

FS Section	Content field	Explanation of content	CSR	eSDS
1. Title	1.1 Title of SPERC	Use in metal working fluids/rolling oils (industrial): solvent-borne	Y	Y
	1.2 SPERC code	ESVOC SPERC 4.7a.v3	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:	Use in formulated metal working fluids/rolling oils including transfer operations, rolling and annealing activities, cutting/machining activities, automated and manual application of corrosion protections (including brushing, dipping and spraying), equipment maintenance, draining and the disposal of waste oils.	Y	Y
	2.3 List of applicable Use Descriptors			
	LCS	IS – Use at industrial sites	Y	Y
SU	SU15 – Manufacture of fabricated metal products, except machinery and equipment	Y	Y	
PC	PC25 – Metal working fluids	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 specific biological STP with assumed discharge rate of municipal biological STP of $\geq 2000 \text{ m}^3/\text{day}$	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 waste water treatment plant for biological degradation. Atmospheric release of waste vapor may be ameliorated using wet scrubbers, thermal oxidizers, solid adsorbents, membrane separators, biofilters, and/or cold oxidizers for trapping residual vapours. Solvent-containing liquid cleaning 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	Y	N	

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		<p>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.</p> <p>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_publication.pdf</p> <p>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</p>		
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_publication.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_publication.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:	25,000 kg/day (NB value modified)	Y	Y
	Fraction of EU tonnage used in region:	100%	Y	N
	Fraction of Regional tonnage used locally:	100%	Y	N
	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			

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	Number of emission days per year:	20 (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 4.7a.a.v3 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)	5.0%	Y	Y
	Justification of RFs (Air):	The air release considers the misting and evaporation that occurs when a conventional solvent-based machining fluid is used to mill metal parts. OECD, 2004. Emission Scenario Documents on Lubricants and Lubricant Additives. No. 10, Organisation for Economic Co-operation and Development. Paris, France. http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=en/jm/mono(2004)21&doclanguage=en	Y	N
5.3.2 Release Factor – water				
	Numeric value / percent of input amount (Water):	0.0001%	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 a published estimate of wastewater effluent volume per tonne of capacity at a site producing a variety of rubber products other than car tires. OECD (2004). Emission Scenario Documents on Additives in Rubber Industry, No. 6. Organisation for Economic Co-operation and Development. Paris, France. http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=en/jm/mono(2004)11&doclanguage=en	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 metalworking fluids did not describe the release of any solvent volatiles to soil. OECD (2004). Emission Scenario Documents on Lubricants and Lubricant Additives. OECD Series on Emission Scenario Documents, Number 10. Organization for Economic Co-operation and Development. Paris, France. http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=en/jm/mono(2004)21&doclanguage=en	Y	N
5.3.4 Release Factor – waste				
	Percent of input amount disposed as waste:	10.0%	Y	N
	Justification of RFs:	The quoted value was derived from a life cycle assessment for the commercial production of base fluids used in the formulation of lubricants	Y	N

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		(Vag et al. 2004). This operation provides a reasonable surrogate for the manufacture of metal working fluids for use in the parts fabrication industry. The highest reported solid waste factor of 1% was judged to be representative of other metal working fluids. An uncertainty factor of 10 has been applied to this value based on the anticipated variability of this factor across different industry sectors. Vag, C. et al. (2002). A comparative life cycle assessment of the manufacture of base fluids for lubricants. <i>Journal of Synthetic Lubrication</i> 19,39-57.		
	sub-SPERC identifier:	ESVOC 4.7a.b.v3 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):	5.0%	Y	Y
	Justification of RFs (Air):	The air release considers the misting and evaporation that occurs when a conventional solvent-based machining fluid is used to mill metal parts. OECD, 2004. Emission Scenario Documents on Lubricants and Lubricant Additives. No. 10, Organisation for Economic Co-operation and Development. Paris, France. http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=en/jm/mono(2004)21&doclanguage=en	Y	N
5.3.2 Release Factor – water				
	Numeric value / percent of input amount (Water):	0.0003%	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 a published estimate of wastewater effluent volume per tonne of capacity at a site producing a variety of rubber products other than car tires. OECD (2004). Emission Scenario Documents on Additives in Rubber Industry, No. 6. Organisation for Economic Co-operation and Development. Paris, France. http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=en/jm/mono(2004)11&doclanguage=en	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 metalworking fluids did not describe the release of any solvent volatiles to soil. OECD (2004). Emission Scenario Documents on Lubricants and Lubricant Additives. OECD Series on Emission Scenario Documents, Number 10. Organization for Economic Co-operation and Development. Paris, France. http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=en/jm/mono(2004)21&doclanguage=en	Y	N
5.3.4 Release Factor – waste				
	Percent of input amount disposed as waste:	10.0%	Y	N
	Justification of RFs:	The quoted value was derived from a life cycle assessment for the commercial production of base fluids used in the formulation of lubricants	Y	N

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	sub-SPERC identifier:	ESVOC 4.7a.c.v3 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):	5.0%	Y	Y
	Justification of RFs (Air):	The air release considers the misting and evaporation that occurs when a conventional solvent-based machining fluid is used to mill metal parts. OECD, 2004. Emission Scenario Documents on Lubricants and Lubricant Additives. No. 10, Organisation for Economic Co-operation and Development. Paris, France. http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=en/v/jm/mono(2004)21&doclanguage=en	Y	N
5.3.2 Release Factor – water				
	Numeric value / percent of input amount (Water):	0.003%	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 a published estimate of wastewater effluent volume per tonne of capacity at a site producing a variety of rubber products other than car tires. OECD (2004). Emission Scenario Documents on Additives in Rubber Industry, No. 6. Organisation for Economic Co-operation and Development. Paris, France. http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=en/v/jm/mono(2004)11&doclanguage=en	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 metalworking fluids did not describe the release of any solvent volatiles to soil. OECD (2004). Emission Scenario Documents on Lubricants and Lubricant Additives. OECD Series on Emission Scenario Documents, Number 10. Organization for Economic Co-operation and Development. Paris, France. http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=en/v/jm/mono(2004)21&doclanguage=en	Y	N
5.3.4 Release Factor – waste				
	Percent of input amount disposed as waste:	10.0%	Y	N
	Justification of RFs:	The quoted value was derived from a life cycle assessment for the commercial production of base fluids used in the formulation of lubricants	Y	N

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	sub-SPERC identifier:	ESVOC 4.7a.d.v3 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):	5.0%	Y	Y
	Justification of RFs (Air):	The air release considers the misting and evaporation that occurs when a conventional solvent-based machining fluid is used to mill metal parts. OECD, 2004. Emission Scenario Documents on Lubricants and Lubricant Additives. No. 10, Organisation for Economic Co-operation and Development. Paris, France. http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=en/v/jm/mono(2004)21&doclanguage=en	Y	N
5.3.2 Release Factor – water				
	Numeric value / percent of input amount (Water):	0.03%	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 a published estimate of wastewater effluent volume per tonne of capacity at a site producing a variety of rubber products other than car tires. OECD (2004). Emission Scenario Documents on Additives in Rubber Industry, No. 6. Organisation for Economic Co-operation and Development. Paris, France. http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=en/v/jm/mono(2004)11&doclanguage=en	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 metalworking fluids did not describe the release of any solvent volatiles to soil. OECD (2004). Emission Scenario Documents on Lubricants and Lubricant Additives. OECD Series on Emission Scenario Documents, Number 10. Organization for Economic Co-operation and Development. Paris, France. http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=en/v/jm/mono(2004)21&doclanguage=en	Y	N
5.3.4 Release Factor – waste				
	Percent of input amount disposed as waste	10.0%	Y	N
	Justification of RFs:	The quoted value was derived from a life cycle assessment for the commercial production of base fluids used in the formulation of lubricants	Y	N

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		(Vag et al. 2004). This operation provides a reasonable surrogate for the manufacture of metal working fluids for use in the parts fabrication industry. The highest reported solid waste factor of 1% was judged to be representative of other metal working fluids. An uncertainty factor of 10 has been applied to this value based on the anticipated variability of this factor across different industry sectors. Vag, C. et al. (2002). A comparative life cycle assessment of the manufacture of base fluids for lubricants. <i>Journal of Synthetic Lubrication</i> 19,39-57.		
	sub-SPERC identifier:	ESVOC 4.7a.e.v3 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):	5.0%	Y	Y
	Justification of RFs (Air):	The air release considers the misting and evaporation that occurs when a conventional solvent-based machining fluid is used to mill metal parts. OECD, 2004. Emission Scenario Documents on Lubricants and Lubricant Additives. No. 10, Organisation for Economic Co-operation and Development. Paris, France. http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=en/v/jm/mono(2004)21&doclanguage=en	Y	N
5.3.2 Release Factor – water				
	Numeric value / percent of input amount (Water):	0.1%	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 a published estimate of wastewater effluent volume per tonne of capacity at a site producing a variety of rubber products other than car tires. OECD (2004). Emission Scenario Documents on Additives in Rubber Industry, No. 6. Organisation for Economic Co-operation and Development. Paris, France. http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=en/v/jm/mono(2004)11&doclanguage=en	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 metalworking fluids did not describe the release of any solvent volatiles to soil. OECD (2004). Emission Scenario Documents on Lubricants and Lubricant Additives. OECD Series on Emission Scenario Documents, Number 10. Organization for Economic Co-operation and Development. Paris, France. http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=en/v/jm/mono(2004)21&doclanguage=en	Y	N
5.3.4 Release Factor – waste				
	Percent of input amount disposed as waste:	10.0%	Y	N
	Justification of RFs:	The quoted value was derived from a life cycle assessment for the commercial production of base fluids used in the formulation of lubricants	Y	N

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		<p>(Vag et al. 2004). This operation provides a reasonable surrogate for the manufacture of metal working fluids for use in the parts fabrication industry. The highest reported solid waste factor of 1% was judged to be representative of other metal working fluids. An uncertainty factor of 10 has been applied to this value based on the anticipated variability of this factor across different industry sectors.</p> <p>Vag, C. et al. (2002). A comparative life cycle assessment of the manufacture of base fluids for lubricants. <i>Journal of Synthetic Lubrication</i> 19,39-57.</p>		
References to SPERC Background Document				
	Reference to Background Document	<p>ESIG/ESVOC (2019). SpERC Background Document. 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.</p>	Y	N