

FS Section	Content field	Explanation of content	CSR	eSDS
1. Title	1.1 Title of SPERC	Use in binders and release agents (industrial): solvent-borne	Y	Y
	1.2 SPERC code	ESVOC SPERC 4.10a.v4	Y	Y
2. Scope	<b>2.1 Substance/Product Domain</b>			
	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
	<b>2.2 Process domain</b>			
	Description of activities/processes:	Use as binders and release agents including material transfers, mixing, application (including spraying and brushing), mould forming and casting, and handling of waste.	Y	Y
	<b>2.3 List of applicable Use Descriptors</b>			
	LCS	IS – Use at industrial sites	Y	Y
	SU	SU0 - Other	Y	Y
PC	PC24 – Lubricants, greases, release products	Y	Y	
3. Operational conditions	<b>3.1 Conditions of use</b>			
	Location of use	Indoor	Y	Y
	Water contact during use	Yes	Y	Y
	Connected to a standard municipal biological STP	Yes	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
	<b>3.2 Waste Handling and Disposal</b>			
	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 vapour 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 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	Y	N

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		in the Chemical Sector. Report EUR 28112 EN. European IPPC Bureau. Seville, Spain. <a href="http://eippcb.jrc.ec.europa.eu/reference/BREF/CWW_Bref_2016_publiched.pdf">http://eippcb.jrc.ec.europa.eu/reference/BREF/CWW_Bref_2016_publiched.pdf</a> 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. <a href="https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008L0098&amp;from=EN">https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008L0098&amp;from=EN</a>		
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. <a href="http://eippcb.jrc.ec.europa.eu/reference/BREF/CWW_Bref_2016_publiched.pdf">http://eippcb.jrc.ec.europa.eu/reference/BREF/CWW_Bref_2016_publiched.pdf</a>	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. <a href="http://eippcb.jrc.ec.europa.eu/reference/BREF/CWW_Bref_2016_publiched.pdf">http://eippcb.jrc.ec.europa.eu/reference/BREF/CWW_Bref_2016_publiched.pdf</a>	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). <a href="https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf">Guidance on Information Requirements and Chemical Safety Assessment. Chapter R.16: Environmental Exposure Assessment</a> Version 3.0. European Chemicals Agency. Helsinki, Finland.	Y	N
5. Exposure Assessment Input	<b>5.1 Substance use rate</b>			
	Amount of substance use per day:	25,000 kg/day	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. <a href="https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf">Guidance on Information Requirements and Chemical Safety Assessment. Chapter R.16: Environmental Exposure Assessment</a> Version 3.0. European Chemicals Agency. Helsinki, Finland.	Y	N
	<b>5.2 Days emitting</b>			
	Number of emission days per year:	100 (default value)	Y	Y
	Justification / information source:	ECHA, 2016. <a href="https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf">Guidance on Information Requirements and Chemical Safety Assessment. Chapter R.16: Environmental Exposure Assessment</a> Version 3.0. European Chemicals Agency. Helsinki, Finland.	Y	N
	<b>5.3 Release factors</b>			

FS Section	Content field	Explanation of content	CSR	eSDS
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.a.v4 VP >10000 Pa; WS <0.001 mg/l	Y	N
	ERC	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure >10000 Pa Water solubility <0.001 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	75%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tqdp2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tqdp2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	0.00001 %	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors. Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.	Y	N
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tqdp2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tqdp2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.b.v4 VP >10000 Pa; WS 0.001-0.01 mg/l	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
	ERC	ERC 4		
	sub-SPERC applicability:	Vapour pressure >10000 Pa Water solubility 0.001-0.01 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	Numeric value / percent of input amount (Air)	75%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				
	Numeric value / percent of input amount (Water):	0.00003%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors. Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.	Y	N
<b>5.3.3 Release Factor – soil</b>				
	Numeric value / percent of input amount (Soil):	1.0%	Y	Y
	Justification of RFs (Soil):	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	Percent of input amount disposed as waste:	0.1%	Y	N
	Justification of RFs:	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	sub-SPERC identifier:	ESVOC 4.10a.c.v4 VP >10000 Pa; WS 0.01-0.1 mg/l	Y	N
	ERC	ERC 4		

FS Section	Content field	Explanation of content	CSR	eSDS
	sub-SPERC applicability:	Vapour pressure >10000 Pa Water solubility 0.01-0.1 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	Numeric value / percent of input amount (Air)	75%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				
	Numeric value / percent of input amount (Water):	0.0003%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors. Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.	Y	N
<b>5.3.3 Release Factor – soil</b>				
	Numeric value / percent of input amount (Soil):	1.0%	Y	Y
	Justification of RFs (Soil):	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	Percent of input amount disposed as waste:	0.1%	Y	N
	Justification of RFs:	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	sub-SPERC identifier:	ESVOC 4.10a.d.v4 VP >10000 Pa; WS 0.1-1.0 mg/l	Y	N
	ERC	ERC 4		
	sub-SPERC applicability:	Vapour pressure >10000 Pa Water solubility 0.1-1.0 mg/l	Y	N

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<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	75%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tqdp2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tqdp2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	0.003%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors. Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.	Y	N
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tqdp2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tqdp2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.e.v4 VP >10000 Pa; WS 1-10 mg/l	Y	N
	<b>ERC</b>	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure >10000 Pa Water solubility 1-10 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				

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	Numeric value / percent of input amount (Air)	75%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. ( <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a> )	Y	N
<b>5.3.2 Release Factor – water</b>				
	Numeric value / percent of input amount (Water):	0.03%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors. Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.	Y	N
<b>5.3.3 Release Factor – soil</b>				
	Numeric value / percent of input amount (Soil):	1.0%	Y	Y
	Justification of RFs (Soil):	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. ( <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a> )	Y	N
<b>5.3.4 Release Factor – waste</b>				
	Percent of input amount disposed as waste:	0.1%	Y	N
	Justification of RFs:	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	sub-SPERC identifier:	ESVOC 4.10a.f.v4 VP >10000 Pa; WS 10-100 mg/l	Y	N
	ERC	ERC 4		
	sub-SPERC applicability:	Vapour pressure >10000 Pa Water solubility 10-100 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	Numeric value / percent of input amount (Air)	75%	Y	Y

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	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	0.3%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors. Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.	Y	N
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.g.v4 VP >10000 Pa; WS 100-1000 mg/l	Y	N
	<b>ERC</b>	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure >10000 Pa Water solubility 100-1000 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	50%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of	Y	N



FS Section	Content field	Explanation of content	CSR	eSDS
		environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>		
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	3%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors. Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.	Y	N
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	<b>ESVOC 4.10a.h.v4</b> <b>VP &gt;10000 Pa; WS &gt;1000 mg/l</b>	Y	N
	<b>ERC</b>	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure >10000 Pa Water solubility >1000 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	10%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM).	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tqdp2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tqdp2_2ed_en.pdf</a>		
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	10%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of neutralizing amines added to the make-up water feeding an industrial steam boiler. The water loss from boiler blowdowns at a large complex of fifteen buildings required the addition of 1 pound of water treatment chemicals per 40 gallons of water (Edgerton et al., 1989). This is equivalent to a water usage factor of 334 m <sup>3</sup> /tonne which allowed a release factor to be calculated for each water solubility category. Edgerton, S.A., Kenny, D.V., Joseph, D.W., 1989. Determination of amines in indoor air from steam humidification. Environmental Science & Technology 23, 484-488.	Y	N
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tqdp2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tqdp2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.i.v4 VP1000-10000 Pa; WS <0.001 mg/l	Y	N
	<b>ERC</b>	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure 1000-10000 Pa Water solubility <0.001 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	50%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM).	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. ( <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a> )		
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	0.00001%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors. Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.	Y	N
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. ( <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a> )	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.j.v4 VP 1000-10000 Pa; WS 0.001-0.01 mg/l	Y	N
	<b>ERC</b>	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure 1000-10000 Pa Water solubility 0.001-0.01 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	50%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2,	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tqdp2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tqdp2_2ed_en.pdf</a>		
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	0.00003%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors. Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.	Y	N
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tqdp2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tqdp2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.k.v4 VP 1000-10000 Pa; WS 0.01-0.1 mg/l	Y	N
	ERC	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure 1000-10000 Pa Water solubility 0.01-0.1 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	50%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tqdp2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tqdp2_2ed_en.pdf</a>	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	0.0003%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors. Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.	Y	N
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.1.v4 VP 1000-10000 Pa; WS 0.1-1.0 mg/l	Y	N
	<b>ERC</b>	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure 1000-10000 Pa Water solubility 0.1-1.0 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	50%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				

FS Section	Content field	Explanation of content	CSR	eSDS
	Numeric value / percent of input amount (Water):	0.003%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of neutralizing amines added to the make-up water feeding an industrial steam boiler. The water loss from boiler blowdowns at a large complex of fifteen buildings required the addition of 1 pound of water treatment chemicals per 40 gallons of water (Edgerton et al., 1989). This is equivalent to a water usage factor of 334 m <sup>3</sup> /tonne which allowed a release factor to be calculated for each water solubility category. Edgerton, S.A., Kenny, D.V., Joseph, D.W., 1989. Determination of amines in indoor air from steam humidification. Environmental Science & Technology 23, 484-488.	Y	N
<b>5.3.3 Release Factor – soil</b>				
	Numeric value / percent of input amount (Soil):	1.0%	Y	Y
	Justification of RFs (Soil):	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	Percent of input amount disposed as waste:	0.1%	Y	N
	Justification of RFs:	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	<b>ESVOC 4.10a.m.v4</b> <b>VP 1000-10000 Pa; WS 1-10 mg/l</b>	Y	N
	ERC	ERC 4		
	sub-SPERC applicability:	Vapour pressure 1000-10000 Pa) Water solubility 1-10 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	Numeric value / percent of input amount (Air)	50%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				

FS Section	Content field	Explanation of content	CSR	eSDS
	Numeric value / percent of input amount (Water):	0.03%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors. Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.	Y	N
<b>5.3.3 Release Factor – soil</b>				
	Numeric value / percent of input amount (Soil):	1.0%	Y	Y
	Justification of RFs (Soil):	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	Percent of input amount disposed as waste:	0.1%	Y	N
	Justification of RFs:	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.n.v4 VP 1000-10000 Pa; WS 10-100 mg/l	Y	N
	ERC	ERC 4		
	sub-SPERC applicability:	Vapour pressure 1000-10000 Pa Water solubility 10-100 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	Numeric value / percent of input amount (Air)	50%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				
	Numeric value / percent of input amount (Water):	0.3%	Y	Y

FS Section	Content field	Explanation of content	CSR	eSDS
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors. Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.	Y	N
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tqdp2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tqdp2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.o.v4 VP 1000-10000 Pa; WS 100-1000 mg/l	Y	N
	<b>ERC</b>	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure 1000-10000 Pa Water solubility 100-1000 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	10%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tqdp2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tqdp2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	3%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a	Y	N



FS Section	Content field	Explanation of content	CSR	eSDS
		water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors. Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.		
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.p.v4 VP 1000-10000 Pa; WS >1000 mg/l	Y	N
	<b>ERC</b>	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure 1000-10000 Pa Water solubility >1000 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	1%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	10%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors. Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.		
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tqdp2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tqdp2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.q.v4 VP100-1000 Pa; WS <0.001 mg/l	Y	N
	<b>ERC</b>	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure 100-1000 Pa Water solubility <0.001 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	10%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tqdp2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tqdp2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	0.00001%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008).	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		This factor was used along with the water solubility limit for each category to calculate the individual water release factors. Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.		
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tqdp2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tqdp2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.r.v4 VP 100-1000 Pa; WS 0.001-0.01 mg/l	Y	N
	<b>ERC</b>	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure 100-1000 Pa Water solubility 0.001-0.01 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	10%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tqdp2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tqdp2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	0.00003%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.		
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.s.v4 VP 100-1000 Pa; WS 0.01-0.1 mg/l	Y	N
	<b>ERC</b>	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure 100-1000 Pa Water solubility 0.01-0.1 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	10%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	0.0003%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.		
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.t.v4 VP 100-1000 Pa; WS 0.1-1.0 mg/l	Y	N
	<b>ERC</b>	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure 100-1000 Pa Water solubility 0.1-1.0 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	10%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	0.003%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. <i>Environmental Modelling &amp; Software</i> 23, 147-168.		
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.u.v4 VP 100-1000 Pa; WS 1-10 mg/l	Y	N
	<b>ERC</b>	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure 100-1000 Pa Water solubility 1-10 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	10%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	0.03%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.		
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.v.v4 VP 100-1000 Pa; WS 10-100 mg/l	Y	N
	<b>ERC</b>	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure 100-1000 Pa Water solubility 10-100 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	10%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	0.3%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. <i>Environmental Modelling &amp; Software</i> 23, 147-168.		
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.w.v4 VP 100-1000 Pa; WS 100-1000 mg/l	Y	N
	<b>ERC</b>	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure 100-1000 Pa Water solubility 100-1000 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	5%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	3%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors.	Y	N



FS Section	Content field	Explanation of content	CSR	eSDS
		Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.		
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.x.v4 VP 100-1000 Pa; WS >1000 mg/l	Y	N
	<b>ERC</b>	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure 100-1000 Pa (Low solubility <100 mg/l) Water solubility >1000 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	0.1%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	10%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.		
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.y.v4 VP10-100 Pa; WS <0.001 mg/l	Y	N
	<b>ERC</b>	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure 10-100 Pa Water solubility <0.001 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	1%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	0.00001%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.		
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.z.v4 VP 10-100 Pa; WS 0.001-0.01 mg/l	Y	N
	<b>ERC</b>	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure 10-100 Pa Water solubility 0.001-0.01 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	1%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	0.00003%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. <i>Environmental Modelling &amp; Software</i> 23, 147-168.		
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.aa.v4 VP 10-100 Pa; WS 0.01-0.1 mg/l	Y	N
	<b>ERC</b>	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure 10-100 Pa Water solubility 0.01-0.1 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	1%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	0.0003%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.		
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.bb.v4 VP 10-100 Pa; WS 0.1-1.0 mg/l	Y	N
	<b>ERC</b>	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure 10-100 Pa Water solubility 0.1-1.0 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	1%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	0.003%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.		
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.cc.v4 VP 10-100 Pa; WS 1-10 mg/l	Y	N
	<b>ERC</b>	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure 10-100 Pa Water solubility 1-10 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	1%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	0.03%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.		
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.dd.v4 VP 10-100 Pa; WS 10-100 mg/l	Y	N
	<b>ERC</b>	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure 10-100 Pa Water solubility 10-100 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	1%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	0.3%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.		
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.ee.v4 VP 10-100 Pa; WS 100-1000 mg/l	Y	N
	<b>ERC</b>	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure 10-100 Pa Water solubility 100-1000 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	0.1%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	3%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors.	Y	N



FS Section	Content field	Explanation of content	CSR	eSDS
		Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.		
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.ff.v4 VP 10-100 Pa; WS >1000 mg/l	Y	N
	<b>ERC</b>	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure 10-100 Pa Water solubility >1000 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	0.01%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	10%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.		
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.gg.v4 VP <10 Pa; WS <0.001 mg/l	Y	N
	<b>ERC</b>	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure <10 Pa Water solubility <0.001 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	0.1%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	0.00001%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.		
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.hh.v4 VP <10 Pa; WS 0.001-0.01 mg/l	Y	N
	<b>ERC</b>	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure <10 Pa Water solubility 0.001-0.01 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	0.1%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	0.00003%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.		
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.ii.v4 VP <10 Pa; WS 0.01-0.1 mg/l	Y	N
	<b>ERC</b>	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure <10 Pa Water solubility 0.01-0.1 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	0.1%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	0.0003%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.		
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.jj.v4 VP <10 Pa; WS 0.1-1.0 mg/l	Y	N
	<b>ERC</b>	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure <10 Pa Water solubility 0.1-1.0 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	0.1%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	0.003%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.		
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.kk.v4 VP <10 Pa; WS 1-10 mg/l	Y	N
	<b>ERC</b>	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure <10 Pa Water solubility 1-10 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	0.1%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	0.03%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.		
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.II.v4 VP <10 Pa; WS 10-100 mg/l	Y	N
	<b>ERC</b>	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure <10 Pa Water solubility 10-100 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	0.1%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	0.3%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.		
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.mm.v4 VP <10 Pa; WS 100-1000 mg/l	Y	N
	<b>ERC</b>	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure <10 Pa) Water solubility 100-1000 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	0.01%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	3%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors.	Y	N



FS Section	Content field	Explanation of content	CSR	eSDS
		Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. Environmental Modelling & Software 23, 147-168.		
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
	<b>sub-SPERC identifier:</b>	ESVOC 4.10a.nn.v4 VP <10 Pa; WS >1000 mg/l	Y	N
	<b>ERC</b>	ERC 4		
	<b>sub-SPERC applicability:</b>	Vapour pressure <10 Pa Water solubility >1000 mg/l	Y	N
<b>5.3.1 Release Factor – air</b>				
	<b>Numeric value / percent of input amount (Air)</b>	0.001%	Y	Y
	<b>Justification of RFs (Air):</b>	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.2 Release Factor – water</b>				
	<b>Numeric value / percent of input amount (Water):</b>	10%	Y	Y
	<b>Justification of RFs (Water):</b>	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with the amounts of a water-based die release agent used in a parts manufacturing operation. Water and release agent usage at an aluminum die casting facility yielded a water use factor of 98 m <sup>3</sup> /tonne of released agent (Neto et al., 2008). This factor was used along with the water solubility limit for each category to calculate the individual water release factors.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		Neto, B., Kroeze, C., Hordijk, L., Costa, C., 2008. Modelling the environmental impact of an aluminium pressure die casting plant and options for control. <i>Environmental Modelling &amp; Software</i> 23, 147-168.		
<b>5.3.3 Release Factor – soil</b>				
	<b>Numeric value / percent of input amount (Soil):</b>	1.0%	Y	Y
	<b>Justification of RFs (Soil):</b>	The soil release factor was taken from a published source that documents the worst-case estimates of the soil emissions associated with substances used in a miscellaneous industrial process. Based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM), the highest soil release factor was selected for a substance that is not widely dispersed. European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.16, Brussels, Belgium. <a href="https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf">https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf</a>	Y	N
<b>5.3.4 Release Factor – waste</b>				
	<b>Percent of input amount disposed as waste:</b>	0.1%	Y	N
	<b>Justification of RFs:</b>	The waste generation factor was taken from a life cycle assessment for the closed-loop production of office paper from recycled paper feedstock (DEFRA, 2012). The value represents the amount of industrial waste generated during pulp and paper production at a facility in Germany. An uncertainty factor has not been applied to the cited value since the facility is representative of the operations at other facilities using water treatment chemicals. DEFRA (2012). Streamlined LCA of Paper Supply Stream. Department for Environment Food & Rural Affairs. London, United Kingdom. <a href="http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956">http://randd.defra.gov.uk/Default.aspx?Menu=Menu&amp;Module=More&amp;Location=None&amp;Completed=0&amp;ProjectID=18956</a> .	Y	N
<b>References to SPERC Background Document</b>				
	Reference to Background Document	ESIG/ESVOC (2023). 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.	Y	N