| FS Section | Content field | Explanation of content | CSR[1] | eSDS[2] |
|---|---|---|---|---|
| **1. Title** | **1.1 Title of SPERC** | Use as a chemical intermediate | Y | Y |
| | **1.2 SPERC code** | ESVOC SPERC 6.1a.v2 | Y | Y |
| **2. Scope** | **2.1 Substance/Product Domain** | | | |
| | **Substance types / functions / properties included or excluded** | Applicable to petroleum substances and petrochemicals. | Y | N |
| | **Additional specification of product types covered:** | Includes a variety of aliphatic and aromatic hydrocarbons, ketones, alcohols, acetates, glycols, glycol ethers, and glycol ether acetates. | Y | N |
| | **Inclusion of sub-SPERCs** | Yes | N | N |
| | **2.2 Process domain** | | | |
| | **Description of activities/processes:** | Use of the substance as an intermediate (not related to Strictly Controlled Conditions). Includes recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container). | Y | Y |
| | **2.3 List of applicable Use Descriptors** | | | |
| | **LCS** | IS – Use at industrial sites | Y | Y |
| | **SU** | SU8 - Manufacture of fine chemicals | Y | Y |
| | **PC** | PC29 – Pharmaceuticals<br>PC32 – Polymer preparations and compounds | Y | Y |
| **3. Operational conditions** | **3.1 Conditions of use** | | | |
| | **Location of use** | Indoor | Y | Y |
| | **Water contact during use** | Yes | Y | Y |
| | **Connected to a standard municipal biological STP** | No, site specifc biological STP with assumed discharge rate of municipal biological STP of >= 2000 m³/day | Y | Y |
| | **Rigorously contained system with minimisation of release to the environment** | No | Y | N |
| | **Further operational conditions impacting on releases to the environment** | Volatile compounds subject to air emission controls. Wastewater emissions generated from equipment cleaning with water. | Y | Y |
| | **3.2 Waste Handling and Disposal** | | | |
| | **Waste Handling and Disposal:** | Residual raw materials and are in some cases recycled and fed back into the process reactor to improve efficiencies. In other cases, residues and by-products are used as raw materials for other downstream applications (EU, 2016). Wastewater generated during cleaning and maintenance operations is directed to a waste water treatment plant for biological degradation. Atmospheric release of waste vapor may be ameliorated using wet scrubbers, thermal oxidizers, solid adsorbents, membrane separators, biofilters, and/or cold oxidizers for trapping residual vapours. | Y | N |

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

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

| FS Section | Content field | Explanation of content | CSR[1] | eSDS[2] |
|---|---|---|---|---|
| | | All unrecovered waste is handled as an industrial waste that can be incinerated or in some cases re-distilled. EU (2016). Best Available Techniques (BAT) Reference Document for Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical Sector. Report EUR 28112 EN. European IPPC Bureau. Seville, Spain. http://eippcb.jrc.ec.europa.eu/reference/BREF/CWW_Bref_2016_published.pdf | | |
| **4. Obligatory RMMs onsite** | **RMM limiting release to air:** | No obligatory RMMs. | Y | Y |
| | **RMM Efficiency (air):** | Optional RMMs have been assigned a nominal removal efficiency value that is not accounted for in the air release factor. See the background document for more information. | Y | Y |
| | **Reference for RMM Efficiency (air):** | EU (2016). Best Available Techniques (BAT) Reference Document for Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical Sector. Report EUR 28112 EN. European IPPC Bureau. Seville, Spain. http://eippcb.jrc.ec.europa.eu/reference/BREF/CWW_Bref_2016_published.pdf | Y | N |
| | **RMM limiting release to water:** | Oil-water separation (e.g. *via* oil water separators, oil skimmers, or dissolved air flotation) is required. | Y | Y |
| | **RMM Efficiency (water):** | The efficiency of this RMM varies dependent on the treatment technology and the properties of the substance. | Y | Y |
| | **Reference for RMM Efficiency (water):** | EU (2016). Best Available Techniques (BAT) Reference Document for Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical Sector. Report EUR 28112 EN. European IPPC Bureau. Seville, Spain. http://eippcb.jrc.ec.europa.eu/reference/BREF/CWW_Bref_2016_published.pdf | Y | N |
| | **RMM limiting release to soil:** | The sludge generated from wastewater treatment is not applied to agricultural soil. | Y | Y |
| | **RMM Efficiency (soil):** | Not applicable | Y | Y |
| | **Reference for RMM Efficiency (soil):** | ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment. Chapter R.16: Environmental Exposure Assessment Version 3.0. European Chemicals Agency. Helsinki, Finland. https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf | Y | N |
| **5. Exposure Assessment Input** | **5.1 Substance use rate** | | | |
| | **Amount of substance use per day:** | 50,000 kg/day | Y | Y |
| | **Fraction of EU tonnage used in region:** | 100% | Y | N |
| | **Fraction of Regional tonnage used locally:** | 100% | Y | N |
| | **Justification / information source:** | ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment. Chapter R.16: Environmental Exposure Assessment Version 3.0. European Chemicals Agency. Helsinki, Finland. https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf | Y | N |
| | **5.2 Days emitting** | | | |
| | **Number of emission days per year:** | 300 (default value) | Y | Y |
| | **Justification / information source:** | ECHA, 2016. Guidance on Information Requirements and Chemical Safety Assessment. Chapter R.16: Environmental Exposure Assessment Version 3.0. European Chemicals Agency. Helsinki, Finland. https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf | Y | N |

| FS Section | Content field | Explanation of content | CSR[1] | eSDS[2] |
|---|---|---|---|---|
| | **5.3 Release factors** | | | |
| | **sub-SPERC identifier:** | ESVOC 6.1a.a.v2<br>VP >10000 Pa; WS <1 mg/l | Y | N |
| | **ERC** | ERC 6a | | |
| | **sub-SPERC applicability:** | Vapour pressure >10000 Pa<br>Water solubility <1 mg/l | Y | N |
| | **5.3.1 Release Factor – air** | | | |
| | **Numeric value / percent of input amount (Air)** | 2.5% | 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).<br>European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.1, Brussels, Belgium.<br>(https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf) | Y | N |
| | **5.3.2 Release Factor – water** | | | |
| | **Numeric value / percent of input amount (Water):** | 0.001% | Y | Y |
| | **Justification of RFs (Water):** | The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with survey results of wastewater effluent volume per tonne of capacity at European oil refineries.<br>CONCAWE (2012). Trends in oil discharged with aqueous effluents from oil refineries in Europe. Report No. 6/12. Brussels, Belgium.<br>(https://www.concawe.eu/wp-content/uploads/2017/01/report-no-6_12.pdf) | Y | N |
| | **5.3.3 Release Factor – soil** | | | |
| | **Numeric value / percent of input amount (Soil):** | 0.1% | Y | Y |
| | **Justification of RFs (Soil):** | The value has been adopted from an authoritative literature source that documents the release factors for each environmental release category (ERC). The preceding value corresponds to the default release factor for use as an intermediate (ERC 6a).<br>ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment Chapter R.16: Environmental exposure assessment Version 3.0. Appendix A.16-1. Helsinki, Finland.<br>(https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf) | Y | N |
| | **5.3.4 Release Factor – waste** | | | |
| | **Percent of input amount disposed as waste:** | 5.0% | Y | N |
| | **Justification of RFs:** | The value has been adopted from an authoritative literature source that documents the release factors for hazardous wastes generated in an industrial setting (EC, 2017).<br>EC, 2017. Best Available Techniques (BAT) Reference Document for the Production of Large Volume Organic Chemicals. Report EUR 28882 EN, European Integrated Pollution Prevention Bureau. European Commission, Seville, Spain,<br>http://eippcb.jrc.ec.europa.eu/reference/BREF/LVOC/JRC109279_Lvoc_bref_2017.pdf | Y | N |

| FS Section | Content field | Explanation of content | CSR[1] | eSDS[2] |
|---|---|---|---|---|
| | **sub-SPERC identifier:** | ESVOC 6.1a.b.v2<br>VP >10000 Pa; WS 1-10 mg/l | Y | N |
| | **ERC:** | ERC 6a | | |
| | **sub-SPERC applicability:** | Vapour pressure >10000 Pa<br>Water solubility 1-10 mg/l | Y | N |
| | **5.3.1 Release Factor – air** | | | |
| | **Numeric value / percent of input amount (Air):** | 2.5% | 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).<br>European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.1, Brussels, Belgium.<br>(https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf) | Y | N |
| | **5.3.2 Release Factor – water** | | | |
| | **Numeric value / percent of input amount (Water):** | 0.003% | Y | Y |
| | **Justification of RFs (Water):** | The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with survey results of wastewater effluent volume per tonne of capacity at European oil refineries.<br>CONCAWE (2012). Trends in oil discharged with aqueous effluents from oil refineries in Europe. Report No. 6/12. Brussels, Belgium.<br>(https://www.concawe.eu/wp-content/uploads/2017/01/report-no-6_12.pdf) | Y | N |
| | **5.3.3 Release Factor – soil** | | | |
| | **Numeric value / percent of input amount (Soil):** | 0.1% | Y | Y |
| | **Justification of RFs (Soil):** | The value has been adopted from an authoritative literature source that documents the release factors for each environmental release category (ERC). The preceding value corresponds to the default release factor for use as an intermediate (ERC 6a).<br>ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment Chapter R.16: Environmental exposure assessment Version 3.0. Appendix A.16-1. Helsinki, Finland.<br>(https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf) | Y | N |
| | **5.3.4 Release Factor – waste** | | | |
| | **Percent of input amount disposed as waste:** | 5.0% | Y | N |
| | **Justification of RFs:** | The value has been adopted from an authoritative literature source that documents the release factors for hazardous wastes generated in an industrial setting (EC, 2017).<br>EC, 2017. Best Available Techniques (BAT) Reference Document for the Production of Large Volume Organic Chemicals. Report EUR 28882 EN, European Integrated Pollution Prevention Bureau. European Commission, Seville, Spain,<br>http://eippcb.jrc.ec.europa.eu/reference/BREF/LVOC/JRC109279_Lvoc_bref_2017.pdf | Y | N |
| | **sub-SPERC identifier:** | ESVOC 6.1a.c.v2<br>VP >10000 Pa; WS 10-100 mg/l | Y | N |

| FS Section | Content field | Explanation of content | CSR[1] | eSDS[2] |
|---|---|---|---|---|
| | **ERC** | ERC 6a | | |
| | **sub-SPERC applicability:** | Vapour pressure >10000 Pa<br>Water Solubility 10-100 mg/l | Y | N |
| | **5.3.1 Release Factor – air** | | | |
| | **Numeric value / percent of input amount (Air):** | 2.5% | 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).<br>European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.1, Brussels, Belgium.<br>(https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf) | Y | N |
| | **5.3.2 Release Factor – water** | | | |
| | **Numeric value / percent of input amount (Water):** | 0.03% | Y | Y |
| | **Justification of RFs (Water):** | The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with survey results of wastewater effluent volume per tonne of capacity at European oil refineries.<br>CONCAWE (2012). Trends in oil discharged with aqueous effluents from oil refineries in Europe. Report No. 6/12. Brussels, Belgium.<br>(https://www.concawe.eu/wp-content/uploads/2017/01/report-no-6_12.pdf) | Y | N |
| | **5.3.3 Release Factor – soil** | | | |
| | **Numeric value / percent of input amount (Soil):** | 0.1% | Y | Y |
| | **Justification of RFs (Soil):** | The value has been adopted from an authoritative literature source that documents the release factors for each environmental release category (ERC). The preceding value corresponds to the default release factor for use as an intermediate (ERC 6a).<br>ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment Chapter R.16: Environmental exposure assessment Version 3.0. Appendix A.16-1. Helsinki, Finland.<br>(https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf) | Y | N |
| | **5.3.4 Release Factor – waste** | | | |
| | **Percent of input amount disposed as waste:** | 5.0% | Y | N |
| | **Justification of RFs:** | The value has been adopted from an authoritative literature source that documents the release factors for hazardous wastes generated in an industrial setting (EC, 2017).<br>EC, 2017. Best Available Techniques (BAT) Reference Document for the Production of Large Volume Organic Chemicals. Report EUR 28882 EN, European Integrated Pollution Prevention Bureau. European Commission, Seville, Spain,<br>http://eippcb.jrc.ec.europa.eu/reference/BREF/LVOC/JRC109279_Lvoc_bref_2017.pdf | Y | N |
| | **sub-SPERC identifier:** | ESVOC 6.1a.d.v2<br>VP >10000 Pa; WS 100-1000 mg/l | Y | N |
| | **ERC** | ERC 6a | | |

| FS Section | Content field | Explanation of content | CSR[1] | eSDS[2] |
|---|---|---|---|---|
| | **sub-SPERC applicability:** | Vapour pressure >10000 Pa<br>Water Solubility 100-1000 mg/l | Y | N |
| | **5.3.1 Release Factor – air** | | | |
| | **Numeric value / percent of input amount (Air):** | 2.5% | 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).<br>European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf) | Y | N |
| | **5.3.2 Release Factor – water** | | | |
| | **Numeric value / percent of input amount (Water):** | 0.3% | Y | Y |
| | **Justification of RFs (Water):** | The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with survey results of wastewater effluent volume per tonne of capacity at European oil refineries.<br>CONCAWE (2012). Trends in oil discharged with aqueous effluents from oil refineries in Europe. Report No. 6/12. Brussels, Belgium. (https://www.concawe.eu/wp-content/uploads/2017/01/report-no-6_12.pdf) | Y | N |
| | **5.3.3 Release Factor – soil** | | | |
| | **Numeric value / percent of input amount (Soil):** | 0.1% | Y | Y |
| | **Justification of RFs (Soil):** | The value has been adopted from an authoritative literature source that documents the release factors for each environmental release category (ERC). The preceding value corresponds to the default release factor for use as an intermediate (ERC 6a).<br>ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment Chapter R.16: Environmental exposure assessment Version 3.0. Appendix A.16-1. Helsinki, Finland. (https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf) | Y | N |
| | **5.3.4 Release Factor – waste** | | | |
| | **Percent of input amount disposed as waste** | 5.0% | Y | N |
| | **Justification of RFs:** | The value has been adopted from an authoritative literature source that documents the release factors for hazardous wastes generated in an industrial setting (EC, 2017).<br>EC, 2017. Best Available Techniques (BAT) Reference Document for the Production of Large Volume Organic Chemicals. Report EUR 28882 EN, European Integrated Pollution Prevention Bureau. European Commission, Seville, Spain, http://eippcb.jrc.ec.europa.eu/reference/BREF/LVOC/JRC109279_Lvoc_bref_2017.pdf | Y | N |
| | **sub-SPERC identifier:** | ESVOC 6.1a.e.v2<br>VP >10000 Pa; WS >1000 mg/l | Y | N |
| | **ERC** | ERC 6a | | |
| | **sub-SPERC applicability:** | Vapour pressure >10000 Pa<br>Water Solubility >1000 mg/l | Y | N |

| FS Section | Content field | Explanation of content | CSR[1] | eSDS[2] |
|---|---|---|---|---|
| | **5.3.1 Release Factor – air** | | | |
| | **Numeric value / percent of input amount (Air):** | 2.5% | 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 A3.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf) | Y | N |
| | **5.3.2 Release Factor – water** | | | |
| | **Numeric value / percent of input amount (Water):** | 1.0% | Y | Y |
| | **Justification of RFs (Water):** | The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with survey results of wastewater effluent volume per tonne of capacity at European oil refineries. CONCAWE (2012). Trends in oil discharged with aqueous effluents from oil refineries in Europe. Report No. 6/12. Brussels, Belgium. (https://www.concawe.eu/wp-content/uploads/2017/01/report-no-6_12.pdf) | Y | N |
| | **5.3.3 Release Factor – soil** | | | |
| | **Numeric value / percent of input amount (Soil):** | 0.1% | Y | Y |
| | **Justification of RFs (Soil):** | The value has been adopted from an authoritative literature source that documents the release factors for each environmental release category (ERC). The preceding value corresponds to the default release factor for use as an intermediate (ERC 6a). ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment Chapter R.16: Environmental exposure assessment Version 3.0. Appendix A.16-1. Helsinki, Finland. (https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf) | Y | N |
| | **5.3.4 Release Factor – waste** | | | |
| | **Percent of input amount disposed as waste:** | 5.0% | Y | N |
| | **Justification of RFs:** | The value has been adopted from an authoritative literature source that documents the release factors for hazardous wastes generated in an industrial setting (EC, 2017). EC, 2017. Best Available Techniques (BAT) Reference Document for the Production of Large Volume Organic Chemicals. Report EUR 28882 EN, European Integrated Pollution Prevention Bureau. European Commission, Seville, Spain, http://eippcb.jrc.ec.europa.eu/reference/BREF/LVOC/JRC109279_Lvoc_bref_2017.pdf | Y | N |
| | **sub-SPERC identifier:** | ESVOC 6.1a.f.v2 VP 1000-10000 Pa; WS <1 mg/l | Y | N |
| | **ERC** | ERC 6a | | |
| | **sub-SPERC applicability:** | Vapour pressure 1000-10000 Pa Water Solubility <1 mg/l | Y | N |
| | **5.3.1 Release Factor – air** | | | |

| FS Section | Content field | Explanation of content | CSR[1] | eSDS[2] |
|---|---|---|---|---|
| | **Numeric value / percent of input amount (Air):** | 1.0% | 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 A3.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf) | Y | N |
| | **5.3.2 Release Factor – water** | | | |
| | **Numeric value / percent of input amount (Water):** | 0.001% | Y | Y |
| | **Justification of RFs (Water):** | The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with survey results of wastewater effluent volume per tonne of capacity at European oil refineries. CONCAWE (2012). Trends in oil discharged with aqueous effluents from oil refineries in Europe. Report No. 6/12. Brussels, Belgium. (https://www.concawe.eu/wp-content/uploads/2017/01/report-no-6_12.pdf) | Y | N |
| | **5.3.3 Release Factor – soil** | | | |
| | **Numeric value / percent of input amount (Soil):** | 0.1% | Y | Y |
| | **Justification of RFs (Soil):** | The value has been adopted from an authoritative literature source that documents the release factors for each environmental release category (ERC). The preceding value corresponds to the default release factor for use as an intermediate (ERC 6a). ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment Chapter R.16: Environmental exposure assessment Version 3.0. Appendix A.16-1. Helsinki, Finland. (https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf) | Y | N |
| | **5.3.4 Release Factor – waste** | | | |
| | **Percent of input amount disposed as waste:** | 5.0% | Y | N |
| | **Justification of RFs:** | The value has been adopted from an authoritative literature source that documents the release factors for hazardous wastes generated in an industrial setting (EC, 2017). EC, 2017. Best Available Techniques (BAT) Reference Document for the Production of Large Volume Organic Chemicals. Report EUR 28882 EN, European Integrated Pollution Prevention Bureau. European Commission, Seville, Spain, http://eippcb.jrc.ec.europa.eu/reference/BREF/LVOC/JRC109279_Lvoc_bref_2017.pdf | Y | N |
| | **sub-SPERC identifier:** | ESVOC 6.1a.g.v2 VP 1000-10000 Pa; WS 1-10 mg/l | Y | N |
| | **ERC** | ERC 6a | | |
| | **sub-SPERC applicability:** | Vapour pressure 1000-10000 Pa Water Solubility 1-10 mg/l | Y | N |
| | **5.3.1 Release Factor – air** | | | |
| | **Numeric value / percent of input amount (Air):** | 1.0% | Y | Y |

| FS Section | Content field | Explanation of content | CSR[1] | eSDS[2] |
|---|---|---|---|---|
| | 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 A3.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf) | Y | N |
| **5.3.2 Release Factor – water** | | | | |
| | Numeric value / percent of input amount (Water): | 0.003% | Y | Y |
| | Justification of RFs (Water): | The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with survey results of wastewater effluent volume per tonne of capacity at European oil refineries. CONCAWE (2012). Trends in oil discharged with aqueous effluents from oil refineries in Europe. Report No. 6/12. Brussels, Belgium. (https://www.concawe.eu/wp-content/uploads/2017/01/report-no-6_12.pdf) | Y | N |
| **5.3.3 Release Factor – soil** | | | | |
| | Numeric value / percent of input amount (Soil): | 0.1% | Y | Y |
| | Justification of RFs (Soil): | The value has been adopted from an authoritative literature source that documents the release factors for each environmental release category (ERC). The preceding value corresponds to the default release factor for use as an intermediate (ERC 6a). ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment Chapter R.16: Environmental exposure assessment Version 3.0. Appendix A.16-1. Helsinki, Finland. (https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf) | Y | N |
| **5.3.4 Release Factor – waste** | | | | |
| | Percent of input amount disposed as waste: | 5.0% | Y | N |
| | Justification of RFs: | The value has been adopted from an authoritative literature source that documents the release factors for hazardous wastes generated in an industrial setting (EC, 2017). EC, 2017. Best Available Techniques (BAT) Reference Document for the Production of Large Volume Organic Chemicals. Report EUR 28882 EN, European Integrated Pollution Prevention Bureau. European Commission, Seville, Spain, http://eippcb.jrc.ec.europa.eu/reference/BREF/LVOC/JRC109279_Lvoc_bref_2017.pdf | Y | N |
| | <mark>sub-SPERC identifier:</mark> | <mark>ESVOC 6.1a.h.v2</mark> <mark>VP 1000-10000 Pa; WS 10-100 mg/l</mark> | Y | N |
| | ERC | ERC 6a | | |
| | sub-SPERC applicability: | Vapour pressure 1000-10000 Pa Water Solubility 10-100 mg/l | Y | N |
| **5.3.1 Release Factor – air** | | | | |
| | Numeric value / percent of input amount (Air): | 1.0% | 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 | Y | N |

| FS Section | Content field | Explanation of content | CSR[1] | eSDS[2] |
|---|---|---|---|---|
| | | 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 A3.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf) | | |
| | **5.3.2 Release Factor – water** | | | |
| | **Numeric value / percent of input amount (Water):** | 0.03% | Y | Y |
| | **Justification of RFs (Water):** | The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with survey results of wastewater effluent volume per tonne of capacity at European oil refineries. CONCAWE (2012). Trends in oil discharged with aqueous effluents from oil refineries in Europe. Report No. 6/12. Brussels, Belgium. (https://www.concawe.eu/wp-content/uploads/2017/01/report-no-6_12.pdf) | Y | N |
| | **5.3.3 Release Factor – soil** | | | |
| | **Numeric value / percent of input amount (Soil):** | 0.1% | Y | Y |
| | **Justification of RFs (Soil):** | The value has been adopted from an authoritative literature source that documents the release factors for each environmental release category (ERC). The preceding value corresponds to the default release factor for use as an intermediate (ERC 6a). ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment Chapter R.16: Environmental exposure assessment Version 3.0. Appendix A.16-1. Helsinki, Finland. (https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf) | Y | N |
| | **5.3.4 Release Factor – waste** | | | |
| | **Percent of input amount disposed as waste:** | 5.0% | Y | N |
| | **Justification of RFs:** | The value has been adopted from an authoritative literature source that documents the release factors for hazardous wastes generated in an industrial setting (EC, 2017). EC, 2017. Best Available Techniques (BAT) Reference Document for the Production of Large Volume Organic Chemicals. Report EUR 28882 EN, European Integrated Pollution Prevention Bureau. European Commission, Seville, Spain, http://eippcb.jrc.ec.europa.eu/reference/BREF/LVOC/JRC109279_Lvoc_bref_2017.pdf | Y | N |
| | **sub-SPERC identifier:** | ESVOC 6.1a.i.v2 VP 1000-10000 Pa; WS 100-1000 mg/l | Y | N |
| | **ERC** | ERC 6a | | |
| | **sub-SPERC applicability:** | Vapour pressure 1000-10000 Pa Water Solubility 100-1000 mg/l | Y | N |
| | **5.3.1 Release Factor – air** | | | |
| | **Numeric value / percent of input amount (Air):** | 1.0% | 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). | Y | N |

| FS Section | Content field | Explanation of content | CSR[1] | eSDS[2] |
|---|---|---|---|---|
| | | European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf) | | |
| | **5.3.2 Release Factor – water** | | | |
| | **Numeric value / percent of input amount (Water):** | 0.3% | Y | Y |
| | **Justification of RFs (Water):** | The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with survey results of wastewater effluent volume per tonne of capacity at European oil refineries. CONCAWE (2012). Trends in oil discharged with aqueous effluents from oil refineries in Europe. Report No. 6/12. Brussels, Belgium. (https://www.concawe.eu/wp-content/uploads/2017/01/report-no-6_12.pdf) | Y | N |
| | **5.3.3 Release Factor – soil** | | | |
| | **Numeric value / percent of input amount (Soil):** | 0.1% | Y | Y |
| | **Justification of RFs (Soil):** | The value has been adopted from an authoritative literature source that documents the release factors for each environmental release category (ERC). The preceding value corresponds to the default release factor for use as an intermediate (ERC 6a). ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment Chapter R.16: Environmental exposure assessment Version 3.0. Appendix A.16-1. Helsinki, Finland. (https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf) | Y | N |
| | **5.3.4 Release Factor – waste** | | | |
| | **Percent of input amount disposed as waste:** | 5.0% | Y | N |
| | **Justification of RFs:** | The value has been adopted from an authoritative literature source that documents the release factors for hazardous wastes generated in an industrial setting (EC, 2017). EC, 2017. Best Available Techniques (BAT) Reference Document for the Production of Large Volume Organic Chemicals. Report EUR 28882 EN, European Integrated Pollution Prevention Bureau. European Commission, Seville, Spain, http://eippcb.jrc.ec.europa.eu/reference/BREF/LVOC/JRC109279_Lvoc_bref_2017.pdf | Y | N |
| | **sub-SPERC identifier:** | ESVOC 6.1a.j.v2 VP 1000-10000 Pa; WS >1000 mg/l | Y | N |
| | **ERC** | ERC 6a | | |
| | **sub-SPERC applicability:** | Vapour pressure 1000-10000 Pa Water Solubility >1000 mg/l | Y | N |
| | **5.3.1 Release Factor – air** | | | |
| | **Numeric value / percent of input amount (Air):** | 1.0% | 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, | Y | N |

| FS Section | Content field | Explanation of content | CSR[1] | eSDS[2] |
|---|---|---|---|---|
| | | Appendix 1, Table A3.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf) | | |
| | **5.3.2 Release Factor – water** | | | |
| | **Numeric value / percent of input amount (Water):** | 1.0% | Y | Y |
| | **Justification of RFs (Water):** | The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with survey results of wastewater effluent volume per tonne of capacity at European oil refineries. CONCAWE (2012). Trends in oil discharged with aqueous effluents from oil refineries in Europe. Report No. 6/12. Brussels, Belgium. (https://www.concawe.eu/wp-content/uploads/2017/01/report-no-6_12.pdf) | Y | N |
| | **5.3.3 Release Factor – soil** | | | |
| | **Numeric value / percent of input amount (Soil):** | 0.1% | Y | Y |
| | **Justification of RFs (Soil):** | The value has been adopted from an authoritative literature source that documents the release factors for each environmental release category (ERC). The preceding value corresponds to the default release factor for use as an intermediate (ERC 6a). ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment Chapter R.16: Environmental exposure assessment Version 3.0. Appendix A.16-1. Helsinki, Finland. (https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf) | Y | N |
| | **5.3.4 Release Factor – waste** | | | |
| | **Percent of input amount disposed as waste:** | 5.0% | Y | N |
| | **Justification of RFs:** | The value has been adopted from an authoritative literature source that documents the release factors for hazardous wastes generated in an industrial setting (EC, 2017). EC, 2017. Best Available Techniques (BAT) Reference Document for the Production of Large Volume Organic Chemicals. Report EUR 28882 EN, European Integrated Pollution Prevention Bureau. European Commission, Seville, Spain, http://eippcb.jrc.ec.europa.eu/reference/BREF/LVOC/JRC109279_Lvoc_bref_2017.pdf | Y | N |
| | **sub-SPERC identifier:** | ESVOC 6.1a.k.v2 VP 100-1000 Pa; WS <1 mg/l | Y | N |
| | **ERC** | ERC 6a | | |
| | **sub-SPERC applicability:** | Vapour pressure 100-1000 Pa Water Solubility <1 mg/l | Y | N |
| | **5.3.1 Release Factor – air** | | | |
| | **Numeric value / percent of input amount (Air):** | 0.1% | 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 A3.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf) | Y | N |

| FS Section | Content field | Explanation of content | CSR[1] | eSDS[2] |
|---|---|---|---|---|
| | **5.3.2 Release Factor – water** | | | |
| | **Numeric value / percent of input amount (Water):** | 0.001% | Y | Y |
| | **Justification of RFs (Water):** | The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with survey results of wastewater effluent volume per tonne of capacity at European oil refineries. CONCAWE (2012). Trends in oil discharged with aqueous effluents from oil refineries in Europe. Report No. 6/12. Brussels, Belgium. (https://www.concawe.eu/wp-content/uploads/2017/01/report-no-6_12.pdf) | Y | N |
| | **5.3.3 Release Factor – soil** | | | |
| | **Numeric value / percent of input amount (Soil):** | 0.1% | Y | Y |
| | **Justification of RFs (Soil):** | The value has been adopted from an authoritative literature source that documents the release factors for each environmental release category (ERC). The preceding value corresponds to the default release factor for use as an intermediate (ERC 6a). ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment Chapter R.16: Environmental exposure assessment Version 3.0. Appendix A.16-1. Helsinki, Finland. (https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf) | Y | N |
| | **5.3.4 Release Factor – waste** | | | |
| | **Percent of input amount disposed as waste:** | 5.0% | Y | N |
| | **Justification of RFs:** | The value has been adopted from an authoritative literature source that documents the release factors for hazardous wastes generated in an industrial setting (EC, 2017). EC, 2017. Best Available Techniques (BAT) Reference Document for the Production of Large Volume Organic Chemicals. Report EUR 28882 EN, European Integrated Pollution Prevention Bureau. European Commission, Seville, Spain, http://eippcb.jrc.ec.europa.eu/reference/BREF/LVOC/JRC109279_Lvoc_bref_2017.pdf | Y | N |
| | **sub-SPERC identifier:** | ESVOC 6.1a.I.v2 VP 100-1000 Pa; WS 1-10 mg/l | Y | N |
| | **ERC** | ERC 6a | | |
| | **sub-SPERC applicability:** | Vapour pressure 100-1000 Pa Water Solubility 1-10 mg/l | Y | N |
| | **5.3.1 Release Factor – air** | | | |
| | **Numeric value / percent of input amount (Air):** | 0.1% | 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 A3.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf) | Y | N |
| | **5.3.2 Release Factor – water** | | | |

| FS Section | Content field | Explanation of content | CSR[1] | eSDS[2] |
|---|---|---|---|---|
| | **Numeric value / percent of input amount (Water):** | 0.003% | Y | Y |
| | **Justification of RFs (Water):** | The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with survey results of wastewater effluent volume per tonne of capacity at European oil refineries. CONCAWE (2012). Trends in oil discharged with aqueous effluents from oil refineries in Europe. Report No. 6/12. Brussels, Belgium. (https://www.concawe.eu/wp-content/uploads/2017/01/report-no-6_12.pdf) | Y | N |
| | **5.3.3 Release Factor – soil** | | | |
| | **Numeric value / percent of input amount (Soil):** | 0.1% | Y | Y |
| | **Justification of RFs (Soil):** | The value has been adopted from an authoritative literature source that documents the release factors for each environmental release category (ERC). The preceding value corresponds to the default release factor for use as an intermediate (ERC 6a). ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment Chapter R.16: Environmental exposure assessment Version 3.0. Appendix A.16-1. Helsinki, Finland. (https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf) | Y | N |
| | **5.3.4 Release Factor – waste** | | | |
| | **Percent of input amount disposed as waste:** | 5.0% | Y | N |
| | **Justification of RFs:** | The value has been adopted from an authoritative literature source that documents the release factors for hazardous wastes generated in an industrial setting (EC, 2017). EC, 2017. Best Available Techniques (BAT) Reference Document for the Production of Large Volume Organic Chemicals. Report EUR 28882 EN, European Integrated Pollution Prevention Bureau. European Commission, Seville, Spain, http://eippcb.jrc.ec.europa.eu/reference/BREF/LVOC/JRC109279_Lvoc_bref_2017.pdf | Y | N |
| | **sub-SPERC identifier:** | ESVOC 6.1a.m.v2 VP 100-1000 Pa; WS 10-100 mg/l | Y | N |
| | **ERC** | ERC 6a | | |
| | **sub-SPERC applicability:** | Vapour pressure 100-1000 Pa Water Solubility 10-100 mg/l | Y | N |
| | **5.3.1 Release Factor – air** | | | |
| | **Numeric value / percent of input amount (Air):** | 0.1% | 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 A3.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf) | Y | N |
| | **5.3.2 Release Factor – water** | | | |
| | **Numeric value / percent of input amount (Water):** | 0.03% | Y | Y |

| FS Section | Content field | Explanation of content | CSR[1] | eSDS[2] |
|---|---|---|---|---|
| | **Justification of RFs (Water):** | The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with survey results of wastewater effluent volume per tonne of capacity at European oil refineries. CONCAWE (2012). Trends in oil discharged with aqueous effluents from oil refineries in Europe. Report No. 6/12. Brussels, Belgium. (https://www.concawe.eu/wp-content/uploads/2017/01/report-no-6_12.pdf) | Y | N |
| | **5.3.3 Release Factor – soil** | | | |
| | **Numeric value / percent of input amount (Soil):** | 0.1% | Y | Y |
| | **Justification of RFs (Soil):** | The value has been adopted from an authoritative literature source that documents the release factors for each environmental release category (ERC). The preceding value corresponds to the default release factor for use as an intermediate (ERC 6a). ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment Chapter R.16: Environmental exposure assessment Version 3.0. Appendix A.16-1. Helsinki, Finland. (https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf) | Y | N |
| | **5.3.4 Release Factor – waste** | | | |
| | **Percent of input amount disposed as waste:** | 5.0% | Y | N |
| | **Justification of RFs:** | The value has been adopted from an authoritative literature source that documents the release factors for hazardous wastes generated in an industrial setting (EC, 2017). EC, 2017. Best Available Techniques (BAT) Reference Document for the Production of Large Volume Organic Chemicals. Report EUR 28882 EN, European Integrated Pollution Prevention Bureau. European Commission, Seville, Spain, http://eippcb.jrc.ec.europa.eu/reference/BREF/LVOC/JRC109279_Lvoc_bref_2017.pdf | Y | N |
| | **sub-SPERC identifier:** | ESVOC 6.1a.n.v2 VP 100-1000 Pa; WS 100-1000 mg/l | Y | N |
| | **ERC** | ERC 6a | | |
| | **sub-SPERC applicability:** | Vapour pressure 100-1000 Pa Water Solubility 100-1000 mg/l | Y | N |
| | **5.3.1 Release Factor – air** | | | |
| | **Numeric value / percent of input amount (Air):** | 0.1% | 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 A3.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf) | Y | N |
| | **5.3.2 Release Factor – water** | | | |
| | **Numeric value / percent of input amount (Water):** | 0.3% | Y | Y |
| | **Justification of RFs (Water):** | The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and | Y | N |

| FS Section | Content field | Explanation of content | CSR[1] | eSDS[2] |
|---|---|---|---|---|
| | | the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with survey results of wastewater effluent volume per tonne of capacity at European oil refineries. CONCAWE (2012). Trends in oil discharged with aqueous effluents from oil refineries in Europe. Report No. 6/12. Brussels, Belgium. (https://www.concawe.eu/wp-content/uploads/2017/01/report-no-6_12.pdf) | | |
| | **5.3.3 Release Factor – soil** | | | |
| | **Numeric value / percent of input amount (Soil):** | 0.1 % | Y | Y |
| | **Justification of RFs (Soil):** | The value has been adopted from an authoritative literature source that documents the release factors for each environmental release category (ERC). The preceding value corresponds to the default release factor for use as an intermediate (ERC 6a). ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment Chapter R.16: Environmental exposure assessment Version 3.0. Appendix A.16-1. Helsinki, Finland. (https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf) | Y | N |
| | **5.3.4 Release Factor – waste** | | | |
| | **Percent of input amount disposed as waste:** | 5.0% | Y | N |
| | **Justification of RFs:** | The value has been adopted from an authoritative literature source that documents the release factors for hazardous wastes generated in an industrial setting (EC, 2017). EC, 2017. Best Available Techniques (BAT) Reference Document for the Production of Large Volume Organic Chemicals. Report EUR 28882 EN, European Integrated Pollution Prevention Bureau. European Commission, Seville, Spain, http://eippcb.jrc.ec.europa.eu/reference/BREF/LVOC/JRC109279_Lvoc_bref_2017.pdf | Y | N |
| | **sub-SPERC identifier:** | ESVOC 6.1a.o.v2 VP 100-1000 Pa; WS >1000 mg/l | Y | N |
| | **ERC** | ERC 6a | | |
| | **sub-SPERC applicability:** | Vapour pressure 100-1000 Pa Water Solubility >1000 mg/l | Y | N |
| | **5.3.1 Release Factor – air** | | | |
| | **Numeric value / percent of input amount (Air):** | 0.1% | 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 A3.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf) | Y | N |
| | **5.3.2 Release Factor – water** | | | |
| | **Numeric value / percent of input amount (Water):** | 1.0% | Y | Y |
| | **Justification of RFs (Water):** | The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water | Y | N |

| FS Section | Content field | Explanation of content | CSR[1] | eSDS[2] |
|---|---|---|---|---|
| | | solubility information together with survey results of wastewater effluent volume per tonne of capacity at European oil refineries. CONCAWE (2012). Trends in oil discharged with aqueous effluents from oil refineries in Europe. Report No. 6/12. Brussels, Belgium. (https://www.concawe.eu/wp-content/uploads/2017/01/report-no-6_12.pdf) | | |
| | **5.3.3 Release Factor – soil** | | | |
| | **Numeric value / percent of input amount (Soil):** | 0.1% | Y | Y |
| | **Justification of RFs (Soil):** | The value has been adopted from an authoritative literature source that documents the release factors for each environmental release category (ERC). The preceding value corresponds to the default release factor for use as an intermediate (ERC 6a). ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment Chapter R.16: Environmental exposure assessment Version 3.0. Appendix A.16-1. Helsinki, Finland. (https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf) | Y | N |
| | **5.3.4 Release Factor – waste** | | | |
| | **Percent of input amount disposed as waste:** | 5.0% | Y | N |
| | **Justification of RFs:** | The value has been adopted from an authoritative literature source that documents the release factors for hazardous wastes generated in an industrial setting (EC, 2017). EC, 2017. Best Available Techniques (BAT) Reference Document for the Production of Large Volume Organic Chemicals. Report EUR 28882 EN, European Integrated Pollution Prevention Bureau. European Commission, Seville, Spain, http://eippcb.jrc.ec.europa.eu/reference/BREF/LVOC/JRC109279_Lvoc_bref_2017.pdf | Y | N |
| | ==**sub-SPERC identifier:**== | ==ESVOC 6.1a.p.v2== ==VP 10-100 Pa; WS <1 mg/l== | Y | N |
| | **ERC** | ERC 6a | | |
| | **sub-SPERC applicability:** | Vapour pressure 10-100 Pa Water Solubility <1 mg/l | Y | N |
| | **5.3.1 Release Factor – air** | | | |
| | **Numeric value / percent of input amount (Air):** | 0.01% | 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 A3.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf) | Y | N |
| | **5.3.2 Release Factor – water** | | | |
| | **Numeric value / percent of input amount (Water):** | 0.001% | Y | Y |
| | **Justification of RFs (Water):** | The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with survey results of wastewater effluent volume per tonne of capacity at European oil refineries. | Y | N |

| FS Section | Content field | Explanation of content | CSR[1] | eSDS[2] |
|---|---|---|---|---|
| | | CONCAWE (2012). Trends in oil discharged with aqueous effluents from oil refineries in Europe. Report No. 6/12. Brussels, Belgium. (https://www.concawe.eu/wp-content/uploads/2017/01/report-no-6_12.pdf) | | |
| | **5.3.3 Release Factor – soil** | | | |
| | **Numeric value / percent of input amount (Soil):** | 0.1% | Y | Y |
| | **Justification of RFs (Soil):** | The value has been adopted from an authoritative literature source that documents the release factors for each environmental release category (ERC). The preceding value corresponds to the default release factor for use as an intermediate (ERC 6a). ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment Chapter R.16: Environmental exposure assessment Version 3.0. Appendix A.16-1. Helsinki, Finland. (https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf) | Y | N |
| | **5.3.4 Release Factor – waste** | | | |
| | **Percent of input amount disposed as waste:** | 5.0% | Y | N |
| | **Justification of RFs:** | The value has been adopted from an authoritative literature source that documents the release factors for hazardous wastes generated in an industrial setting (EC, 2017). EC, 2017. Best Available Techniques (BAT) Reference Document for the Production of Large Volume Organic Chemicals. Report EUR 28882 EN, European Integrated Pollution Prevention Bureau. European Commission, Seville, Spain, http://eippcb.jrc.ec.europa.eu/reference/BREF/LVOC/JRC109279_Lvoc_bref_2017.pdf | Y | N |
| | **sub-SPERC identifier:** | ESVOC 6.1a.q.v2; VP 10-100 Pa; WS 1-10 mg/l | Y | N |
| | **ERC** | ERC 6a | | |
| | **sub-SPERC applicability:** | Vapour pressure 10-100 Pa Water Solubility 1-10 mg/l | Y | N |
| | **5.3.1 Release Factor – air** | | | |
| | **Numeric value / percent of input amount (Air):** | 0.01% | 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 A3.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf) | Y | N |
| | **5.3.2 Release Factor – water** | | | |
| | **Numeric value / percent of input amount (Water):** | 0.003% | Y | Y |
| | **Justification of RFs (Water):** | The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with survey results of wastewater effluent volume per tonne of capacity at European oil refineries. CONCAWE (2012). Trends in oil discharged with aqueous effluents from oil refineries in Europe. Report No. 6/12. Brussels, Belgium. | Y | N |

| FS Section | Content field | Explanation of content | CSR[1] | eSDS[2] |
|---|---|---|---|---|
| | | (https://www.concawe.eu/wp-content/uploads/2017/01/report-no-6_12.pdf) | | |
| | **5.3.3 Release Factor – soil** | | | |
| | **Numeric value / percent of input amount (Soil):** | 0.1% | Y | Y |
| | **Justification of RFs (Soil):** | The value has been adopted from an authoritative literature source that documents the release factors for each environmental release category (ERC). The preceding value corresponds to the default release factor for use as an intermediate (ERC 6a). ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment Chapter R.16: Environmental exposure assessment Version 3.0. Appendix A.16-1. Helsinki, Finland. (https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf) | Y | N |
| | **5.3.4 Release Factor – waste** | | | |
| | **Percent of input amount disposed as waste:** | 5.0% | Y | N |
| | **Justification of RFs:** | The value has been adopted from an authoritative literature source that documents the release factors for hazardous wastes generated in an industrial setting (EC, 2017). EC, 2017. Best Available Techniques (BAT) Reference Document for the Production of Large Volume Organic Chemicals. Report EUR 28882 EN, European Integrated Pollution Prevention Bureau. European Commission, Seville, Spain, http://eippcb.jrc.ec.europa.eu/reference/BREF/LVOC/JRC109279_Lvoc_bref_2017.pdf | Y | N |
| | **sub-SPERC identifier:** | ESVOC 6.1a.r.v2 VP 10-100 Pa; WS 10-100 mg/l | Y | N |
| | **ERC** | ERC 6a | | |
| | **sub-SPERC applicability:** | Vapour pressure 10-100 Pa Water Solubility 10-100 mg/l | Y | N |
| | **5.3.1 Release Factor – air** | | | |
| | **Numeric value / percent of input amount (Air):** | 0.01% | 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 A3.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf) | Y | N |
| | **5.3.2 Release Factor – water** | | | |
| | **Numeric value / percent of input amount (Water):** | 0.03% | Y | Y |
| | **Justification of RFs (Water):** | The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with survey results of wastewater effluent volume per tonne of capacity at European oil refineries. CONCAWE (2012). Trends in oil discharged with aqueous effluents from oil refineries in Europe. Report No. 6/12. Brussels, Belgium. (https://www.concawe.eu/wp-content/uploads/2017/01/report-no-6_12.pdf) | Y | N |

| FS Section | Content field | Explanation of content | CSR[1] | eSDS[2] |
|---|---|---|---|---|
| | **5.3.3 Release Factor – soil** | | | |
| | **Numeric value / percent of input amount (Soil):** | 0.1% | Y | Y |
| | **Justification of RFs (Soil):** | The value has been adopted from an authoritative literature source that documents the release factors for each environmental release category (ERC). The preceding value corresponds to the default release factor for use as an intermediate (ERC 6a). ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment Chapter R.16: Environmental exposure assessment Version 3.0. Appendix A.16-1. Helsinki, Finland. (https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf) | Y | N |
| | **5.3.4 Release Factor – waste** | | | |
| | **Percent of input amount disposed as waste:** | 5.0% | Y | N |
| | **Justification of RFs:** | The value has been adopted from an authoritative literature source that documents the release factors for hazardous wastes generated in an industrial setting (EC, 2017). EC, 2017. Best Available Techniques (BAT) Reference Document for the Production of Large Volume Organic Chemicals. Report EUR 28882 EN, European Integrated Pollution Prevention Bureau. European Commission, Seville, Spain, http://eippcb.jrc.ec.europa.eu/reference/BREF/LVOC/JRC109279_Lvoc_bref_2017.pdf | Y | N |
| | <mark>**sub-SPERC identifier:**</mark> | <mark>ESVOC 6.1a.s.v2<br>VP 10-100 Pa; WS 100-1000 mg/l</mark> | Y | N |
| | **ERC** | ERC 6a | | |
| | **sub-SPERC applicability:** | Vapour pressure 10-100 Pa<br>Water Solubility 100-1000 mg/l | Y | N |
| | **5.3.1 Release Factor – air** | | | |
| | **Numeric value / percent of input amount (Air):** | 0.01% | 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 A3.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf) | Y | N |
| | **5.3.2 Release Factor – water** | | | |
| | **Numeric value / percent of input amount (Water):** | 0.3% | Y | Y |
| | **Justification of RFs (Water):** | The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with survey results of wastewater effluent volume per tonne of capacity at European oil refineries. CONCAWE (2012). Trends in oil discharged with aqueous effluents from oil refineries in Europe. Report No. 6/12. Brussels, Belgium. (https://www.concawe.eu/wp-content/uploads/2017/01/report-no-6_12.pdf) | Y | N |
| | **5.3.3 Release Factor – soil** | | | |

| FS Section | Content field | Explanation of content | CSR[1] | eSDS[2] |
|---|---|---|---|---|
| | **Numeric value / percent of input amount (Soil):** | 0.1% | Y | Y |
| | **Justification of RFs (Soil):** | The value has been adopted from an authoritative literature source that documents the release factors for each environmental release category (ERC). The preceding value corresponds to the default release factor for use as an intermediate (ERC 6a).<br>ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment Chapter R.16: Environmental exposure assessment Version 3.0. Appendix A.16-1. Helsinki, Finland. (https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf) | Y | N |
| | **5.3.4 Release Factor – waste** | | | |
| | **Percent of input amount disposed as waste:** | 5.0% | Y | N |
| | **Justification of RFs:** | The value has been adopted from an authoritative literature source that documents the release factors for hazardous wastes generated in an industrial setting (EC, 2017).<br>EC, 2017. Best Available Techniques (BAT) Reference Document for the Production of Large Volume Organic Chemicals. Report EUR 28882 EN, European Integrated Pollution Prevention Bureau. European Commission, Seville, Spain, http://eippcb.jrc.ec.europa.eu/reference/BREF/LVOC/JRC109279_Lvoc_bref_2017.pdf | Y | N |
| | **sub-SPERC identifier:** | ESVOC 6.1a.t.v2<br>VP 10-100 Pa; WS >1000 mg/l | Y | N |
| | **ERC** | ERC 6a | | |
| | **sub-SPERC applicability:** | Vapour pressure 10-100 Pa<br>Water Solubility >1000 mg/l | Y | N |
| | **5.3.1 Release Factor – air** | | | |
| | **Numeric value / percent of input amount (Air):** | 0.01% | 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).<br>European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf) | Y | N |
| | **5.3.2 Release Factor – water** | | | |
| | **Numeric value / percent of input amount (Water)** | 1.0% | Y | Y |
| | **Justification of RFs (Water):** | The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with survey results of wastewater effluent volume per tonne of capacity at European oil refineries.<br>CONCAWE (2012). Trends in oil discharged with aqueous effluents from oil refineries in Europe. Report No. 6/12. Brussels, Belgium. (https://www.concawe.eu/wp-content/uploads/2017/01/report-no-6_12.pdf) | Y | N |
| | **5.3.3 Release Factor – soil** | | | |
| | **Numeric value / percent of input amount (Soil):** | 0.1 % | Y | Y |

| FS Section | Content field | Explanation of content | CSR[1] | eSDS[2] |
|---|---|---|---|---|
| | **Justification of RFs (Soil):** | The value has been adopted from an authoritative literature source that documents the release factors for each environmental release category (ERC). The preceding value corresponds to the default release factor for use as an intermediate (ERC 6a).<br>ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment Chapter R.16: Environmental exposure assessment Version 3.0. Appendix A.16-1. Helsinki, Finland. ([https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf](https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf)) | Y | N |
| | **5.3.4 Release Factor – waste** | | | |
| | **Percent of input amount disposed as waste:** | 5.0% | Y | N |
| | **Justification of RFs:** | The value has been adopted from an authoritative literature source that documents the release factors for hazardous wastes generated in an industrial setting (EC, 2017).<br>EC, 2017. Best Available Techniques (BAT) Reference Document for the Production of Large Volume Organic Chemicals. Report EUR 28882 EN, European Integrated Pollution Prevention Bureau. European Commission, Seville, Spain, [http://eippcb.jrc.ec.europa.eu/reference/BREF/LVOC/JRC109279_Lvoc_bref_2017.pdf](http://eippcb.jrc.ec.europa.eu/reference/BREF/LVOC/JRC109279_Lvoc_bref_2017.pdf) | Y | N |
| | **sub-SPERC identifier:** | ESVOC 6.1a.u.v2<br>VP 1-10 Pa; WS <1 mg/l | Y | N |
| | **ERC** | ERC 6a | | |
| | **sub-SPERC applicability:** | Vapour pressure 1-10 Pa<br>Water Solubility <1 mg/l | Y | N |
| | **5.3.1 Release Factor – air** | | | |
| | **Numeric value / percent of input amount (Air):** | 0.001% | 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).<br>European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A3.1, Brussels, Belgium. ([https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf](https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)) | Y | N |
| | **5.3.2 Release Factor – water** | | | |
| | **Numeric value / percent of input amount (Water):** | 0.001% | Y | Y |
| | **Justification of RFs (Water):** | The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with survey results of wastewater effluent volume per tonne of capacity at European oil refineries.<br>CONCAWE (2012). Trends in oil discharged with aqueous effluents from oil refineries in Europe. Report No. 6/12. Brussels, Belgium. ([https://www.concawe.eu/wp-content/uploads/2017/01/report-no-6_12.pdf](https://www.concawe.eu/wp-content/uploads/2017/01/report-no-6_12.pdf)) | Y | N |
| | **5.3.3 Release Factor – soil** | | | |
| | **Numeric value / percent of input amount (Soil):** | 0.1% | Y | Y |
| | **Justification of RFs (Soil):** | The value has been adopted from an authoritative literature source that documents the release factors for each environmental release category | Y | N |

| FS Section | Content field | Explanation of content | CSR[1] | eSDS[2] |
|---|---|---|---|---|
| | | (ERC). The preceding value corresponds to the default release factor for use as an intermediate (ERC 6a). ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment Chapter R.16: Environmental exposure assessment Version 3.0. Appendix A.16-1. Helsinki, Finland. (https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf) | | |
| | **5.3.4 Release Factor – waste** | | | |
| | **Percent of input amount disposed as waste:** | 5.0% | Y | N |
| | **Justification of RFs:** | The value has been adopted from an authoritative literature source that documents the release factors for hazardous wastes generated in an industrial setting (EC, 2017). EC, 2017. Best Available Techniques (BAT) Reference Document for the Production of Large Volume Organic Chemicals. Report EUR 28882 EN, European Integrated Pollution Prevention Bureau. European Commission, Seville, Spain, http://eippcb.jrc.ec.europa.eu/reference/BREF/LVOC/JRC109279_Lvoc_bref_2017.pdf | Y | N |
| | **sub-SPERC identifier:** | ESVOC 6.1a.v.v2 VP 1-10 Pa; WS 1--10 mg/l | Y | N |
| | **ERC** | ERC 6a | | |
| | **sub-SPERC applicability:** | Vapour pressure 1-10 Pa Water Solubility 1-10 mg/l | Y | N |
| | **5.3.1 Release Factor – air** | | | |
| | **Numeric value / percent of input amount (Air):** | 0.001% | 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 A3.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf) | Y | N |
| | **5.3.2 Release Factor – water** | | | |
| | **Numeric value / percent of input amount (Water):** | 0.003% | Y | Y |
| | **Justification of RFs (Water):** | The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with survey results of wastewater effluent volume per tonne of capacity at European oil refineries. CONCAWE (2012). Trends in oil discharged with aqueous effluents from oil refineries in Europe. Report No. 6/12. Brussels, Belgium. (https://www.concawe.eu/wp-content/uploads/2017/01/report-no-6_12.pdf) | Y | N |
| | **5.3.3 Release Factor – soil** | | | |
| | **Numeric value / percent of input amount (Soil):** | 0.1% | Y | Y |
| | **Justification of RFs (Soil):** | The value has been adopted from an authoritative literature source that documents the release factors for each environmental release category (ERC). The preceding value corresponds to the default release factor for use as an intermediate (ERC 6a). | Y | N |

| FS Section | Content field | Explanation of content | CSR[1] | eSDS[2] |
|---|---|---|---|---|
| | | ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment Chapter R.16: Environmental exposure assessment Version 3.0. Appendix A.16-1. Helsinki, Finland. (https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf) | | |
| | **5.3.4 Release Factor – waste** | | | |
| | **Percent of input amount disposed as waste:** | 5.0% | Y | N |
| | **Justification of RFs:** | The value has been adopted from an authoritative literature source that documents the release factors for hazardous wastes generated in an industrial setting (EC, 2017). EC, 2017. Best Available Techniques (BAT) Reference Document for the Production of Large Volume Organic Chemicals. Report EUR 28882 EN, European Integrated Pollution Prevention Bureau. European Commission, Seville, Spain, http://eippcb.jrc.ec.europa.eu/reference/BREF/LVOC/JRC109279_Lvoc_bref_2017.pdf | Y | N |
| | **sub-SPERC identifier:** | ESVOC 6.1a.w.v2 VP 1-10 Pa; WS 10-100 mg/l | Y | N |
| | **ERC** | ERC 6a | | |
| | **sub-SPERC applicability:** | Vapour pressure 1-10 Pa Water Solubility 10-100 mg/l | Y | N |
| | **5.3.1 Release Factor – air** | | | |
| | **Numeric value / percent of input amount (Air):** | 0.001% | 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 A3.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf) | Y | N |
| | **5.3.2 Release Factor – water** | | | |
| | **Numeric value / percent of input amount (Water):** | 0.03% | Y | Y |
| | **Justification of RFs (Water):** | The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with survey results of wastewater effluent volume per tonne of capacity at European oil refineries. CONCAWE (2012). Trends in oil discharged with aqueous effluents from oil refineries in Europe. Report No. 6/12. Brussels, Belgium. (https://www.concawe.eu/wp-content/uploads/2017/01/report-no-6_12.pdf) | Y | N |
| | **5.3.3 Release Factor – soil** | | | |
| | **Numeric value / percent of input amount (Soil):** | 0.1% | Y | Y |
| | **Justification of RFs (Soil):** | The value has been adopted from an authoritative literature source that documents the release factors for each environmental release category (ERC). The preceding value corresponds to the default release factor for use as an intermediate (ERC 6a). | Y | N |

| FS Section | Content field | Explanation of content | CSR[1] | eSDS[2] |
|---|---|---|---|---|
| | | ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment Chapter R.16: Environmental exposure assessment Version 3.0. Appendix A.16-1. Helsinki, Finland. (https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf) | | |
| | **5.3.4 Release Factor – waste** | | | |
| | **Percent of input amount disposed as waste:** | 5.0% | Y | N |
| | **Justification of RFs:** | The value has been adopted from an authoritative literature source that documents the release factors for hazardous wastes generated in an industrial setting (EC, 2017). EC, 2017. Best Available Techniques (BAT) Reference Document for the Production of Large Volume Organic Chemicals. Report EUR 28882 EN, European Integrated Pollution Prevention Bureau. European Commission, Seville, Spain, http://eippcb.jrc.ec.europa.eu/reference/BREF/LVOC/JRC109279_Lvoc_bref_2017.pdf | Y | N |
| | **sub-SPERC identifier:** | ESVOC 6.1a.x.v2 VP 1-10 Pa; WS 100-1000 mg/l | Y | N |
| | **ERC** | ERC 6a | | |
| | **sub-SPERC applicability:** | Vapour pressure 1-10 Pa Water Solubility 100-1000 mg/l | Y | N |
| | **5.3.1 Release Factor – air** | | | |
| | **Numeric value / percent of input amount (Air):** | 0.001% | 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 A3.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf) | Y | N |
| | **5.3.2 Release Factor – water** | | | |
| | **Numeric value / percent of input amount (Water):** | 0.3% | Y | Y |
| | **Justification of RFs (Water):** | The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with survey results of wastewater effluent volume per tonne of capacity at European oil refineries. CONCAWE (2012). Trends in oil discharged with aqueous effluents from oil refineries in Europe. Report No. 6/12. Brussels, Belgium. (https://www.concawe.eu/wp-content/uploads/2017/01/report-no-6_12.pdf) | Y | N |
| | **5.3.3 Release Factor – soil** | | | |
| | **Numeric value / percent of input amount (Soil):** | 0.1% | Y | Y |
| | **Justification of RFs (Soil):** | The value has been adopted from an authoritative literature source that documents the release factors for each environmental release category (ERC). The preceding value corresponds to the default release factor for as an intermediate (ERC 6a). | Y | N |

| FS Section | Content field | Explanation of content | CSR[1] | eSDS[2] |
|---|---|---|---|---|
| | | ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment Chapter R.16: Environmental exposure assessment Version 3.0. Appendix A.16-1. Helsinki, Finland. (https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf) | | |
| | **5.3.4 Release Factor – waste** | | | |
| | **Percent of input amount disposed as waste:** | 5.0% | Y | N |
| | **Justification of RFs:** | The value has been adopted from an authoritative literature source that documents the release factors for hazardous wastes generated in an industrial setting (EC, 2017). EC, 2017. Best Available Techniques (BAT) Reference Document for the Production of Large Volume Organic Chemicals. Report EUR 28882 EN, European Integrated Pollution Prevention Bureau. European Commission, Seville, Spain, http://eippcb.jrc.ec.europa.eu/reference/BREF/LVOC/JRC109279_Lvoc_bref_2017.pdf | Y | N |
| | **sub-SPERC identifier:** | ESVOC 6.1a.y.v2 VP 1-10 Pa; WS >1000 mg/l | Y | N |
| | **ERC** | ERC 6a | | |
| | **sub-SPERC applicability:** | Vapour pressure 1-10 Pa Water Solubility >1000 mg/l | Y | N |
| | **5.3.1 Release Factor – air** | | | |
| | **Numeric value / percent of input amount (Air):** | 0.001% | 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 A3.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf) | Y | N |
| | **5.3.2 Release Factor – water** | | | |
| | **Numeric value / percent of input amount (Water):** | 1.0% | Y | Y |
| | **Justification of RFs (Water):** | The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with survey results of wastewater effluent volume per tonne of capacity at European oil refineries. CONCAWE (2012). Trends in oil discharged with aqueous effluents from oil refineries in Europe. Report No. 6/12. Brussels, Belgium. (https://www.concawe.eu/wp-content/uploads/2017/01/report-no-6_12.pdf) | Y | N |
| | **5.3.3 Release Factor – soil** | | | |
| | **Numeric value / percent of input amount (Soil):** | 0.1% | Y | Y |
| | **Justification of RFs (Soil):** | The value has been adopted from an authoritative literature source that documents the release factors for each environmental release category (ERC). The preceding value corresponds to the default release factor for as an intermediate (ERC 6a). | Y | N |

| FS Section | Content field | Explanation of content | CSR[1] | eSDS[2] |
|---|---|---|---|---|
| | | ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment Chapter R.16: Environmental exposure assessment Version 3.0. Appendix A.16-1. Helsinki, Finland. (https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf) | | |
| | **5.3.4 Release Factor – waste** | | | |
| | **Percent of input amount disposed as waste:** | 5.0% | Y | N |
| | **Justification of RFs:** | The value has been adopted from an authoritative literature source that documents the release factors for hazardous wastes generated in an industrial setting (EC, 2017). EC, 2017. Best Available Techniques (BAT) Reference Document for the Production of Large Volume Organic Chemicals. Report EUR 28882 EN, European Integrated Pollution Prevention Bureau. European Commission, Seville, Spain, http://eippcb.jrc.ec.europa.eu/reference/BREF/LVOC/JRC109279_Lvoc_bref_2017.pdf | Y | N |
| | **sub-SPERC identifier:** | ESVOC 6.1a.z.v2 VP <1 Pa; WS <1 mg/l | Y | N |
| | **ERC** | ERC 6a | | |
| | **sub-SPERC applicability:** | Vapour pressure <1 Pa Water Solubility <1 mg/l | Y | N |
| | **5.3.1 Release Factor – air** | | | |
| | **Numeric value / percent of input amount (Air):** | 0.0% | 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 A3.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf) | Y | N |
| | **5.3.2 Release Factor – water** | | | |
| | **Numeric value / percent of input amount (Water):** | 0.001% | Y | Y |
| | **Justification of RFs (Water):** | The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with survey results of wastewater effluent volume per tonne of capacity at European oil refineries. CONCAWE (2012). Trends in oil discharged with aqueous effluents from oil refineries in Europe. Report No. 6/12. Brussels, Belgium. (https://www.concawe.eu/wp-content/uploads/2017/01/report-no-6_12.pdf) | Y | N |
| | **5.3.3 Release Factor – soil** | | | |
| | **Numeric value / percent of input amount (Soil):** | 0.1% | Y | Y |
| | **Justification of RFs (Soil):** | The value has been adopted from an authoritative literature source that documents the release factors for each environmental release category (ERC). The preceding value corresponds to the default release factor for use as an intermediate (ERC 6a). | Y | N |

| FS Section | Content field | Explanation of content | CSR[1] | eSDS[2] |
|---|---|---|---|---|
| | | ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment Chapter R.16: Environmental exposure assessment Version 3.0. Appendix A.16-1. Helsinki, Finland. (https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf) | | |
| | **5.3.4 Release Factor – waste** | | | |
| | **Percent of input amount disposed as waste:** | 5.0% | Y | N |
| | **Justification of RFs:** | The value has been adopted from an authoritative literature source that documents the release factors for hazardous wastes generated in an industrial setting (EC, 2017). EC, 2017. Best Available Techniques (BAT) Reference Document for the Production of Large Volume Organic Chemicals. Report EUR 28882 EN, European Integrated Pollution Prevention Bureau. European Commission, Seville, Spain, http://eippcb.jrc.ec.europa.eu/reference/BREF/LVOC/JRC109279_Lvoc_bref_2017.pdf | Y | N |
| | **sub-SPERC identifier:** | ESVOC 6.1a.aa.v2 VP <1 Pa; WS 1--10 mg/l | Y | N |
| | **ERC** | ERC 6a | | |
| | **sub-SPERC applicability:** | Vapour pressure <1 Pa Water Solubility 1-10 mg/l | Y | N |
| | **5.3.1 Release Factor – air** | | | |
| | **Numeric value / percent of input amount (Air):** | 0.0% | 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 A3.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf) | Y | N |
| | **5.3.2 Release Factor – water** | | | |
| | **Numeric value / percent of input amount (Water):** | 0.003% | Y | Y |
| | **Justification of RFs (Water):** | The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with survey results of wastewater effluent volume per tonne of capacity at European oil refineries. CONCAWE (2012). Trends in oil discharged with aqueous effluents from oil refineries in Europe. Report No. 6/12. Brussels, Belgium. (https://www.concawe.eu/wp-content/uploads/2017/01/report-no-6_12.pdf) | Y | N |
| | **5.3.3 Release Factor – soil** | | | |
| | **Numeric value / percent of input amount (Soil):** | 0.1 % | Y | Y |
| | **Justification of RFs (Soil):** | The value has been adopted from an authoritative literature source that documents the release factors for each environmental release category (ERC). The preceding value corresponds to the default release factor for as an intermediate (ERC 6a). | Y | N |

| FS Section | Content field | Explanation of content | CSR[1] | eSDS[2] |
|---|---|---|---|---|
| | | ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment Chapter R.16: Environmental exposure assessment Version 3.0. Appendix A.16-1. Helsinki, Finland. (https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf) | | |
| | **5.3.4 Release Factor – waste** | | | |
| | **Percent of input amount disposed as waste:** | 5.0% | Y | N |
| | **Justification of RFs:** | The value has been adopted from an authoritative literature source that documents the release factors for hazardous wastes generated in an industrial setting (EC, 2017). EC, 2017. Best Available Techniques (BAT) Reference Document for the Production of Large Volume Organic Chemicals. Report EUR 28882 EN, European Integrated Pollution Prevention Bureau. European Commission, Seville, Spain. http://eippcb.jrc.ec.europa.eu/reference/BREF/LVOC/JRC109279_Lvoc_bref_2017.pdf | Y | N |
| | **sub-SPERC identifier:** | ESVOC 6.1a.bb.v2 VP <1 Pa; WS 10-100 mg/l | Y | N |
| | **ERC** | ERC 6a | | |
| | **sub-SPERC applicability:** | Vapour pressure <1 Pa Water Solubility 10-100 mg/l | Y | N |
| | **5.3.1 Release Factor – air** | | | |
| | **Numeric value / percent of input amount (Air):** | 0.0% | 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 A3.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf) | Y | N |
| | **5.3.2 Release Factor – water** | | | |
| | **Numeric value / percent of input amount (Water):** | 0.03% | Y | Y |
| | **Justification of RFs (Water):** | The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with survey results of wastewater effluent volume per tonne of capacity at European oil refineries. CONCAWE (2012). Trends in oil discharged with aqueous effluents from oil refineries in Europe. Report No. 6/12. Brussels, Belgium. (https://www.concawe.eu/wp-content/uploads/2017/01/report-no-6_12.pdf) | Y | N |
| | **5.3.3 Release Factor – soil** | | | |
| | **Numeric value / percent of input amount (Soil):** | 0.1% | Y | Y |
| | **Justification of RFs (Soil):** | The value has been adopted from an authoritative literature source that documents the release factors for each environmental release category (ERC). The preceding value corresponds to the default release factor for as an intermediate (ERC 6a). ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment Chapter R.16: Environmental exposure assessment Version 3.0. Appendix A.16-1. Helsinki, Finland. | Y | N |

| FS Section | Content field | Explanation of content | CSR[1] | eSDS[2] |
|---|---|---|---|---|
| | | ([https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf](https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf)) | | |
| | **5.3.4 Release Factor – waste** | | | |
| | **Percent of input amount disposed as waste:** | 5.0% | Y | N |
| | **Justification of RFs:** | The value has been adopted from an authoritative literature source that documents the release factors for hazardous wastes generated in an industrial setting (EC, 2017). EC, 2017. Best Available Techniques (BAT) Reference Document for the Production of Large Volume Organic Chemicals. Report EUR 28882 EN, European Integrated Pollution Prevention Bureau. European Commission, Seville, Spain, [http://eippcb.jrc.ec.europa.eu/reference/BREF/LVOC/JRC109279_Lvoc_bref_2017.pdf](http://eippcb.jrc.ec.europa.eu/reference/BREF/LVOC/JRC109279_Lvoc_bref_2017.pdf) | Y | N |
| | **sub-SPERC identifier:** | ESVOC 6.1a.cc.v2 VP <1 Pa; WS 100-1000 mg/l | Y | N |
| | **ERC** | ERC 6a | | |
| | **sub-SPERC applicability:** | Vapour pressure <1 Pa Water Solubility 100-1000 mg/l | Y | N |
| | **5.3.1 Release Factor – air** | | | |
| | **Numeric value / percent of input amount (Air):** | 0.0% | 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 A3.1, Brussels, Belgium. ([https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf](https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)) | Y | N |
| | **5.3.2 Release Factor – water** | | | |
| | **Numeric value / percent of input amount (Water):** | 0.3% | Y | Y |
| | **Justification of RFs (Water):** | The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with survey results of wastewater effluent volume per tonne of capacity at European oil refineries. CONCAWE (2012). Trends in oil discharged with aqueous effluents from oil refineries in Europe. Report No. 6/12. Brussels, Belgium. ([https://www.concawe.eu/wp-content/uploads/2017/01/report-no-6_12.pdf](https://www.concawe.eu/wp-content/uploads/2017/01/report-no-6_12.pdf)) | Y | N |
| | **5.3.3 Release Factor – soil** | | | |
| | **Numeric value / percent of input amount (Soil):** | 0.1% | Y | Y |
| | **Justification of RFs (Soil):** | The value has been adopted from an authoritative literature source that documents the release factors for each environmental release category (ERC). The preceding value corresponds to the default release factor for as an intermediate (ERC 6a). ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment Chapter R.16: Environmental exposure assessment Version 3.0. Appendix A.16-1. Helsinki, Finland. ([https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf](https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf)) | Y | N |

| FS Section | Content field | Explanation of content | CSR[1] | eSDS[2] |
|---|---|---|---|---|
| | **5.3.4 Release Factor – waste** | | | |
| | **Percent of input amount disposed as waste:** | 5.0% | Y | N |
| | **Justification of RFs:** | The value has been adopted from an authoritative literature source that documents the release factors for hazardous wastes generated in an industrial setting (EC, 2017). EC, 2017. Best Available Techniques (BAT) Reference Document for the Production of Large Volume Organic Chemicals. Report EUR 28882 EN, European Integrated Pollution Prevention Bureau. European Commission, Seville, Spain, http://eippcb.jrc.ec.europa.eu/reference/BREF/LVOC/JRC109279_Lvoc_bref_2017.pdf | Y | N |
| | **sub-SPERC identifier:** | ESVOC 6.1a.dd.v2 VP <1 Pa; WS >1000 mg/l | Y | N |
| | **ERC** | ERC 6a | | |
| | **sub-SPERC applicability:** | Vapour pressure <1 Pa Water Solubility >1000 mg/l | Y | N |
| | **5.3.1 Release Factor – air** | | | |
| | **Numeric value / percent of input amount (Air):** | 0.0% | 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 A3.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf) | Y | N |
| | **5.3.2 Release Factor – water** | | | |
| | **Numeric value / percent of input amount (Water):** | 1.0% | Y | Y |
| | **Justification of RFs (Water):** | The approach used to assign this value is largely qualitative in nature and takes into consideration both the physical properties of the substance and the magnitude of wastewater production at representative production sites. This release factor has been conservatively calculated using water solubility information together with survey results of wastewater effluent volume per tonne of capacity at European oil refineries. CONCAWE (2012). Trends in oil discharged with aqueous effluents from oil refineries in Europe. Report No. 6/12. Brussels, Belgium. (https://www.concawe.eu/wp-content/uploads/2017/01/report-no-6_12.pdf) | Y | N |
| | **5.3.3 Release Factor – soil** | | | |
| | **Numeric value / percent of input amount (Soil):** | 0.1% | Y | Y |
| | **Justification of RFs (Soil):** | The value has been adopted from an authoritative literature source that documents the release factors for each environmental release category (ERC). The preceding value corresponds to the default release factor for as an intermediate (ERC 6a). ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment Chapter R.16: Environmental exposure assessment Version 3.0. Appendix A.16-1. Helsinki, Finland. (https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf) | Y | N |
| | **5.3.4 Release Factor – waste** | | | |

| FS Section | Content field | Explanation of content | CSR[1] | eSDS[2] |
|---|---|---|---|---|
| | **Percent of input amount disposed as waste:** | 5.0% | Y | N |
| | **Justification of RFs:** | The value has been adopted from an authoritative literature source that documents the release factors for hazardous wastes generated in an industrial setting (EC, 2017). EC, 2017. Best Available Techniques (BAT) Reference Document for the Production of Large Volume Organic Chemicals. Report EUR 28882 EN, European Integrated Pollution Prevention Bureau. European Commission, Seville, Spain, http://eippcb.jrc.ec.europa.eu/reference/BREF/LVOC/JRC109279_Lvoc_bref_2017.pdf | Y | N |
| **References to SPERC Background Document** | | | | |
| | **Reference to Background Document** | ESIG/ESVOC (2018). SpERC Background Document (1st draft). Specific Environmental Release Categories (SpERCs) for the industrial manufacture, formulation, and intermediate use of solvents and solvent borne substances. European Solvents Industry Group. Brussels, Belgium. | Y | N |