**SPERC fact sheet – *Blowing Agents – Industrial (Solvent-borne)***

|  |  |
| --- | --- |
| **General Information** | |
| **Title of Specific ERC** | Blowing Agents (industrial): solvent-borne |
| **Applicable ERC** | 4 – Industrial use of processing aids |
| **Responsible** | ESIG/ESVOC |
| **Version** | V1 |
| **Code** | ESVOC 4.9.v1 |
| **Scope** | Use as a blowing agent for rigid and flexible foams, including material transfers, mixing and injection, curing, cutting, storage and packing  *Substance Domain*: Applicable to petroleum substances (e.g., aliphatic and aromatic hydrocarbons) and petrochemicals (e.g., ketones, alcohols, acetates, glycols, glycol ethers, and glycol ether acetates).  *Size of installation:* Assumed that 15000 tonnes/year of substance is used  *Processing conditions:* Dry process |
| **Coverage** | Process Categories: 1 (use in closed process, no likelihood of exposure), 2 (use in closed, continuous process with occasional controlled exposure), 3 (use in closed batch process (synthesis or formulation)), 8b (transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities), 9 (Transfer of substance or preparation into small containers (dedicated filling line, including weighting)), 12 (Use of blowing agents in manufacture of foam) |

|  |  |  |
| --- | --- | --- |
|  | **Characteristics of specific ERC** | **Type of Input Information** |
| **Operational Conditions** | Indoor use. Solvent-based process. Negligible wastewater emissions as process operates without water contact. |  |
| **Obligatory onsite RMMs** | Emission factors to wastewater are based on water solubility. Assumes no free product in wastewater stream; oil-water separation (e.g. *via* oil water separators, oil skimmers, dissolved air floatation) may be required under some circumstances |  |
| **Substance Use Rate** | The substance maximum use rate (MSPERC) is assumed to be 50000 kg/d | Maximum site tonnage, based on sector knowledge\*May be overwritten with own site use rate |
| **Days Emitting** | 300 days/year | Default ‘Industrial end use’ – Tonnage > 5000 tonnes/year. Consider overwriting if use rate is <5000 tonnes / year1 |
| **Environmental Parameters for Fate Calculation** | Assumed dilution factor in freshwater is 10. For marine assessments an additional tenfold dilution is assumed, i.e., dilution factor in marine water = 100. | ERC default settings2 |

\*Maximum amount of substance that is delivered to a site in one day based on typical site capacity (e.g., two trucks, each with a volume of 25 tonnes)

1ECHA Guidance on information requirements and chemical safety assessment, Chapter R.16: Environmental Exposure Estimation, Section R.16.3.2.1

2ECHA Guidance on information requirements and chemical safety assessment, Chapter R.16: Environmental Exposure Estimation, Section R.16.6.3

<http://echa.europa.eu/documents/10162/17224/information_requirements_r16_en.pdf>

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Characteristics of Specific ERC** | | **Justification** |
| **Emission Fractions**  **(from the process)** | ***To Air*** | 1 | ERC4 default.3 Reasonably conservative estimate based on intended use. |
| ***To Wastewater/Sewer/ Water courses*** WS < 1mg/L  WS 1-10 mg/L  WS 10-100 mg/L  WS 100-1000 mg/L  WS > 1000 mg/L | ***f* (water solubility)**  0.000001  0.000003  0.00003  0.0003  0.001 | Use is considered a dry process. Nominal releases to wastewater due to incidental spillage. Emission factors to wastewater are conservatively calculated from equipment cleaning and substance aqueous solubility  *Assumption of 1 m3 of wastewater generated per 1 tonne of substance used is conservative. Example: 1 mg/L x 1 m3/tonne use x 1000 L/m3 x 1tonne/109mg = 0.000001 tonnes/tonne used. For WS range (e.g., 1-10 mg/L), the geometric mean (i.e., 3.2 mg/L) is used to calculate the fraction released.* |
| ***To Soil*** | 0 | 100% of substance is assumed to be released to the environment via air. Value derived on basis of mass conservation. |

3ECHA Guidance on information requirements and chemical safety assessment, Chapter R.16: Environmental Exposure Estimation, Appendix R.16-1 Environmental Release Categories

|  |  |  |
| --- | --- | --- |
|  | **Type of RMM** | **Typical Efficiency** |
| **Appropriate Risk Management Measures (RMM) that may be used to achieve required emission reduction** | ***Air*** | |
| *On-site Technology*  Thermal oxidation  *Other* | 98%  Default efficiencies of the RMMs according to CEFIC Risk Management Library and 4*IPPC 2009 draft BREF on Common Waste Water & Waste Gas Treatment/Management Systems in the Chemical Sector*. A default value of 0% was selected since typical operations do not include vapor capture/recovery due to safety concerns. |
| ***Water*** | |
| *Offsite Technology*  Municipal wastewater treatment plant | The removal efficiency of a sewage treatment plant can be estimated. The standard estimation is via the SimpleTreat module of EUSES or ECETOC TRA.  \*Specific substance efficiency calculated via SimpleTreat and is assumed to represent default removal efficiency. |
| *Onsite Technology*  Acclimated biological treatment  *Other* | The efficiency of the RMMs varies dependent on the treatment technology and the properties of the substance. According to CEFIC Risk Management Library onsite RMMs typically provide removal efficiencies in excess of 80%. For readily and inherently biodegradable substances, the removal efficiency for acclimated biological treatment may be significantly higher than SimpleTreat default estimates; thus, SimpleTreat estimates can serve as a conservative lower bound.5  Substance-specific efficiencies can be considered. |

4 http://eippcb.jrc.es/reference/

5http://www.aromaticsonline.net/Downloads/WWTP.doc

|  |
| --- |
| **Narrative Description of Specific ERC** |
| Industrial use of solvent-borne blowing agents encompasses a wide range of activities such as material transfers, mixing and injection, curing, etc. Substance losses are reduced through use of general and site-specific risk management measures to maintain workplace concentrations of airborne VOCs and particulates below respective OELs. The nature of solvent use during industrial blowing agent processes accounts for the high emission factor to air and subsequently low emission factors to wastewater and soil. Releases to waste water are generally restricted to cleaning of equipment |

|  |
| --- |
| **Safe Use** |
| **Communication in SDS**  The REACH registrant establishes a set of standard conditions of safe use for a substance (for industrial use of a solvent-borne processing aid) by adopting the conditions specified in this SPERC and recommending a Required Removal Efficiency (RRE) for adequate risk reduction. If RRE = 0, wastewater emission controls (beyond those specified by the operational conditions) are not required to ensure safe use of the substance. If > 0, the RRE may be achieved via offsite municipal sewage treatment (providing substance removal efficiency, REOffsite) and/or onsite emission controls (providing substance removal efficiency, REOnsite). Multiple onsite emission reduction technologies can also be considered, if necessary and applicable (e.g., REOnsite = 1 – [(1 – REOnsite, 1) x (1 – REOnsite, 2) x etc.], where REOnsite, *n* represents the substance removal efficiency for each onsite emission reduction technology). For direct comparison to the RRE, a total substance emission reduction efficiency (RETotal) is calculated (RETotal = 1 – [(1 – REOnsite) x (1 – REOffsite)]. An RETotal < RRE is indicative of the safe use of a substance.  Removal efficiency requirements, as dictated by the assumed operating conditions, are documented in the Chemical Safety Report and communicated in the Safety Data Sheet. All other parameters underlying a substance exposure scenario based on the SPERC ‘Blowing agents – industrial (solvent-borne)’ are implicitly referred to via the reference to this SPERC.  **Scaling**  *Wastewater*  The users of solvent-borne processing aids are responsible for evaluating the compliance of their specific situations with the registrant’s information. To that end, the users need to know their site-specific substance use rate (MSite) and days emitting (TEmission, Site), onsite and offsite emission controls and subsequent total substance emission reduction efficiency (RETotal, Site = 1 – [(1 – REOnsite, Site) x (1 – REOffsite, Site)]), sewage treatment plant effluent flow rate (GEffluent, Site) and receiving water dilution factor (qSite). Adequate control of risk exists if the following relevant expression holds true:  *for risk driven by wastewater treatment plant microbes*  [MSPERC x (1 – RETotal, SPERC)] / GEffluent, SPERC ≥ [MSite x (1 – RETotal, Site)] / GEffluent, Site  *for risk driven by freshwater/freshwater sediments, marine water/marine water sediments*  [MSPERC x (1 – RETotal, SPERC)] / (GEffluent, SPERC x qSPERC) ≥ [MSite x (1 – RETotal, Site)] / (GEffluent, Site x qSite)  *for risk driven by secondary poisoning (freshwater fish/marine top predator) or indirect exposure to humans (oral)*  [MSPERC x TEmission, SPERC x (1 – RETotal, SPERC)] / (GEffluent, SPERC x qSPERC) ≥ [MSite x TEmission, Site x (1 – RETotal, Site)] / (GEffluent, SpERC x qSite)  It is simpler and thus may be preferable to some users to compare MSite with MSafe (*the maximum tonnage that can be safely used, within the prescribed operating conditions, OCSpERC and RMM, RETotal, SpERC*). Adequate control of risk exists if the following conditions are met [RETotal, Site ≥ RETotal, SPERC, GEffluent, Site ≥ GEffluent, SPERC, and qSite ≥ qSPERC] and MSafe ≥ MSite.    Local amount used, emission days per year, receiving water flow rate (or dilution factor), sewage treatment plant effluent flow rate, and risk management measure removal efficiency are the adjustable parameters for emission assessment. These parameters can be refined using site-specific information, which often is obtainable with limited effort and expertise. Adjusting the assessment by refining these parameters is referred to as scaling. Scaling is applied to evaluate compliance of a specific use with a generic Exposure Scenario. For that reason, site parameter values which deviate from the default values need to reflect the actual situation.  The release factors are an additional set of adjustable parameters; however, refining the default values requires significant justification and, thus, is beyond the boundary conditions defined in the SPERC Factsheet. For that reason, release factor refinements do not constitute a SPERC-based assessment and must be considered an element of downstream user chemical safety assessment. |

### ESVOC 4.9.v1

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Determinant Label** | **Quali-/ Quanti-tative** | **Value** | | **Description of Value** | **Effectiveness in % (default, min-max) for water and/or air** | | **Exposure route** | **Use conditions worker** | **Use condition consumer** | **Standard Phrase** | |
| Indoor/Outdoor use | Qual | Indoor use | |  |  | | Air/ water/ soil | e-w-3 | e-c-4 | Indoor | |
| Equipment cleaning | Qual | No release to wastewater from process as such, wastewater emissions limited to release generated from final equipment cleaning step using water | | - |  | | Water | e-w-3 | e-c-4 | Same as “value’ | |
| On site treatment of wastewater | RMM | Acclimated biological treatment | | For readily and inherently biodegradable substances, the removal efficiency for acclimated biological treatment may be significantly higher than SimpleTreat estimates; thus, SimpleTreat estimates can serve as a conservative lower bound.  Substance-specific efficiencies can be considered and can be used to overwrite the arbitrary default of this determinant value, which is set to 70% | | Water 70% | Water | e-w-3 |  | Same as “ value “ |
|  |  |  |  | |  | |  |  |  |  |
|  |  |  |  | |  | |  |  |  |  |
|  |  |  |  | |  | |  |  |  |  |
|  |  |  |  | |  | |  |  |  |  |
|  |  |  |  | |  | |  |  |  |  |