

TOLUENE**Code : 16850****SECTION 1. Identification of the substance/mixture and of the company/undertaking****1.1. Product identifier**

Chemical description : Toluene , Methyl benzene .
Type of product : Pure product .
Reach registration number : 01-2119471310-51

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified use(s) : See table on the front page of the annex.

* Use(s) advised against : This product is not recommended for any industrial, professional or consumer use other than identified in table on the front page of the annex.
Not for use in ornamental articles, in tricks and jokes and in games (in accordance with Annex XVII to Regulation (EC) No 1907/2006) (3. Liquid substances or mixtures, which are regarded as dangerous according to the definitions in Council Directive 67/548/EEC and Directive 1999/45/EC).
Not for use in aerosol dispensers for entertainment and decorative purposes (in accordance with Annex XVII to Regulation (EC) No 1907/2006) (40. Substances meeting the criteria of flammability in Directive 67/548/EEC and classified as flammable, highly flammable or extremely flammable regardless of whether they appear in Part 3 of Annex VI to Regulation (EC) No 1272/2008 or not).
Not for use as substances, as constituents of other substances or in mixtures for supply to the general public (in accordance with Annex XVII to Regulation (EC) No 1907/2006) (30. Substances which appear in Part 3 of Annex VI to Regulation (EC) No 1272/2008 classified as toxic to reproduction category 1A or 1B (Table 3.1) or toxic to reproduction category 1 or 2 (Table 3.2)).
Shall not be placed on the market, or used, as a substance or in mixtures in a concentration equal to or greater than 0,1% by weight where the substance or mixture is used in adhesives or spray paints intended for supply to the general public (in accordance with Annex XVII to Regulation (EC) No 1907/2006) (48. Toluene).

1.3. Details of the supplier of the safety data sheet

Company identification : BRENNTAG N.V. - Nijverheidslaan 38 - BE-8540 DEERLIJK
TEL: +32(0)56/77.69.44 - FAX: +32(0)56/77.57.11
E-MAIL: info@brenntag.be - Website: www.brenntag.be

BRENNTAG Nederland B.V. - Donker Duyvisweg 44 - NL-3316 BM DORDRECHT
TEL: +31(0)78/65.44.944 - FAX: +31(0)78/65.44.919
E-MAIL: info@brenntag.nl - Website: www.brenntag.nl

1.4. Emergency telephone number

Emergency phone number : Belgium : Antipoison Center - Brussels
TEL: +32(0)70/245.245

The Netherlands : National Poisoning Information Center - Bilthoven
TEL: +31(0)30/274.88.88 (Only for the purpose of informing medical personnel in cases of acute intoxications)

SECTION 2. Hazards identification**2.1. Classification of the substance or mixture****Classification according to Regulation (EC) No 1272/2008**

* Flammable liquids - Category 2 - Danger (Flam. Liq. 2; H225)
Aspiration hazard - Category 1 - Danger (Asp. Tox. 1; H304)
Skin irritation - Category 2 - Warning (Skin Irrit. 2; H315)
Specific Target Organ Toxicity - Single exposure - Narcotic effects - Category 3 - Warning (STOT SE 3; H336)
Reproductive toxicity - Unborn Child - Category 2 - Warning (Repr. 2; H361d)
Specific Target Organ Toxicity - Repeated exposure - Category 2 - Warning (STOT RE 2; H373)

TOLUENE

Code : 16850

SECTION 2. Hazards identification (continued)

Hazardous to the aquatic environment - Chronic hazard - Category 3 (Aquatic Chronic 3; H412)

2.2. Label elements

Label in accordance with Regulation (EC) No 1272/2008

- Dangerous ingredient(s) : Toluene
- Hazard pictogram(s)



- Signal word : Danger
- * • Hazard statements : H225 - Highly flammable liquid and vapour. H304 - May be fatal if swallowed and enters airways. H315 - Causes skin irritation. H336 - May cause drowsiness or dizziness. H361d - Suspected of damaging the unborn child. H373 - May cause damage to organs through prolonged or repeated exposure. H412 - Harmful to aquatic life with long lasting effects.
- Precautionary statements
- * - Prevention : P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P261 - Avoid breathing dust/fume/gas/mist/vapours/spray. P273 - Avoid release to the environment. P280 - Wear protective gloves/protective clothing/eye protection/face protection.
- * - Response : P301+P310+P331 - IF SWALLOWED: Immediately call a POISON CENTER/ doctor/... Do NOT induce vomiting. P308+P313 - If exposed or concerned : get medical advice.
- * - Storage : P403+P235 - Store in well-ventilated place. Keep cool.

2.3. Other hazards

- Physical/chemical hazards : Friction may cause sufficiently high static charge to induce sparks causing fire (or explosion).
- * Hazards for the health : If swallowed accidentally, the product may enter the lungs due to its low viscosity and lead to the rapid development of very serious pulmonary lesions (medical survey during 48 hours).
A health dangerous concentration in the air will very quickly be reached by evaporation of this substance at app. 20°C; even faster by spraying.
Toluene : Black list substance .
- Hazards for the environment : No significant danger. This product is no substance or contains no PBT or vPvB (in accordance with Annex XIII).
- Hazards for the safety : Vapor mixes readily with air forming explosive mixtures.

SECTION 3. Composition/information on ingredients

3.1. Substances

Name component(s)	Weight %	CAS nr	EINECS nr	Index nr	Reach nr	CLASSIFICATION
* Toluene	: > 99 %	108-88-3	203-625-9	601-021-00-3	01-2119471310-51	Flam. Liq. 2; H225 Asp. Tox. 1; H304 Skin Irrit. 2; H315 STOT SE 3; H336 Repr. 2; H361d STOT RE 2; H373 Aquatic Chronic 3; H412

The full text of the (EU)H-statements is in section 16.

TOLUENE

Code : 16850

SECTION 4. First aid measures

4.1. Description of first aid measures

- | | |
|--------------------|---|
| General | : CALL A PHYSICIAN IN ALL CIRCUMSTANCES.
Never give anything by mouth to an unconscious person. |
| First Aid Measures | |
| * - Inhalation | : Remove victim into fresh air.
Allow the affected person to rest in semi-sitting position.
If not breathing, give artificial respiration.
Consult a doctor. |
| - Skin Contact | : Remove contaminated clothing.
Rinse skin immediately with mild soap and plenty of water. (shower if necessary).
Consult a doctor. |
| - Eye Contact | : Rinse immediately thoroughly and long (at least 15 min.) with plenty of water.
Remove contact lenses.
Consult eye doctor. |
| * - Ingestion | : DO NOT INDUCE VOMITING. Rinse mouth with water.
Give 2 glasses of water to drink.
Immediately call a POISON CENTER or doctor/physician. |

4.2. Most important symptoms and effects, both acute and delayed

See section 11.

4.3. Indication of any immediate medical attention and special treatment needed

For specialist advice doctors should contact the NVCI or the Belgian Poison center.

SECTION 5. Firefighting measures

5.1. Extinguishing media

Extinguishing Media

- | | |
|------------------|---|
| - Suitable | : Extinguishing powder , Foam , Carbon dioxide (CO2) , Water spray , Sand . |
| - Not to be used | : Heavy water stream . |

5.2. Special hazards arising from the substance or mixture

Special Exposure Hazards : Fire may liberate carbon oxides (CO) and smoke.

5.3. Advice for firefighters

- | | |
|---|---|
| Special Protective Equipment for Firefighters | : Use self-contained breathing apparatus and wear protective clothes when in close proximity to fire. |
| Special Procedures | : Apply water spray or fog to cool nearby equipment. Avoid fire-fighting water to enter environment. |

SECTION 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal Precautions : Eliminate every possible source of ignition (open fire, sparks, smoking, ...).
Evacuate all personnel immediately and ventilate area.
Avoid breathing vapour and contact with skin, eyes and clothing. Wear recommended personal protective equipment. (See section 8)

6.2. Environmental precautions

Environmental Precautions : Shut off leaks if without risks.
Dike in the spilled product as much as possible with inert material.
Prevent entry of product in public water, sewers or soil.
Notify authorities if product enters sewers or public waters.

TOLUENE

Code : 16850

SECTION 6. Accidental release measures (continued)

6.3. Methods and material for containment and cleaning up

Methods for Cleaning Up : Collect the spillage in closable, suitable disposal containers.
Clean up any spills as soon as possible, using an inert absorbent material.
Eventual remaining residues may be washed down with a soap solution.
Collect rinsing water.

6.4. Reference to other sections

For personal protection, see section 8.
For the removal of the waste product, see section 13.

SECTION 7. Handling and storage

7.1. Precautions for safe handling

Handling : Pay attention : SKIN ABSORPTION ! STRONG HYGIENE !
Prevent exposure to (pregnant) women.
Avoid breathing vapour and contact with skin, eyes and clothing. Wear recommended personal protective equipment. (See section 8)
When using, do not eat, drink or smoke.
Emergency eye wash fountains and showers should be available in the immediate vicinity of any potential exposure.

7.2. Conditions for safe storage, including any incompatibilities

Storage : Keep only in the original container in a cool, well ventilated, fireproof and dark place.
All dangerous products should be placed on a drip tray or should be barreled.
Keep away from : Oxidizing agents , Strong acids , Strong bases , Halogen compounds .

Protection against Fire and Explosion : Remove all sources of ignition (open fire, sparks, smoking, ...).
Heavier than air, vapours may travel long distances along ground, ignite and flash back to source.
Do not use compressed air to either agitate or transfer contents of storage containers (tanks) / shipping drums containing this material.
Take measures against electrostatic discharges.
Always use explosionproof electrical equipment.
Use spark-arm implement.

Packaging Material : Stainless steel .

Insuitable Packaging Material : Rubber , Several synthetics .

7.3. Specific end use(s)

For identified uses, see subsection 1.2 and/or exposure scenarios.

SECTION 8. Exposure controls/personal protection

8.1. Control parameters

* Occupational Exposure Limits : Toluene : Limit value (BE) : 20 ppm (77 mg/m³) (2014) (D)
Toluene : Short time value (BE) : 100 ppm (384 mg/m³) (2014) (D)
Toluene : Limit value (TWA 8 h) (NL) : 40 ppm (150 mg/m³) (2007) (H)
Toluene : Limit value (TWA 15 min) (NL) : 100 ppm (384 mg/m³) (2007) (H)
(D) The mention "D" means that the absorption of the agent by skin, mucous membranes or eyes constitutes an important part of the total exposition. This absorption can be the consequence of direct contact as well as his presence in the air.
(H) The addition of an "H" indicates that the substance is relative easily absorbed by the skin.

TOLUENE

Code : 16850

SECTION 8. Exposure controls/personal protection (continued)

- Biological limit values : They will be included when available.
- DNELs : • Toluene : Worker, acute - local effects, inhalation : 384 mg/m³
 • Toluene : Worker, acute - systemic effects, inhalation : 384 mg/m³
 • Toluene : Worker, long-term - local effects, inhalation : 192 mg/m³
 • Toluene : Worker, long-term - systemic effects, inhalation : 192 mg/m³
 • Toluene : Worker, long-term - systemic effects, dermal : 384 mg/kg bw/day
 • Toluene : Consumer, acute - local effects, inhalation : 226 mg/m³
 • Toluene : Consumer, acute - systemic effects, inhalation : 226 mg/m³
 • Toluene : Consumer, long-term - systemic effects, inhalation : 56,5 mg/m³
 • Toluene : Consumer, long-term - systemic effects, dermal : 226 mg/kg bw/day
 • Toluene : Consumer, long-term - systemic effects, oral : 8,13 mg/kg bw/day
- PNECs : • Toluene : Fresh water : 0,68 mg/l
 • Toluene : Marine water : 0,68 mg/l
 • Toluene : Fresh water sediment : 16,39 mg/l
 • Toluene : Marine water sediment : 16,39 mg/l
 • Toluene : Soil : 2,89 mg/kg
 • Toluene : Sewage treatment plant : 13,61 mg/l

8.2. Exposure controls

- Engineering Measures : Ventilation (Through the floor), Local exhaust .
- Personal Protection Equipment
- Respiratory protection : CE-approved mask for organic vapours and solvents (type A, brown).
 Self contained breathing apparatus, in case of emergency.
- Skin protection : Suitable protective clothing (Anti-static).
- * - Hand protection : Suitable material for safety gloves (EN 374):
 The suitability of the gloves and the breakthrough time for a specific workplace should be discussed with the producers of the protective gloves.
 - material : Viton
 - thickness : all thicknesses
 - breakthrough time : > 480'
- Eye/Face protection : Closed safety glasses or face shield.
- Environmental exposure controls : See sections 6, 7, 12 and 13.

SECTION 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

- Physical State (20°C) : Liquid .
- Form/Colour : Clear , Colourless .
- Odour : Aromatic odour .
- Odour threshold : No data available.
- pH value : Not applicable.
- Melting/Freezing point : -95 °C
- Boiling Point/Range (1013 hPa) : 111 °C
- Flash point : 4 °C
- * Evaporation rate : 6 (Ether = 1)
 2,0 (n-Butyl acetate)
- Explosion limits in air : 1,2 - 7,1 vol.%
- Vapour pressure : 2,9 kPa (20°C)
 12,3 kPa (50°C)
- Relative vapour density (air=1) : 3,1
- Relative density of saturated vapour/air mixture (air=1) : 1,06 (20°C)

TOLUENE

Code : 16850

SECTION 9. Physical and chemical properties (continued)

Relative density (water=1)	: 0,9
Solubility in water (20°C)	: 0,0573 g/ 100ml
Soluble in	: Mineral oil , Fats , Organic solvents : Ethanol (100%), Ether (100%), Acetone (10%).
Log P Octanol/Water (20°C)	: 2,73
Auto-ignition temperature	: 480 °C
Minimum ignition energy	: 0,24 mJ
Decomposition temperature	: Not applicable.
Viscosity (20°C)	: 0,57 mm ² /s Kinematic)
Explosive properties	: No chemical groups associated with explosive properties .
Oxidizing properties	: No chemical groups associated with oxidizing properties .

9.2. Other information

Surface tension (20°C)	: 30 mN/m
Specific leading	: < 10 pS/m
% Volatiles (by weight)	: > 99

SECTION 10. Stability and reactivity

10.1. Reactivity

Reactivity : Reacts violently with oxidizing agents, strong acids and strong lyes.

10.2. Chemical stability

Stability : Stable at normal circumstances .

10.3. Possibility of hazardous reactions

Hazardous reactions : Vapor mixes readily with air forming explosive mixtures.
Agitation can cause build up of electrostatic charge.

10.4. Conditions to avoid

Conditions to avoid : Heat , Flames , Sparks , Direct sunlight .

10.5. Incompatible materials

Materials to avoid : Oxidizing agents , Strong acids , Strong bases , Halogen compounds , Rubber , Several synthetics .

10.6. Hazardous decomposition products

* Hazardous Decomposition Products : Carbon oxides , Aldehydes , Ketones .

SECTION 11. Toxicological information

11.1. Information on toxicological effects

Acute toxicity

- * - Inhalation : High concentrations may produce central nervous system depression and loss of consciousness (diminuation of consciousness).
Symptoms include: Sore throat , Cough , Headache , Confusion , Dizziness , Sleepiness , Weakness , Loss of coordination , Unconsciousness .
• Toluene : LC50 (Rat, inhalation, 4 h) : 28,1 mg/l (Air; OECD Guideline 403)
- Skin contact : Product degrades skin.
Symptoms include: Redness , Dry skin , Rough skin .
• Toluene : LD50 (Rabbit, dermal) : > 5000 mg/kg

TOLUENE

Code : 16850

SECTION 11. Toxicological information (continued)

- Ingestion : After swallowing, some drops of liquid can enter the lungs (aspiration), which may cause pneumonia.
Symptoms include: Abdominal cramps , Nausea , See "Inhalation" .
• Toluene : LD50 (Rat, oral) : 5580 mg/kg
- Skin corrosion/irritation : Causes skin irritation.
Skin contact can damage eczema.
- Serious eye damage/irritation : No indication of harmful effects.
- Aspiration hazard : May cause lung damage.
May be fatal if swallowed and enters airways.
- Respiratory or skin sensitisation : Not sensitive .
- Carcinogenicity : Not listed as carcinogenic .
- Mutagenicity : Not listed as mutagenic .
- Reproductive toxicity : Suspected of damaging the unborn child.
- Specific target organ toxicity - single exposure : To human : Vapours may cause drowsiness and dizziness.
Target organ(s) : Central nervous system .
- Specific target organ toxicity - repeated exposure : To human : May cause damage to organs through prolonged or repeated exposure.
(Product may affect kidney and liver, resulting in organ damages.)

SECTION 12. Ecological information

12.1. Toxicity

- * Ecotoxicity : • Toluene : LC50 (Fish, 96 h) : 5,5 mg/l (Oncorhynchus kisutch)
• Toluene : EC50 (Daphnia magna, 48 h) : 3,78 mg/l
• Toluene : NOEC (Algae, 72 h) : 10 mg/l (Skeletonema costatum)
• Toluene : NOEC (Daphnia magna, 7 d) : 0,74 mg/l (Ceriodaphnia dubia)

12.2. Persistence and degradability

- Persistence and degradability : • Toluene : Persistence and degradability : Readily biodegradable .

12.3. Bioaccumulative potential

- Bioaccumulation : • Toluene : Bioaccumulation : Bioaccumulation not expected .

12.4. Mobility in soil

- * Mobility : • Toluene : Mobility : Adsorption to solid soil phase is possible.

12.5. Results of PBT and vPvB assessment

- Evaluation : • Toluene : PBT/vPvB : No

12.6. Other adverse effects

- Photochemical ozone creation potential : No data available.
- Ozone depletion potential : No data available.
- Endocrine disrupting potential : No data available.
- Global warming potential : No data available.

SECTION 13. Disposal considerations

13.1. Waste treatment methods

- Waste from residues/Unused products : The product has to be destroyed according to national or local legislation, by a company specialised in handling hazardous waste products.
- European list of waste products : XXXXXX - European waste product code. This code is assigned on the basis of the most current applications and can not be representative for pollutions which are arisen at the effective use of the product. The producer of the waste has to evaluate its process himself and has to grant the appropriate waste coding. See Decision 2001/118/EC.

TOLUENE

Code : 16850

SECTION 13. Disposal considerations (continued)

Removal contaminated packaging : Packing is to be used exclusively for the packing of this product.
After use, empty and close the packing very carefully.
In case of returned packing, the empty packing can be offered back to the supplier.

SECTION 14. Transport information

14.1. UN number

UN Number : 1294

14.2. UN proper shipping name

ADR/RID Name : UN 1294 Toluene, 3, II, (D/E)
ADN Name : UN 1294 Toluene , 3, II
IMDG Name : UN 1294 Toluene , 3, II, (4°C)
IATA Name : UN 1294 Toluene , 3, II

14.3. Transport hazard classe(s)

Class : 3

14.4. Packing group

Packaging Group : II

14.5. Environmental hazards

Environmentally hazard : No
Marine pollutant : No

14.6. Special precautions for user

Danger number : 33
Hazard Label(s) : 3
EmS-N° : F-E , S-D

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

Type ship : No data available.
Pollution category : No data available.

SECTION 15. Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Inventories : Australian inventory (AICS): Listed in inventory.
Canadian inventory (DSL): Listed in inventory.
Chinese inventory (IECS): Listed in inventory.
European inventory (EINECS): Listed in inventory.
Japanese inventory (ENCS): Listed in inventory.
Korean inventory (KECI): Listed in inventory.
Philippine inventory (PICCS): Listed in inventory.
Inventory of the United States (TSCA): Listed in inventory.

NFPA n° : 2-3-0

Relevant EU Rule(s) : Directive 76/464/EEC of the Council of 4 May 1976 on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community
Directive 96/82/EC of the Council of 9 December 1996 on the control of major-accident hazards involving dangerous substances
Directive 98/24/EC of the Council of 7 April 1998 on the protection of the health and safety of workers from the risks related to chemical agents at work
Directive 1999/13/EC of the Council of 11 March 1999 on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain activities and installations

TOLUENE

Code : 16850

SECTION 15. Regulatory information (continued)

Directive 2004/42/CE of the European Parliament and of the Council of 21 April 2004 on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain paints and varnishes and vehicle refinishing products and amending Directive 1999/13/EC
 Regulation (EC) No 273/2004 of the European Parliament and of the Council of 11 February 2004 on drug precursors
 Decision 2001/118/EC of the Commission of 16 January 2001 amending Decision 2000/532/EC as regards the list of wastes
 Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006
 Regulation (EU) No 453/2010 of 20 May 2010 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (Reach)

* The restrictions in Annex XVII to Regulation (EC) No 1907/2006 must be observed.

National regulations

- * - Germany : WGK : 2
- * - Netherlands : Water damaging : 1
 Decontamination exertion : A (contains Black list substance)
 SZW-list of reproduction toxic substances : Toluene

15.2. Chemical Safety Assessment

* A chemical safety assessment has been carried out for the material.

SECTION 16. Other information

This safety data sheet has been drawn up in accordance with Regulation (EU) No 453/2010.
 This safety data sheet is exclusively made for industrial/professional use.

* Has changed compared to previous revision.

- * Changes : Section 1 , Section 2 , Section 3 , Section 4 , Section 7 , Section 8 , Section 9 , Section 10 , Section 11 , Section 12 , Section 15 , Section 16 .
- * Sources of used key data : The information contained herein is based on the present state of our knowledge (Producer(s) , Chemical cards , ...)
 See also on the webaddress:
<http://apps.echa.europa.eu/registered/registered-sub.aspx#search>
- (EU)H-statement(s) : H225 - Highly flammable liquid and vapour.
 H304 - May be fatal if swallowed and enters airways.
 H315 - Causes skin irritation.
 H336 - May cause drowsiness or dizziness.
 H361d - Suspected of damaging the unborn child.
 H373 - May cause damage to organs through prolonged or repeated exposure.
 H412 - Harmful to aquatic life with long lasting effects.
- * List of abbreviations and acronyms : Asp. Tox. 1 : Aspiration hazard - Category 1
 ADN (Accord européen relatif au transport international des marchandises Dangereuses par voie de Navigation interieur) : European agreement concerning the international carriage of dangerous goods by inland waterways
 ADR (Accord européen relatif au transport international des marchandises Dangereuses par Route) : European agreement concerning the international carriage of dangerous goods by road
 CO : Carbon monoxide
 DNEL (Derived No Effect Level) : an estimated safe exposure level
 EC50 : median Effective Concentration
 EmS (Emergency Schedule) : the first code refers to the relevant fire schedule and

TOLUENE**Code : 16850****SECTION 16. Other information (continued)**

the second code refers to the relevant spillage schedule
Flam. Liq. 2 : Flammable liquids - Category 2
IATA (International Air Transport Association) : provisions concerning the international carriage of dangerous goods by air
IMDG (International Maritime Dangerous Goods code)
LC50 : median Lethal Concentration
LD50 : median Lethal Dose
NFPA (National Fire Protection Association) or fire diamant
NOEC (No Observed Effect Concentration)
NVCI : National Poisoning Information Center
OECD : Organisation for Economic Cooperation and Development
PBT : persistent, bioaccumulative and toxic
PNEC (Predicted No Effect Concentration) : concentration below which exposure to a substance is not expected to cause adverse effects
RCP (Reciprocal Calculation Procedure)
REACH : Registration, Evaluation, Authorisation and restriction of Chemicals
Repr. 2 : Reproductive toxicity - Category 2
RID (Règlement concernant le transport International ferroviaire des marchandises Dangereuses) : Regulation concerning the International carriage of Dangerous goods by rail
Skin Irrit. 2 : Skin irritation - Category 2
STOT RE 2 : Specific Target Organ Toxicity - Repeated exposure - Category 2
STOT SE 3 : Specific Target Organ Toxicity - Single exposure - Category 3
SZW-list : Non-limitative list of reproduction toxic substances to which the additional registration obligation applies as referred to in Article 4.2a, second paragraph of the Working conditions decree
TWA (Time-Weighted Average) : the average exposure over a specified period
WGK (Wassergefährdungsklasse) : a German classification of substances that indicate the environmental hazard for surface water
vPvB : very persistent and very bioaccumulative
Black list : List I of Directive 76/464/EEC contains substances which belong to families and groups of substances, selected mainly on the basis of their toxicity, persistence and bioaccumulation, with the exception of those which are biologically harmless or which are rapidly converted into substances which are biologically harmless

This information is to our knowledge correct and complete on the date of issue of this safety data sheet. The information only concerns the product and does not give any guarantee for the quality and the completeness of the properties of the product, or in case of mixing or using in any other process. It remains the responsibility of the user to assure himself that the information is suitable and complete concerning the special use he makes of the product.

BRENNTAG denies all responsibility for loss or damage resulting from the use of these data.

End of document

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

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No.	Short title	Main User Group (SU)	Sector of Use (SU)	Product Category (PC)	Process Category (PROC)	Environmental Release Category (ERC)	Article Category (AC)	Specified
1	Manufacture of substance - liquid	3	8, 9	NA	1, 2, 3, 4, 8a, 8b, 15	1, 4	NA	ES642
2	Use as an intermediate	3	8, 9	NA	1, 2, 3, 4, 8a, 8b, 15	6a	NA	ES648
3	Distribution of substance	3	8, 9	NA	1, 2, 3, 4, 8a, 8b, 9, 15	1, 2, 3, 4, 5, 6a, 6b, 6c, 6d, 7	NA	ES1679
4	Formulation & (re)packing of substances and mixtures	3	10	NA	1, 2, 3, 4, 5, 8a, 8b, 9, 14, 15	2	NA	ES1689
5	Rubber production and processing	3	10	NA	1, 2, 3, 4, 5, 6, 7, 8a, 8b, 9, 13, 14, 15, 21	1, 4, 6d	NA	ES747
6	Uses in coatings	3	NA	NA	1, 2, 3, 4, 5, 7, 8a, 8b, 10, 13, 15	4	NA	ES696
7	Uses in coatings	22	NA	NA	1, 2, 3, 4, 5, 8a, 8b, 10, 11, 13, 15, 19	8a, 8d	NA	ES656
8	Uses in coatings	21	NA	1, 4, 8, 9a, 9b, 9c, 15, 18, 23, 24, 31	NA	8a, 8d	NA	ES671
9	Use in Cleaning Agents	3	NA	NA	1, 2, 3, 4, 7, 8a, 8b, 10, 13	4	NA	ES707
10	Use in Cleaning Agents	22	NA	NA	1, 2, 3, 4, 8a, 8b, 10, 11, 13	8a, 8d	NA	ES717
11	Use as binders and release agents	3	NA	NA	1, 2, 3, 4, 6, 7, 8b, 10, 13, 14	4, 5	NA	ES731
12	Use as binders and release agents	22	NA	NA	1, 2, 3, 4, 6, 8a, 8b, 10, 11, 14	8a, 8d	NA	ES733
13	Use as a fuel	3	NA	NA	1, 2, 3, 8a, 8b, 16	7	NA	ES735
14	Use as a fuel	22	NA	NA	1, 2, 3, 8a, 8b, 16	9a, 9b	NA	ES737
15	Use as Functional	3	NA	NA	1, 2, 3, 4,	7	NA	ES739

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

	Fluids				8a, 8b, 9			
16	Use as Functional Fluids	22	NA	NA	1, 2, 3, 8a, 9, 20	9a, 9b	NA	ES741
17	Use in laboratories	3	NA	NA	10, 15	2, 4	NA	ES743
18	Use in laboratories	22	NA	NA	10, 15	4	NA	ES745
19	Use in road and construction applications	22	NA	NA	8a, 8b, 9, 10, 11, 13	8d, 8f	NA	ES9219
20	Use in Oil and Gas field drilling and production operations	3	NA	NA	1, 2, 3, 4, 8a, 8b	4	NA	ES729

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

1. Short title of Exposure Scenario 1: Manufacture of substance - liquid

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC15: Use as laboratory reagent
Environmental Release Categories	ERC1: Manufacture of substances ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
Activity	Manufacture of substance. Includes recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container)

2.1 Contributing scenario controlling environmental exposure for: ERC1, ERC4

Substance is a unique structure, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	300000
	Fraction of Regional tonnage used locally:	1
	Annual site tonnage (tons/year):	300000
	Maximum daily site tonnage (kg/day):	1000000 kg
Environment factors not influenced by risk management	Dilution Factor (River)	40
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	0,5 %

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

	Emission or Release Factor: Water	0,01 %
	Emission or Release Factor: Soil	0,01 %
	initial release prior to RMM	
<p>Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site</p>	Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):, If discharging to domestic sewage treatment plant, no secondary wastewater treatment required, Risk from environmental exposure is driven by wastewater treatment plant microbes., Prevent discharge of undissolved substance to or recover from onsite wastewater. (Degradation effectiveness: 93,3 %)
	Air	Treat air emissions to provide a typical removal (or abatement) (Efficiency: 90 %)
	Soil	Do not apply industrial sludge to natural soils.
	Common practices vary across sites thus conservative process release estimates used.	
<p>Conditions and measures related to sewage treatment plant</p>	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
	Sludge Treatment	Sludge should be incinerated, contained or reclaimed.
<p>Conditions and measures related to external treatment of waste for disposal</p>	Waste treatment	During manufacturing no waste of the substance is generated.
<p>Conditions and measures related to external recovery of waste</p>	Recovery Methods	During manufacturing no waste of the substance is generated.
<p>2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15</p>		
<p>Product characteristics</p>	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions	Assumes use at not more than 20°C above ambient temperature, unless stated	
PA100434_001	4/90	EN

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

affecting workers exposure	differently.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	Process sampling	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) or Sample via a closed loop or other system to avoid exposure.(PROC3, PROC4)
	Bulk transfers (open systems)	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC8a, PROC8b)
	Bulk transfers (closed systems)	Transfer via enclosed lines. Clear transfer lines prior to de-coupling.(PROC8a, PROC8b)
	Equipment cleaning and maintenance	Drain down and flush system prior to equipment opening or maintenance.(PROC8a, PROC8b)
	Storage	Store substance within a closed system.(PROC1, PROC2)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent/minimize exposures
	Bulk transfers (open systems)	If technical measures not practical: Operate activity away from sources of substance emission or release.(PROC8a, PROC8b)
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately.
	Bulk transfers (open systems) (closed systems)	If above technical/organisational control measures are not feasible, then adopt following PPE: Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (type EN374) if regular skin contact likely.(PROC8a, PROC8b)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC1, ERC4	---	---	Msafe	4070000 kg/day	< 1

ESVOC spERC 1.1v1 has been used to evaluate the exposure for the environment

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.

Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

Health

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

Users are advised to consider national Occupational Exposure Limits or other equivalent values

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

1. Short title of Exposure Scenario 2: Use as an intermediate

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC15: Use as laboratory reagent
Environmental Release Categories	ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)
Activity	Use as an intermediate (not related to Strictly Controlled Conditions). Includes incidental exposures during recycling/recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).

2.1 Contributing scenario controlling environmental exposure for: ERC6a

Substance is a unique structure, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	12000
	Fraction of Regional tonnage used locally:	1
	Annual site tonnage (tons/year):	12000
	Maximum daily site tonnage (kg/day):	40000 kg
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	0,2 %

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

	Emission or Release Factor: Water	0,3 %
	Emission or Release Factor: Soil	0,1 %
	initial release prior to RMM	

<p>Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site</p>	Air	Treat air emissions to provide a typical removal (or abatement) (Efficiency: 80 %)
	Water	Prevent discharge of undissolved substance to or recover from onsite wastewater., Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement). (Degradation effectiveness: 93,3 %)
	Soil	Do not apply industrial sludge to natural soils., Risk from environmental exposure is driven by soil.
	Water	If discharging to domestic sewage treatment plant, no secondary wastewater treatment required
	Common practices vary across sites thus conservative process release estimates used.	

<p>Conditions and measures related to sewage treatment plant</p>	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
	Sludge Treatment	Sludge should be incinerated, contained or reclaimed.

<p>Conditions and measures related to external treatment of waste for disposal</p>	Waste treatment	This substance is consumed during use and no waste of the substance is generated.
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<p>Conditions and measures related to external recovery of waste</p>	Recovery Methods	This substance is consumed during use and no waste of the substance is generated.
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2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15

<p>Product characteristics</p>	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa standard temperature and pressure

<p>Frequency and duration of use</p>	Covers daily exposures up to 8 hours (unless stated differently).	
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<p>Other operational conditions</p>	Assumes use at not more than 20°C above ambient temperature, unless stated	
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SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

affecting workers exposure	differently.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	Storage	Store substance within a closed system.(PROC2)
	Process sampling	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) or Sample via a closed loop or other system to avoid exposure.(PROC3, PROC4)
	Bulk transfers (open systems) with potential for aerosol generation	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC8a, PROC8b)
	Bulk transfers (closed systems)	Transfer via enclosed lines. Clear transfer lines prior to de-coupling.(PROC8a, PROC8b)
	Equipment cleaning and maintenance	Drain down system prior to equipment opening or maintenance.(PROC8a, PROC8b)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
	Bulk transfers	If technical measures not practical: Operate activity away from sources of substance emission or release.(PROC8a, PROC8b)
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately.
	Bulk transfers	If above technical/organisational control measures are not feasible, then adopt following PPE: Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (type EN374) if regular skin contact likely.(PROC8a, PROC8b)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC6a	---	---	Msafe	45600 kg/day	< 1

PA100434_001

9/90

EN

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.

Health

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

Users are advised to consider national Occupational Exposure Limits or other equivalent values

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

1. Short title of Exposure Scenario 3: Distribution of substance

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU8: Manufacture of bulk, large scale chemicals (including petroleum products) SU9: Manufacture of fine chemicals
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC15: Use as laboratory reagent
Environmental Release Categories	ERC1: Manufacture of substances ERC2: Formulation of preparations ERC3: Formulation in materials ERC4: Industrial use of processing aids in processes and products, not becoming part of articles ERC5: Industrial use resulting in inclusion into or onto a matrix ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates) ERC6b: Industrial use of reactive processing aids ERC6c: Industrial use of monomers for manufacture of thermoplastics ERC6d: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers ERC7: Industrial use of substances in closed systems
Activity	Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading, distribution and associated laboratory activities.

2.1 Contributing scenario controlling environmental exposure for: ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	300000
	Fraction of Regional tonnage used locally:	1
	Annual site tonnage (tons/year):	300000
	Maximum daily site tonnage (kg/day):	1000000 kg

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	0,01 %
	Emission or Release Factor: Water	0,001 %
	Emission or Release Factor: Soil	0,001 %
initial release prior to RMM		
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	Treat air emissions to provide a typical removal (or abatement) (Efficiency: 90 %)
	Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement). (Degradation effectiveness: 93,3 %)
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions	Assumes use at not more than 20°C above ambient temperature, unless stated	
PA100434_001	12/90	EN

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

affecting workers exposure	differently.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	Bulk transfers (closed systems)	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). or Ensure operation is undertaken outdoors.(PROC1, PROC2, PROC3, PROC8a, PROC8b)
	Bulk transfers (open systems)	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC8a, PROC8b)
	Equipment cleaning and maintenance	Drain down and flush system prior to equipment opening or maintenance.(PROC8a, PROC8b)
	Storage	Store substance within a closed system.(PROC2)
	Drum and small package filling	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC9)
Organisational measures to prevent /limit releases, dispersion and exposure	Bulk transfers (open systems)	If technical measures not practical: Operate activity away from sources of substance emission or release.(PROC8a, PROC8b)
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately.
	Bulk transfers (open systems)	If above technical/organisational control measures are not feasible, then adopt following PPE: Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (type EN374) if regular skin contact likely.(PROC8a, PROC8b)
	Equipment cleaning and maintenance	If above technical/organisational control measures are not feasible, then adopt following PPE: Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (type EN374) if regular skin contact likely.(PROC8a, PROC8b)
	Drum and small package filling	If no adequate ventilation is available: Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (type EN374) if regular skin contact likely.(PROC9)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ESVOC SpERC 1.1b.v1	---	---	---	13600000 kg/day	< 1

ESVOC spERC 1.1b.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.

Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

Health

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

Users are advised to consider national Occupational Exposure Limits or other equivalent values

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

1. Short title of Exposure Scenario 4: Formulation & (re)packing of substances and mixtures

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU 10: Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)
Process categories	<p>PROC1: Use in closed process, no likelihood of exposure</p> <p>PROC2: Use in closed, continuous process with occasional controlled exposure</p> <p>PROC3: Use in closed batch process (synthesis or formulation)</p> <p>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</p> <p>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p>PROC14: Production of preparations or articles by tableting, compression, extrusion, pelettisation</p> <p>PROC15: Use as laboratory reagent</p>
Environmental Release Categories	ERC2: Formulation of preparations
Activity	Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.

2.1 Contributing scenario controlling environmental exposure for: ERC2

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	1500
	Fraction of Regional tonnage used locally:	1
	Annual site tonnage (tons/year):	1500
	Maximum daily site tonnage (kg/day):	5000 kg
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release	2,5 %

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

	Factor: Air	
	Emission or Release Factor: Water	0,2 %
	Emission or Release Factor: Soil	0,01 %
	initial release prior to RMM	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	Treat air emissions to provide a typical removal (or abatement) (Efficiency: 0 %)
	Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement). (Degradation effectiveness: 93,3 %)
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	Batch processes at elevated temperatures	Ensure material transfers are under containment or extract ventilation. Provide extraction ventilation at points where
PA100434_001	16/90	EN

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

		emissions occur.(PROC3, PROC4)
	Manual Transfer from/pouring from containers	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC8a, PROC8b, PROC9)
	Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance.(PROC8a, PROC8b)
	Bulk transfers	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC8a, PROC8b)
	Storage	Store substance within a closed system.(PROC2)
	Drum/batch transfers	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC8a, PROC8b, PROC9)
	Production of preparations or articles by tableting, compression, extrusion, pelettisation	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC14)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
	Bulk transfers	If technical measures not practical: Operate activity away from sources of substance emission or release.(PROC8a, PROC8b)
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately.
	Bulk transfers	If above technical/organisational control measures are not feasible, then adopt following PPE: Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (type EN374) if regular skin contact likely.(PROC8a, PROC8b)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ESVOC SpERC 2.2.v1	---	---	Msafe	67800 kg/day	< 1

ESVOC spERC 2.2.v1 has been used to evaluate the exposure for the environment

PA100434_001

17/90

EN

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.

Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

Users are advised to consider national Occupational Exposure Limits or other equivalent values

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

1. Short title of Exposure Scenario 5: Rubber production and processing

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU 10: Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)
Process categories	<p>PROC1: Use in closed process, no likelihood of exposure</p> <p>PROC2: Use in closed, continuous process with occasional controlled exposure</p> <p>PROC3: Use in closed batch process (synthesis or formulation)</p> <p>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</p> <p>PROC6: Calendering operations</p> <p>PROC7: Industrial spraying</p> <p>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p>PROC13: Treatment of articles by dipping and pouring</p> <p>PROC14: Production of preparations or articles by tableting, compression, extrusion, pelettisation</p> <p>PROC15: Use as laboratory reagent</p> <p>PROC21: Low energy manipulation of substances bound in materials and/or articles</p>
Environmental Release Categories	<p>ERC1: Manufacture of substances</p> <p>ERC4: Industrial use of processing aids in processes and products, not becoming part of articles</p> <p>ERC6d: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers</p>
Activity	Manufacture of tyres and general rubber articles, including processing of raw (uncured) rubber, handling and mixing of rubber additives, vulcanising, cooling and finishing.

2.1 Contributing scenario controlling environmental exposure for: ERC1, ERC4, ERC6d

Substance is a unique structure, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	6000
	Fraction of Regional tonnage used locally:	1
	Maximum daily site	20000

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

	tonnage (kg/day):	
	Annual site tonnage (tons/year):	6000
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	1 %
	Emission or Release Factor: Water	0,3 %
	Emission or Release Factor: Soil	0,01 %
	initial release prior to RMM	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	Treat air emission to provide a typical removal efficiency of (%): (Efficiency: 0 %)
	Water	Prevent discharge of undissolved substance to or recover from onsite wastewater., Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement). (Degradation effectiveness: 93,3 %)
	Soil	Do not apply industrial sludge to natural soils.
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
	Sludge Treatment	Sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC7, PROC8a, PROC8b, PROC9, PROC13, PROC14, PROC15, PROC21		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
PA100434_001	20/90	EN

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Assumes use at not more than 20°C above ambient temperature.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	Material transfers	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC9)
	Calendering (including Banburys)	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC6)
	Additive premixing	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC4)
	Vulcanisation	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC6)
	Cooling cured articles	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC6)
	Small scale weighing	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC9)
	Pressing uncured rubber blanks	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC14)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
PA100434_001		21/90			EN

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

ERC1, ERC4, ERC6d	---	---	Msafe	467000 kg/day	< 1
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ESVOC spERC 4.19a.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.

Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

Health

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

Users are advised to consider national Occupational Exposure Limits or other equivalent values

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

1. Short title of Exposure Scenario 6: Uses in coatings

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	<p>PROC1: Use in closed process, no likelihood of exposure</p> <p>PROC2: Use in closed, continuous process with occasional controlled exposure</p> <p>PROC3: Use in closed batch process (synthesis or formulation)</p> <p>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</p> <p>PROC7: Industrial spraying</p> <p>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC10: Roller application or brushing</p> <p>PROC13: Treatment of articles by dipping and pouring</p> <p>PROC15: Use as laboratory reagent</p>
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
Activity	Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application by spray, roller, spreader, dip, flow, fluidised bed on production lines and film formation) and equipment cleaning, maintenance and associated laboratory activities.

2.1 Contributing scenario controlling environmental exposure for: ERC4

Substance is a unique structure, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	4500
	Fraction of Regional tonnage used locally:	1
	Annual site tonnage (tons/year):	4500
	Maximum daily site tonnage (kg/day):	15000 kg
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

	Emission or Release Factor: Air	98 %
	Emission or Release Factor: Water	0,7 %
	Emission or Release Factor: Soil	0 %
	initial release prior to RMM	
<p>Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site</p>	Air	Treat air emissions to provide a typical removal (or abatement) (Efficiency: 90 %)
	Water	Prevent discharge of undissolved substance to or recover from onsite wastewater., Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement)., If discharging to domestic sewage treatment plant, no secondary wastewater treatment required (Degradation effectiveness: 93,3 %)
	Soil	Do not apply industrial sludge to natural soils., Risk from environmental exposure is driven by soil.
	Common practices vary across sites thus conservative process release estimates used.	
<p>Conditions and measures related to sewage treatment plant</p>	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
	Sludge Treatment	Sludge should be incinerated, contained or reclaimed.
<p>Conditions and measures related to external treatment of waste for disposal</p>	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
<p>Conditions and measures related to external recovery of waste</p>	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
<p>2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC10, PROC13, PROC15</p>		
<p>Product characteristics</p>	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
<p>PA100434_001 24/90 EN</p>		

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	Storage	Store substance within a closed system.(PROC1, PROC2)
	Preparation of material for application	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC5)
	Spraying/fogging by manual application	Carry out in a vented booth or extracted enclosure. or Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC7)
	Mixing operations (open systems)	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC5)
	Spraying (automatic/robotic)	Carry out in a vented booth or extracted enclosure.(PROC7)
	Material transfers	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC8a, PROC8b)
	Drum/batch transfers	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC8a, PROC8b)
	Transfer from/pouring from containers	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC8a, PROC8b)
	Equipment cleaning and maintenance	Drain down and flush system prior to equipment opening or maintenance.(PROC8a, PROC8b)
	Roller, spreader, flow application	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC10)
	Dipping, immersion and pouring	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC13)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wash off any skin contamination immediately. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.
	Spraying/fogging by	Wear a respirator conforming to EN140 with Type A

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

manual application	filter or better.(PROC7)
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3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC4	---	---	Msafe	19900 kg/day	< 1

ESVOC spERC 4.3a.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.

Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

Health

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

Users are advised to consider national Occupational Exposure Limits or other equivalent values

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

1. Short title of Exposure Scenario 7: Uses in coatings

Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process categories	<p>PROC1: Use in closed process, no likelihood of exposure</p> <p>PROC2: Use in closed, continuous process with occasional controlled exposure</p> <p>PROC3: Use in closed batch process (synthesis or formulation)</p> <p>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</p> <p>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC10: Roller application or brushing</p> <p>PROC11: Non industrial spraying</p> <p>PROC13: Treatment of articles by dipping and pouring</p> <p>PROC15: Use as laboratory reagent</p> <p>PROC19: Hand-mixing with intimate contact and only PPE available</p>
Environmental Release Categories	<p>ERC8a: Wide dispersive indoor use of processing aids in open systems</p> <p>ERC8d: Wide dispersive outdoor use of processing aids in open systems</p>
Activity	Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application by spray, roller, brush, spreader by hand or similar methods, and film formation) and equipment cleaning, maintenance and associated laboratory activities.

2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d

Substance is a unique structure, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	15000 ton(s)/year
	Fraction of Regional tonnage used locally:	0,002
	Annual site tonnage (tons/year):	30
	Maximum daily site tonnage (kg/day):	82,2 kg
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting	Number of emission days	365

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

environmental exposure

per year	
Emission or Release Factor: Air	98 %
Emission or Release Factor: Water	10 %
Emission or Release Factor: Soil	10 %
initial release prior to RMM	

Technical conditions and measures at process level (source) to prevent release
 Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
 Organizational measures to prevent/limit release from the site

Air	Treat air emissions to provide a typical removal (or abatement) (Efficiency: 0 %)
Water	Prevent discharge of undissolved substance to or recover from onsite wastewater., Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement). (Degradation effectiveness: 93,3 %)
Soil	Do not apply industrial sludge to natural soils.
Water	If discharging to domestic sewage treatment plant, no secondary wastewater treatment required
Common practices vary across sites thus conservative process release estimates used.	

Conditions and measures related to sewage treatment plant

Type of Sewage Treatment Plant	Municipal sewage treatment plant
Flow rate of sewage treatment plant effluent	2.000 m3/d
Percentage removed from waste water	93,3 %
Sludge Treatment	Sludge should be incinerated, contained or reclaimed.

Conditions and measures related to external treatment of waste for disposal

Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
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Conditions and measures related to external recovery of waste

Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
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2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC10, PROC11, PROC13, PROC15, PROC19

Product characteristics

Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	liquid
Vapour pressure	0,5 - 10 kPa

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

	standard temperature and pressure	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
	Avoid carrying out operation for more than 4 hours.(PROC5, PROC13, PROC19)	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
	Indoor/Outdoor use.(PROC5, PROC13, PROC19)	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	Storage	Store substance within a closed system.(PROC2)
	Film formation - air drying	Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan.(PROC2, PROC4)
	Preparation of material for application	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC3)
	Film formation - air drying	Ensure operation is undertaken outdoors.(PROC4)
	Preparation of material for application	Ensure operation is undertaken outdoors.(PROC5)
	Equipment cleaning and maintenance	Drain down system prior to equipment opening or maintenance.(PROC8a, PROC8b)
	Drum/batch transfers	Use drum pumps or carefully pour from container.(PROC9)
	Roller, spreader, flow application	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC10)
	Roller, spreader, flow application	Ensure operation is undertaken outdoors.(PROC10)
	Spraying/fogging by manual application	Ensure operation is undertaken outdoors.(PROC11)
	Spraying/fogging by manual application Indoor	Carry out in a vented booth or extracted enclosure.(PROC11)
	Dipping, immersion and pouring	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC13)
	Dipping, immersion and pouring	Ensure operation is undertaken outdoors.(PROC13)
	Hand application - finger paints, pastels, Adhesives	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(Indoor PROC19)

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

	Hand application - finger paints, pastels, Adhesives	Ensure operation is undertaken outdoors.(PROC19)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying. Wash off any skin contamination immediately.
	Roller, spreader, flow application	Avoid carrying out operation for more than 4 hours. or Wear a respirator conforming to EN140 with Type A filter or better.(PROC10)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ESVOC SpERC 8.3b.v1	---	---	Msafe	12700 kg/day	< 1

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.

Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

Health

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.
Users are advised to consider national Occupational Exposure Limits or other equivalent values

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

1. Short title of Exposure Scenario 8: Uses in coatings

Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)
Chemical product category	PC1: Adhesives, sealants PC4: Anti-freeze and de-icing products PC8: Biocidal products PC9a: Coatings and paints, thinners, paint removers PC9b: Fillers, putties, plasters, modelling clay PC9c: Finger paints PC15: Non-metal-surface treatment products PC18: Ink and toners PC23: Leather tanning, dye, finishing, impregnation and care products PC24: Lubricants, greases, release products PC31: Polishes and wax blends
Environmental Release Categories	ERC8a: Wide dispersive indoor use of processing aids in open systems ERC8d: Wide dispersive outdoor use of processing aids in open systems
Activity	Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including product transfer and preparation, application by brush, spray by hand or similar methods) and equipment cleaning.

2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d

Substance is a unique structure, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	15000 ton(s)/year
	Fraction of Regional tonnage used locally:	0,002
	Annual site tonnage (tons/year):	30
	Maximum daily site tonnage (kg/day):	82,2 kg
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	98,5 %
	Emission or Release Factor: Water	10 %
	Emission or Release Factor: Soil	0,5 %

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

	initial release prior to RMM	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling consumer exposure for: PC4: Washing car window

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 1 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	0,5 g
Frequency and duration of use	Exposure duration per day	0,02 h
	Frequency of use	1 Times per day
	Frequency of use	365 days/year
Other given operational conditions affecting consumers exposure	Room size	34 m3
	Covers use at ambient temperatures., Covers use in a one car garage (34 m3) under typical ventilation.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

2.3 Contributing scenario controlling consumer exposure for: PC4: Pouring into radiator

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 10%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

Amount used	Amount used per event	2 kg
Frequency and duration of use	Exposure duration per event	0,17 h
	Frequency of use	1 Times per day
	Frequency of use	365 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	34 m3
	Covers use at ambient temperatures., Covers use in a one car garage (34 m3) under typical ventilation.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

2.4 Contributing scenario controlling consumer exposure for: PC4: Lock de-icer

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	4 g
Frequency and duration of use	Exposure duration per event	0,25 h
	Frequency of use	1 Times per day
	Frequency of use	365 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	34 m3
	Covers use at ambient temperatures.Covers use in a one car garage (34 m3) under typical ventilation.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

2.5 Contributing scenario controlling consumer exposure for: PC8: Laundry and dish washing products

(excipient only)		
PA100434_001	34/90	EN

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 5 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
Amount used	Amount used per event	15 g
Frequency and duration of use	Exposure duration per event	0,5 h
	Frequency of use	1 Times per day
	Frequency of use	365 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

2.6 Contributing scenario controlling consumer exposure for: PC8: Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)

(excipient only)

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 5 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	27 g
Frequency and duration of use	Exposure duration per event	0,33 h
	Frequency of use	1 Times per day
	Frequency of use	128 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)

No specific risk management measure identified beyond those operational conditions stated.

2.7 Contributing scenario controlling consumer exposure for: PC8: Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)

(excipient only)

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 15%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	35 g
Frequency and duration of use	Exposure duration per event	0,17 h
	Frequency of use	1 Times per day
	Frequency of use	128 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

2.8 Contributing scenario controlling consumer exposure for: PC9a: Waterborne latex wall paint

Product characteristics	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	2,76 kg
Frequency and duration of use	Exposure duration per event	2,2 h
	Frequency of use	1 Times per day
	Frequency of use	4 days/year
Human factors not influenced by risk management		

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

Other given operational conditions affecting consumers exposure

Room size	20 m3
Covers use at ambient temperatures.	

Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)

No specific risk management measure identified beyond those operational conditions stated.

2.9 Contributing scenario controlling consumer exposure for: PC9a: Solvent rich, high solid, water borne paint

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 2,5%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	

Amount used	Amount used per event	744 g
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Frequency and duration of use	Exposure duration per event	2,2 h
	Frequency of use	1 Times per day
	Frequency of use	6 days/year

Human factors not influenced by risk management

Other given operational conditions affecting consumers exposure

Room size	20 m3
Covers use at ambient temperatures.	

Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)

No specific risk management measure identified beyond those operational conditions stated.

2.10 Contributing scenario controlling consumer exposure for: PC9a: Removers (paint-, glue-, wall paper-, sealant-remover)

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 4%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	

Amount used	Amount used per event	491 g
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Frequency and duration of use	Exposure duration per event	2 h
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SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

	Frequency of use	1 Times per day
	Frequency of use	3 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

2.11 Contributing scenario controlling consumer exposure for: PC9b: Fillers and putty

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 2%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	85 g
Frequency and duration of use	Exposure duration per event	4 h
	Frequency of use	1 Times per day
	Frequency of use	12 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

2.12 Contributing scenario controlling consumer exposure for: PC9b: Plasters and floor equalizers

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 0% - 0,1%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

Amount used	Amount used per event	13,8 kg
Frequency and duration of use	Exposure duration per event	2 h
	Frequency of use	1 Times per day
	Frequency of use	12 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

2.13 Contributing scenario controlling consumer exposure for: PC9b: Modelling clay

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 1 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	1 g
Frequency and duration of use	Exposure duration per event	1 h
	Frequency of use	1 Times per day
	Frequency of use	365 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

2.14 Contributing scenario controlling consumer exposure for: PC9c: Finger paints

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product: 0% - 0,1%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

	standard temperature and pressure	
Amount used	Amount used per event	1,35 g
Frequency and duration of use	Exposure duration per event	1 h
	Frequency of use	1 Times per day
	Frequency of use	365 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

2.15 Contributing scenario controlling consumer exposure for: PC15: Waterborne latex wall paint

Product characteristics	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	2,76 kg
Frequency and duration of use	Exposure duration per event	2,20 h
	Frequency of use	1 Times per day
	Frequency of use	4 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

2.16 Contributing scenario controlling consumer exposure for: PC15: Solvent rich, high solid, water borne paint

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 1 %.
	Physical Form (at time of use)	liquid

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	744 g
Frequency and duration of use	Exposure duration per event	2,20 h
	Frequency of use	1 Times per day
	Frequency of use	6 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

2.17 Contributing scenario controlling consumer exposure for: PC15: Aerosol spray can

Product characteristics	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	215 g
Frequency and duration of use	Exposure duration per event	0,33 h
	Frequency of use	1 Times per day
	Frequency of use	2 days/year
Other given operational conditions affecting consumers exposure	Room size	34 m3
	Covers use at ambient temperatures.Covers use in a one car garage (34 m3) under typical ventilation.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

2.18 Contributing scenario controlling consumer exposure for: PC15: Removers (paint-, glue-, wall paper-, sealant remover)

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 1,5%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

	standard temperature and pressure	
Amount used	Amount used per event	491 g
Frequency and duration of use	Exposure duration per event	2 h
	Frequency of use	1 Times per day
	Frequency of use	3 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

2.19 Contributing scenario controlling consumer exposure for: PC18

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 10%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	40 g
Frequency and duration of use	Exposure duration per event	2,20 h
	Frequency of use	1 Times per day
	Frequency of use	365 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

2.20 Contributing scenario controlling consumer exposure for: PC23: Polishes, wax/cream (floor, furniture, shoes)

Product characteristics	Physical Form (at time of use)	liquid
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SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	56 g
Frequency and duration of use	Exposure duration per event	1,23 h
	Frequency of use	1 Times per day
	Frequency of use	29 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

2.21 Contributing scenario controlling consumer exposure for: PC23: Polishes, spray (furniture, shoes)

Product characteristics	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	56 g
Frequency and duration of use	Exposure duration per event	0,33 h
	Frequency of use	1 Times per day
	Frequency of use	8 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

2.22 Contributing scenario controlling consumer exposure for: PC24: Liquids

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 35%
	Physical Form (at time of use)	liquid

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

	use)	
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	2,2 kg
Frequency and duration of use	Exposure duration per event	0,17 h
	Frequency of use	1 Times per day
	Frequency of use	4 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	34 m3
	Covers use at ambient temperatures.Covers use in a one car garage (34 m3) under typical ventilation.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

2.23 Contributing scenario controlling consumer exposure for: PC24: Pastes

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 35%
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	34 g
Frequency and duration of use	Exposure duration per event	0,17 h
	Frequency of use	1 Times per day
	Frequency of use	10 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	34 m3
	Covers use at ambient temperatures.Covers use in a one car garage (34 m3) under typical ventilation.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

2.24 Contributing scenario controlling consumer exposure for: PC24: Sprays

PA100434_001	44/90	EN
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SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 5 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	73 g
Frequency and duration of use	Exposure duration per event	0,17 h
	Frequency of use	1 Times per day
	Frequency of use	6 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

2.25 Contributing scenario controlling consumer exposure for: PC31: Polishes, wax / cream (floor, furniture, shoes)

Product characteristics	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	142 g
Frequency and duration of use	Exposure duration per event	1,23 h
	Frequency of use	1 Times per day
	Frequency of use	29 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

2.26 Contributing scenario controlling consumer exposure for: PC31: Polishes, spray (furniture,

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

shoes)

Product characteristics	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	35 g
Frequency and duration of use	Exposure duration per event	0,33 h
	Frequency of use	1 Times per day
	Frequency of use	8 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

2.27 Contributing scenario controlling consumer exposure for: PC34

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 5 %.
	Physical Form (at time of use)	liquid
	Vapour pressure	> 10 kPa
	standard temperature and pressure	
Amount used	Amount used per event	115 g
Frequency and duration of use	Exposure duration per event	1 h
	Frequency of use	1 Times per day
	Frequency of use	365 days/year
Human factors not influenced by risk management		
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	No specific risk management measure identified beyond those operational conditions stated.	

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC9a, ERC9b	---	---	Msafe	13600 kg/day	< 1

ESVOC spERC 8.3c.v1 has been used to evaluate the exposure for the environment

Consumers

The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.

Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

1. Short title of Exposure Scenario 9: Use in Cleaning Agents

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	<p>PROC1: Use in closed process, no likelihood of exposure</p> <p>PROC2: Use in closed, continuous process with occasional controlled exposure</p> <p>PROC3: Use in closed batch process (synthesis or formulation)</p> <p>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC7: Industrial spraying</p> <p>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC10: Roller application or brushing</p> <p>PROC13: Treatment of articles by dipping and pouring</p>
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
Activity	Covers the use as a component of cleaning products including transfer from storage, pouring/unloading from drums or containers. exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping, automated and by hand), related equipment cleaning and maintenance.

2.1 Contributing scenario controlling environmental exposure for: ERC4

Substance is a unique structure, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	1500
	Fraction of Regional tonnage used locally:	1
	Annual site tonnage (tons/year):	1500
	Maximum daily site tonnage (kg/day):	5000 kg
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	30 %
	Emission or Release	0,003 %

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

	Factor: Water	
	Emission or Release Factor: Soil	0 %
	initial release prior to RMM	
<p>Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site</p>	Air	Treat air emissions to provide a typical removal (or abatement) (Efficiency: 70 %)
	Water	Prevent discharge of undissolved substance to or recover from onsite wastewater., Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement). (Degradation effectiveness: 93,3 %)
	Water	Risk from environmental exposure is driven by freshwater., If discharging to domestic sewage treatment plant, no secondary wastewater treatment required
	Common practices vary across sites thus conservative process release estimates used.	
<p>Conditions and measures related to sewage treatment plant</p>	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
	Sludge Treatment	Sludge should be incinerated, contained or reclaimed., Do not apply industrial sludge to natural soils.
<p>Conditions and measures related to external treatment of waste for disposal</p>	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
<p>Conditions and measures related to external recovery of waste</p>	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
<p>2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC10, PROC13</p>		
<p>Product characteristics</p>	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
<p>Frequency and duration of use</p>	Covers daily exposures up to 8 hours (unless stated differently).	
PA100434_001	49/90	EN

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

Other operational conditions affecting workers exposure

Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Technical conditions and measures to control dispersion from source towards the worker

General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
Storage	Store substance within a closed system.(PROC2)
Batch processes at elevated temperatures	Provide extraction ventilation at points where emissions occur.(PROC3, PROC4)
Bulk transfers	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC8a)
Filling / preparation of equipment from drums or containers	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC8a)
Equipment cleaning and maintenance	Drain down and flush system prior to equipment opening or maintenance.(PROC8a, PROC8b)
Cleaning with high pressure washers	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC10)
Cleaning with low-pressure washers	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC10)
Degreasing small objects in cleaning station	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC13)

Organisational measures to prevent /limit releases, dispersion and exposure

General measures (skin irritants)
Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.

Conditions and measures related to personal protection, hygiene and health evaluation

General measures (skin irritants)
Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying. Wash off any skin contamination immediately.

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ESVOC SpERC 4.4a.v1	---	---	Msafe	1770000 kg/day	< 1

ESVOC spERC 4.4a.v1 has been used to evaluate the exposure for the environment

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.

Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

Health

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

Users are advised to consider national Occupational Exposure Limits or other equivalent values

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

1. Short title of Exposure Scenario 10: Use in Cleaning Agents

Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process categories	<p>PROC1: Use in closed process, no likelihood of exposure</p> <p>PROC2: Use in closed, continuous process with occasional controlled exposure</p> <p>PROC3: Use in closed batch process (synthesis or formulation)</p> <p>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC10: Roller application or brushing</p> <p>PROC11: Non industrial spraying</p> <p>PROC13: Treatment of articles by dipping and pouring</p>
Environmental Release Categories	<p>ERC8a: Wide dispersive indoor use of processing aids in open systems</p> <p>ERC8d: Wide dispersive outdoor use of processing aids in open systems</p>
Activity	Covers the use as a component of cleaning products including pouring/unloading from drums or containers; and exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping, automated and by hand).

2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d

Substance is a unique structure, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	1500
	Fraction of Regional tonnage used locally:	0,002
	Annual site tonnage (tons/year):	3
	Maximum daily site tonnage (kg/day):	8,2 kg
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	2 %
	Emission or Release Factor: Water	0 %

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

	Emission or Release Factor: Soil	0 %
	initial release prior to RMM	
<p>Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site</p>	Air	Treat air emissions to provide a typical removal (or abatement) (Efficiency: 0 %)
	Water	Prevent discharge of undissolved substance to or recover from onsite wastewater., Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement). (Degradation effectiveness: 93,3 %)
	Soil	Do not apply industrial sludge to natural soils.
	Water	Risk from environmental exposure is driven by freshwater., If discharging to domestic sewage treatment plant, no secondary wastewater treatment required
	Common practices vary across sites thus conservative process release estimates used.	
<p>Conditions and measures related to sewage treatment plant</p>	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
	Sludge Treatment	Sludge should be incinerated, contained or reclaimed.
<p>Conditions and measures related to external treatment of waste for disposal</p>	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
<p>Conditions and measures related to external recovery of waste</p>	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
<p>2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC10, PROC11, PROC13</p>		
<p>Product characteristics</p>	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
<p>Frequency and duration of use</p>	Covers daily exposures up to 8 hours (unless stated differently).	
<p>Other operational conditions affecting workers exposure</p>	Assumes use at not more than 20°C above ambient temperature, unless stated	
PA100434_001	53/90	EN

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

	differently.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	Storage	Store substance within a closed system.(PROC1, PROC2)
	Filling / preparation of equipment from drums or containers	Avoid carrying out operation for more than 4 hours.(PROC8a, PROC8b)
	Equipment cleaning and maintenance	Drain down system prior to equipment opening or maintenance.(PROC8a, PROC8b)
	Cleaning with low-pressure washers	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC10)
	Cleaning with high pressure washers	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(Indoor PROC11)
	Filling / preparation of equipment from drums or containers Dedicated facility	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC8b)
	Semi-automated process (e.g.: Semi-automatic application of floor care and maintenance products)	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC4)
	Application of cleaning products in closed systems	Ensure operation is undertaken outdoors. or provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC2, PROC4)
	Cleaning of medical devices	Provide extract ventilation to points where emissions occur.(PROC4)
	Filling / preparation of equipment from drums or containers	Ensure operation is undertaken outdoors. or Avoid carrying out operation for more than 4 hours.(Outdoor PROC8a, PROC8b)
	Ad hoc manual application via trigger sprays, dipping, etc	Provide extract ventilation to points where emissions occur. or provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC10)
	Manual Surfaces cleaning Spraying	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC10)
Manual Surfaces cleaning	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC13)	

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

	Dipping, immersion and pouring	
	Cleaning with high pressure washers	Ensure operation is undertaken outdoors.(Outdoor PROC11)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying. Wash off any skin contamination immediately.
	Cleaning with low-pressure washers	Wear a respirator conforming to EN140 with Type A filter or better.(PROC10)
	Cleaning with high pressure washers	Wear a respirator conforming to EN140 with Type A filter or better.(Indoor PROC11)
	Ad hoc manual application via trigger sprays, dipping, etc	Wear a respirator conforming to EN140 with Type A filter or better.(PROC10)
	Manual Surfaces cleaning Spraying	Wear a respirator conforming to EN140 with Type A filter or better.(PROC10)
	Cleaning with high pressure washers	Wear a respirator conforming to EN140 with Type A filter or better.(Outdoor PROC11)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a, ERC8d	---	---	Msafe	3900 kg/day	< 1

ESVOC spERC 8.4b.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the

PA100434_001

55/90

EN

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

Exposure Scenario

Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.

Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

Health

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

Users are advised to consider national Occupational Exposure Limits or other equivalent values

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

1. Short title of Exposure Scenario 11: Use as binders and release agents

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	<p>PROC1: Use in closed process, no likelihood of exposure</p> <p>PROC2: Use in closed, continuous process with occasional controlled exposure</p> <p>PROC3: Use in closed batch process (synthesis or formulation)</p> <p>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC6: Calendering operations</p> <p>PROC7: Industrial spraying</p> <p>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC10: Roller application or brushing</p> <p>PROC13: Treatment of articles by dipping and pouring</p> <p>PROC14: Production of preparations or articles by tableting, compression, extrusion, pelettisation</p>
Environmental Release Categories	<p>ERC4: Industrial use of processing aids in processes and products, not becoming part of articles</p> <p>ERC5: Industrial use resulting in inclusion into or onto a matrix</p>
Activity	Covers the use as binders and release agents including material transfers, mixing, application (including spraying and brushing) and handling of waste.

2.1 Contributing scenario controlling environmental exposure for: ERC4, ERC5

Substance is a unique structure, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	1500
	Fraction of Regional tonnage used locally:	1
	Annual site tonnage (tons/year):	1500
	Maximum daily site tonnage (kg/day):	5000
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	20 %
	Emission or Release Factor: Water	0,003 %

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

Emission or Release Factor: Soil	0 %
initial release prior to RMM	

<p>Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site</p>	Compartment	Water
	Water	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal., Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement)., Prevent discharge of substance to wastewater or recover from wastewater (Degradation effectiveness: 93,3 %)
	Compartment	Air
	Air	Treat air emissions to provide a typical removal (or abatement) (Efficiency: 80 %)
	Compartment	Soil
	Soil	Risk from environmental exposure is driven by soil., Do not apply industrial sludge to natural soils.
	Common practices vary across sites thus conservative process release estimates used.	

<p>Conditions and measures related to sewage treatment plant</p>	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
	Sludge Treatment	Sludge should be incinerated, contained or reclaimed.

<p>Conditions and measures related to external treatment of waste for disposal</p>	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
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<p>Conditions and measures related to external recovery of waste</p>	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
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2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC6, PROC7, PROC8b, PROC10, PROC13, PROC14

<p>Product characteristics</p>	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	Storage	Store substance within a closed system.(PROC2)
	Spraying/fogging by manual application	Carry out in a vented booth or extracted enclosure.(PROC7)
	Spraying/fogging by manual application	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC7)
	Rolling, Brushing	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC10)
	Article formation in mould	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC14)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC4, ERC5	---	---	Msafe	744000 kg/day	< 1

ESVOC spERC 4.10a.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

PA100434_001

59/90

EN

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.

Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

Health

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

Users are advised to consider national Occupational Exposure Limits or other equivalent values

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

1. Short title of Exposure Scenario 12: Use as binders and release agents

Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process categories	<p>PROC1: Use in closed process, no likelihood of exposure</p> <p>PROC2: Use in closed, continuous process with occasional controlled exposure</p> <p>PROC3: Use in closed batch process (synthesis or formulation)</p> <p>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC6: Calendering operations</p> <p>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC10: Roller application or brushing</p> <p>PROC11: Non industrial spraying</p> <p>PROC14: Production of preparations or articles by tableting, compression, extrusion, pelettisation</p>
Environmental Release Categories	<p>ERC8a: Wide dispersive indoor use of processing aids in open systems</p> <p>ERC8d: Wide dispersive outdoor use of processing aids in open systems</p>
Activity	Covers the use as binders and release agents including material transfers, mixing, application by spraying, brushing, and handling of waste.

2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d

Substance is a unique structure, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	1500
	Fraction of Regional tonnage used locally:	2000
	Annual site tonnage (tons/year):	3
	Maximum daily site tonnage (kg/day):	8,2
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	95 %
	Emission or Release Factor: Water	2,5 %

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

	Emission or Release Factor: Soil	2,5 %
	initial release prior to RMM	
<p>Technical conditions and measures at process level (source) to prevent release</p> <p>Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil</p> <p>Organizational measures to prevent/limit release from the site</p>	Air	Treat air emissions to provide a typical removal (or abatement) (Efficiency: 0 %)
	Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): (Degradation effectiveness: 93,3 %)
	Soil	Do not apply industrial sludge to natural soils.
	Common practices vary across sites thus conservative process release estimates used.	
<p>Conditions and measures related to sewage treatment plant</p>	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
	Sludge Treatment	Sludge should be incinerated, contained or reclaimed.
<p>Conditions and measures related to external treatment of waste for disposal</p>	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
<p>Conditions and measures related to external recovery of waste</p>	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
<p>2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC6, PROC8a, PROC8b, PROC10, PROC11, PROC14</p>		
<p>Product characteristics</p>	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
<p>Frequency and duration of use</p>	Covers daily exposures up to 8 hours (unless stated differently).	
<p>Human factors not influenced by risk management</p>	Assumes a good basic standard of occupational hygiene is implemented.	
<p>Technical conditions and measures to control dispersion from source towards the worker</p>	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	Spraying/fogging by manual application	Carry out in a vented booth or extracted enclosure. Provide a good standard of controlled ventilation
PA100434_001	62/90	EN

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

		(10 to 15 air changes per hour) or provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC11)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
	Spraying/fogging by manual application	Ensure operatives are trained to minimise exposures.(PROC11)
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Identify potential areas for indirect skin contact. Avoid direct skin contact with product. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately. Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.
	Spraying/fogging by manual application	Wear a respirator conforming to EN140 with Type A filter or better.(PROC11)

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8a, ERC8d	---	---	Msafe	2660 kg/day	< 1

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.

Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

*SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006***Toluene**

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

Health

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

1. Short title of Exposure Scenario 13: Use as a fuel

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC16: Using material as fuel sources, limited exposure to unburned product to be expected
Environmental Release Categories	ERC7: Industrial use of substances in closed systems
Activity	Covers the use as a fuel (or fuel additive), and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

2.1 Contributing scenario controlling environmental exposure for: ERC7

Substance is a unique structure, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	15000
	Fraction of Regional tonnage used locally:	1
	Annual site tonnage (tons/year):	15000
	Maximum daily site tonnage (kg/day):	50000
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	0,25 %
	Emission or Release Factor: Water	0,001 %
	Emission or Release Factor: Soil	0 %
initial release prior to RMM		
Technical conditions and	Air	Treat air emission to provide a typical removal

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

measures at process level (source) to prevent release
 Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
 Organizational measures to prevent/limit release from the site

	efficiency of (%): (Efficiency: 95 %)
Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):, Risk from environmental exposure is driven by freshwater. (Degradation effectiveness: 93,3 %)
Common practices vary across sites thus conservative process release estimates used.	

Conditions and measures related to sewage treatment plant

Type of Sewage Treatment Plant	Municipal sewage treatment plant
Flow rate of sewage treatment plant effluent	2.000 m3/d
Percentage removed from waste water	93,3 %
Sludge Treatment	Do not apply industrial sludge to natural soils., Sludge should be incinerated, contained or reclaimed.

Conditions and measures related to external treatment of waste for disposal

Waste treatment	This substance is consumed during use and no waste of the substance is generated.
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Conditions and measures related to external recovery of waste

Recovery Methods	This substance is consumed during use and no waste of the substance is generated.
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2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16

Product characteristics

Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	liquid
Vapour pressure	0,5 - 10 kPa
standard temperature and pressure	

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other operational conditions affecting workers exposure

Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Technical conditions and measures to control dispersion from source towards the worker

General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
Drum/batch transfers	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC3, PROC8a, PROC8b)
Equipment maintenance	Drain down system prior to equipment opening or maintenance. Drain or remove substance from equipment prior to break-in or maintenance.(PROC8a, PROC8b)

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

	Storage	Store substance within a closed system.(PROC2)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately.

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC7	---	---	Msafe	11000000 kg/day	< 1

ESVOC spERC 7.12a.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.

Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

Health

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

Users are advised to consider national Occupational Exposure Limits or other equivalent values

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

1. Short title of Exposure Scenario 14: Use as a fuel

Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC16: Using material as fuel sources, limited exposure to unburned product to be expected
Environmental Release Categories	ERC9a: Wide dispersive indoor use of substances in closed systems ERC9b: Wide dispersive outdoor use of substances in closed systems
Activity	Covers the use as a fuel (or fuel additive), and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

2.1 Contributing scenario controlling environmental exposure for: ERC9a, ERC9b

Substance is a unique structure, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	15000
	Fraction of Regional tonnage used locally:	2000
	Annual site tonnage (tons/year):	30
	Maximum daily site tonnage (kg/day):	82
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	0,1 %
	Emission or Release Factor: Water	0,001 %
	Emission or Release Factor: Soil	0,001 %
	initial release prior to RMM	
Technical conditions and	Water	Prevent discharge of undissolved substance to or

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

measures at process level (source) to prevent release
 Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil
 Organizational measures to prevent/limit release from the site

	recover from onsite wastewater., Risk from environmental exposure is driven by freshwater., Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement). (Degradation effectiveness: 93,3 %)
Air	Treat air emission to provide a typical removal efficiency of (%): (Efficiency: 0 %)
Soil	Do not apply industrial sludge to natural soils.

Conditions and measures related to sewage treatment plant

Type of Sewage Treatment Plant	Municipal sewage treatment plant
Flow rate of sewage treatment plant effluent	2.000 m3/d
Percentage removed from waste water	93,3 %
Sludge Treatment	Sludge should be incinerated, contained or reclaimed.

Conditions and measures related to external treatment of waste for disposal

Waste treatment	This substance is consumed during use and no waste of the substance is generated.
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Conditions and measures related to external recovery of waste

Recovery Methods	This substance is consumed during use and no waste of the substance is generated.
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2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	

Frequency and duration of use: Covers daily exposures up to 8 hours (unless stated differently).

Technical conditions and measures to control dispersion from source towards the worker	Bulk transfers	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)
	Drum/batch transfers	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
	Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance.
	Storage	Store substance within a closed system.

3. Exposure estimation and reference to its source

Environment

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC9a, ERC9b	---	---	Msafe	3900 kg/day	< 1

ESVOC spERC 9.12b.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.

Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

Health

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

1. Short title of Exposure Scenario 15: Use as Functional Fluids

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Environmental Release Categories	ERC7: Industrial use of substances in closed systems
Activity	Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in professional equipment including maintenance and related material transfers.

2.1 Contributing scenario controlling environmental exposure for: ERC7

Substance is a unique structure, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	1500
	Fraction of Regional tonnage used locally:	1
	Annual site tonnage (tons/year):	1500
	Maximum daily site tonnage (kg/day):	5000
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	1 %
	Emission or Release Factor: Water	0,03 %

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

	Emission or Release Factor: Soil	0,1 %
	initial release prior to RMM	
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Soil	Do not apply industrial sludge to natural soils., Risk from environmental exposure is driven by soil.
	Air	Treat air emissions to provide a typical removal (or abatement) (Efficiency: 0 %)
	Water	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal., Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement). (Degradation effectiveness: 93,3 %)
	Common practices vary across sites thus conservative process release estimates used.	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
	Sludge Treatment	Sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Assumes use at not more than 20°C above ambient temperature.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
PA100434_001	72/90	EN

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

	Equipment maintenance	Drain or remove substance from equipment prior to break-in or maintenance.(PROC8a, PROC8b)
	Remanufacture of reject articles	Drain or remove substance from equipment prior to break-in or maintenance.(PROC9)
	Filling of articles/equipment	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC9)
	Storage	Store substance within a closed system.(PROC1, PROC2)
	Filling / preparation of equipment from drums or containers	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC8a, PROC8b, PROC9)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately.

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC7	---	---	Msafe	455000 kg/day	< 1

ESVOC spERC 7.13a.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.

*SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006***Toluene**

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

Health

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

Users are advised to consider national Occupational Exposure Limits or other equivalent values

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

1. Short title of Exposure Scenario 16: Use as Functional Fluids

Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC20: Heat and pressure transfer fluids in dispersive, professional use but closed systems
Environmental Release Categories	ERC9a: Wide dispersive indoor use of substances in closed systems ERC9b: Wide dispersive outdoor use of substances in closed systems
Activity	Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in professional equipment including maintenance and related material transfers.

2.1 Contributing scenario controlling environmental exposure for: ERC9a, ERC9b

Substance is a unique structure, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	1500
	Fraction of Regional tonnage used locally:	2000
	Annual site tonnage (tons/year):	3
	Maximum daily site tonnage (kg/day):	8,2
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	5 %
	Emission or Release Factor: Water	2,5 %
	Emission or Release Factor: Soil	2,5 %
	initial release prior to RMM	

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

<p>Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site</p>	Water	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal., Risk from environmental exposure is driven by freshwater., Prevent discharge of undissolved substance to or recover from onsite wastewater., Treat onsite wastewater (prior to receiving water discharge) to provide the required removal (or abatement). (Degradation effectiveness: 93,3 %)
	Air	Treat air emission to provide a typical removal efficiency of (%): (Efficiency: 0 %)
	Common practices vary across sites thus conservative process release estimates used.	

<p>Conditions and measures related to sewage treatment plant</p>	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
	Sludge Treatment	Do not apply industrial sludge to natural soils., Sludge should be incinerated, contained or reclaimed.

<p>Conditions and measures related to external treatment of waste for disposal</p>	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
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<p>Conditions and measures related to external recovery of waste</p>	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
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2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC8a, PROC9, PROC20

<p>Product characteristics</p>	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	

<p>Frequency and duration of use</p>	Covers daily exposures up to 8 hours (unless stated differently).	
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<p>Human factors not influenced by risk management</p>	Assumes use at not more than 20°C above ambient temperature.	
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<p>Technical conditions and measures to control dispersion from source towards the worker</p>	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	General exposures (open systems)	Handle substance within a predominantly closed system provided with extract ventilation.(PROC2,

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

	Elevated temperature	PROC3)
	Drum/batch transfers Non-dedicated facility	Use drum pumps or carefully pour from container.(PROC8a)
	Transfer from/pouring from containers	Use drum pumps or carefully pour from container.(PROC8b)
	Filling / preparation of equipment from drums or containers	Use drum pumps or carefully pour from container.
	Remanufacture of reject articles	Drain down system prior to equipment opening or maintenance.(PROC9)
	Equipment maintenance Non-dedicated facility	Drain down system prior to equipment break-in or maintenance.(PROC8a)
	Storage	Store substance within a closed system.(PROC1, PROC2)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately.

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC9a, ERC9b	---	---	Msafe	2660 kg/day	< 1

ESVOC spERC 9.13b.v1 has been used to evaluate the exposure for the environment

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

combination.

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.

Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

Health

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

Users are advised to consider national Occupational Exposure Limits or other equivalent values

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

1. Short title of Exposure Scenario 17: Use in laboratories

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	PROC10: Roller application or brushing PROC15: Use as laboratory reagent
Environmental Release Categories	ERC2: Formulation of preparations ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
Activity	Use of the substance within laboratory settings, including material transfers and equipment cleaning..

2.1 Contributing scenario controlling environmental exposure for: ERC2, ERC4

Substance is a unique structure, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	1500
	Fraction of Regional tonnage used locally:	1
	Annual site tonnage (tons/year):	1500
	Maximum daily site tonnage (kg/day):	5000
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	300
	Emission or Release Factor: Air	2,5 %
	Emission or Release Factor: Water	2,0 %
	Emission or Release Factor: Soil	0,01 %
initial release prior to RMM		
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

Conditions and measures related to external treatment of waste for disposal

Waste treatment

External treatment and disposal of waste should comply with applicable local and/or national regulations.

Conditions and measures related to external recovery of waste

Recovery Methods

External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC10, PROC15

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Assumes use at not more than 20°C above ambient temperature.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	cleaning Rolling, Brushing Vessel and container cleaning	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC10)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately.

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC2, ERC4	---	---	Msafe	7020 kg/day	< 1

Workers

PA100434_001

80/90

EN

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.

Health

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

Users are advised to consider national Occupational Exposure Limits or other equivalent values

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

1. Short title of Exposure Scenario 18: Use in laboratories

Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process categories	PROC10: Roller application or brushing PROC15: Use as laboratory reagent
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
Activity	Use of small quantities within laboratory settings, including material transfers and equipment cleaning.

2.1 Contributing scenario controlling environmental exposure for: ERC4

Substance is a unique structure, Readily biodegradable.

Amount used	Fraction of EU tonnage used in region:	0,1
	Annual site tonnage (tons/year):	3
	Fraction of Regional tonnage used locally:	2000
	Regional use tonnage (tons/year):	1500
	Maximum daily site tonnage (kg/day):	8,2
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	50 %
	Emission or Release Factor: Water	50 %
	Emission or Release Factor: Soil	0 %
initial release prior to RMM		
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
Conditions and measures related	Waste treatment	External treatment and disposal of waste should

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

to external treatment of waste for disposal		comply with applicable local and/or national regulations.
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Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.
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2.2 Contributing scenario controlling worker exposure for: PROC10, PROC15

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Assumes use at not more than 20°C above ambient temperature.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	cleaning Rolling, Brushing Vessel and container cleaning	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC10)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible. Wash off any skin contamination immediately.

3. Exposure estimation and reference to its source

Environment

Used EUSES model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC4	---	---	Msafe	280 kg/day	< 1

ESVOC spERC 8.17.v1 has been used to evaluate the exposure for the environment

Workers

PA100434_001

83/90

EN

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.

Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

Health

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.

Users are advised to consider national Occupational Exposure Limits or other equivalent values

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

1. Short title of Exposure Scenario 19: Use in road and construction applications

Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process categories	PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC10: Roller application or brushing PROC11: Non industrial spraying PROC13: Treatment of articles by dipping and pouring
Environmental Release Categories	ERC8d: Wide dispersive outdoor use of processing aids in open systems ERC8f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix

2.1 Contributing scenario controlling environmental exposure for: ERC8d, ERC8f

Amount used	Fraction of EU tonnage used in region:	30000
	Regional use tonnage (tons/year):	3000
	Fraction of Regional tonnage used locally:	0,002
	Annual site tonnage (tons/year):	60
	Maximum daily site tonnage (kg/day):	78,5
Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100
Other given operational conditions affecting environmental exposure	Number of emission days per year	365
	Emission or Release Factor: Air	95 %
	Emission or Release Factor: Water	1 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to	Water	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): (Degradation effectiveness: 93,3 %)

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

prevent/limit release from the site

Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Domestic sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Percentage removed from waste water	93,3 %
	Sludge Treatment	Do not apply industrial sludge to natural soils.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste	Recovery Methods	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	Drum/batch transfers	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)(PROC8a)
	Drum/batch transfers	Ensure material transfers are under containment or extract ventilation.(PROC8b)
	Manual Rolling, Brushing	Ensure operation is undertaken outdoors.(PROC10)
	Spraying/fogging by machine application	Ensure operation is undertaken outdoors.(PROC11)
	Dipping, immersion and pouring	Ensure operation is undertaken outdoors.(PROC13)
	Equipment cleaning and maintenance	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a, PROC8b, PROC9)
Conditions and measures related to personal protection, hygiene and health evaluation	If above technical/organisational control measures are not feasible, then adopt following PPE: Wear suitable respiratory protection (conforming to EN140 with Type A filter or	

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

better) and gloves (type EN374) if regular skin contact likely.(PROC8a)	
If above technical/organisational control measures are not feasible, then adopt following PPE: Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (type EN374) if regular skin contact likely.(PROC8b)	
Spraying/fogging by machine application	Wear a respirator conforming to EN140 with Type A/P2 filter or better.(PROC11)

3. Exposure estimation and reference to its source

Environment

Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

Workers

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.
Users are advised to consider national Occupational Exposure Limits or other equivalent values

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

1. Short title of Exposure Scenario 20: Use in Oil and Gas field drilling and production operations

Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Process categories	PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
Activity	Oil field well drilling and production operations (including drilling muds and well cleaning) including material transfers, on-site formulation, well head operations, shaker room activities and related maintenance.

2.1 Contributing scenario controlling environmental exposure for: ERC4

No exposure assessment presented for the environment.

Environment factors not influenced by risk management	Dilution Factor (River)	10
	Dilution Factor (Coastal Areas)	100

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b

Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
	standard temperature and pressure	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, unless stated differently.	
Technical conditions and measures to control dispersion from source towards the worker	General measures (skin irritants)	Clean up contamination/spills as soon as they occur.
	Storage	Store substance within a closed system.(PROC2)
	General exposures (open systems)	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC4)
	Filling / preparation of equipment from drums or	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC8a,

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88/90

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SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

Toluene

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

	containers	PROC8b)
	Operation of solids filtering equipment	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC4)
	Equipment cleaning and maintenance	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC8a, PROC8b)
	Pouring from small containers	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC8a, PROC8b)
	Bulk transfers	provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).(PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b)
Organisational measures to prevent /limit releases, dispersion and exposure	General measures (skin irritants)	Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.
	Bulk transfers	If technical measures not practical: Operate activity away from sources of substance emission or release.(PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b)
Conditions and measures related to personal protection, hygiene and health evaluation	General measures (skin irritants)	Identify potential areas for indirect skin contact. Avoid direct skin contact with product. Wash off any skin contamination immediately. Wear suitable gloves tested to EN374 during the activities where the skin contact is possible.

3. Exposure estimation and reference to its source

Environment

No exposure assessment presented for the environment. Quantitative exposure and risk assessment not possible due to lack of emissions to aquatic environment.

Workers

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Environment

No exposure assessment presented for the environment.

Health

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

*SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006***Toluene**

Version 2.0

Print Date 12.02.2013

Revision Date 12.02.2013

Additional good practice advice beyond the REACH Chemical Safety Assessment

Assumes a good basic standard of occupational hygiene is implemented.
Users are advised to consider national Occupational Exposure Limits or other equivalent values

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