Date: 19 February 2010
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REACH: SpERC (specific emission release category) for the manufacture of coatings and inks: streamlining of OECD emission factors and testing vs default factors

SpERC M2: Manufacture of *water-borne* coatings and inks: selection and justification for SpERCs

<table>
<tr><th></th><th>Characteristics of specific ERC</th><th>Type of Input Information</th><th>Processing of Input Information</th></tr>
<tr><td>Title of specific ERC</td><td>Manufacture of water borne coatings and inks</td><td></td><td></td></tr>
<tr><td>Based on ERC</td><td>2 (Formulation of preparations)</td><td></td><td></td></tr>
<tr><td>Scope</td><td>Formulation of water borne coatings and inks</td><td></td><td></td></tr>
<tr><td>Use rates</td><td>Water-borne coatings and inks are comprised of substances, grouped by functional categories, with the typical maximum use of any one substance in each category as follows

<table>
<tr><th>Substance category</th><th>Maximum use for any one substance[1] (tonnes/day)</th></tr>
<tr><td>Pigment/extender/filler</td><td>25</td></tr>
<tr><td>Binder</td><td>25</td></tr>
<tr><td>Water</td><td>75</td></tr>
<tr><td>Organic solvent/coalescent</td><td>10</td></tr>
<tr><td>Additives</td><td>1</td></tr>
<tr><td colspan="2">[1]Note: in many coatings and inks manufacturing facilities, usage rates will be substantially below the figures shown</td></tr>
</table>
</td><td></td><td></td></tr>
<tr><td>Emission fractions</td><td>1. To air:

<u>Volatile substances:</u>

Emissions to the air of organic solvents during the manufacture of coatings and inks are regulated by the Solvent Emissions Directive (1999/13/EC).
VOCs:
- maximum 5% to air (< 1000t/a organic solvent)</td><td>1.VOCs: emission limits from The Solvent Emissions Directive (1999/13/EC)

2. EMISSION SCENARIO</td><td></td></tr>
</table>

	Characteristics of specific ERC	Type of Input Information	Processing of Input Information
	- maximum 3% to air (> 1000 t/a organic solvent) Emissions per substance per site depend on - the volatility of the substance - the air speed - other technical measures to control releases to the air CEPE estimated the fraction of solvents released per production site to be - for 'low boiling point solvents' (b.p. below 110-120°C): **0.3 – 2.2 %** - for 'high boiling point solvents' (b.p. above 120°C): **0.1 – 0.4 %** of the substance volume used per site. <u>Solid substances:</u> No direct dust emissions to the air are expected. Initial loss from handling of solid substances is captured by air extraction devices. Final percentage of solid substances emitted to the air is expected to be **max. 0.0097 %** of the substance volume used per site.	DOCUMENT ON COATINGS INDUSTRY (PAINTS, LACQUERS AND VARNISHES), OECD, July 2009	
	2. To wastewater/sewer/watercourses: Emissions via equipment cleaning and subsequent discharge to wastewater. Release to wastewater is expected to be **max. 0.5 %** of the substance volume used per site.		
	3. To soil: <u>Liquid substances:</u> 0 % <u>Solid substances:</u> 0%		

	Characteristics of specific ERC	Type of Input Information	Processing of Input Information
Type of RMM (not applicable to a route with 0% emission)	**VOC controls** RMMs primarily are aimed at controlling emissions of VOCs at source, rather than at “end of pipe” to meet the relevant total emission limit value set out in section 17, Annex IIA,1999/13/EC (SED). A wide range of RMMs are used to minimise emissions to atmosphere: - use of closed storage facilities (e.g. bulk storage tanks, IBCs, drums) for VOC-containing raw materials - use of closed transfers of liquids from storage to production equipment (e.g. metered piped or pumped additions) - use of closed production equipment, with no extraction, except when opening vessels for additions/sampling etc - use of semi-closed production vessels with extraction to atmosphere to maintain workplace airborne VOC concentrations below respective OELs - use of impermeable covers on work in progress - use of closed filling equipment - use of closed equipment cleaning and use of non-organic solvent based cleaning fluids. - storage of finished products in closed containers (bulk tanks, IBCs, drums, cans etc) - recycling and reuse of overmake product in subsequent batches - storage of all VOC-containing wastes in closed, secure containers (bulk tanks, IBCs, drums) **Particulates** RMMs are primarily aimed at controlling emissions of particulates at the most significant emission points to atmosphere from sources within the manufacturing process where airborne particulates can be created. Typically: - particulate raw materials are delivered in bulk tankers and discharged to closed silos - particulate raw materials are delivered in closed packaging (IBCs, drums, boxes, sacks) - closed transfers of particulates from storage to production equipment (e.g. metered piped or pumped additions) is used - no extraction is used on closed production equipment, when adding and incorporating particulate raw materials		

	Characteristics of specific ERC	Type of Input Information	Processing of Input Information
	- use of semi-closed production vessels with extraction to atmosphere are used to maintain workplace airborne particulate concentrations below respective OELs - cyclone and bag filters, connected to (often multiple) emission sources, are used to control emissions from manufacturing plant - particulate wastes are stored in closed containers.		
Efficiency of RMMs (not applicable to a route with 0% emission)	**VOC RMMs** As the SED VOC emission controls are focused on controlling global emissions from the manufacturing plant, the performance of individual RMMs is not relevant – the overall efficiency of the total manufacturing process (process steps + RMMs) is a minimum either 95% or 98%. **Particulate RMMs** Bag and cyclone filters are typically rated at 99% efficient.		
Narrative description of/ justification for specific ERC	**Description:** The manufacture of water borne coatings and inks is a multi-stage batch process. The process is arranged to maximise the efficiency of use of input raw materials, through the highest conversion into formulated products. Process losses are reduced to the absolute minimum, through use of general and manufacturing plant extraction to maintain workplace concentrations of airborne VOCs and particulates below respective OELs; and through use of closed or covered manufacturing equipment, wherever possible, to minimise evaporative losses of VOCs. The composition of products and the overall process are such that there are no discharges of raw materials or products to waste-water or to soil from the manufacturing plant. **Justification**: The overall high efficiency of the coatings and inks manufacturing process is reflected in the low emission factors identified in independent assessments, such as that carried out by the UK's Environment Protection Agency, as part of the development of an Emission Scenarios Document for the OECD.		