna barva - IIA(a), 75 g/l (2007); izdelek vsebuje: max. 55 g/l	
			SPEKTRA latex mat/polmat - IIA(a), 75 g/l (2007); izdelek vsebuje: max. 55 g/l and IIA(a), 75 g/l (2007); izdelek vsebuje: max. 57 g/l	
			SPEKTRA Domflok lističi -/	
			SPEKTRA Domflok lak (sijajni) - IIA(b), 100 g/l (2010); izdelek vsebuje: max. 80 g/l	
			SPEKTRA Domflok lak (polmat) - IIA(b), 100 g/l (2010); izdelek vsebuje: max. 85 g/l	
			SPEKTRA Domflok perl lak - IIA(l), 200 g/l (2010); izdelek vsebuje: max. 83 g/l	
			SPEKTRA Decor transparent - IIA(a), 75 g/l (2007); izdelek vsebuje: max. 25 g/l	
			SPEKTRA biocidno sredstvo Sanitol - /	
			SPEKTRA zidna barva za kuhinje in kopalnice - IIA(a), 30 g/l (2010); izdelek vsebuje: max. 9 g/l	
			SPEKTRA antimikrobna barva - IIA(g), 350g/l (2010); izdelek vsebuje:max.350g/l	
			SPEKTRA antinikotinska barva - IIA(g), 350g/l (2010); izdelek vsebuje:max.350g/l	
			SPEKTRA silikonska impregnacija - IIA(h), 30 g/l (2010); izdelek vsebuje: max. 0 g/l	
			SPEKTRA akrilna fasadna barva - IIA(a), 75 g/l (2007); izdelek vsebuje: max. 50 g/l	
			SPEKTRA akrilna fasadna barva z vlakni - IIA(a), 75 g/l (2007); izdelek vsebuje: max. 46 g/l	
			SPEKTRA silikonska fasadna barva - IIA(a), 30 g/l (2010); izdelek vsebuje: max. 30 g/l	
			SPEKTRA siloksanska fasadna barva - IIA(a), 75 g/l (2007); izdelek vsebuje: max. 54 g/l	
			SPEKTRA fasadna barva Heliofas - IIA(c), 430 g/l (2010); izdelek vsebuje: max. 425 g/l	
			SPEKTRA osnovni univerzalni premaz - IIA(h), 30 g/l (2010); izdelek vsebuje: max. 20 g/l	
			SPEKTRA akrilatni omet - IIA(a), 75 g/l (2007); izdelek vsebuje: max. 40 g/l	
			SPEKTRA silikonski omet- IIA(a), 30 g/l (2010); izdelek vsebuje: max. 25 g/l	
			SPEKTRA akrilna barva za betonske ograje - IIA(c), 75 g/l (2007); izdelek vsebuje: max. 55 g/l	
			SPEKTRA akrilna barva za beton - IIA(i), 140 g/l (2010); izdelek vsebuje: max. 90 g/l	
			SPEKTRA 2K epoksi barva za beton - /	
			TESSAROL osnovna barva za železo - IIA(i), 500 g/l (2010); izdelek vsebuje:max. 500 g/l	
			TESSAROL akril osnovna barva za železo - IIA(i), 140 g/l (2010); izdelek vsebuje: max. 110 g/l	
			NITRO osnovna barva za železo - IIA(i), 600 g/l (2007); izdelek vsebuje: max. 600 g/l	
			TESSAROL univerzalna osnovna barva - IIA(i), 500 g/l (2010); izdelek vsebuje:max. 500 g/l	
			TESSAROL emajl - IIA(d), 400 g/l (2007); izdelek vsebuje: max. 390 g/l, baze: max. 399 g/l	
			TESSAROL akril emajl - IIA(d), 130 g/l (2010); izdelek vsebuje:max. 110 g/l, baze: max. 120 g/l	
			TESSAROL professional emajl - IIA(d), 400 g/l (2007); izdelek vsebuje: max. 390 g/l, baze: max. 399 g/l	
			TESSAROL antikorozivni emajl - IIA(i), 500 g/l (2010); izdelek vsebuje:max. 500 g/l	
			TESSAROL antik - IIA(i), 500g/l (2010); izdelek vsebuje:max.500g/l	
			TESSAROL Alu bronza 400°C - IIA(i), 500g/l (2010); izdelek vsebuje:max.500g/l	

No.	Slovenian Producer Name	Telefon number	List of product with HOS data	National sales of the products in year 2006
			TESSAROL emajl za pocinkano pločevino - IIA(i), 600 g/l (2007); izdelek vsebuje: max. 599 g/l	
			TESSAROL emajl za radiatorje - IIA(i), 500 g/l (2010); izdelek vsebuje:max. 490 g/l	
			BORI impregnacija - IIA(h), 30 g/l (2010); izdelek vsebuje: max. 20 g/l	
			BORI tankoslojna lazura z biocidom - IIA(h), 750 g/l (2010); izdelek vsebuje: max. 680 g/l	
			BORI tankoslojna lazura - IIA(f), 700 g/l (2010); izdelek vsebuje: max. 660 g/l, baza max. 690 g/l	
			BORI lak lazura UV PROTECTION - IIA(e), 500 g/l (2007); izdelek vsebuje: max. 490 g/l, baza max. 500 g/l	
			BORI lak lazura UV EXTRA - IIA(e), 500 g/l (2007); izdelek vsebuje: max. 490 g/l	
			BORI lazura UV PROTECTION - IIA(e), 130 g/l (2010); izdelek vsebuje: max. 80 g/l	
			BORI gel lazura UV PROTECTION - IIA(e), 500 g/l (2007); izdelek vsebuje: max. 495 g/l	
			TESSAROL akrilni kit za les - IIA(g), 30 g/l (2010); izdelek vsebuje: max. 20 g/l	
			TESSAROL osnovna barva za les - IIA(g), 450 g/l (2007); izdelek vsebuje: max. 440 g/l	
			TESSAROL akril osnovna barva za les - IIA(d), 130 g/l (2010); max. 90 g/l	
			TESSAROL univerzalna osnovna barva -IIA(i), 500 g/l (2010)max. 500 g/	
			TESSAROL emajl - IIA(d), 400 g/l (2007); max. 390 g/l, baze: max. 399 g/l	
			TESSAROL akril emajl - IIA(d), 130 g/l (2010); max. 110 g/l, baze: max. 120 g/l	
			TESSAROL professional emajl - IIA(d), 400 g/l (2007); max. 390 g/l, baze: max. 399 g/l	
			TESSAROL lak za čolne - IIA(e), 500 g/l (2007); max. 500 g/l	
			TESSAROL lak sijajni/mat - IIA(e), 500 g/l (2007); max.500 g/l	
			TESSAROL akril lak - IIA(e), 130 g/l (2010); max. 110 g/l	
			IDEAL Fugirna tekočina -/	
			IDEAL Fugirna tekočina DS - IIA(h), 750 g/l (2010); max. 750 g/l	
			IDEAL vodna fugirna tekočina - IIA(h), 50 g/l (2007);: max. 50 g/l	
			IDEAL osnova za kislinske lake - /	
			IDEAL 2K poliuretanski osnovni lak za parket- /	
			IDEAL 2K poliuretanski osnovni lak za parket DS - IIA(j), 550 g/l (2007); max. 550 g/l	
			IDEAL Osnovni vodni lak za parket - IIA(i), 140 g/l (2010); max. 70 g/l	
			IDEAL gel - IIA(h),750 g/l (2007), max. 750 g/l	
			IDEAL vodni gel - IIA(h), 50 g/l (2007), i max. 50 g/l	
			IDEAL 2K poliuretanski lak za parket - /	
			IDEAL 2K poliuretanski lak za parket DS - IIA(j), 550 g/l (2007); i max. 550 g/l	
			IDEAL 2K poliuretanski vodni lak za parket - IIA(j), 140 g/l (2010); max. 95 g/l	
			IDEAL 2K kislinski lak za parket - /	
			IDEAL Vodni lak za parket VAL - IIA(i), 140 g/l (2010); max. 70 g/l	
5.	Jub d.o.o	**00386 1 588-42-17 /18**		
			Please see Sheet - JUB products.	
6.	MINERVA d.o.o.	00386 2 4617024		

No.	Slovenian Producer Name	Telefon number	List of product with HOS data	National sales of the products in year 2006
			ADMIRAL VL3B - IIA(e), 150g/l (2007) , 130g/l(2010); max. 110 g/l VOC.	
			Few products are in developement phase.	
7.	Svežina, Smlednik, d.o.o.	00386 40649509		
			Lateks belez - VOC data "<0,1"	
			Belež, Apleni Belež - VOC "0"	
			Frislak , Fasadni belez - VOC "0"	
8.	Tikra d.o.o.	00386 41 640286		
			no product with VOC	
9.	TKK Srpenica d.d.	00386 5 3841300	zarli nataša 362	
10.	Amal d.o.o.	**00386 1 200-77-40**		
			AMAL IIA(e), 150g/l (2007) , 130g/l(2010); in product max. 110 g/l VOC.	
11.	Tanin Sevnica d.d.	**00386 7 816-44-10**		
			Biotan zaščitni premaz za les - EU VOC (kat. A/e) max.:150 g/l (2007) , 130 g/l (2010) max. 85 g/l VOC	
			Biotan akrilna lak lazura z UV zaščito - EU VOC (kat. A/e) max.:150 g/l (2007) , 130 g/l (2010) max. 85 g/l VOC	
			Protektan temeljna zaščita lesa - EU VOC (Kat. A/h) max.: 50 g/l (2007), 30 g/l (2010) max.: 23 g/l VOC.	
			Larvin - EU VOC (Kat. A/h) max.: 50 g/L (2007), 30 g/L (2010) max.: 15 g/L VOC	
12.	KEMS d.o.o.	**00386 41 641 543**		
			plastični butil glikol - no VOC data	
			plastični shellsol D40 no VOC data	
			sandolin kemix lazur SD - max 470 l/g	
13.	Cap Kolor d.o.o.	00386 1 428 97 70	Vito - 041 424 356 Medved	
			no data received	
14.	Fragmat d.d. DEMIT d.o.o.	**00386037344500**		
			IBITOL - IIA (c), 450g/l (2007) 430 g/l (2010), in product max: 430g/l	
			IBITOL PRO - IIA(c), 450g/l(2007), 430 g/l (2010), in product max: 450g/l	
			IBITOL E5 - IIA(c), 450g/l(2007), 430 g/l (2010), in product max :450g/l	

Protective coatings for wood

Transparent protective system for wood on solvent base

NAZIV IZDELKA			me	emb	"izdelek vsebuje" - in product voc
LESOL FUNGICOL			lit.	0,75	EU VOC kategorija in meje: IIA (h), 750 g/l (2010);in product max. 720 g/l
LESOL FUNGICOL			lit.	2,5	EU VOC kategorija in meje: IIA (h), 750 g/l (2010); izdelek vsebuje: max. 720 g/l
LESOL FUNGICOL			lit.	100	EU VOC kategorija in meje: IIA (h), 750 g/l (2010); izdelek vsebuje: max. 720 g/l
LESOL TON lazura	1	brezbarvna	lit.	0,75	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	2	svetli bor	lit.	0,75	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	8	macesen	lit.	0,75	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	97	bor	lit.	0,75	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	7	mahagonij	lit.	0,75	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	93	hrast	lit.	0,75	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	3	teak	lit.	0,75	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	4	oreh	lit.	0,75	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	9	palisander	lit.	0,75	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	5	ebenovina	lit.	0,75	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	6	olivno zelena	lit.	0,75	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	1	brezbarvna	lit.	2,5	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	2	svetli bor	lit.	2,5	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	8	macesen	lit.	2,5	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	97	bor	lit.	2,5	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	7	mahagonij	lit.	2,5	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	93	hrast	lit.	2,5	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	3	teak	lit.	2,5	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	4	oreh	lit.	2,5	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l

Protective coatings for wood

Transparent protective system for wood on solvent base

			me	emb	voc
LESOL TON lazura	9	palisander	lit.	2,5	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	5	ebenovina	lit.	2,5	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	6	olivno zelena	lit.	2,5	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	1	brezbarvna	lit.	10	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	2	svetli bor	lit.	10	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	8	macesen	lit.	10	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	97	bor	lit.	10	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	7	mahagonij	lit.	10	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	93	hrast	lit.	10	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	3	teak	lit.	10	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	4	oreh	lit.	10	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	9	palisander	lit.	10	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	5	ebenovina	lit.	10	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	6	olivno zelena	lit.	10	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	1	brezbarvna	lit.	100	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	2	svetli bor	lit.	100	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	97	bor	lit.	100	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	7	mahagonij	lit.	100	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	93	hrast	lit.	100	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	3	teak	lit.	100	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	4	oreh	lit.	100	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l
LESOL TON lazura	5	ebenovina	lit.	100	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 630 g/l

Protective coatings for wood

Transparent protective system for wood on solvent base

			me	emb	voc
LESOL TOP lak lazura	1	brezbarvna	lit.	0,75	EU VOC kategorija in meje: IIA (e), 500 g/l (2010); izdelek vsebuje: max. 490 g/l
LESOL TOP lak lazura	2	svetli bor	lit.	0,75	EU VOC kategorija in meje: IIA (e), 500 g/l (2010); izdelek vsebuje: max. 490 g/l
LESOL TOP lak lazura	8	macesen	lit.	0,75	EU VOC kategorija in meje: IIA (e), 500 g/l (2010); izdelek vsebuje: max. 490 g/l
LESOL TOP lak lazura	97	bor	lit.	0,75	EU VOC kategorija in meje: IIA (e), 500 g/l (2010); izdelek vsebuje: max. 490 g/l
LESOL TOP lak lazura	7	mahagonij	lit.	0,75	EU VOC kategorija in meje: IIA (e), 500 g/l (2010); izdelek vsebuje: max. 490 g/l
LESOL TOP lak lazura	93	hrast	lit.	0,75	EU VOC kategorija in meje: IIA (e), 500 g/l (2010); izdelek vsebuje: max. 490 g/l
LESOL TOP lak lazura	3	teak	lit.	0,75	EU VOC kategorija in meje: IIA (e), 500 g/l (2010); izdelek vsebuje: max. 490 g/l
LESOL TOP lak lazura	4	oreh	lit.	0,75	EU VOC kategorija in meje: IIA (e), 500 g/l (2010); izdelek vsebuje: max. 490 g/l
LESOL TOP lak lazura	9	palisander	lit.	0,75	EU VOC kategorija in meje: IIA (e), 500 g/l (2010); izdelek vsebuje: max. 490 g/l
LESOL TOP lak lazura	5	ebenovina	lit.	0,75	EU VOC kategorija in meje: IIA (e), 500 g/l (2010); izdelek vsebuje: max. 490 g/l
LESOL TOP lak lazura	6	olivno zelena	lit.	0,75	EU VOC kategorija in meje: IIA (e), 500 g/l (2010); izdelek vsebuje: max. 490 g/l
LESOL TOP lak lazura	1	brezbarvna	lit.	2,5	EU VOC kategorija in meje: IIA (e), 500 g/l (2010); izdelek vsebuje: max. 490 g/l
LESOL TOP lak lazura	2	svetli bor	lit.	2,5	EU VOC kategorija in meje: IIA (e), 500 g/l (2010); izdelek vsebuje: max. 490 g/l
LESOL TOP lak lazura	8	macesen	lit.	2,5	EU VOC kategorija in meje: IIA (e), 500 g/l (2010); izdelek vsebuje: max. 490 g/l
LESOL TOP lak lazura	97	bor	lit.	2,5	EU VOC kategorija in meje: IIA (e), 500 g/l (2010); izdelek vsebuje: max. 490 g/l
LESOL TOP lak lazura	7	mahagonij	lit.	2,5	EU VOC kategorija in meje: IIA (e), 500 g/l (2010); izdelek vsebuje: max. 490 g/l
LESOL TOP lak lazura	93	hrast	lit.	2,5	EU VOC kategorija in meje: IIA (e), 500 g/l (2010); izdelek vsebuje: max. 490 g/l
LESOL TOP lak lazura	3	teak	lit.	2,5	EU VOC kategorija in meje: IIA (e), 500 g/l (2010); izdelek vsebuje: max. 490 g/l
LESOL TOP lak lazura	4	oreh	lit.	2,5	EU VOC kategorija in meje: IIA (e), 500 g/l (2010); izdelek vsebuje: max. 490 g/l
LESOL TOP lak lazura	9	palisander	lit.	2,5	EU VOC kategorija in meje: IIA (e), 500 g/l (2010); izdelek vsebuje: max. 490 g/l
LESOL TOP lak lazura	5	ebenovina	lit.	2,5	EU VOC kategorija in meje: IIA (e), 500 g/l (2010); izdelek vsebuje: max. 490 g/l
LESOL TOP lak lazura	6	olivno zelena	lit.	2,5	EU VOC kategorija in meje: IIA (e), 500 g/l (2010); izdelek vsebuje: max. 490 g/l

Protective coatings for wood

LESOL AQUA -Transaparent protective system for wood on water based

			me	emb	voc
LESOL FUNGICOL AQUA			lit.	0,75	EU VOC kategorija in meje: IIA (h), 30 g/l (2010); izdelek vsebuje: max. 20 g/l
LESOL TON AQUA lazura	1	brezbarvna	lit.	0,75	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 70 g/l
LESOL TON AQUA lazura	99	bela	lit.	0,75	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 70 g/l
LESOL TON AQUA lazura	95	siva	lit.	0,75	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 70 g/l
LESOL TON AQUA lazura	2	svetli bor	lit.	0,75	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 70 g/l
LESOL TON AQUA lazura	8	macesen	lit.	0,75	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 70 g/l
LESOL TON AQUA lazura	97	bor	lit.	0,75	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 70 g/l
LESOL TON AQUA lazura	7	mahagonij	lit.	0,75	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 70 g/l
LESOL TON AQUA lazura	93	hrast	lit.	0,75	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 70 g/l
LESOL TON AQUA lazura	3	teak	lit.	0,75	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 70 g/l
LESOL TON AQUA lazura	4	oreh	lit.	0,75	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 70 g/l
LESOL TON AQUA lazura	9	palisander	lit.	0,75	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 70 g/l
LESOL TON AQUA lazura	5	ebenovina	lit.	0,75	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 70 g/l
LESOL TON AQUA lazura	6	olivno zelena	lit.	0,75	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 70 g/l
LESOL TON AQUA lazura	1	brezbarvna	lit.	2,5	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 70 g/l
LESOL TON AQUA lazura	99	bela	lit.	2,5	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 70 g/l
LESOL TON AQUA lazura	95	siva	lit.	2,5	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 70 g/l
LESOL TON AQUA lazura	2	svetli bor	lit.	2,5	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 70 g/l
LESOL TON AQUA lazura	8	macesen	lit.	2,5	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 70 g/l
LESOL TON AQUA lazura	97	bor	lit.	2,5	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 70 g/l
LESOL TON AQUA lazura	7	mahagonij	lit.	2,5	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 70 g/l
LESOL TON AQUA lazura	93	hrast	lit.	2,5	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 70 g/l
LESOL TON AQUA lazura	3	teak	lit.	2,5	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 70 g/l
LESOL TON AQUA lazura	4	oreh	lit.	2,5	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 70 g/l

Protective coatings for wood

LESOL AQUA -Transaparent protective system for wood on water based

			me	emb	voc
LESOL TON AQUA lazura	9	palisander	lit.	2,5	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 70 g/l
LESOL TON AQUA lazura	5	ebenovina	lit.	2,5	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 70 g/l
LESOL TON AQUA lazura	6	olivno zelena	lit.	2,5	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 70 g/l
LESOL TOP AQUA lak lazura	svetla		lit.	0,75	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 70 g/l
LESOL TOP AQUA lak lazura	temna		lit.	0,75	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 70 g/l
LESOL TOP AQUA lak lazura	brezbarvna		lit.	0,75	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 70 g/l
HITROSUŠEČI TEMELJNI LAK			lit.	0,75	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 75 g/l
HITROSUŠEČI TEMELJNI LAK			lit.	2,5	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 75 g/l
HITROSUŠEČI LAK			lit.	0,75	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 75 g/l
HITROSUŠEČI LAK	sijajni		lit.	2,5	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 75 g/l
HITROSUŠEČI LAK	polmat		lit.	0,75	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 75 g/l
HITROSUŠEČI LAK	polmat		lit.	2,5	EU VOC kategorija in meje: IIA (e), 130 g/l (2010); izdelek vsebuje: max. 75 g/l
LESOL IMPREGNACIJA			lit.	0,75	EU VOC kategorija in meje: IIA (f), 700 g/l (2010); izdelek vsebuje: max. 640 gl
LAK ZA ČOLNE			lit.	0,75	EU VOC kategorija in meje: IIA (h), 750 g/l (2010); izdelek vsebuje: max. 720 gl
LAK ZA LES	sijajni		lit.	0,75	EU VOC kategorija in meje: IIA (e), 500 g/l (2010); izdelek vsebuje: max. 490 gl
LAK ZA LES	sijajni		lit.	2,5	EU VOC kategorija in meje: IIA (e), 500 g/l (2010); izdelek vsebuje: max. 490 gl
LAK ZA LES	polmat		lit.	0,75	EU VOC kategorija in meje: IIA (e), 500 g/l (2010); izdelek vsebuje: max. 490 gl

Protective coatings for wood

UNICOL - Cover protective system for wood on solvent base

		me	emb	voc
UNICOL IMPREGNACIJA	bela	lit.	0,75	EU VOC kategorija in meje: IIA (h), 750 g/l (2010); izdelek vsebuje: max. 650 gl
UNICOL KIT		kg	0,5	EU VOC kategorija in meje: IIA (g), 350 g/l (2010); izdelek vsebuje: max. 320 gl
UNICOL KIT		kg	1	EU VOC kategorija in meje: IIA (g), 350 g/l (2010); izdelek vsebuje: max. 320 gl
UNICOL KIT		kg	4	EU VOC kategorija in meje: IIA (g), 350 g/l (2010); izdelek vsebuje: max. 320 gl
UNICOL AKRILNI KIT	beli	kg	0,75	EU VOC kategorija in meje: IIA (g), 30 g/l (2010); izdelek vsebuje: max. 20 g/l
UNICOL AKRILNI KIT	smreka	kg	0,75	EU VOC kategorija in meje: IIA (g), 30 g/l (2010); izdelek vsebuje: max. 20 g/l
UNICOL AKRILNI KIT	bukev	kg	0,75	EU VOC kategorija in meje: IIA (g), 30 g/l (2010); izdelek vsebuje: max. 20 g/l
UNICOL AKRILNI KIT	hrast	kg	0,75	EU VOC kategorija in meje: IIA (g), 30 g/l (2010); izdelek vsebuje: max. 20 g/l
UNICOL TEMELJNA BARVA	bela	lit.	0,2	EU VOC kategorija in meje: IIA (g), 450 g/l (2010); izdelek vsebuje: max. 450 g/l
UNICOL TEMELJNA BARVA	bela	lit.	0,75	EU VOC kategorija in meje: IIA (g), 450 g/l (2010); izdelek vsebuje: max. 450 g/l
UNICOL TEMELJNA BARVA	bela	lit.	2,5	EU VOC kategorija in meje: IIA (g), 450 g/l (2010); izdelek vsebuje: max. 450 g/l
UNICOL POKRIVNA BARVA	bela	lit.	0,75	EU VOC kategorija in meje: IIA (d), 400 g/l (2007); izdelek vsebuje: max. 390 g/l
UNICOL POKRIVNA BARVA	bela	lit.	2,5	EU VOC kategorija in meje: IIA (d), 400 g/l (2007); izdelek vsebuje: max. 390 g/l
UNICOL POKRIVNA BARVA	bela polmat	lit.	0,75	EU VOC kategorija in meje: IIA (d), 400 g/l (2007); izdelek vsebuje: max. 390 g/l
UNICOL POKRIVNA BARVA	bela polmat	lit.	2,5	EU VOC kategorija in meje: IIA (d), 400 g/l (2007); izdelek vsebuje: max. 390 g/l

Protective coatings for metal and wood

		me	emb	voc
COLOMIN TEMELJNA BARVA	oksidno rdeča	lit.	0,2	EU VOC kategorija in meje: IIA (i), 500 g/l (2010); izdelek vsebuje: max. 490 gl
COLOMIN TEMELJNA BARVA	oksidno rdeča	lit.	0,75	EU VOC kategorija in meje: IIA (i), 500 g/l (2010); izdelek vsebuje: max. 490 gl
COLOMIN TEMELJNA BARVA	oksidno rdeča	lit.	2,5	EU VOC kategorija in meje: IIA (i), 500 g/l (2010); izdelek vsebuje: max. 490 gl
COLOMIN TEMELJNA BARVA	oksidno rdeča	lit.	10	EU VOC kategorija in meje: IIA (i), 500 g/l (2010); izdelek vsebuje: max. 490 gl
COLOMIN TEMELJNA BARVA	siva	lit.	0,2	EU VOC kategorija in meje: IIA (i), 500 g/l (2010); izdelek vsebuje: max. 490 gl
COLOMIN TEMELJNA BARVA	siva	lit.	0,75	EU VOC kategorija in meje: IIA (i), 500 g/l (2010); izdelek vsebuje: max. 490 gl
COLOMIN TEMELJNA BARVA	siva	lit.	2,5	EU VOC kategorija in meje: IIA (i), 500 g/l (2010); izdelek vsebuje: max. 490 gl
COLOMIN TEMELJNA BARVA	siva	lit.	10	EU VOC kategorija in meje: IIA (i), 500 g/l (2010); izdelek vsebuje: max. 490 gl
COLOMIN POKRIVNA BARVA	bela	lit.	0,2	EU VOC kategorija in meje: IIA (d), 400 g/l (2007); izdelek vsebuje: max. 390 gl
COLOMIN POKRIVNA BARVA	rumena	lit.	0,2	EU VOC kategorija in meje: IIA (d), 400 g/l (2007); izdelek vsebuje: max. 390 gl
COLOMIN POKRIVNA BARVA	oker	lit.	0,2	EU VOC kategorija in meje: IIA (d), 400 g/l (2007); izdelek vsebuje: max. 390 gl
COLOMIN POKRIVNA BARVA	rdeča	lit.	0,2	EU VOC kategorija in meje: IIA (d), 400 g/l (2007); izdelek vsebuje: max. 390 gl
COLOMIN POKRIVNA BARVA	modra	lit.	0,2	EU VOC kategorija in meje: IIA (d), 400 g/l (2007); izdelek vsebuje: max. 390 gl
COLOMIN POKRIVNA BARVA	zelena	lit.	0,2	EU VOC kategorija in meje: IIA (d), 400 g/l (2007); izdelek vsebuje: max. 390 gl
COLOMIN POKRIVNA BARVA	rjava	lit.	0,2	EU VOC kategorija in meje: IIA (d), 400 g/l (2007); izdelek vsebuje: max. 390 gl
COLOMIN POKRIVNA BARVA	siva	lit.	0,2	EU VOC kategorija in meje: IIA (d), 400 g/l (2007); izdelek vsebuje: max. 390 gl
COLOMIN POKRIVNA BARVA	črna	lit.	0,2	EU VOC kategorija in meje: IIA (d), 400 g/l (2007); izdelek vsebuje: max. 390 gl
COLOMIN POKRIVNA BARVA	bela	lit.	0,75	EU VOC kategorija in meje: IIA (d), 400 g/l (2007); izdelek vsebuje: max. 390 gl
COLOMIN POKRIVNA BARVA	rumena	lit.	0,75	EU VOC kategorija in meje: IIA (d), 400 g/l (2007); izdelek vsebuje: max. 390 gl
COLOMIN POKRIVNA BARVA	oker	lit.	0,75	EU VOC kategorija in meje: IIA (d), 400 g/l (2007); izdelek vsebuje: max. 390 gl
COLOMIN POKRIVNA BARVA	rdeča	lit.	0,75	EU VOC kategorija in meje: IIA (d), 400 g/l (2007); izdelek vsebuje: max. 390 gl
COLOMIN POKRIVNA BARVA	modra	lit.	0,75	EU VOC kategorija in meje: IIA (d), 400 g/l (2007); izdelek vsebuje: max. 390 gl
COLOMIN POKRIVNA BARVA	zelena	lit.	0,75	EU VOC kategorija in meje: IIA (d), 400 g/l (2007); izdelek vsebuje: max. 390 gl
COLOMIN POKRIVNA BARVA	rjava	lit.	0,75	EU VOC kategorija in meje: IIA (d), 400 g/l (2007); izdelek vsebuje: max. 390 gl

Protective coatings for metal and wood

		me	emb	voc
COLOMIN POKRIVNA BARVA	siva	lit.	0,75	EU VOC kategorija in meje: IIA (d), 400 g/l (2007); izdelek vsebuje: max. 390 gl
COLOMIN POKRIVNA BARVA	črna	lit.	0,75	EU VOC kategorija in meje: IIA (d), 400 g/l (2007); izdelek vsebuje: max. 390 gl
COLOMIN POKRIVNA BARVA	bela	lit.	2,5	EU VOC kategorija in meje: IIA (d), 400 g/l (2007); izdelek vsebuje: max. 390 gl
COLOMIN POKRIVNA BARVA	rumena	lit.	2,5	EU VOC kategorija in meje: IIA (d), 400 g/l (2007); izdelek vsebuje: max. 390 gl
COLOMIN POKRIVNA BARVA	oker	lit.	2,5	EU VOC kategorija in meje: IIA (d), 400 g/l (2007); izdelek vsebuje: max. 390 gl
COLOMIN POKRIVNA BARVA	rdeča	lit.	2,5	EU VOC kategorija in meje: IIA (d), 400 g/l (2007); izdelek vsebuje: max. 390 gl
COLOMIN POKRIVNA BARVA	modra	lit.	2,5	EU VOC kategorija in meje: IIA (d), 400 g/l (2007); izdelek vsebuje: max. 390 gl
COLOMIN POKRIVNA BARVA	zelena	lit.	2,5	EU VOC kategorija in meje: IIA (d), 400 g/l (2007); izdelek vsebuje: max. 390 gl
COLOMIN POKRIVNA BARVA	rjava	lit.	2,5	EU VOC kategorija in meje: IIA (d), 400 g/l (2007); izdelek vsebuje: max. 390 gl
COLOMIN POKRIVNA BARVA	siva	lit.	2,5	EU VOC kategorija in meje: IIA (d), 400 g/l (2007); izdelek vsebuje: max. 390 gl
COLOMIN POKRIVNA BARVA	črna	lit.	2,5	EU VOC kategorija in meje: IIA (d), 400 g/l (2007); izdelek vsebuje: max. 390 gl
COLOMIN POKRIVNA BARVA	bela	lit.	10	EU VOC kategorija in meje: IIA (d), 400 g/l (2007); izdelek vsebuje: max. 390 gl
COLOMIN TEM.B. ZA LES AQUA	bela	lit.	0,75	EU VOC kategorija in meje: IIA (d), 130 g/l (2010); izdelek vsebuje: max. 110 g/l
COLOMIN TEM.B. ZA KOV AQUA	siva	lit.	0,75	EU VOC kategorija in meje: IIA (i), 140 g/l (2010); izdelek vsebuje: max. 110 g/l
COLOMIN POKRIVNA BARVA AQ	bela	lit.	0,75	EU VOC kategorija in meje: IIA (d), 130 g/l (2010); izdelek vsebuje: max. 110 g/l
COLOMIN POKRIVNA BARVA AQ	siva	lit.	0,75	EU VOC kategorija in meje: IIA (d), 130 g/l (2010); izdelek vsebuje: max. 110 g/l
COLOMIN POKRIVNA BARVA AQ	črna	lit.	0,75	EU VOC kategorija in meje: IIA (d), 130 g/l (2010); izdelek vsebuje: max. 110 g/l
COLOMIN POKRIVNA BARVA AQ	rumena	lit.	0,75	EU VOC kategorija in meje: IIA (d), 130 g/l (2010); izdelek vsebuje: max. 110 g/l
COLOMIN POKRIVNA BARVA AQ	rdeča	lit.	0,75	EU VOC kategorija in meje: IIA (d), 130 g/l (2010); izdelek vsebuje: max. 110 g/l
COLOMIN POKRIVNA BARVA AQ	modra	lit.	0,75	EU VOC kategorija in meje: IIA (d), 130 g/l (2010); izdelek vsebuje: max. 110 g/l
COLOMIN POKRIVNA BARVA AQ	zelena	lit.	0,75	EU VOC kategorija in meje: IIA (d), 130 g/l (2010); izdelek vsebuje: max. 110 g/l
COLOMIN POKRIVNA BARVA AQ	rjava	lit.	0,75	EU VOC kategorija in meje: IIA (d), 130 g/l (2010); izdelek vsebuje: max. 110 g/l

Protective coatings for metal and wood

EGALIN - Cover protection system for metal and wood on nitro base

		me	emb	voc
EGALIN TEMELJNA BARVA	rdeča	lit.	0,75	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
EGALIN TEMELJNA BARVA	rdeča	lit.	2,5	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
EGALIN TEMELJNA BARVA	rdeča	lit.	20	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
EGALIN TEMELJNA BARVA	siva	lit.	0,75	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
EGALIN TEMELJNA BARVA	siva	lit.	2,5	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
EGALIN TEMELJNA BARVA	siva	lit.	20	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
EGALIN POKRIVNA BARVA	beli	lit.	0,75	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
EGALIN POKRIVNA BARVA	beli mat	lit.	0,75	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
EGALIN POKRIVNA BARVA	rumeni	lit.	0,75	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
EGALIN POKRIVNA BARVA	oker	lit.	0,75	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
EGALIN POKRIVNA BARVA	oranžni	lit.	0,75	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
EGALIN POKRIVNA BARVA	rdeči	lit.	0,75	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
EGALIN POKRIVNA BARVA	par. modri	lit.	0,75	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
EGALIN POKRIVNA BARVA	zeleni	lit.	0,75	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
EGALIN POKRIVNA BARVA	rjavi	lit.	0,75	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
EGALIN POKRIVNA BARVA	srebrni	lit.	0,75	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
EGALIN POKRIVNA BARVA	sivi	lit.	0,75	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
EGALIN POKRIVNA BARVA	črni	lit.	0,75	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
EGALIN POKRIVNA BARVA	črni mat kropan	lit.	0,75	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l

Protective coatings for metal

SYNTOL - Protection system for metal on solvent base

		me	emb	voc
SYNTOL TEMELJNA BARVA	sivozelena	lit.	0,75	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 580 g/l
SYNTOL POKRIVNA BARVA	beli	lit.	0,75	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
SYNTOL POKRIVNA BARVA	krem	lit.	0,75	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
SYNTOL POKRIVNA BARVA	rumeni	lit.	0,75	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
SYNTOL POKRIVNA BARVA	oker	lit.	0,75	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
SYNTOL POKRIVNA BARVA	oranžni	lit.	0,75	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
SYNTOL POKRIVNA BARVA	rdeči	lit.	0,75	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
SYNTOL POKRIVNA BARVA	modri	lit.	0,75	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
SYNTOL POKRIVNA BARVA	zeleni	lit.	0,75	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
SYNTOL POKRIVNA BARVA	rjavi	lit.	0,75	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
SYNTOL POKRIVNA BARVA	srebrni	lit.	0,75	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
SYNTOL POKRIVNA BARVA	sivi	lit.	0,75	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
SYNTOL POKRIVNA BARVA	črni	lit.	0,75	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
SYNTOL POKRIVNA BARVA	črni mat	lit.	0,75	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
SYNTOL POKRIVNA BARVA	beli	lit.	2,5	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
SYNTOL POKRIVNA BARVA	beli	lit.	10	EU VOC kategorija in meje: IIA (i), 600 g/l (2007); izdelek vsebuje: max. 590 g/l
AVTOCOL KIT SOFT		kg	0,5	EU VOC kategorija in meje: IIA (g), 350 g/l (2010); izdelek vsebuje: max. 235 g/l
AVTOCOL KIT SOFT		kg	1	EU VOC kategorija in meje: IIA (g), 350 g/l (2010); izdelek vsebuje: max. 235 g/l
EFEKT POKRIVNA BARVA	zelena	lit.	0,75	EU VOC kategorija in meje: IIB (e), 840 g/l (2007); izdelek vsebuje: max. 650 g/l
EFEKT POKRIVNA BARVA	bakrena	lit.	0,75	EU VOC kategorija in meje: IIB (e), 840 g/l (2007); izdelek vsebuje: max. 650 g/l
EFEKT POKRIVNA BARVA	modra	lit.	0,75	EU VOC kategorija in meje: IIB (e), 840 g/l (2007); izdelek vsebuje: max. 650 g/l

Protective coatings for metal

SYNTOL - Protection system for metal on solvent base

		me	emb	voc
EFEKT POKRIVNA BARVA	srebrna	lit.	0,75	EU VOC kategorija in meje: IIB (e), 840 g/l (2007); izdelek vsebuje: max. 650 g/l
EFEKT POKRIVNA BARVA	siva	lit.	0,75	EU VOC kategorija in meje: IIB (e), 840 g/l (2007); izdelek vsebuje: max. 650 g/l
EFEKT POKRIVNA BARVA	črna	lit.	0,75	EU VOC kategorija in meje: IIB (e), 840 g/l (2007); izdelek vsebuje: max. 650 g/l
EPOLOR HB	bela	kom	1	EU VOC kategorija in meje: IIA (j), 500 g/l (2010); izdelek vsebuje: max. 500 g/l
EPOLOR HB	zelena	kom	1	EU VOC kategorija in meje: IIA (j), 500 g/l (2010); izdelek vsebuje: max. 500 g/l
EPOLOR HB	rjava	kom	1	EU VOC kategorija in meje: IIA (j), 500 g/l (2010); izdelek vsebuje: max. 500 g/l
EPOLOR HB	srebrna	kom	1	EU VOC kategorija in meje: IIA (j), 500 g/l (2010); izdelek vsebuje: max. 500 g/l
EPOLOR HB	siva	kom	1	EU VOC kategorija in meje: IIA (j), 500 g/l (2010); izdelek vsebuje: max. 500 g/l
EPOLOR HB	črna	kom	1	EU VOC kategorija in meje: IIA (j), 500 g/l (2010); izdelek vsebuje: max. 500 g/l

Varnishes for wooden floor

BUKOLIT -Polyurethane varnish for woden floor

		me	emb	voc
BUKOLIT sijaj - brez razredčila	komponenta A	lit.	1	EU VOC kategorija in meje: IIA (j), 550 g/l (2007); izdelek vsebuje: max. 550 g/l
BUKOLIT sijaj - brez razredčila	komponenta B	lit.	1	EU VOC kategorija in meje: IIA (j), 550 g/l (2007); izdelek vsebuje: max. 550 g/l
BUKOLIT sijaj - brez razredčila	komponenta A	lit.	2,5	EU VOC kategorija in meje: IIA (j), 550 g/l (2007); izdelek vsebuje: max. 550 g/l
BUKOLIT sijaj - brez razredčila	komponenta B	lit.	2,5	EU VOC kategorija in meje: IIA (j), 550 g/l (2007); izdelek vsebuje: max. 550 g/l
BUKOLIT	garnitura sijajna	kom	10 m^2	EU VOC kategorija in meje: IIA (j), 550 g/l (2007); izdelek vsebuje: max. 550 g/l
BUKOLIT	garnitura sijajna	kom	20 m^2	EU VOC kategorija in meje: IIA (j), 550 g/l (2007); izdelek vsebuje: max. 550 g/l
BUKOLIT	garnitura POLMAT	kom	20 m^2	EU VOC kategorija in meje: IIA (j), 550 g/l (2007); izdelek vsebuje: max. 550 g/l

PARKETIN -Varnish for wooden foor

		me	emb	voc
PARKETIN	garnitura sijajna	kom	20 m^2	EU VOC kategorija in meje: IIA (j), 550 g/l (2007); izdelek vsebuje: max. 550 g/l

AQUALIT - Varnish for wooden floor, parquet floor

		me	emb	voc
AQUALIT	sijajni	lit.	1	EU VOC kategorija in meje: IIA (i), 140 g/l (2010); izdelek vsebuje: max. 110 g/l
AQUALIT	sijajni	lit.	3	EU VOC kategorija in meje: IIA (i), 140 g/l (2010); izdelek vsebuje: max. 110 g/l

Dispersive paints

		me	emb	voc
DICOL- zidna barva	bela	*lit.*	2	EU VOC kategorija in meje: IIA (a), 30 g/l (2010); izdelek vsebuje: max. 1 g/l
DICOL- zidna barva	bela	lit.	5	EU VOC kategorija in meje: IIA (a), 30 g/l (2010); izdelek vsebuje: max. 1 g/l
DICOL- zidna barva	bela	lit.	15	EU VOC kategorija in meje: IIA (a), 30 g/l (2010); izdelek vsebuje: max. 1 g/l
SYNKOLIT		lit.	5	EU VOC kategorija in meje: IIA (a), 30 g/l (2010); izdelek vsebuje: max.10 g/l
SYNKOLIT		lit.	15	EU VOC kategorija in meje: IIA (a), 30 g/l (2010); izdelek vsebuje: max.10 g/l

Facade system

		me	emb	voc
AKRILNA ZIDNA IMPREGNACIJA		lit.	1	EU VOC kategorija in meje: IIA (h), 30 g/l (2010); izdelek vsebuje: max. 1 g/l
AKRILNA ZIDNA IMPREGNACIJA		lit.	10	EU VOC kategorija in meje: IIA (h), 30 g/l (2010); izdelek vsebuje: max. 1 g/l
AQUAFAS FASADNA BARVA	bela	lit.	5	EU VOC kategorija in meje: IIA (c), 40 g/l (2010); izdelek vsebuje: max. 25 g/l
AQUAFAS FASADNA BARVA	bela	lit.	15	EU VOC kategorija in meje: IIA (c), 40 g/l (2010); izdelek vsebuje: max. 25 g/l

Other

		me	emb	voc
COLOR BARVA 500 C		lit.	0,75	EU VOC kategorija in meje: IIB (e), 840 g/l (2007); izdelek vsebuje: max. 650 g/l
PBF TEMELJ ZA BARVNE KOVIN	rdeča	lit.	0,75	EU VOC kategorija in meje: IIB (c), 780 g/l (2007); izdelek vsebuje: max. 750 g/l
PBF TEMELJ ZA BARVNE KOVIN	siva	lit.	0,75	EU VOC kategorija in meje: IIB (c), 780 g/l (2007); izdelek vsebuje: max. 750 g/l

Akril emulzija	EU VOC (kat. A/g) 50 g/l (2007) 30 g/l (2010)
	AKRIL EMULZIJA max. 18 g/l VOC
Unigrund	EU VOC (kat. A/g) 50 g/l (2007) 30 g/l (2010)
	UNIGRUND max. 4 g/l VOC
Jukol	EU VOC (kat. A/g) 50 g/l (2007) 30 g/l (2010)
	JUKOL max. 36 g/l VOC
Jubosil GX	EU VOC (kat. A/g) 50 g/l (2007) 30 g/l (2010)
	JUBOSIL GX max. 48 g/l VOC
Jubosil G	EU VOC (kat. A/g) 50 g/l (2007) 30 g/l (2010)
	JUBOSIL G max. 1,6 g/l VOC
Jubosil GF	EU VOC (kat. A/g) 50 g/l (2007) 30 g/l (2010)
	JUBOSIL GF max. 5 g/l VOC
Jubosil EX	EU VOC (kat. A/g) 50 g/l (2007) 30 g/l (2010)
	JUBOSIL EX max. 12 g/l VOC
Vezakril	EU VOC (kat. A/g) 50 g/l (2007) 30 g/l (2010)
	VEZAKRIL max. 4 g/l VOC
Marmorin emulzija	EU VOC (kat. A/g) 50 g/l (2007) 30 g/l (2010)
	MARMORIN EMULZIJA max. 0,02 g/l VOC
Antinikotinska barva	EU VOC (kat. A/h) 750 g/l (2007) 750 g/l (2010)
	ANTINIKOTINSKA BARVA max. 490 g/l VOC
Denikol	EU VOC (kat. A/g) 50 g/l (2007) 30 g/l (2010)
	DENIKOL max. 0,4 g/l VOC
Jupol	EU VOC (kat. A/a) 75 g/l (2007) 30 g/l (2010)
	JUPOL max. 0,2 g/l VOC
Jupol citro	EU VOC (kat. A/a) 75 g/l (2007) 30 g/l (2010)

	JUPOL CITRO max. 0,2 g/l VOC
Jupol koncentrat	EU VOC (kat. A/a) 75 g/l (2007) 30 g/l (2010)
	JUPOL KONCENTRAT max. 11 g/l VOC
Jupol rustikal	EU VOC (kat. A/a) 75 g/l (2007) 30 g/l (2010)
	JUPOL RUSTIKAL max. 0,2 g/l VOC
Jupol trend	EU VOC (kat. A/a) 75 g/l (2007) 30 g/l (2010)
	JUPOL TREND max. 0,1 g/l VOC
Jupol junior	EU VOC (kat. A/a) 75 g/l (2007) 30 g/l (2010)
	JUPOL TREND max. 0,1 g/l VOC
Jupol gold	EU VOC (kat. A/a) 75 g/l (2007) 30 g/l (2010)
	JUPOL GOLD max. 0,1 g/l VOC
Jupol special	EU VOC (kat. A/a) 75 g/l (2007) 30 g/l (2010)
	JUPOL SPECIAL max. 0,1 g/l VOC
Jupol briljant	EU VOC (kat. A/a) 75 g/l (2007) 30 g/l (2010)
	JUPOL BRILJANT max. 0,1 g/l VOC
Jupol silikat	EU VOC (kat. A/a) 75 g/l (2007) 30 g/l (2010)
	JUPOL SILIKAT max. 0,2 g/l VOC
Jupol lateks mat	EU VOC (kat. A/a) 75 g/l (2007) 30 g/l (2010)
	JUPOL LATEKS MAT max. 0,1 g/l VOC
Jupol lateks saten	EU VOC (kat. A/b) 150 g/l (2007) 100 g/l (2010)
	JUPOL LATEKS SATEN max. 0,5 g/l VOC
Jupol lateks polmat	EU VOC (kat. A/b) 150 g/l (2007) 100 g/l (2010)
	JUPOL LATEKS POLMAT max. 0,5 g/l VOC
Jupol ekonomik	EU VOC (kat. A/a) 75 g/l (2007) 30 g/l (2010)
	JUPOL EKONOMIK max. 0,2 g/l VOC

REC Data collection **Phase 1 [Decopaint products]** **Productlist of the company: JUB [Slovenia]**

Bio apnena notranja barva	EU VOC (kat. A/a) 75 g/l (2007) 30 g/l (2010)
	BIO APNENA NOTRANJA BARVA max. 3 g/l VOC
Belol	EU VOC (kat. A/a) 75 g/l (2007) 30 g/l (2010)
	BELOL max. 0,2 g/l VOC
Jubosil antik	EU VOC (kat. A/a) 75 g/l (2007) 30 g/l (2010)
	JUBOSIL ANTIK max. 41 g/l VOC
Amikol	EU VOC (kat. A/a) 75 g/l (2007) 30 g/l (2010)
	AMIKOL max. 2 g/l VOC
Uniton	EU VOC (kat. A/a) 75 g/l (2007) 30 g/l (2010)
	UNITON max. 70 g/l VOC
Artcolor	EU VOC (kat. A/b) 150 g/l (2007) 100 g/l (2010)
	ARTCOLOR max. 82 g/l VOC
Akrildekor	EU VOC (kat. A/k) 150 g/l (2007) 100 g/l (2010)
	AKRILDEKOR max. 11 g/l
Emajl primer	EU VOC (kat. A/d) 150 g/l (2007) 130 g/l (2010)
	EMAJL PRIMER max. 75 g/l VOC
Jubin emajl	EU VOC (kat. A/d) 150 g/l (2007) 130 g/l (2010)
	JUBIN EMAJL max. 48 g/l VOC
Metal primer	EU VOC (kat. A/d) 150 g/l (2007) 130 g/l (2010)
	METAL PRIMER max. 81 g/l VOC
Jubin lasur	EU VOC (kat. A/e) 150 g/l (2007) 130 g/l (2010)
	JUBIN LASUR max. 20 g/l VOC
Acrylcolor	EU VOC (kat. A/c) 75 g/l (2007) 40 g/l (2010)
	ACRYLCOLOR max. 27 g/l VOC
Revitalcolor	EU VOC (kat. A/c) 75 g/l (2007) 40 g/l (2010)

AG	REVITALCOLOR AG max. 5 g/l VOC
Acrylcolor relief	EU VOC (kat. A/c) 75 g/l (2007) 40 g/l (2010)
	ACRYLCOLOR RELIEF max. 4 g/l VOC
Takril	EU VOC (kat. A/c) 75 g/l (2007) 40 g/l (2010)
	TAKRIL max. 32 g/l VOC
Jubosil F	EU VOC (kat. A/c) 75 g/l (2007) 40 g/l (2010)
	JUBOSIL F max. 6 g/l VOC
Jubosil FX	EU VOC (kat. A/c) 75 g/l (2007) 40 g/l (2010)
	JUBOSIL FX max. 24 g/l VOC
Revitalcolor SI	EU VOC (kat. A/c) 75 g/l (2007) 40 g/l (2010)
	REVITALCOLOR SI max. 10 g/l VOC
Bio apnena fasadna barva	EU VOC (kat. A/c) 75 g/l (2007) 40 g/l (2010)
	BIO APNENA FASADNA BARVA max. 0,1 g/l VOC
Epoksil A+B	EU VOC (kat. A/j) 140 g/l (2007) 140 g/l (2010)
	EPOKSIL A+B max. 131 g/l VOC
Lasur primer	EU VOC (kat. A/h) 50 g/l (2007) 30 g/l (2010)
	LASUR PRIMER max. 42 g/l VOC
Jubosil H	EU VOC (kat. A/h) 750 g/l (2007) 750 g/l (2010)
	JUBOSIL H max. 385 g/l VOC
Jupol bianco	EU VOC (kat. A/a) 75 g/l (2007) 30 g/l (2010)
	JUPOL BIANCO max. 0,2 g/l VOC
Jupol speciale	EU VOC (kat. A/a) 75 g/l (2007) 30 g/l (2010)
	JUPOL SPECIALE max. 0,1 g/l VOC
Jupol quarzo	EU VOC (kat. A/c) 75 g/l (2007) 40 g/l (2010)
	JUPOL QUARZO max. 0,2 g/l VOC

Name of Producer	Product groups	Address	Phone number	E-mail address	Home page
HENKEL SLOVENIJA D.O.O.	Cleaners	INDUSTRIJSKA ULICA 23 2000 MARIBOR	00386 2-2222-161	henkel.slovenija@henkel.at	WWW.HENKEL.SI, WWW.PRAZNIK-LEPOTE.SI
FENOLIT D.D.	Adhesive	BREG PRI BOROVNICI 22 1353 BOROVNICA	00386 41 788 421	INFO@FENOLIT.SI	WWW.FENOLIT.SI
ECOLAB D.O.O.	Cleaners	VAJNGERLOVA ULICA 4 2000 MARIBOR	00386 2-429-31-16	MOJCA.GOLNER@ECOLAB.COM	
MITOL D.D., SEŽANA	Adhesive	PARTIZANSKA CESTA 78 6210 SEŽANA	00386 5-7312 300	TAJNISTVO@MITOL.SI	
ILIRIJA -L KOZMETIKA, d.o.o.	Cosmetic (body, hair) ethanol	TRŽAŠKA CESTA 40 1000 LJUBLJANA	00386 1 470 92 70	info@ilirija.si	WWW.LEKKOZMETIKA.SI
KOZMETIKA AFRODITA d.o.o. Rogaška Slatina	Cosmetics (body and hair) ethanol	KIDRIČEVA ULICA 54 3250 ROGAŠKA SLATINA	00386 3-8121160	KOZMETIKA.AFRODITA@SIOL.NET	
UNIHEM, D.O.O., LJUBLJANA	Adhesive	LJUBLJANA, KAJAKAŠKA CESTA 30 1211 LJUBLJANA ŠMARTNO	00386 1-300-76-50	helena.podgorsek@unihem.si	
KIMI D.O.O.	Cleaners	PLANJAVA 1 1236 TRZIN	00386 1 530-05-64	INFO@KIMI.SI, KIMI@KIMI.SI	
BELINKA KEMOSTIK, D.O.O.	Adhesives	MEKINJE, MOLKOVA POT 10 1241 KAMNIK	00386 1 8303772	KEMOSTIK@BELINKA.SI	WWW.BELINKA.SI
TEHNOCHEM D.O.O.	Parfumes, toilets products	JURJEVICA 49 1310 RIBNICA	00386 31-758-242	stanka.grasic@tehnochem.si	
INTER KOOP D.O.O.	Cleaners	ULICA HEROJA ŠARANOVIČA 34 2000 MARIBOR	00386 2-250-45-30	MAJDA.SAKELSEK@INTER-KOOP.SI	
ECOT D.O.O.	Auto cosmetics	LJUBLJANA, BRNČIČEVA ULICA 11 1231 LJUBLJANA-ČRNUČE	00386 1 530 20 30	INFO@ECOT.SI	
IRBIS, d.o.o., Ilirska Bistrica	Professional cleaners	KOSEZE 32C 6250 ILIRSKA BISTRICA	00386 5 710 02 81	info@irbis.si	
DONISTIK, d.o.o., Tržič	Adhesive other chemical products	PRISTAVA, MLAKA 10 4290 TRŽIČ			
KEMIS PLUS D.O.O.	Adhesive	PRESERJE PRI RADOMLJAH, KAJUHOVA ULICA 4 1235 RADOMLJE	00386 1 722 75 47	KEMISPLUS@SIOL.NET	
ROLINE D.O.O.	Cleaners, polish, airfresh	HUDO, HUJSKA CESTA 5 1235 RADOMLJE	00386 1 724 62 63	ROLINE@SIOL.NET	

Name of Producer	Product groups	Address	Phone number	E-mail address	Home page
PROKEMING d.o.o.	Cleaners	KOŠENICE 47 8000 NOVO MESTO	00386 7-334-70-64		
MULLER IPM D.O.O.	Perfumes, toilets products	LOKA PRI MENGŠU, TESTENOVA ULICA 78 1234 MENGEŠ	00386 1 723 04 36	MULLERCOSMETICS @SIOL.NET	
SIB, D.O.O., CERKLJE	Cleaners, cosmetics	ULICA ANTONA KODRA 11 4207 CERKLJE NA GORENJSKEM	003864 252-12-75		
GET POVER D.O.O.	Perfumes, toilets products	KERSNIKOVA ULICA 19 3000 CELJE	00386 3 491 13 30	get.power@siol.net	
DETERCHEM D.O.O.	Cleaners	DEKANI 3A 6271 DEKANI	00386 5 6699-571		
ROLANDO D.O.O.	Perfumes, toilets products	DOL PRI HRASTOVLJAH 41 6275 ČRNI KAL	00386 5 630 09 50		
VITRAX, d.o.o., Kranjska Gora	Cleaners	PODKOREN 74E 4280 KRANJSKA GORA	00386 4-588-12-88		
SILVER COMMERCE, D.O.O.	Cleaners	BRATOVŠEVA PLOŠČAD 5 1000 LJUBLJANA	445812		
KIKO KOVIČ D.O.O.	Cleaners	SELO PRI IHANU 27 1230 DOMŽALE	00386 1 724 18 18	ALOJZKOVIC@SIOL.NET	
DSP D.O.O.	Cleaners	GASILSKA CESTA 12 1290 GROSUPLJE			
NARAVNA KOZMETIKA d.o.o. - v stečaju		CESTA V GORICE 36 1000 LJUBLJANA	00386 5/6720015	INFO@MEDITERANEA.COM	WWW.MEDITERANEA.COM
BIOKOR d.o.o.	cleaners, soaps	ZILJE 55 8344 VINICA	00386 4/5121842		
FLAMA IZDELOVANJE ČISTIL FLEISCHMANN MAJDA S.P.	cleaners	TRUBARJEVA ULICA 3 1234 MENGEŠ	00386 7 237790		
KEMPLAST KEMIČNI IZDELKI IN PREDELAVA PLASTIČNIH MAS ALMA NOVLJAN S.P.	cleaners	OBRTNIŠKA ULICA 1 1230 DOMŽALE			
JANEŽ PAVEL S.P.	cleaners	NOVI DOM 44A 1420 TRBOVLJE			
LEROY - DVE d.o.o., Ribnica	Cleaners	GRIČ, CESTA III 1 1310 RIBNICA	00386 1 836-2605		
MATEJA LIMOVŠEK S.P. - NIBO ČISTILA	Cleaners	ZABORŠT, ŠUMBERŠKA CESTA 18 1230 DOMŽALE			
VRANEŠIČ & Co d.n.o.	Cleaners	TRIBUČE 54 8340 ČRNOMELJ			
ALOJZ ČERNAČ S.P.	Cleaners	DRAGOMER, VRTNA POT 9 1351 BREZOVICA PRI LJUBLJANI	00386 1 7565215	REXAL@AMIS.NET	
ERŽEN LJUBICA S.P.	Cleaners	LJUBLJANA, BRNČIČEVA ULICA 11 1231 LJUBLJANA-ČRNUČE			
NURDIN BAJRAMOVIĆ S.P. - KOZMOBIS	Perfumes, toilets products	STEGNE 25A 1000 LJUBLJANA	00386 41 732 182		

Name of Producer	Product groups	Address	Phone number	E-mail address	Home page
TOMAŽ MUNIH, S.P.	Perfumes, toilets products	ŽAGARJEVA ULICA 9 5220 TOLMIN		munih32@gmail.com	
DROGESAN - IZDELOVANJE PARFUMOV IN TOALETNIH SREDSTEV IN TRGOVINA NA DROBNO MARJETA BENČINA S.P.	Perfumes, toilets products	PREŠERNOVA ULICA 19 4000 KRANJ			
IZDELOVANJE MAZIL ZA MASAŽO KONC JANEZ S.P.	Cosmetics (body)	PODREBER 26 4202 NAKLO			
PROTEA KOZMETIKA BEGEŠ NATAŠA S.P.	Perfumes, toilets products	NA TRATI 59 4248 LESCE			
SOAN SONJA ŽORŽ S.P.	Perfumes, toilets products	IZOLA, ZAPRTA ULICA 1 6310 IZOLA - ISOLA			
MARIA PLAUTZ S.P.	Perfumes, toilets products	PIRAN, ROZMANOVA ULICA 1 6330 PIRAN - PIRANO			
PROTOKOL VP d.o.o.	Cleaners	BUKOVICA 47A 5293 VOLČJA DRAGA	00386 5 338 55 00	goran.zivec@pejo-sampionka.si	
SIMETRY d.o.o.	Perfumes, toilets products	VOJKOVA CESTA 58 1000 LJUBLJANA			
PARFUMMELE d.o.o.	Perfumes, toilets products	HARDEK 44C 2270 ORMOŽ			
BIM * Murska Sobota d.o.o. - V STEČAJU	Cleaners	CIRIL METODOVA ULICA 50 9000 MURSKA SOBOTA	00386 2/5321501		
SVITA d.o.o.	Cleaners	GOTOVLJE 75 3310 ŽALEC			
KUPALA IRENA REGOVEC s.p.	Cleaners	RUSJANOV TRG 8 1000 LJUBLJANA			

Content of VOCs
Data collection from websites

Name of Company	Interior paints	Exterior paints	Trim wood/metal	Varnish and woodstains	Primers	Decorative effect painting	Multi-coloured coatings
ANNA WEISS PRODART SRL	22,50%	25%	N/A	N/A	75%	N/A	40%
ATLAS CORPORATION	24 g/L	24 g/L	max 105 g/l	max 105 g/l	max 45 g/l	24 g/L	N/A
Azur	max 40%	max 40%	max 33-34%	max 50% +/- 3%	max 30%	N/A	N/A
Chimcolor S.A.	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SC CIBICOLOR SRL	34% - 40%	16% - 25%	N/A	aprox. 50%	aprox. 60%	max 45%	N/A
dufa-DEUTEK	40%	36%	N/A	37& - 42&	27%	25%	N/A
SC FABRYO CORPORATION SRL	N/A	N/A	N/A	N/A	N/A	N/A	N/A
IR Colours	max 29 g/L	max 28 g/L	N/A	N/A	max 26 g/L	max. 38 g/L	N/A
KOBER	33% (calculated for 0.5g,150cm², 125°C, 25 mins)	33% (calculated for 0.5g,150cm², 125°C, 25 mins)	max 36%	N/A	max 33% (calculated for 1g/100cm², 125°C, 25 mins)	33% (calculated for 0.5g,150cm², 125°C, 25 mins)	N/A
Policolor S.A.	40% (1g/100cm², 120°C, 25 mins)	40% (1g/100cm², 120°C, 25 mins)	35% - 45%	58% - 60% (at 125°C±2°, 2hours)	N/A	N/A	N/A

Name of Company	Address	Contact				Contact person
		Phone	Fax	E-mail	Web	
ANNA WEISS PRODART SRL	B-dul Dimitrie Cantemir nr.19, sect.4, Bucuresti	021 345 66 44	021 345 55 66	office@anaweiss.gtsmail.ro anaweiss@go.ro	www.anaweiss.ro	N/A
ATLAS CORPORATION	Sos. Pipera, nr. 59, Bucuresti	021 230.87.77	021 230.87.60	info@atlascorporation.ro	www.atlastrading.ro	N/A
Azur	Bulevardul Constructorilor Nr. 1-3 Timisoara 300571	0256-222139	0256-222179	N/A	www.azur.ro	**Alina Bostioca** - Brand Manager Tel: 0722.328305 E-mail: alina.bostioca@azur.ro
Chimcolor S.A.	Bd Pompei Dimitrie,prof., Nr. 10 Sect. 2, Bucuresti	021/2422092 021/2423275	021/2422653	N/A	www.chimcolor.ro	**Aldea Marioara**
SC CIBICOLOR SRL	DRUMUL BELSUGULUI 20-24, SECTOR 6,	021 3172785	021 4934042	office@cibicolor.ro cibicolor@yahoo.com	www.cibicolor.ro	**Adam Ioana**
dufa-DEUTEK	Str. Catanoaia nr. 33, Bucuresti - sector 3	021 256 03 85	021 256 03 79	office@dufa.ro	www.dufa.ro	N/A
SC FABRYO CORPORATION SRL	Sos. Oltenitei nr. 202B, Popesti Leordeni, Jud Ilfov	021 405.50.25	021 405.50.26	office@fabryo.com	www.fabryo.com	N/A
IR Colours	Calea Bucuresti 91 075100 Otopeni, jud. Ilfov	021 300 75 47 021 300 75 48	021 300 75 49	ircolours@ircolours.ro	www.ircolours.ro	N/A
KOBER	Turturesti - GIROV, judetul Neamt	0233.207.800 0233.207.930	0233.234.450 0233.290.700	office@kober.ro	www.kober.ro	**Stefan Barna**-Director Marketing Tel.: 0233.207.864; 0233.207.866; mobil: 0722 731 921 email: stefan.barna@kober.ro
Policolor S.A.	Bd. Theodor Pallady nr. 51, sector 3, Bucuresti	021 345 17 30	021 345 19 30	policolor@policolor.ro	www.policolor.ro	N/A

Company	Contact data					Products	VOC contents
	Address	Phone	Fax	E-mail	Web		
SC FABRYO CORPORATION SRL	Sos. Oltenitei nr. 202B, Popesti Leordeni, Jud Ilfov	0040 21 405.50.25	0040 21 405.50.26	office@fabryo.com	www.fabryo.com	adhesives for wood and furniture	N/A
						adhesives for construction	N/A
KOBER	Turturesti - GIROV, judetul Neamt	0040 233.207.800 0040 233.207.930	0040 233.234.450 0040 233.290.700	office@kober.ro	www.kober.ro	adhesives for construcyion and parquet	59 ± 2% (calculated for 0.7-0.9g/100 cm², at 125°C, 25 mins)
						adhesive for wood furniture	55 ± 2% (calculated for 0.7-0.9g/100cm², at 120°C, 60 mins)
						adhesive for wall paper	ecological product
SC Gabbro SRL Com	Sinmihaiul Roman 1936, Loc. Utvin, nr.431, Judetul Timis	0040 256 290.417	0040 256 290.417	gabbro@mail.dnttm.ro	www.ceradez.ro	adhesive for interior/ exterior	N/A
Soceram	B-dul. I.C. Bratianu nr.10, sect.3, Bucuresti	0040 21 315.17.90	0040 21 315.14.65	N/A	www.soceram.ro	adhesives for interior/exterior	N/A

Company	Contact data					Products	VOC contents
	Address	Phone	Fax	E-mail	Web		
Azur	Bulevardul Constructorilor Nr. 1-3 Timisoara 300571	0040 256-222139	0040 256-222179	N/A	www.azur.ro	fluted coating	13- 17%
Policolor S.A.	Bd. Theodor Pallady nr. 51, sector 3, Bucuresti	0040 21 345 17 30	0040 21 345 19 30	policolor@policolor.ro	www.policolor.ro	marmurino coating	35% (calculated for 1g/100cm²/ 120°C, 25 mins)

Company	Contact data					Products	VOC contents
	Address	Phone	Fax	E-mail	Web		
Azur	Bulevardul Constructorilor Nr. 1-3 Timisoara 300571	0040 256-222139	0040 256-222179	N/A	www.azur.ro	cleaners for wood, metal, leather surfaces	N/A
SC CIBICOLOR SRL	DRUMUL BELSUGULUI 20-24, SECTOR 6,	0040 21 3172785	0040 21 4934042	office@cibicolor.ro cibicolor@yahoo.com	www.cibicolor.ro	wall disinfectant	max. 73%
SC Tehnic Cerabam SRL	Str. Ing. A. Saligny nr.17A, cod 300588, Timisoara	0040 256 486.804	0040 256 486.804	office@tehnic-ceraban.ro	www.tehnic-ceraban.ro	industrial cleaners	N/A

Company	Contact data					Products	VOC contents
	Address	Phone	Fax	E-mail	Web		
KOBER	Turturesti - GIROV, judetul Neamt	0233.207.800 0233.207.930	0233.234.450 0233.290.700	office@kober.ro	www.kober.ro	paint aerosols for cars	693 g/L (out of 840 g/L permitted)
						car varnish	660 g/L (out of 840 g/L permitted)
						rim paint	650 g/L (out of 840 g/L permitted)
						primers for plastic surfaces	745 g/L (out of 840 g/L permitted)
Temad CO SRL	Sos. Feldioarei 64, Brasov-500483, RO	0040 268 506.108 0040 268 506.109	0040 268 419.340	office@temad.ro	www.temad.ro	paint aerosols for cars	N/A
						car enamels	N/A

REC Data collection **Phase 1 [Decopaint products]** **List of producers [Bulgaria]**

No.	Bulgarian Producer Name	**Telefon number**	List of product by Directive Subcategories	National sales of the products in year 2007	content of national sales 2007
1.	Aglaya Ivan OOD - Vidin				
	Alexander Radulov - manager	**00359 (094)601939**	Interior glossy walls and ceilings and primers(kat. A/)	52000,800 kg	
2.	DAL OOD - Mizia				
	dal.mizia@dir.bg	**00359(09161)2270**	Interior walls(kat.A/b) - 2,68g/l VOC	1 800 000kg	**2,68g/l**
	Petar Krushovenski - manager	**00359(0889)201641**	Interior walls hydro (kat.A/b) - 1,64g/l VOC		**1,64g/l**
3.	ORGAHIM - Ruse				
	desislava.tsoneva@orgachim.bg	**00359(082)886371**	**Interior glossy walls and ceilings (Gloss >25@60°)**		
	Desislava Tsoneva -ecology		Deko Professional Gloss (katA/b)	465kg	
			Interior/exterior trim varnishes and woodstains, including opaque woodstains		
			Blago varnishes universal (katA/e)	13141kg	
			Woodstains WB (katA/e)	260kg	
			Leko Yacht varnish (katA/e)	110356kg	
			Varnish for furniture WB(katA/e)	22kg	
			Varnish transperant(katA/e)	378kg	
			Haleon AQUA woodstain(katA/e)	31689kg	
			Leko cellulose nitrate varnish gloss and mat(katA/e)	34465kg	
			Vehicle Refinishing Products		
			Removal preparatory for old paints(kat B/a)	670kg	
			Bodyfillerf or black metals(kat B/b)	5kg	
			Poliester Bodifiller for cars(kat B/b)	15799kg	

No.	Bulgarian Producer Name	**Telefon number**	List of product by Directive Subcategories	National sales of the products in year 2007	content of national sales 2007
			Surface primer for cars(ka B/c)	495kg	
			General primer(kat.B/c)	6144kg	
			Special finish avtoemailak(kat.B/d)	45714kg	
			Average VOC content for all products		**346g/l**
4.	KOLORA AD - Sofiq				
	info@kolora.bg	**00359(02)9963391**	Alkyd paints (kat A/b) -	22268kg	1960kg
		00359(02)9963324	Trim varnishes extra(kat. A/e)	106 103kg	12 057kg
			Quickly dry linseed oil PK-01(kat. A/f)	2 544kg	2 120kg
			Trim varnish Kolorin (kat. A/e)	3 860kg	486kg
			Trim varnish and avto-trim vernish(kat. A/e)	7 657kg	676kg
			2K acryl glaze varnish and varnish(kat. A/e)	1 864kg	200kg
			Paint for horizontal road marking	210 234kg	37 590kg
			Glaze varnishes HS(kat. A/e)	2 824kg	300kg
			Glaze varnishes M60/HS(kat. A/e)	3 710kg	2 226kg
			Heatproof varnish(kat. A/e)	1 582kg	950kg
			Glaze varnishes GF-15(kat.A/e)	2890kg	752kg
			Alkyd primers (kat.A/g)	157kg	80kg
			Primer HS - 01(kat.A/g)	61 088kg	16 371kg
			Primer acryl(kat.A/g)	6792kg	3 396kg
			Swimming pool paint (kat A/i)	195kg	15kg
			Varnish BT-58	661kg	400kg
			Cinex 800 AU - Binding primer(kat.A/h)	2985kg	600kg
			Congealer DN 18	637kg	500kg

No.	Bulgarian Producer Name	**Telefon number**	List of product by Directive Subcategories	National sales of the products in year 2007	content of national sales 2007
			Average VOC content for all products	**total: 442 711kg/438 266l**	**total: 83 208kg/97 964l**
5.	UNIVERSALSTROI OOD - Dalbok Dol				
		00359(888)849910	**Interior glossy walls and ceilings (Gloss >25@60°)**		
		00359(06955)314	Interior mat walls and ceilings(kat.A/b) - 15g/l VOC	234 238kg	2195,98g/l
			Exterior walls mineral base(kat.A/b) - 30g/l VOC	65999kg	1365,49 g/l
			Primers(kat A/g) - 35g/l VOC	7440kg	260,40 g/l
			Interior/exterior trim varnishes and woodstains, including opaque woodstains		
			Trim varnish(kat A/e) - 600g/l VOC	2146kg	1430,66g/l
			Yacht varnish (katA/e) -490g/l VOC	2101kg	1143,87g/l
			Varnishes universal (katA/e) - 490g/l VOC	1569kg	854,23g/l
			One-pack performance coatings		
			Alkyd paint(kat A/i) - 380g/l VOC	35755kg	9704,92g/l
			Alkyd primer(kat A/i) - 380g/l VOC	39662kg	10047,70g/l
			Average VOC content for all products		**0,1048g/l**
6.	KUPRO 94 EOOD - Gorna Oriahovitsa				
		00359 (0618)60049	Interior glossy walls and ceilings(kat.A/b)	300 000kg	50 000kg
			Interior/exterior trim varnishes and woodstains, including opaque woodstains(kat A/e)	70 000kg	40 000 kg
			Vehicle Refinishing Products(kat B)	10 000kg	3 000kg
7.	TOPLIVO AD - Shumen				

No.	Bulgarian Producer Name	**Telefon number**	List of product by Directive Subcategories	National sales of the products in year 2007	content of national sales 2007
		00359(052)750197	Interior glossy walls and ceilings(kat.A/b)Interior/exterior trim varnishes(kat A/e)	11582l	
			Vehicle Refinishing Products(kat B)	275l	
8.	HBG - KOMERS EOOD - Shumen				
		00359(054)832181	Interior glossy walls and ceilings(kat.A/b)Interior/exterior trim varnishes(kat A/e)	130 570l	
			Vehicle Refinishing Products(kat B)	48 930l	
9.	LAKPROM - Sofia		**Didn't provide information**		
	Irina Yocheva - ecology expert	**00359(02)9963247**			
		00359(02)9963142			
10.	CHIMATECH - Sofia				
	Kalinka Stoichkova - expert ecology	**00359(02)9651 258**	**Interior glossy walls and ceilings (Gloss >25@60°)**		
		00359(02)9651234	Interior glossy walls and ceilings antibacterial(kat.A/a)	315kg	70g/l
			Binding primer Sylicat(kat A/h)	322kg	750g/l
			One-pack performance coatings		
			Vynil glaze varnishes(kat A/i)	474kg	600g/l
			Vynil primer(kat A/i)	5kg	600g/l
			Chlorinerubber glaze varnishes(kat A/i)	101kg	600g/l
			Chlorinerubber primer(kat A/i)	41kg	600g/l
			Sylicon glaze varnish(kat.A/i)	5kg	600g/l
			Electro insulation varnish(katA/i)	126kg	600g/l

No.	Bulgarian Producer Name	**Telefon number**	List of product by Directive Subcategories	National sales of the products in year 2007	content of national sales 2007
			Electro insulation varnish EV-36 (katA/i)	8982kg	600g/l
			Heat resistant varnish(kat A/i)	30kg	560g/l
			Heat resistant ferolyt(kat A/i)	34kg	560g/l
			Flame resistant paint Antiplam(kat A/i)	100kg	470g/l
			Paint for horizontal road marking	5kg	400g/l
			Flame resistant wood varnish(kat A/i)	351kg	600g/l
			Glaze varnish KC-71(kat.A/i)	225kg	600g/l
			Glaze varnish XB-54(kat A/i)	64kg	600g/l
			Adhesive BL-2 (kat A/i)	1581kg	600g/l
			Varnish NC-512(kat A/i)	5kg	600g/l
			Varnish XB-5179 G(kat A/i)	10kg	600g/l
			Alcyd varnish AF-98(kat A/i)	104kg	400g/l
			Alcyd primer(kat A/i)	50kg	350g/l
			Two-pack reactive performance coatings for specific end use such as floors		
			Epoxic glaze varnish EP-98(katA/j)	2131kg	50g/l
			Epoxic glaze varnish EP-65(katA/j)	6kg	280g/l
			Epoxic glaze varnish EP-710(katA/j)	81kg	200g/l
			Epoxic glaze varnish EP-12(katA/j)	22kg	280g/l
			Epoxic concrete primer (katA/j)	1348kg	500g/l
			Epoxid primer for universal use(kat A/j)	29kg	300g/l
			Epoxic Zinc phosphide primer(kat A/j)	198kg	290g/l
			Zinc-epoxy primer(kat A/j)	350kg	290g/l

No.	Bulgarian Producer Name	**Telefon number**	List of product by Directive Subcategories	National sales of the products in year 2007	content of national sales 2007
			Epoxy paste K(kat A/j)	285kg	0
			Epoxy paste D(kat A/j)	384kg	0
			Epoxy structure G(kat A/j)	170kg	0
			Polymer structure Daupol (kat A/j)	7268kg	20g/l
			Epoxy resin for coverage(katA/j)	246kg	20g/l
			Insolation XT (kat A/j)	38kg	20g/l
			Epoxy-tar varnish (katA/j)	250kg	20g/l
			Polyurethane varnish(katA/j)	124kg	440g/l
			Polyurethane glaze varnish(katA/j)	51kg	300g/l
			Vinylester primer, modified with caoutchouc(katA/j)	140kg	220g/l
			Vinilester varnish HT(katA/j)	228kg	235g/l
			Vinilester paste HT(katA/j)	5kg	85g/l
			Vinilester resin HT(katA/j)	5kg	300g/l
			Vehicle Refinishing Products		
			Diluent EAE (ketA/j)	8000kg	850g/l
			Diluent EAE I (ketA/j)	600kg	850g/l
			Diluent PUL(ketA/j)	30kg	850g/l
			Diluent for varnish EV-36 (ketA/j)	1200kg	850g/l
			Diluent for glaze varnish EP-710(ketA/j)	1400kg	850g/l
			Diluent KB(ketA/j)	9kg	850g/l
			Diluent XK (ketA/j)	157kg	840g/l
			Diluent XC (ketA/j)	6kg	840g/l
			Diluent P-7(ketA/j)	18kg	840g/l

No.	Bulgarian Producer Name	**Telefon number**	List of product by Directive Subcategories	National sales of the products in year 2007	content of national sales 2007
			Mixed solvent	601kg	850g/l
			Coresilin(aceton)	150kg	850g/l
			Cleaning material DAKS	1840kg	850g/l
			Efectol GK	1150kg	450g/l
11.	BAUMIT BULGARIA EOOD - Elin Pelin		**Didn't provide information**		
	n.bachvarov@baumit.bg office@baumit.bg	**00359(02)9266 911**			
		00359(02) 9266 918			
12.	LEKTRA - Haskovo		**Didn't provide information**		
	lateva@escom.bg	**00359(038) 66 03 12**			
13.	BULMAT EOOD - Gabrovo		**Didn't provide information**		
	bulmat_ltd@abv.bg office@bulmat-bg.com	**00359(066) 804 817**			
		00359(066)802 688			
14.	MEGAHIM AD - Ruse		**Didn't provide information**		
	office@megachim.com	**00359 (82) 8177 27**			
	Dimitar Yosifov - ecology	**00359 (82) 8177 30**			
15.	BORO - BOGOMIL DACHEV ET		**Didn't provide information**		
	boro177@abv.bg	**00359(02)962 83 10**			
		00359(02)962 83 20			
16.	VECTOR OOD -Troian		**Didn't provide information**		
		00359(0670)60250			

No.	Bulgarian Producer Name	Telefon number	List of product	National sales of the products in year 2007	Average VOC content of national sales
1.	DAL OOD - Mizia	**00359(09161)2270**			
	dal.mizia@dir.bg		Adhesives (kat.B)	804 000kg	VOC info not available
2.	PROMA OOD - Madan	**00359(0308)2458**			
			Adhesives (kat.B)	63 000kg	VOC info not available
3.	CHIMATECH - Sofia				
	Kalinka Stoichkova - expert ecology	**00359(02)9651341**	**Cosmetics products**		
		00359(02)9651234	Seboral	14000kg	120g/l
			Nail polish remover	10kg	800g/l
			Adhesive remover for lenghtening hair	40kg	800g/l
			Cleaners		
			Skrejin cleaning antifreeze liquid	250kg	500g/l
			Avtoefectol BM	200kg	80g/l
			Efectol AL-cleaner for aluminium	200kg	60g/l
			Efectol MP-K-cleaner for hard surface	140kg	300g/l
			Efectol MP-C-cleaner for hard surface	0	120g/l
			Efectol MP-cleaner for hard surface	150kg	300g/l
			Efectol Shine-cleaner for glass	50kg	100g/l
			Efectol MP-X-washing and skiming cleaner	0	200g/l
			Cleaners for cabels	1600kg	12000g/l
			Cleaner Chimsazol TB	200kg	780g/l

REC Data collection **Phase 2 [Decopaint products]** **List of producers [Croatia]**

Producers	Adress	Phone number	E-mail
A-Proma d.o.o.	10 000 Zagreb, Žitnjak bb	385 1 24 98 555	zeljko.setek@a-proma.hr
ASTRA - DUBRAVKA d.o.o.	20 000 Dubrovnik, Put Republike 3	385 20 35 70 75	
Bifix d.o.o.	Buje, Digitronska 10	385 52 77 22 04	bifix@bifix.hr
Bitumina d.o.o.	21 203 Donji Muć, Gornji Muć bb	385 21 66 83 00	info@bitumina.com
Bojoplast d.d.	52 100 Pula, Flaciusova 20	385 52 21 77 90	bojoplast@bojoplast.hr
CHROMOS Boje i lakovi d.d.	10 000 Zagreb, Radnička Cesta 173 d	385 1 24 10 666	chromos@chromos-bil.hr
Chromos Organske boje d.d.	10 000 Zagreb, Žitnjak bb	385 1 24 04 835	info@chromos-orb.hr
Chromos Svjetlost	35 257 Lužani, Mijata stojanovića 13	385 35 21 38 00	maric@chromos-svjetlost.hr
CHROMOS Tvornica grafičkih boj	10 430 Samobor, Zagrebačka 30	385 1 33 62 909	chromos-tgb@zg.t-com.hr
DEA-Kolor d.d.	49 284 Budinščina, Budinščina bb	385 49 45 93 63	
HEMPEL d.o.o.	52 470 Umag, Novigradska 32	385 52 74 17 77	
HERBOS d.d.	44 000 Sisak, Obrtnička 17	385 44 54 51 80	herbos@herbos.hr
ICI Commenda-Adria d.o.o.	10 090 Zagreb, Franje Lučića 23	385 1 34 75 688	info@commenda-adria.hr
Iskra d.o.o.	10 380 Sveti Ivan Zelina, Fučkani 6	385 1 20 66 422	iskra@iskra-zelina.hr
ITS-KEM d.o.o.	10 090 Zagreb, Franje Lučića 23	385 1 34 98 592	
KARBON-NOVA d.o.o.	10 290 Zaprešić, Maršala Tita 94	385 1 33 10 523	info@karbon-nova.hr
Katran d.o.o.	10 000 Zagreb, Radnička Cesta 27	385 1 60 62 200	katran@katran.hr
MEGATTI d.o.o.	10 000 Zagreb, Katuraška 31	385 1 61 70 405	info@megatti.com
Metakem d.o.o.	42 230 Ludbreg, Frankopanska 64	385 42 81 05 44	slavko.varga@razvitak.hr
Mony d.o.o.	10 360 Sesvete, Zlatarska 13, Markovo Polje	385 1 20 10 362	mony@inte.hr
Pinky-s d.o.o.	40 000 Čakovec, Pribislavec V. Nazora 3	385 40 36 07 00	pinky-s@pinky-s.com
Polyester Universal Brajdić	10 000 Zagreb, VIII Vrbik 22	385 1 30 18 775	info@brajdic-polyester.com
Pripol d.o.o.	10 000 Zagreb, Žitnjak bb	385 1 24 06 256	mario.debeljak@pripol.hr
Signoplast d.o.o.	10 020 Zagreb, Sajmišna Cesta 6	385 1 66 000 22	signoplast@signoplast.hr
Sitolor Medius d.o.o.	35 000 Slavonski Brod, Osječka 280	385 35 25 84 31	sitolor-medius@sitolor-medius.hr
Turist-gradnja d.o.o.	22 000 Šibenik, N. Tesle 20 a	385 22 20 06 99	boje.lakovi@turist-gradnja.com

CHROMOS and SITOLOR don't have data and BITUMINA and KATRAN answered that they don't use VOC in their products.

Consumprion of organic solvents in 2006		
Name of organic solvent		Consumprion in kg
1.	butyl acetat	970
2.	butyl diglycol	3980
3.	ETHYL ACETATE	960
4.	o- ksilen	6000
5.	Solvesso 100	1100
6.	toluene	4800
7.	White spirit	31500
Total		**49310**

Realization of products with organic solvents in 2006		
Name of product		Selling in litre
1.	Lignosan lazura	26200
2.	Lignosan lak-lazura	14000
3.	Herboluxa	12000
4.	Diluent	8000
5.	Nitrorate diluent	4000
Total		**64200**

REC Data collection **Phase 1 [Decopaint products]** **Sales data of a company: ICI Commenda-Adria [Croatia]**

Name of product	Total Production one year Volume/l
DULUX TRADE HIGH GLOSS sjajni lak za drvo i metal	3.294,50
DULUX TRADE SATINWOOD polumat lak za drvo i metal	3.948,50
DULUX TRADE PROTECTIVE WOODSHEEN alkidna lazura za	201,00
DULUX TRADE WEATHERSHIELD STABILISING PRIMER fasa	145,00
DULUX TRADE PRIMER SEALER impregnacija	37,50
DULUX TRADE UNDERCOAT alkidni međupremaz za drvo i met	375,00
HAMMERITE EFEKT LAK ZA METAL MAX	35.348,00
HAMMERITE POLUMAT LAK ZA METAL MAX	3.116,25
HAMMERITE RAZRJEĐIVAČ	13.861,00
HAMMERITE PREDPREMAZ ZA HRĐ.ŽE	601,75
HAMMERITE SJAJNI LAK ZA METAL MAX	6.319,75
Total:	67.248,25

Directory of chemical industry

Red. br.	Name of company	ContactI	Director	Production programme
1.	BIFIX d.d.	Digitronska 10, HR-52460 Buje tel. +385 (0)52 / 772 224, 772-320 fax +385 (0)52 / 772 308 e-mail: bifix@bifix.hr www.bifix.hr	g. Ivan Štiglić	Adhesives
2.	CHROMOS TVORNICA SMOLA d.d.	Žitnjak bb, HR- 10000 Zagreb tel. +385 (0)1 / 24 06 440 fax +385 (0)1 / 24 04 573 e-mail: cts@chromos-cts.hr www.chromos-cts.hr	g. Georg Alan Malcolm White	Adhesives
3.	KARBON-NOVA d.o.o.	Maršala Tita 94, HR-10290 Zaprešić tel. +385 (0)1 / 33 10 523, 33 10 605 fax +385 (0)1 / 33 10 228 e-mail: info@karbon-nova.hr www.karbon-nova.com	Gerhard Mosser	Adhesives
4.	METAKEM d.o.o.	Frankopanska 64, HR-42230 Ludbreg tel. +385 (0)42 / 810 146 fax +385 (0)42 / 810 288 e-mail: slavko.varga@razvitak.hr www.metakem.hr	g. Slavko Varga	Adhesives

Red. br.	Name of company	Contactl	Director	Production programme
5.	ISKRA d.d.	Fučkani 6, HR-10280 Sveti Ivan Zelina tel. +385 (0)1 / 20 66 462, 20 66 055 fax +385 (0)1 / 20 66 056 e-mail: iskra@iskra-zelina.hr www.iskra-zelina.hr	g. Marko Jurić	Cleaners
6.	IVAKEM d.o.o.	Industrijska cesta 12, HR-10310 Ivanić Grad tel. +385 (0)1 / 28 88 580 fax +385 (0)1 / 28 88 583 e-mail: ivakem@sk.t-com.hr	gđa Dragica Škrivanek	Cleaners
7.	IVASIM d.d.	Industrijska cesta 4, HR-10310 Ivanić Grad tel. +385 (0)1 / 28 88 556, 28 88 558 fax +385 (01) / 28 88 562 e-mail: ivasim@zg.t-com.hr	g. Dalibor Bobinec	Cleaners
8.	KEMIKA d.d.	Heinzelova 53, HR-10000 Zagreb tel. +385 (0)1 / 24 41 400 fax +385 (0)1 / 24 41 381 e-mail: uprava@kemika.hr www.kemika.hr	g. Branimir Weiss	Cleaners

Red. br.	Name of company	Contactl	Director	Production programme
9.	KUTRILIN TPV d.o.o.	Žitnjak bb , HR-10000 Zagreb tel. +385 (0)1 / 24 04 100, 24 09 494 fax +385 (0)1 / 24 04 618 www.labud.hr	g. Ivan Vučković	Cleanesr
10.	LABUD d.o.o.	Žitnjak bb , HR-10000 Zagreb tel. +385 (0)1 / 24 04 100, 24 04 565 fax +385 (0)1 / 24 04 618 e-mail: labud@labud.hr www.labud.hr	g. Ivan Vučković	Cleaners
11.	METEOR d.d.	Industrijska zona bb, HR- 31400 Đakovo tel. +385 (0)31 / 840 200, 840 180 fax +385 (0)31 / 818 057 e-mail: meteor@meteor.hr www.meteor.hr	g. Radoslav Širić	Cleaners
12.	SAPONIA d.d.	Matije Gupca 2, HR-31000 Osijek tel. +385 (0)31 / 513 513, 513 101 fax +385 (0)31 / 513 103 e-mail: saponia@saponia.hr www.saponia.hr	g. Damir Skender	Cleaners
13.	ŠVENDA-TARMANN CHEMIE d.o.o.	Čehovec 95, HR-40323 Prelog tel. +385 (0)40 / 645 918, 646 505 fax +385 (0)40 / 646 602 www.svenda-tarmann.hr	g. Dragutin Švenda	Cleaners

Red. br.	Name of company	Contactl	Director	Production programme
14.	BELUPO d.d.	Ulica Danica 5, HR-48000 Koprivnica tel. +385 (0)48 / 652 200 fax +385 (0)48 / 624 271 e-mail: belupo@belupo.hr www.belupo.hr	g. Stanislav Biondić	Cosmetics
15.	JADRAN-Galenski laboratorij d.d.	Pulac bb , HR-51000 Rijeka tel. +385 (0)51 / 546 124, 546 024 fax +385 (0)51 / 546 024 e-mail: jgl@jgl.hr www.jgl.hr	g. Ivo Usmiani	Cosmetics
16.	METEOR d.d.	Industrijska zona bb, HR- 31400 Đakovo tel. +385 (0)31 / 840 200, 840 180 fax +385 (0)31 / 818 057 e-mail: meteor@meteor.hr www.meteor.hr	g. Radoslav Širić	Cosmetics
17.	MILLA d.o.o.	Stjepana Draganića 5, HR-10090 Zagreb tel. +385 (0)1 / 38 85 900 fax +385 (0)1 / 37 34 914 e-mail: milla@milla.hr www.milla.hr	g. Zvonko Hladnik	Cosmetics

Red. br.	Name of company	Contactl	Director	Production programme
18.	NEVA d.o.o.	Tuškanova 41, HR-10000 Zagreb tel. +385 (0)1 / 24 13 700 fax +385 (0)1 / 24 13 783 e-mail: neva@neva.hr www.neva.hr	g. Ivica Grdenić	Cosmetics
19.	SAPONIA d.d.	Matije Gupca 2, HR-31000 Osijek tel. +385 (0)31 / 513 513, 513 101 fax +385 (0)31 / 513 103 e-mail: saponia@saponia.hr www.saponia.hr	g. Damir Skender	Cosmetics
20.	WACHEM d.o.o.	Branimirova 24-26, HR-42202 Trnovec Bartolovečki tel. +385 (0)42 / 208 180 fax +385 (0)42 / 683 146 e-mail: info@annyer.hr	g. Branko Šmrček	Cosmetics
21.	CHROMOS BOJE I LAKOVI d.d.	Radnička cesta 173/d, HR-10000 Zagreb tel. +385 (0)1 / 24 10 666 fax +385 (0)1 / 24 05 514 e-mail: chromos@chromos-bil.hr www.chromos-bil.hr	g. Tomislav Cerc	Protective coatings
22.	CHROMOS-SVJETLOST d.o.o.	Mijata Stojanovića 13, HR-35257 Lužani tel. +385 (0)35 / 213 800 fax +385 (0)35 / 213 801 e-mail: maric@chromos-svjetlost.hr www.chromos-svjetlost.hr	g. Šimo Marić	Protective coatings

Red. br.	Name of company	Contactl	Director	Production programme
23.	HEMPEL d.o.o.	Novigradska ul. 32 , HR-52470 Umag tel. +385 (0)52 / 741 777, 741 132 fax +385 (0)52 / 741 352 www.hempel.com	g. Marijan Kovačić	Protective coatings
24.	HERBOS d.d.	Obrtnička 17, HR-44000 Sisak tel. +385 (0)44 / 545 180 fax (0)44 / 540 069 e-mail: herbos@herbos.hr www.herbos.hr	g. Mijo Ivanković	Protective coatings
25.	ISKRA d.d.	Fučkani 6, HR-10280 Sveti Ivan Zelina tel. +385 (0)1 / 20 66 462, 20 66 055 fax +385 (0)1 / 20 66 056 e-mail: iskra@iskra-zelina.hr www.iskra-zelina.hr	g. Marko Jurić	Protective coatings

	Firm	Contact Person	Address	Telephone	Fax	E-mail	Web Address	Products
1	ADOLİN BOYA KİMYA SAN. AŞ.	Mr. Burhan Örs	Fevzi Paşa Mah. No:42 PK.34950 Değirmenköy, Silivri İSTANBUL	+90 212 735 3824	+90 212 735 3828	contact@adolin.com	www.adolin.com	Interior Wall Paints, Exterior Wall Paints, Synthetic Paints and Primers, Heat Resistant Products, Varnish & Woodstain Products, Thinners
2	AKÇALI BOYA SAN. TİC. AŞ.	Mr. M. Akın Akçalı	Hadımköy Yolu Üzeri Fevzi Çakmak Cad. 3. Bölge No:33 Büyükçekmece İSTANBUL	+90 212 886 2343	+90 212 886 1811	akcali@akcali.com	www.akcaliboya.com	Plastic paints, ceiling paint, synthetic paint, wall paints, antirusts, wood paints
3	AK-İŞ BOYA SAN. TİC. AŞ.	Mr. Mehmet İyigüllü	Demirtaş OSB Ali Osman Sönmez Cad. No:4 Demirtaş BURSA	+90 224 261 0537	+90 224 261 0542		http://www.iyigullu.com.tr/	nitrocellulose automotive topcoat paint, admiral synthetic automotive paint, admiral acyrilic metallic automotive paint, admiral 1K automotive paint, wash primer, wash primer hardener, admiral acyrilic 4+1 primer, acrylic varnish, admiral 2K hardener, admiral polyester steel putty, polyurethane coating materials, auto underbody coating, autobody deadne, furniture paints, insulating, water and solvent based external wall paint,
4	AK-TAŞ DIŞ TİC. A.Ş.	Mr. Cenk Türkay	Sarıgazi Cad. Bulgurlu Mah. No:29 34696 Çamlıca Üsküdar İSTANBUL	+90 216 524 1212				solven paint and varnishes
5	AKZO NOBEL BOYA SAN. AŞ.	Mr. Semih Kılıç	Ankara Karayolu 25.km, PK 35177 Kemalpaşa / İzmir	+90 232 252 27 00	+90 232 877 08 22		www.akzonobel.com.tr	solvent and water based paints and primers for interior walls, solvent and water based wood metal paints, exterior walls coatings and primers, woodstains and varnishes for wood
6	Akzo Nobel Endüstri ve Otomobil Boyaları Sanayi ve Ticaret A.Ş.	Mr. Mustafa Altan	Ankara Karayolu 25.km, PK 35177 Kemalpaşa / İZMİR	(0232) 877 1176	(0232) 877 0070		www.akzonobelkemipol.com.tr	Vehicle repair paints, vehicle body paints, metal primers, woodstains
7	BETEK BOYA VE KİMYA SAN. TİC. AŞ.	Mr. Tayfun Küçükoğlu	Ankara Asfaltı Hüseyin Çelik Sok. No:2 Kozyatağı Bostancı 34742	+90 216 571 10 00	+90 216 571 13 15		www.betek.com.tr	decorative synthehtic based paints, primers, varnishes
8	CLARİANT TÜRKİYE BOYA VE KİMY. MAD. SAN. TİC. AŞ.	Mr. Erol Özer	Tahsin Tekoğlu Cad. No:1-3 34295 Sefaköy Istanbul	+90 212 411 05 27	+90 212 592 74 63			
9	ÇBS BOYA VE KİMYA SAN. TİC. AŞ.	Mr. Ali Çavuşoğlu	Cumhuriyet Mah. Istanbul Cad. No:140 Çayırova Gebze Kocaeli	+90 262 744 95 60	+90 262 744 95 77		www.cbs.com.tr	clear coating, metal primers,base coat paints for vehicles, decorative paints for interior and exterior walls, primers and varnishes
10	DOW TÜRKİYE KİMYA SAN. LTD. ŞTİ.	Ms. Venüs Iğnak	Bayar Cad. Odak Plaza A Blok No:5/3 34742 Kozyatağı Istanbul	+216 571 16 00	+90 216 416 08 90			
11	DUPONT TÜRKİYE SANAYİİ BOYALARI SAN. TİC. AŞ.	Ms. Perihan Hasşerbetçi	Tavşancıl Köyü Eynarca Mevkii 41455 Dilovası Gebze Kocaeli	+90 262 754 56 60	+90 262 754 98 57		www.dupont.com.tr	paint and coatings for metal exterior, paint and coatings for plastic exteriors, vehicle refinish performance coatings, commercial vehicle paints
12	DYO BOYA FABRİKALARI AŞ.	Mr. Ahmet Yiğitbaşı	Şehit Fethi Bey Cad. No:120 35210 Konak İzmir	+90 232 482 22 00	+90 232 441 27 86	info@dyo.com.tr	www.dyo.com.tr	coatings and paints for interior and exterior walls, primers, automotive paints
13	ESKİM KİMYA SAN. TİC. AŞ.	Mr. Kani Tezgören	Organize Sanayi Bölgesi 6.Cadde No:2 26110 Eskişehir	+90 222 236 01 90	+90 222 236 01 87	info@eskim.com.tr	www.eskim.com.tr	interior wall paints and primers, exterior walls primer and paints, woodstain, synthetic paints and primers,
14	EVONİK DEGUSSA LTD. ŞTİ.	Mr. Erich Heim	Ankara Asf. Üzeri Kanlı Mandıra Mvk. Tuzla Kavşağı N:68 34940 Tuzla İstanbul	+90 216 395 99 61	+90 216 446 27 90			
15	HACIOĞULLARI BOYA SAN.	Mr. Necmi Sadıkoğlu	Gebze Organize Sanayi Bölgesi İhsan Dede Cad. 700 Sok. Gebze Kocaeli	+90 262 751 07 25	+90 262 751 07 29		www.hob.com.tr	solvent based finishing paints, solvent based coatings, wood protectors and varnishes, water based interior paints, water based exterior paints, water based coatings
16	İBA KİMYA SAN. TİC. AŞ.	Mr. Tulga Dal	Karamanlılar Cad. No:12 1.Organize Sanayi Bölgesi 06930 Sincan Ankara	+312 267 09 83	+90 312 267 09 87	info@iba.com.tr	www.iba.com.tr	coatings on wood
17	İZOSAN BOYA SAN. TİC. AŞ.	Mr. Şeref Şenok	Sanayi Cad. Şehit Cevdet Çelenk sok. No:10 34912 Kurtköy Pendik İstanbul	+90 216 378 10 50	+90 216 378 11 43		www.izosanboya.com	

	Firm	Contact Person	Address	Telephone	Fax	E-mail	Web Address	Products
18	JOTUN BOYA SAN. TİC. AŞ.	Gavsi Özarpak	Yeni Çamlık Cad. Ayaz Sok. No:2 K:4 4.Levent İstanbul	+90 212 279 78 78	+90 212 279 25 49		www.jotun.com.tr	paints, primers for interior and exterior walls, wood protection products
19	KALEKİM KİM. MAD. SAN. TİC. AŞ.	Mr. Ferruh Gülhan	Reşitpaşa Cad. No:125 Avcılar İstanbul	+90 212 591 30 51	+90 212 591 94 27		www.kalekim.com.tr	
20	KALETERASİT KİM. MAD. AŞ.	Mr. Ferdi Erdoğan	Esenyurt Yolu Üzeri Firuzköy 34325 Avcılar İstanbul	+90 212 423 00 18	+90 212 423 31 88		www.kaleterasit.com	water based interior, exterior wall paints
21	KARDELEN BOYA VE KİMYA SAN. TİC. LTD. ŞTİ.	Mr. Mustafa Deryal	Eseboğa Havaalanı Yolu 25.km Akyurt Ankara	+90 312 398 11 33	+90 312 398 09 11	kardelen@kardelenboya.com.tr	www.kardelenboya.com.tr	
22	KAYALAR KİMYA SAN. TİC. AŞ.	Mr. İrfan Çetindamar	Yakacık Yan Yol Senem Sokak No: 7 Kartal İstanbul	+90 216 377 00 45	+90 216 377 11 88		www.kayalarkimya.com.tr	wood protector, synthetic paints, water based paints and primers
23	KAYALAR MEFFERT BOYA SAN. TİC. AŞ.	Mr. Ersin Kayalar	İstanbul Tuzla Kimya Sanayicileri Organize San. Böl. Melek Aras Bulvarı No:48 34956 Tepeören Tuzla	+90 216 593 24 80	+90 216 593 24 15		www.dufa.com.tr	water based interior wall paints and primers, synthetic based metal-wood paints and primers, synthetic based wood protectors and varnishes, water based interior wall paints and primers
24	KEMİROPA DIŞ TİC. PAZ. LTD. ŞTİ.	Mr. M. Nafiz Çavuşoğlu	İstanbul Cad. Karina İş Merkezi No:6/3 34075 Göktürk İstanbul	+90 212 322 30 80	+90 212 322 30 85	info@kemiropa.com.tr	www.kemiropa.com.tr	
25	MARSHALL BOYA VE VERNİK SAN. TİC. AŞ.	Mr. Feridun Uzunyol	Tavşancıl Köyü Eynarca Mevkii 41455 Dilovası Gebze Kocaeli	+90 262 754 74 70	+90 262 754 19 25		www.marshallboya.com	solvent and water based paints and primers for interior walls, solvent and water based wood metal paints, exterior walls coatings and primers, woodstains and varnishes for wood
26	MEGES BOYA SAN. TİC. AŞ.	Mr. Lütfü Okman	Sanayi Mah. Kurtköy San. C. N:14 34912 Kurtköy Pendik İstanbul	+90 216 378 11 19	+90 216 378 11 97		www.meges.com	
27	MERBOLİN BOYA SAN. TİC. AŞ.	Mr. Kenan Baytaş	Poyraz Sok. Söğütlüçeşme İş Merkezi No:2 L:4 Kadıköy İstanbul	+90 216 418 45 92	+90 216 336 25 10	info@merbolin.com.tr	www.merbolin.com.tr	solvent based primers, wood protectors and varnishes, solvent based topcoat paints, exterior primers, exterior topcoat paintings and coatings, water based primers and water based topcoat paints
28	ORGANİK KİMYA SAN. TİC. AŞ.	Mr. Sinan Kaba	Cendere Yolu N:16 34396 Ayazağa İstanbul	+90 212 289 26 00	+90 212 289 26 01	organik@organik.com.tr	www.organikkimya.com.tr	
29	POLİSAN BOYA SAN. TİC. AŞ.	Mr. Erol Mizrahi	Ali Nihat Taran Cad. N:86 34752 İçerenköy Bostancı İstanbul	+90 216 578 56 00	+90 216 573 77 97		www.polisan.com.tr	solvent based finishing paint, solvent based primers, water based interior and exterior paints, water based primers
30	PROSEP BOYA SAN. TİC. LTD. ŞTİ.	Mr. Necati Binici	2.Organize Sanayi Bölgesi Celal Doğan Blv. 11Nolu Sok. No:5 Şehitkamil Gaziantep	+90 342 337 45 20	+90 342 337 45 23		www.prosep.com.tr	solvent based finishing paint, solvent based primers, water based interior walls finishing paints, water based primers and water based exterior wall finishing paint
31	PULVER TOZ BOYA AŞ.	Mr. Metin Mızraklı	İnönü Mah. Gençlik Cad. No:219 Gebze Kocaeli	+90 262 643 00 01	+90 262 643 00 30		www.pulver.com.tr	decorative coatings
32	ROHM&HAAS KİMYASAL ÜRÜN. DAĞ. AŞ.	Mr. Haluk Erşen	Değirmen Sok. Nida Plaza No:12 K:18 34742 Kozyatağı İstanbul	+90 216 571 91 00	+90 216 416 22 21		www.rohmhaas.com.tr	
33	SERVER BOYA MATBAA MRK. VE VERNİK SAN. TİC. AŞ.	Mr. Hulki Yenier	İstanbul Tuzla KOSB Parsel B/5 Tepeören Tuzla İstanbul	+90 216 593 10 30	+90 216 593 22 35		www.serverboya.com	
34	SG-WEBER MARKEM YAPI KİMYASALLARI SAN. TİC. AŞ.	Mr. Levent Gökçe	Ankara Karayolu 26.km 35171 Kemalpaşa İzmir	+90 232 397 07 00	+90 232 397 07 01			
35	SOLVENTAŞ KİM. MAD. DEPOLAMA AŞ.	Mr. Macit Dalgıçoğlu	Meclisi Mebusan Cad. Tütün Han. N:167/2 34427 Kabataş İstanbul	+90 212 334 49 00	+90 212 334 49 95			
36	TAÇ BOYA VE KİMYA SAN. LTD. ŞTİ.	Mr. Lütfi Ortaç	İstanbul Boyacılar ve Vernikçiler Koop. Mutlu Akü Altı No:35 Tepeören	+90 216 304 24 80	+0216 304 24 84		www.tacboya.com.tr	interior and exterior walls coatings and paints, primers
37	TERRACO YAPI MALZEMELERİ A.Ş.	Mr. Rauf Göktaş	Organize Sanayi Bölgesi Mümtaz Zeytinoğlu Bulvarı No:21 26110 Eskişehir	+90 222 236 04 23	+90 222 236 04 25	terraco@terraco.com.tr	www.terraco.com.tr	exterior coatings, exterior paints, interior coatings, interior paints, primers, wood coatings
38	YAŞAR BASF LTD. ŞTİ.	Mr. Şerif Vardar	Sanayi Cad. No:37 35100 Bornova İzmir	+90 232 461 55 98	+90 232 462 11 83			

TURKEY'S PAINT INDUSTRY EXPORTS BY PRODUCTS (1000 $)

Product Code	Products	2005	2006	2007
3201	Vegetable tanning and extracts; tannings and their salts	1,327	1,525	1,724
3202	Synthetic organic and inorganic tanning substances; tanning preps	32,068	38,423	46,097
3203	Vegetable/animal origin coloring matter	24	116	104
3204	Synthetic organic coloring matter and preparations	17,967	19,217	26,627
3205	Colour lac and preparations based thereon	116	771	1,073
3206	Other coloring matter, inorganic products used as luminophores	9,002	9,421	13,213
3207	Pigments, opacifiers, colors, enamels and glazes, engobes, liquid lustre	12,695	19,541	27,856
3208	Nonaqueous solution of paint and varnish	53,647	63,862	74,808
3209	Aqeous solution of paint and varnish	24,242	30,386	35,052
3210	Other paints and varnishes	15,139	17,093	20,726
3211	Prepared driers	5,392	5,505	6,955
3212	Pigments, nonaqeous media (liquid, paste) for paints and dyes	3,966	4,492	5,28
3213	Artists' color, modifying tints and amusement colors	1,548	1,386	1,16
3214	Glaziers putty, grafting putty, resin cements, painters fillings	41,644	55,008	70,304
3215	Printing, writing or drawing inks and inks nes	15,92	20,998	25,899
32	**TOTAL**	234,697	287,745	356,879