FS Section	Content field	Explanation of content	CSR[1]	eSDS[2]
1. Title	**1.1 Title of SPERC**	Use in coatings (industrial): solvent-borne	Y	Y
	1.2 SPERC code	ESVOC SPERC 4.3a.v2	Y	Y
2. Scope	**2.1 Substance/Product Domain**			
	Substance types / functions / properties included or excluded	Applicable to petroleum substances and petrochemicals.	Y	N
	Additional specification of product types covered:	Includes a variety of aliphatic and aromatic hydrocarbons, ketones, alcohols, acetates, glycols, glycol ethers, and glycol ether acetates.	Y	N
	Inclusion of sub-SPERCs	Yes	N	N
	2.2 Process domain			
	Description of activities/processes:	Covers the use in coatings (paints, inks, adhesives, etc.) including exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application by spray, roller, spreader, dip, flow, fluidized bed on production lines and film formation) and equipment cleaning, maintenance and associated laboratory activities.	Y	Y
	2.3 List of applicable Use Descriptors			
	LCS	IS – Use at industrial sites	Y	Y
	SU	SU0 - Other	Y	Y
	PC	PC9a – Coatings and paints, thinners, paint removers	Y	Y
3. Operational conditions	**3.1 Conditions of use**			
	Location of use	Indoor	Y	Y
	Water contact during use	Yes	Y	Y
	Connected to a standard municipal biological STP	No, site specifc biological STP with assumed discharge rate of municipal biological STP of >= 2000 m^3/day	Y	Y
	Rigorously contained system with minimisation of release to the environment	No	Y	N
	Further operational conditions impacting on releases to the environment	Volatile compounds subject to air emission controls. Wastewater emissions generated from equipment cleaning with water.	Y	Y
	3.2 Waste Handling and Disposal			
	Waste Handling and Disposal:	Residual raw materials and are in some cases recycled and fed back into the process reactor to improve efficiencies. In other cases, residues and by-products are used as raw materials for other downstream applications (EU, 2016). Wastewater generated during cleaning and maintenance operations is directed to a wastewater treatment plant for biological degradation. Atmospheric release of waste vapor may be ameliorated	Y	N

[1] Explanations that are more detailed can be provided for the CSR..

[2] For the ES for communication a standard phrase may be selected from the ESCom catalogue when available. When no phrase is available yet in the catalogue the proposed phrase can be reported here.

FS Section	Content field	Explanation of content	CSR[1]	eSDS[2]
		using wet scrubbers, thermal oxidizers, solid adsorbents, membrane separators, biofilters, and/or cold oxidizers for trapping residual vapours. Solvent-containing liquid coating wastes are handled as hazardous waste and disposed of via thermal or catalytic incineration capable of efficiently converting volatile organic compounds to carbon dioxide and water. Hazardous waste handling conforms with the requirements of the Waste Framework Directive and includes procedures that minimize release during production, collection, storage, transportation, and treatment. These measures include a ban on the mixing of waste types, suitable packaging and labelling, and detailed documentation on the sources, quantities, and characteristics of the waste. EU (2016). Best Available Techniques (BAT) Reference Document for Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical Sector. Report EUR 28112 EN. European IPPC Bureau. Seville, Spain. http://eippcb.jrc.ec.europa.eu/reference/BREF/CWW_Bref_2016_published.pdf EU (2008). Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives. Official Journal of the European Union 22.11.2008. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008L0098&from=EN		
4. Obligatory RMMs onsite	**RMM limiting release to air:**	No obligatory RMMs.	Y	Y
	RMM Efficiency (air):	Optional RMMs have been assigned a nominal removal efficiency value that is not accounted for in the air release factor. See the background document for more information.	Y	Y
	Reference for RMM Efficiency (air):	EU (2016). Best Available Techniques (BAT) Reference Document for Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical Sector. Report EUR 28112 EN. European IPPC Bureau. Seville, Spain. http://eippcb.jrc.ec.europa.eu/reference/BREF/CWW_Bref_2016_published.pdf	Y	N
	RMM limiting release to water:	Oil-water separation (e.g. *via* oil water separators, oil skimmers, or dissolved air flotation) is required.	Y	Y
	RMM Efficiency (water):	The efficiency of this RMM varies dependent on the treatment technology and the properties of the substance.	Y	Y
	Reference for RMM Efficiency (water):	EU (2016). Best Available Techniques (BAT) Reference Document for Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical Sector. Report EUR 28112 EN. European IPPC Bureau. Seville, Spain. http://eippcb.jrc.ec.europa.eu/reference/BREF/CWW_Bref_2016_published.pdf	Y	N
	RMM limiting release to soil:	The sludge generated from wastewater treatment is not applied to agricultural soil.	Y	Y
	RMM Efficiency (soil):	Not applicable	Y	Y
	Reference for RMM Efficiency (soil):	ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment. Chapter R.16: Environmental Exposure Assessment Version 3.0. European Chemicals Agency. Helsinki, Finland. https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf	Y	N
5. Exposure Assessment Input	**5.1 Substance use rate**			
	Amount of substance use per day:	50,000 kg/day	Y	Y
	Fraction of EU tonnage used in region:	100%	Y	N
	Fraction of Regional tonnage used locally:	100%	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS[2]
	Justification / information source:	ECHA, 2016. Guidance on Information Requirements and Chemical Safety Assessment. Chapter R.16: Environmental Exposure Assessment Version 3.0. European Chemicals Agency. Helsinki, Finland. https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf	Y	N
	5.2 Days emitting			
	Number of emission days per year:	300 (default value)	Y	Y
	Justification / information source:	ECHA, 2016. Guidance on Information Requirements and Chemical Safety Assessment. Chapter R.16: Environmental Exposure Assessment Version 3.0. European Chemicals Agency. Helsinki, Finland. https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf	Y	N
	5.3 Release factors			
	sub-SPERC identifier:	ESVOC 4.3a.a.v2 WS <1 mg/l	Y	N
	ERC	ERC 4		
	sub-SPERC applicability:	Water solubility <1 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	98%	Y	Y
	Justification of RFs (Air):	The rationale for this value relies on published information citing the air emissions associated with industrial coating applications for a variety of commercial products (OECD, 2009). The air release is equivalent to the emission factor for the flat line application of a decorative coating to furniture. Other coating processes showing more modest releases were disregarded in favor of operations that showed the greatest emission potential. OECD (2009). Emission Scenario Document on Coating Industry (Paints. Lacquers and Varnishes). OECD Series on Emission Scenario Documents, Number 22. Organization for Economic Co-operation and Development. Paris, France. http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=env/jm/mono(2009)24&doclanguage=en	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.002%	Y	Y
	Justification of RFs (Water):	The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with published survey results of wastewater effluent volume per tonne of capacity at a site producing a water-based paint in a batch operation. Kutluay, G., et al., 2004. Treatability of water-based paint industry effluents. Fresenius Environmental Bulletin 13, 1057-1060.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.0%	Y	Y
	Justification of RFs (Soil):	An authoritative review of the emissions associated with the manufacture of organic solvent-borne coatings did not find any release of solvent volatiles to soil.	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS[2]
		OECD (2009). Emission Scenario Document on Coating Industry (Paints. Lacquers and Varnishes). OECD Series on Emission Scenario Documents, Number 22. Organization for Economic Co-operation and Development. Paris, France. http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=env/jm/mono(2009)24&doclanguage=en		
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	5.0%	Y	N
	Justification of RFs:	The cited value was extracted from a review of the wastes resulting from the formulation of liquid coatings (OECD, 2009). The waste release estimate of 0.5% for the batch preparation of a solvent-borne coatings was judged to be representative of all other operations. An uncertainty factor of 10 has been applied to this value based on the anticipated variability of this factor across different industry sectors. OECD, 2009. Emission Scenario Document on Coating Industry (Paints. Lacquers and Varnishes). No. 22, Organisation for Economic Co-operation and Development. Paris, France. http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=env/jm/mono(2009)24&doclanguage=en.	Y	N
	sub-SPERC identifier:	ESVOC 4.3a.b.v2 WS 1-10 mg/l	Y	N
	ERC:	ERC 4		
	sub-SPERC applicability:	Water solubility 1-10 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air):	98%	Y	Y
	Justification of RFs (Air):	The rationale for this value relies on published information citing the air emissions associated with industrial coating applications for a variety of commercial products (OECD, 2009). The air release is equivalent to the emission factor for the flat line application of a decorative coating to furniture. Other coating processes showing more modest releases were disregarded in favor of operations that showed the greatest emission potential. OECD (2009). Emission Scenario Document on Coating Industry (Paints. Lacquers and Varnishes). OECD Series on Emission Scenario Documents, Number 22. Organization for Economic Co-operation and Development. Paris, France. http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=env/jm/mono(2009)24&doclanguage=en	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.007%	Y	Y
	Justification of RFs (Water):	The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with published survey results of wastewater effluent volume per tonne of capacity at a site producing a water-based paint in a batch operation. Kutluay, G., et al., 2004. Treatability of water-based paint industry effluents. Fresenius Environmental Bulletin 13, 1057-1060.	Y	N
	5.3.3 Release Factor – soil			

FS Section	Content field	Explanation of content	CSR[1]	eSDS[2]
	Numeric value / percent of input amount (Soil):	0.0%	Y	Y
	Justification of RFs (Soil):	An authoritative review of the emissions associated with the manufacture of organic solvent-borne coatings did not find any release of solvent volatiles to soil. OECD (2009). Emission Scenario Document on Coating Industry (Paints. Lacquers and Varnishes). OECD Series on Emission Scenario Documents, Number 22. Organization for Economic Co-operation and Development. Paris, France. http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=env/jm/mono(2009)24&doclanguage=en	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.1-1.7%	Y	N
	Justification of RFs:	The range in waste release factors describes the reported waste and by-product amounts described for three types of coating production operations in Europe: bitumen adhesive, alkyd paint, and powder coating. ECOINVENT Database (2013). Version 3.01. Accessed July 2018. (https://www.ecoinvent.org/database/database.html) Frischknecht, R. et al. (2005). The ECOINVENT database: Overview and methodological framework. Int. J. Life Cycle Assess. 10, 3-9.	Y	N
	sub-SPERC identifier:	ESVOC 4.3a.c.v2 WS 10-100 mg/l	Y	N
	ERC	ERC 4		
	sub-SPERC applicability:	Water Solubility 10-100 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air):	98%	Y	Y
	Justification of RFs (Air):	The rationale for this value relies on published information citing the air emissions associated with industrial coating applications for a variety of commercial products (OECD, 2009). The air release is equivalent to the emission factor for the flat line application of a decorative coating to furniture. Other coating processes showing more modest releases were disregarded in favor of operations that showed the greatest emission potential. OECD (2009). Emission Scenario Document on Coating Industry (Paints. Lacquers and Varnishes). OECD Series on Emission Scenario Documents, Number 22. Organization for Economic Co-operation and Development. Paris, France. http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=env/jm/mono(2009)24&doclanguage=en	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.07%	Y	Y
	Justification of RFs (Water):	The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with published survey results of wastewater effluent volume per tonne of capacity at a site producing a water-based paint in a batch operation. Kutluay, G., et al., 2004. Treatability of water-based paint industry effluents. Fresenius Environmental Bulletin 13, 1057-1060.	Y	N
	5.3.3 Release Factor – soil			

FS Section	Content field	Explanation of content	CSR[1]	eSDS[2]
	Numeric value / percent of input amount (Soil):	0.0%	Y	Y
	Justification of RFs (Soil):	An authoritative review of the emissions associated with the manufacture of organic solvent-borne coatings did not find any release of solvent volatiles to soil. OECD (2009). Emission Scenario Document on Coating Industry (Paints. Lacquers and Varnishes). OECD Series on Emission Scenario Documents, Number 22. Organization for Economic Co-operation and Development. Paris, France. http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=env/jm/mono(2009)24&doclanguage=en	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	5.0%	Y	N
	Justification of RFs:	The cited value was extracted from a review of the wastes resulting from the formulation of liquid coatings (OECD, 2009). The waste release estimate of 0.5% for the batch preparation of a solvent-borne coatings was judged to be representative of all other operations. An uncertainty factor of 10 has been applied to this value based on the anticipated variability of this factor across different industry sectors. OECD, 2009. Emission Scenario Document on Coating Industry (Paints. Lacquers and Varnishes). No. 22, Organisation for Economic Co-operation and Development. Paris, France. http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=env/jm/mono(2009)24&doclanguage=en.	Y	N
	sub-SPERC identifier:	ESVOC 4.3a.d.v2 WS 100-1000 mg/l	Y	N
	ERC	ERC 4		
	sub-SPERC applicability:	Water Solubility 100-1000 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air):	98%	Y	Y
	Justification of RFs (Air):	The rationale for this value relies on published information citing the air emissions associated with industrial coating applications for a variety of commercial products (OECD, 2009). The air release is equivalent to the emission factor for the flat line application of a decorative coating to furniture. Other coating processes showing more modest releases were disregarded in favor of operations that showed the greatest emission potential. OECD (2009). Emission Scenario Document on Coating Industry (Paints. Lacquers and Varnishes). OECD Series on Emission Scenario Documents, Number 22. Organization for Economic Co-operation and Development. Paris, France. http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=env/jm/mono(2009)24&doclanguage=en	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.7%	Y	Y
	Justification of RFs (Water):	The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with published survey results of wastewater effluent volume per tonne of capacity at a site producing a water-based paint in a batch operation.	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS[2]
		Kutluay, G., et al., 2004. Treatability of water-based paint industry effluents. Fresenius Environmental Bulletin 13, 1057-1060.		
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.0%	Y	Y
	Justification of RFs (Soil):	An authoritative review of the emissions associated with the manufacture of organic solvent-borne coatings did not find any release of solvent volatiles to soil. OECD (2009). Emission Scenario Document on Coating Industry (Paints. Lacquers and Varnishes). OECD Series on Emission Scenario Documents, Number 22. Organization for Economic Co-operation and Development. Paris, France. http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=env/jm/mono(2009)24&doclanguage=en	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste	5.0%	Y	N
	Justification of RFs:	The cited value was extracted from a review of the wastes resulting from the formulation of liquid coatings (OECD, 2009). The waste release estimate of 0.5% for the batch preparation of a solvent-borne coatings was judged to be representative of all other operations. An uncertainty factor of 10 has been applied to this value based on the anticipated variability of this factor across different industry sectors. OECD, 2009. Emission Scenario Document on Coating Industry (Paints. Lacquers and Varnishes). No. 22, Organisation for Economic Co-operation and Development. Paris, France. http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=env/jm/mono(2009)24&doclanguage=en.	Y	N
	sub-SPERC identifier:	ESVOC 4.3a.e.v2 WS >1000 mg/l	Y	N
	ERC	ERC 4		
	sub-SPERC applicability:	Water Solubility >1000 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air):	98%	Y	Y
	Justification of RFs (Air):	The rationale for this value relies on published information citing the air emissions associated with industrial coating applications for a variety of commercial products (OECD, 2009). The air release is equivalent to the emission factor for the flat line application of a decorative coating to furniture. Other coating processes showing more modest releases were disregarded in favor of operations that showed the greatest emission potential. OECD (2009). Emission Scenario Document on Coating Industry (Paints. Lacquers and Varnishes). OECD Series on Emission Scenario Documents, Number 22. Organization for Economic Co-operation and Development. Paris, France. http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=env/jm/mono(2009)24&doclanguage=en	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	2.0%	Y	Y
	Justification of RFs (Water):	The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production	Y	N

FS Section	Content field	Explanation of content	CSR[1]	eSDS[2]
		sites. This release factor has been conservatively calculated using water solubility information together with published survey results of wastewater effluent volume per tonne of capacity at a site producing a water-based paint in a batch operation. Kutluay, G., et al., 2004. Treatability of water-based paint industry effluents. Fresenius Environmental Bulletin 13, 1057-1060.		
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.0%	Y	Y
	Justification of RFs (Soil):	An authoritative review of the emissions associated with the manufacture of organic solvent-borne coatings did not find any release of solvent volatiles to soil. OECD (2009). Emission Scenario Document on Coating Industry (Paints. Lacquers and Varnishes). OECD Series on Emission Scenario Documents, Number 22. Organization for Economic Co-operation and Development. Paris, France. http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=env/jm/mono(2009)24&doclanguage=en	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	5.0%	Y	N
	Justification of RFs:	The cited value was extracted from a review of the wastes resulting from the formulation of liquid coatings (OECD, 2009). The waste release estimate of 0.5% for the batch preparation of a solvent-borne coatings was judged to be representative of all other operations. An uncertainty factor of 10 has been applied to this value based on the anticipated variability of this factor across different industry sectors. OECD, 2009. Emission Scenario Document on Coating Industry (Paints. Lacquers and Varnishes). No. 22, Organisation for Economic Co-operation and Development. Paris, France. http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=env/jm/mono(2009)24&doclanguage=en.	Y	N
References to SPERC Background Document				
	Reference to Background Document	ESIG/ESVOC (2018). SpERC Background Document (1st draft). Specific Environmental Release Categories (SpERCs) for the use of solvents and solvent borne substances in the industrial production and/or use of binders/releasing agents, coatings, cleaners, and metalworking fluids. European Solvents Industry Group. Brussels, Belgium.	Y	N