

**ISOPROPANOL**
**Code : 13333**
**SECTION 1. Identification of the substance/mixture and of the company/undertaking**
**1.1. Product identifier**

Chemical description : Isopropanol , 2- Propanol , sec-Propyl alcohol , Dimethyl carbinol , Isopropyl alcohol , IPA .  
 Type of product : Pure product .  
 Reach registration number : 01-2119457558-25

**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.

**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 : België : Antipoison Center - Brussels  
 TEL: +32(0)70/245.245

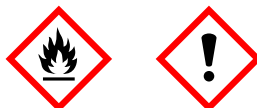
The Netherlands : National Poisoning Information Center - Bilthoven  
 TEL: +31(0)30/274.88.88 (Only for the purpose of informing medical personnel in cases of acute intoxications)

**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)  
 Eye irritation - Category 2 - Warning (Eye Irrit. 2; H319)  
 Specific Target Organ Toxicity - Single exposure - Narcotic effects - Category 3 - Warning (STOT SE 3; H336)

**2.2. Label elements**
**Label in accordance with Regulation (EC) No 1272/2008**

• Dangerous ingredient(s) : Isopropyl alcohol  
 • Hazard pictogram(s)



• Signal word : Danger  
 • Hazard statements : H225 - Highly flammable liquid and vapour. H319 - Causes serious eye irritation. H336 - May cause drowsiness or dizziness.  
 • Precautionary statements  
   - Prevention : P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P280 - Wear protective gloves/eye protection/face protection.  
   - Response : P305+P351+P338 - IF IN EYES : Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P312 - Call a POISON CENTER/doctor/... if you feel unwell. P337+P313 - If eye irritation persists: Get medical advice/attention.

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**SECTION 2. Hazards identification (continued)**

- Storage : P403+P235 - Store in well-ventilated place. Keep cool.

**2.3. Other hazards**

- Physical/chemical hazards : The substance decomposes by heating or burning in formation of toxic vapours. Risk of explosion by many reactions.
- Hazards for the health : A health dangerous concentration in the air will not or very slowly be reached by evaporation of this substance at app. 20°C; by spraying much faster.
- 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 : At or above flash point, available vapours may burn in open or explode if confined when mixed with air and exposed to ignition source.

**SECTION 3. Composition/information on ingredients**

**3.1. Substances**

Name component(s)	Weight %	CAS nr	EINECS nr	Index nr	Reach nr	CLASSIFICATION
Isopropyl alcohol	: 100 %	67-63-0	200-661-7	603-117-00-0	01-2119457558-25	Flam. Liq. 2; H225 Eye Irrit. 2; H319 STOT SE 3; H336

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

**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 plenty of water. (shower if necessary).
- \* - Eye Contact : Rinse immediately thoroughly and long (at least 15 min.) with plenty of water.  
Remove contact lenses.  
Consult eye doctor.  
Keep rinsing or dripping the eye during transport.
- Ingestion : DO NOT INDUCE VOMITING. Rinse mouth with water.  
Seek medical attention or take to hospital.

**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

**ISOPROPANOL****Code : 13333****SECTION 5. Firefighting measures (continued)**

- Suitable : Extinguishing powder , Alcohol resistant foam , Carbon dioxide (CO<sub>2</sub>) , Water spray
- Insuitable : 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.

**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. Residue is to be washed down with plenty of 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 : AVOID FOG TRANSFORMATION !  
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.  
Wash hands before and after working with the product.  
Emergency eye wash fountains and showers should be available in the immediate vicinity of any potential exposure.  
Before distillation: check if peroxides exist.

**7.2. Conditions for safe storage, including any incompatibilities**

- \* Storage : Keep only in the original, safely locked container in a cool, well ventilated and fireproof place.  
All dangerous products should be placed on a drip tray or should be barreled.  
Store away from all heat sources, including direct sunlight.  
Keep away from : Oxidizing agents , Strong acids , Chlorine-containing compounds , Aldehydes , Alkanolamines , Alkali- and earthalkali-metals .

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**SECTION 7. Handling and storage (continued)**

- Protection against Fire and Explosion : Remove all sources of ignition (open fire, sparks, smoking, ...).  
With a temperature equal to or higher than the flash point, the mixture steam-air may create a highly flammable and explosive mixture.  
Vapours are heavier than air and spread along the ground.  
Take measures against electrostatic discharges.  
Do not use compressed air to either agitate or transfer contents of storage containers (tanks) / shipping drums containing this material.  
Use explosionproof equipment.  
Sufficiently earthen.
- Packaging Material : Stainless steel , Polypropylene , Polyethylene , Polyester , Teflon , PVC and Epoxy phenolic coatings .
- Insuitable Packaging Material : Aluminium , Polystyrene , Natural rubber , Butyl rubber , EPDM and Amine epoxy coatings .

**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 : Isopropyl alcohol : Limit value (BE) : 200 ppm (500 mg/m<sup>3</sup>) (2014)  
Isopropyl alcohol : Short time value (BE) : 400 ppm (1000 mg/m<sup>3</sup>) (2014)
- Biological limit values : • Isopropyl alcohol : Biological limit values : 40 mg/l ( Acetone in urine ) (2008) ( ACGIH)
- DNELs : • Isopropyl alcohol : Worker, long-term - systemic effects, inhalation : 500 mg/m<sup>3</sup>  
• Isopropyl alcohol : Worker, long-term - systemic effects, dermal : 888 mg/kg bw/ day  
• Isopropyl alcohol : Consumer, long-term - systemic effects, inhalation : 89 mg/m<sup>3</sup>  
• Isopropyl alcohol : Consumer, long-term - systemic effects, dermal : 319 mg/kg bw/ day  
• Isopropyl alcohol : Consumer, long-term - systemic effects, oral : 26 mg/kg
- PNECs : • Isopropyl alcohol : Fresh water : 140,9 mg/l  
• Isopropyl alcohol : Marine water : 140,9 mg/l  
• Isopropyl alcohol : Intermittent release : 140,9 mg/l  
• Isopropyl alcohol : Fresh water sediment : 552 mg/kg  
• Isopropyl alcohol : Marine water sediment : 552 mg/kg  
• Isopropyl alcohol : Soil : 28 mg/kg  
• Isopropyl alcohol : Sewage treatment plant : 2251 mg/l

**8.2. Exposure controls**

- Engineering Measures : Ventilation , Local exhaust ( Through the floor ).
- Personal Protection Equipment
- Respiratory protection : CE-approved mask for organic vapours and solvents (type A, brown).
  - Skin protection : Suitable protective clothing .
- \* - 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 : Nitril rubber  
- thickness : 0,35 mm  
- breakthrough time : > 480'
- Eye/Face protection : Closed safety glasses or face shield.
- Environmental exposure controls : See sections 6, 7, 12 and 13.

**ISOPROPANOL****Code : 13333****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	: Odour of alcohol .
* Odour threshold	: 0,36 mg/m <sup>3</sup>
pH value	: 7
Melting/Freezing point	: -89 °C
Boiling Point/Range (1013 hPa)	: 82 - 83 °C
Flash point	: 12 °C
* Evaporation rate	: 3,9 ( n-Butyl acetate = 1)
Explosion limits in air	: 2,0 - 13,0 vol.%
Vapour pressure (20°C)	: 4,2 - 6,0 kPa
Relative vapour density (air=1)	: 2,1
Relative density of saturated vapour/air mixture (air=1)	: 1,05
Relative density (water=1)	: 0,8
* Solubility in water (20°C)	: Complete solubility .
Soluble in	: Alcohol , Ether , Chloroform .
Log P Octanol/Water (20°C)	: 0,05
Auto-ignition temperature	: > 350 °C
Minimum ignition energy	: 0,65 mJ
Decomposition temperature	: No data available.
Viscosity (25°C)	: 2,1 - 2,5 mPa.s ( Dynamic ) 2,66 mm <sup>2</sup> /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)	: 22,7 mN/m
Specific leading	: 5,8*10E6 pS/m
% Volatiles (by weight)	: 100
Others	: Hygroscopic .

**SECTION 10. Stability and reactivity****10.1. Reactivity**

Reactivity : Reacts violently with oxidizing agents and strong acids.

**10.2. Chemical stability**

Stability : May form peroxides.

**10.3. Possibility of hazardous reactions**

Hazardous reactions : The substance decomposes by heating or burning in formation of toxic vapours.  
Contact with metallic substances may release inflammable hydrogen gas.

**10.4. Conditions to avoid**

Conditions to avoid : High temperatures .

**10.5. Incompatible materials**

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**SECTION 10. Stability and reactivity (continued)**

\* Materials to avoid : Oxidizing agents , Strong acids , Chlorine-containing compounds , Aldehydes , Alkanolamines , Alkali- and earthalkali-metals ( Aluminium , ...) Some synthetics , Rubber , Amine epoxy coatings .

**10.6. Hazardous decomposition products**

Hazardous Decomposition Products : Carbon oxides , Formaldehyde , Hydrogen .

**SECTION 11. Toxicological information**

**11.1. Information on toxicological effects**

Acute toxicity

- Inhalation : Exposure to high concentrations may cause lowering of consciousness. Symptoms include: Sore throat , Cough , Dizziness , Headache , Sleepiness , Loss of coordination .  
• Isopropyl alcohol : LC50 (Rat, inhalation, 6 h) : >25000 mg/m<sup>3</sup> ( Vapour; OECD Guideline 403)

- Skin contact : Product degreases skin. Symptoms include: Redness , Dry skin , Irritation .  
• Isopropyl alcohol : LD50 (Rabbit, dermal) : 13900 mg/kg ( OECD Guideline 402)

\* - Ingestion : Symptoms include: Nausea , Abdominal pain , Vomiting , Diarrhea , Reduced blood pressure , Unconsciousness , See "Inhalation" .  
• Isopropyl alcohol : LD50 (Rat, oral) : 5840 mg/kg ( OECD Guideline 401)

\* Skin corrosion/irritation : Repeated exposure may cause skin dryness or cracking.

Serious eye damage/irritation : Causes serious eye irritation.

\* Aspiration hazard : Aspiration into the lungs when swallowed or vomited may cause chemical pneumonitis which can be fatal.

Respiratory or skin sensitisation : Not sensitive .

Carcinogenicity : Not listed as carcinogenic .

Mutagenicity : Not listed as mutagenic .

Reproductive toxicity : Not listed for reproductive toxicity .

Specific target organ toxicity - single exposure : To human : Vapours may cause drowsiness and dizziness.

\* Specific target organ toxicity - repeated exposure : To human : Listed not for organ toxicity  
By male rats : The product can affect the kidneys and liver, resulting in functional disturbances.

**SECTION 12. Ecological information**

**12.1. Toxicity**

Ecotoxicity : • Isopropyl alcohol : LC50 (Fish, 96 h) : 9640 mg/l (Pimephales promelas) ( OECD Guideline 203)  
• Isopropyl alcohol : EC50 (Daphnia magna, 24 h) : 9714 mg/l ( OECD Guideline 202)  
• Isopropyl alcohol : LOEC (Algae, 8d) : 1000 mg/l

**12.2. Persistence and degradability**

Persistence and degradability : • Isopropyl alcohol : Persistence and degradability : Readily biodegradable .

**12.3. Bioaccumulative potential**

Bioaccumulation : • Isopropyl alcohol : Bioaccumulation : No bioaccumulation .

**12.4. Mobility in soil**

**ISOPROPANOL****Code : 13333****SECTION 12. Ecological information (continued)**

\* Mobility : • Isopropyl alcohol : Mobility : Expected to remain in water or migrate through soil.

**12.5. Results of PBT and vPvB assessment**

Evaluation : • Isopropyl alcohol : 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.

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 : 1219

**14.2. UN proper shipping name**

\* ADR/RID Name : UN 1219 Isopropanol (Isopropyl alcohol), 3, II, (D/E)  
ADN Name : UN 1219 Isopropanol (Isopropyl alcohol) , 3, II  
IMDG Name : UN 1219 Isopropanol (Isopropyl alcohol), 3, II, (12°C)  
IATA Name : UN 1219 Isopropanol (Isopropylalcohol), 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**

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**SECTION 14. Transport information (continued)**

Type ship : -  
Pollution category : Z

**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° : 1-3-0

Relevant EU Rule(s) : 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  
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  
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)

National regulations

\* - Germany : WGK : 1

\* - Netherlands : Water damaging : 11  
Decontamination exertion : B

**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 2 , Section 3 , Section 4 , Section 7 , Section 8 , Section 9 , Section 10 , Section 11 , Section 14 , 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:



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**SECTION 16. Other information (continued)**

- <http://apps.echa.europa.eu/registered/registered-sub.aspx#search>
- \* (EU)H-statement(s) : H225 - Highly flammable liquid and vapour.  
H319 - Causes serious eye irritation.  
H336 - May cause drowsiness or dizziness.
  - \* List of abbreviations and acronyms : ACGIH : American Conference of Governmental Industrial Hygienists  
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 the second code refers to the relevant spillage schedule  
EPDM : Ethylene propylene diene monomer  
Eye Irrit. 2 : Eye irritation - Category 2  
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  
PVC : Polyvinyl chloride  
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  
RID (Règlement concernant le transport International ferroviaire des marchandises Dangereuses) : Regulation concerning the International carriage of Dangerous goods by rail  
STOT SE 3 : Specific Target Organ Toxicity - Single exposure - Category 3  
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

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*

**Isopropanol**

Version 1.2

Print Date 14.01.2013

Revision Date 03.07.2012

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	3	8, 9	NA	1, 2, 3, 4, 8a, 8b, 15	1, 4	NA	ES001
2	Use as an intermediate	3	8, 9	NA	1, 2, 3, 4, 8a, 8b, 15	6a	NA	ES003
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	ES005
4	Formulation & (re)packing of substances and mixtures	3	10	NA	1, 2, 3, 4, 5, 8a, 8b, 9, 14, 15	2	NA	ES007
5	Rubber production and processing	3	NA	NA	1, 2, 3, 4, 5, 6, 7, 8a, 8b, 9, 13, 14, 15, 21	4	NA	ES029
6	Polymer processing	3	NA	NA	1, 2, 3, 4, 5, 6, 8a, 8b, 9, 13, 14, 21	4	NA	ES031
7	Polymer processing	22	NA	NA	1, 2, 6, 8a, 8b, 14, 21	8a, 8d	NA	ES069
8	Uses in coatings	3	NA	NA	1, 2, 3, 4, 5, 7, 8a, 8b, 9, 10, 13, 14, 15	4	NA	ES009
9	Uses in coatings	22	NA	NA	1, 2, 3, 4, 5, 8a, 8b, 10, 11, 13, 15, 19	8a, 8d	NA	ES039
10	Uses in coatings	21	NA	1, 4, 8, 9a, 9b, 9c, 15, 18, 23, 24, 31, 34	NA	8a, 8d	NA	ES073
11	Use in Cleaning Agents	3	NA	NA	1, 2, 3, 4, 7, 8a, 8b, 10, 13	4	NA	ES011
12	Use in Cleaning Agents	22	NA	NA	1, 2, 3, 4, 8a, 8b, 10, 11, 13	8a, 8d	NA	ES041
13	Use in Cleaning Agents	21	NA	3, 4, 8, 9a, 24, 35, 38	NA	8a, 8d	NA	ES338

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14	Use as binders and release agents	3	NA	NA	1, 2, 3, 4, 6, 7, 8b, 10, 14	4	NA	ES021
15	Use as binders and release agents	22	NA	NA	1, 2, 3, 4, 6, 8b, 10, 11, 14	8a, 8d	NA	ES047
16	Use in agrochemicals	22	NA	NA	1, 2, 4, 8a, 8b, 11, 13	8a, 8d	NA	ES049
17	Use in agrochemicals	21	NA	12, 27	NA	8a, 8d	NA	ES438
18	Use as a fuel	3	NA	NA	1, 2, 3, 8a, 8b, 16	7	NA	ES023
19	Use as a fuel	22	NA	NA	1, 2, 3, 8a, 8b, 16	9a, 9b	NA	ES051
20	Use as a fuel	21	NA	13	NA	9a, 9b	NA	ES440
21	Use as lubricants	3	NA	NA	1, 2, 3, 4, 7, 8a, 8b, 9, 10, 13, 17, 18	4, 7	NA	ES015
22	Use as lubricants	22	NA	NA	1, 2, 3, 4, 8a, 8b, 9, 10, 11, 13, 17, 18, 20	8a, 9a, 9b, 8d	NA	ES036
23	Use as lubricants	21	NA	1, 24, 31	NA	8a, 8d, 9a, 9b	NA	ES427
24	Use as Functional Fluids	3	NA	NA	1, 2, 4, 8a, 8b, 9	7	NA	ES025
25	Use as Functional Fluids	22	NA	NA	1, 2, 3, 8a, 9, 20	9a, 9b	NA	ES053
26	Use as Functional Fluids	21	NA	16, 17	NA	9a, 9b	NA	ES449
27	Use in laboratories	3	NA	NA	10, 15	2, 4	NA	ES027
28	Use in laboratories	22	NA	NA	10, 15	8a	NA	ES061
29	Use in metal working fluids / rolling oils	3	NA	NA	1, 2, 3, 4, 5, 7, 8a, 8b, 9, 10, 13, 17	4	NA	ES017
30	Use in metal working fluids / rolling oils	22	NA	NA	1, 2, 3, 8a, 8b, 9, 10, 11, 13, 17	8a, 8d	NA	ES045
31	Blowing agents	3	NA	NA	1, 3, 8b, 12	4	NA	ES019
32	Use in de-icing and anti-icing applications	22	NA	NA	8b, 11	8d	NA	ES055
33	Use in de-icing and anti-icing applications	21	NA	4	NA	8d	NA	ES453
34	Use in road and	22	NA	NA	8a, 8b, 9,	8d, 8f	NA	ES059

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	construction applications				10, 11, 13			
35	Use as water treatment chemicals	3	NA	NA	1, 2, 3, 4, 8a, 8b, 13	3, 4	NA	ES033
36	Use as water treatment chemicals	22	NA	NA	1, 3, 4, 8a, 8b, 13	8f	NA	ES071
37	Use as water treatment chemicals	21	NA	36, 37	NA	8f	NA	ES459
38	Use in Oil and Gas field drilling and production operations	3	NA	NA	1, 2, 3, 4, 8a, 8b	4	NA	ES013
39	Use as mining chemicals	3	NA	NA	1, 2, 3, 4, 5, 8a, 8b, 9	4	NA	ES037
40	Explosives manufacture & use	22	NA	NA	1, 2, 3, 5, 8a, 8b	8d	NA	ES063
41	Other consumer uses	21	NA	28, 39	NA	8a, 8d	NA	ES457

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**1. Short title of Exposure Scenario 1: Manufacture 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 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

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

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, 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
Frequency and duration of use	Frequency of use	8 hours/day
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 exposures (closed systems)	Handle substance within a closed system.(PROC1, PROC2, PROC3)
	General exposures (open systems)	Handle substance within a closed system.(PROC4)
	Bulk transfers (open systems)	Handle substance within a closed system.(PROC8b)
	Bulk transfers (closed systems)	Ensure material transfers are under containment or extract ventilation. Clear transfer lines prior to de-coupling.(PROC8b)

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	Equipment cleaning and maintenance	Retain drain downs in sealed storage pending disposal or for subsequent recycle. Drain down system prior to equipment break-in or maintenance. Clear spills immediately.(PROC8a)
	Storage	Store substance within a closed system. Avoid dip sampling. Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).(PROC2)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.	

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

**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**

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.  
 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.  
 For scaling see: <http://www.ecetoc.org/tra>  
 Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

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**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)

**2.1 Contributing scenario controlling environmental exposure for: ERC6a**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, 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
Frequency and duration of use	Frequency of use	8 hours/day
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 exposures (closed systems)	Handle substance within a closed system.(PROC1, PROC2, PROC3)
	General exposures (open systems)	Handle substance within a closed system.(PROC4)
	Bulk transfers (open systems)	Handle substance within a closed system.(PROC8b)
	Bulk transfers (closed systems)	Ensure material transfers are under containment or extract ventilation.(PROC8b)
	Equipment cleaning and maintenance	Retain drain downs in sealed storage pending disposal or for subsequent recycle.

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		Drain down system prior to equipment break-in or maintenance. Clear spills immediately.(PROC8a)
	Storage	Store substance within a closed system. Avoid dip sampling.(PROC2)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.	

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

**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**

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.  
 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.  
 For scaling see: <http://www.ecetoc.org/tra>  
 Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.



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**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

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

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**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
Frequency and duration of use	Frequency of use	8 hours/day

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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 exposures (closed systems)	Handle substance within a closed system.(PROC1, PROC2, PROC3)
General exposures (open systems)	Clear transfer lines prior to de-coupling.(PROC4)
Process sampling	Avoid dip sampling.(PROC3)
Bulk transfers (open systems)	Clear transfer lines prior to de-coupling.(PROC8b)
Bulk transfers (closed systems)	Clear transfer lines prior to de-coupling.(PROC8b)
Drum and small package filling	Clear spills immediately. Put lids on containers immediately after use.(PROC9)
Equipment cleaning and maintenance	Retain drain downs in sealed storage pending disposal or for subsequent recycle. Drain down system prior to equipment break-in or maintenance. Apply vessel entry procedures including use of supplied compressed air.(PROC8a)
Storage	Store substance within a closed system. Avoid dip sampling.(PROC2)

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

Use suitable eye protection.  
Avoid direct eye contact with product, also via contamination on hands.

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

**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**

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.  
 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.  
 For scaling see: <http://www.ecetoc.org/tra>  
 Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are

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within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

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**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

**2.1 Contributing scenario controlling environmental exposure for: ERC2**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**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
Frequency and duration of use	Frequency of use	8 hours/day
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 exposures (closed systems)	Handle substance within a closed system.(PROC1, PROC2, PROC3)
	Process sampling	Avoid dip sampling.(PROC3)
	Bulk transfers	Clear transfer lines prior to de-coupling. Clear spills immediately.

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	Remotely vent displaced vapours.(PROC8b)
Drum and small package filling	Put lids on containers immediately after use.(PROC9)
Equipment cleaning and maintenance	Apply vessel entry procedures including use of supplied compressed air. Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a)
Storage	Store substance within a closed system. Avoid dip sampling.(PROC2)

Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection.
	Avoid direct eye contact with product, also via contamination on hands.

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

**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**

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. 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. For scaling see: <http://www.ecetoc.org/tra> Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

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**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
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	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

**2.1 Contributing scenario controlling environmental exposure for: ERC4**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**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).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Frequency and duration of use	Frequency of use	8 hours/day
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	Material transfers	Handle substance within a closed system.(PROC8b)
	Calendering (including	Minimise exposure by extracted full enclosure for

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Banburys)	the operation or equipment.(PROC6)
Tyre build up	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC7)
Vulcanisation	Minimise exposure by extracted full enclosure for the operation or equipment.(PROC6)
Vulcanisation	Provide extract ventilation to material transfer points and other openings.(PROC6)
Cooling cured articles	Minimise exposure by extracted full enclosure for the operation or equipment.(PROC6)
Storage	Store substance within a closed system.(PROC1, PROC2)

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

**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**

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.  
 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.  
 For scaling see: <http://www.ecetoc.org/tra>  
 Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

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**1. Short title of Exposure Scenario 6: Polymer processing**

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>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>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>PROC21: Low energy manipulation of substances bound in materials and/or articles</p>
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

**2.1 Contributing scenario controlling environmental exposure for: ERC4**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC13, PROC14, PROC21**

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
Frequency and duration of use	Frequency of use	8 hours/day
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	Bulk transfers	Handle substance within a closed system.(PROC8b)
	Bulk weighing	Handle substance within a closed system.(PROC1)
	Small scale weighing	Handle all packages and containers carefully to



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	minimise spills.(PROC9)
Additive premixing	Handle all packages and containers carefully to minimise spills.(PROC3, PROC4)
Bulk transfers	Use dry break couplings for material transfer.(PROC8b, PROC9)
Equipment maintenance	Clear up spills immediately and dispose of waste safely.(PROC8a)
Storage	Store substance within a closed system.(PROC1, PROC2)

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

**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**

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.  
 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.  
 For scaling see: <http://www.ecetoc.org/tra>  
 Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

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**1. Short title of Exposure Scenario 7: Polymer processing**

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 PROC6: Calendering operations 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 PROC14: Production of preparations or articles by tableting, compression, extrusion, pelettisation PROC21: Low energy manipulation of substances bound in materials and/or articles
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

**2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC6, PROC8a, PROC8b, PROC14, PROC21**

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
Frequency and duration of use	Frequency of use	8 hours/day
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	Bulk transfers	Handle substance within a closed system.(PROC1, PROC2)
	Material transfers	Use bulk or semi-bulk handling systems.(PROC8b)
	Storage	Store substance within a closed system.(PROC1, PROC2)

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

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**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**

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.  
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.  
For scaling see: <http://www.ecetoc.org/tra>  
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

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**1. Short title of Exposure Scenario 8: 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>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</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> <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

**2.1 Contributing scenario controlling environmental exposure for: ERC4**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, 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
Frequency and duration of use	Frequency of use	8 hours/day
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 exposures (closed systems)	Handle substance within a closed system.(PROC1)
	General exposures (closed systems) with sample collection	Handle substance within a closed system.(PROC2)

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Use in contained systems	
Film formation - force drying (50-100°C). stoving (>100°C). UV/EB radiation curing	Handle substance within a closed system.(PROC2)
Mixing operations (closed systems) General exposures (closed systems)	Handle substance within a closed system.(PROC3)
Spraying (automatic/robotic)	Carry out in a vented booth provided with laminar airflow.(PROC7)
Manual Spraying	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).(PROC7)
Material transfers	Clear transfer lines prior to de-coupling.(PROC8a)
Material transfers	Clear transfer lines prior to de-coupling.(PROC8b)
Dipping, immersion and pouring	Avoid manual contact with wet work pieces.(PROC13)

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

Use suitable eye protection.  
Avoid direct eye contact with product, also via contamination on hands.

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

**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**

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.  
 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.  
 For scaling see: <http://www.ecetoc.org/tra>  
 Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

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**1. Short title of Exposure Scenario 9: 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>

**2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**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
Frequency and duration of use	Frequency of use	8 hours/day
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 exposures (closed systems)	Handle substance within a closed system.(PROC1)
	Filling / preparation of equipment from drums or containers	Handle substance within a closed system.(PROC2)
	General exposures (closed systems)	Handle substance within a closed system.(PROC2)

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	Use in contained systems	
	Manual Spraying Indoor	Carry out in a vented booth or extracted enclosure.(PROC11)
	Manual Spraying Outdoor.	Ensure operation is undertaken outdoors.(PROC11)
	Dipping, immersion and pouring Indoor	Avoid manual contact with wet work pieces. Clear up spills immediately and dispose of waste safely.(PROC13)
	Dipping, immersion and pouring Outdoor.	Avoid manual contact with wet work pieces. Clear up spills immediately and dispose of waste safely.(PROC13)
	Hand application - finger paints, pastels, Adhesives Indoor	Ensure doors and windows are opened.(PROC19)
Conditions and measures related to personal protection, hygiene and health evaluation	Manual Spraying Outdoor.	Wear a respirator conforming to EN140 with Type A filter or better.(PROC11)
	Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.	

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

**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**

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.  
 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.  
 For scaling see: <http://www.ecetoc.org/tra>  
 Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

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**1. Short title of Exposure Scenario 10: 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 PC34: Textile dyes, finishing and impregnating products; including bleaches and other processing aids
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

**2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**2.2 Contributing scenario controlling consumer exposure for: PC1: Glues, hobby use**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 30%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	9 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	240 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 35,73 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m <sup>3</sup>
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.



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**2.3 Contributing scenario controlling consumer exposure for: PC1: Glues DIY-use (carpet glue, tile glue, wood parquet glue)**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 30%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	6390 g
Frequency and duration of use	Frequency of use	1 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	360 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 110 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**2.4 Contributing scenario controlling consumer exposure for: PC1: Glue from spray**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 30%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	85,05 g
Frequency and duration of use	Frequency of use	6 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	240 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 35,73 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g.	Consumer Measures	No specific risk management measure identified

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behavioural advice, personal protection and hygiene)		beyond those operational conditions stated.
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**2.5 Contributing scenario controlling consumer exposure for: PC1: Sealants**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 30%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	75 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	60 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 35,73 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**2.6 Contributing scenario controlling consumer exposure for: PC4: Washing car window**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	0,5 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	1,2 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 857,5 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	34 m3
	Covers use under typical household ventilation., Covers use at ambient temperatures., Covers use in a one car garage (34 m3) under typical ventilation.	

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

Consumer Measures

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

**2.7 Contributing scenario controlling consumer exposure for: PC4: Pouring into radiator**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	2000 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	10,2 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 428 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	34 m <sup>3</sup>
	Covers use under typical household ventilation., Covers use at ambient temperatures., Covers use in a one car garage (34 m <sup>3</sup> ) under typical ventilation.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

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

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	4 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	15 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 214,4 cm <sup>2</sup>
Other given operational conditions affecting consumers	Room size	34 m <sup>3</sup>
	Covers use under typical household ventilation., Covers use at ambient	

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exposure	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)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**2.9 Contributing scenario controlling consumer exposure for: PC8: Cleaners, liquids**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 5%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	27 g
Frequency and duration of use	Frequency of use	128 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	19,8 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 857,5 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**2.10 Contributing scenario controlling consumer exposure for: PC8: Cleaners, trigger sprays**

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	0,5 - 10 kPa
Amount used	Amount used per event	35 g
Frequency and duration of use	Frequency of use	128 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	10,2 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 428 cm <sup>2</sup>
Other given operational	Room size	20 m3

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conditions affecting consumers exposure	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**2.11 Contributing scenario controlling consumer exposure for: PC9a: Solvent rich, high solid, water borne paint, PC15: Solvent rich, high solid, water borne paint**

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 27,5%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	744 g
Frequency and duration of use	Frequency of use	6 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	132 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 428,75 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**2.12 Contributing scenario controlling consumer exposure for: PC9a: Aerosol spray can, PC15: Aerosol spray can**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	215 g
Frequency and duration of use	Frequency of use	2 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	19,8 min

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Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 857,5 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	34 m <sup>3</sup>
	Covers use under typical household ventilation., Covers use at ambient temperatures., Covers use in a one car garage (34 m <sup>3</sup> ) under typical ventilation.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**2.13 Contributing scenario controlling consumer exposure for: PC9a: Removers (paint-, glue-, wall paper-, sealant-remover), PC15: Removers (paint-, glue-, wall paper-, sealant remover)**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	491 g
Frequency and duration of use	Frequency of use	3 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	120 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 857,5 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m <sup>3</sup>
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**2.14 Contributing scenario controlling consumer exposure for: PC9b: Fillers and putty**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 2%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	85 g
Frequency and duration of use	Frequency of use	12 days/year
	Frequency of use	1 Times per day

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	Exposure duration per event	240 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 35,73 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m <sup>3</sup>
		Covers use under typical household ventilation., Covers use at ambient temperatures.
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**2.15 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% - 2%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	13800 g
Frequency and duration of use	Frequency of use	12 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	120 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 857,5 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m <sup>3</sup>
		Covers use under typical household ventilation., Covers use at ambient temperatures.
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**2.16 Contributing scenario controlling consumer exposure for: PC9b: Modelling clay**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 10%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	1 g

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Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	360 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 254,4 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m <sup>3</sup>
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**2.17 Contributing scenario controlling consumer exposure for: PC9c**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	1,35 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	360 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 254,4 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m <sup>3</sup>
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	Avoid using at a product concentration greater than 15 %

**2.18 Contributing scenario controlling consumer exposure for: PC18**

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



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Amount used	Amount used per event	40 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	132 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 71,40 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m <sup>3</sup>
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.
<b>2.19 Contributing scenario controlling consumer exposure for: PC23: Polishes, wax/cream (floor, furniture, shoes)</b>		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	56 g
Frequency and duration of use	Frequency of use	29 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	73,8 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 430 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m <sup>3</sup>
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.
<b>2.20 Contributing scenario controlling consumer exposure for: PC23: Polishes, spray (furniture, shoes)</b>		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
	Physical Form (at time of use)	liquid
PA100057_001	32/115	EN

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	use)	
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	56 g
Frequency and duration of use	Frequency of use	8 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	19,8 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 430 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.
<b>2.21 Contributing scenario controlling consumer exposure for: PC24: Liquids</b>		
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
Amount used	Amount used per event	2200 g
Frequency and duration of use	Frequency of use	4 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	10,2 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 468 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	34 m3
	Covers use under typical household ventilation., 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)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.
<b>2.22 Contributing scenario controlling consumer exposure for: PC24: Pastes</b>		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 20%
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	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	34 g
Frequency and duration of use	Frequency of use	10 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	360 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 468 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m <sup>3</sup>
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**2.23 Contributing scenario controlling consumer exposure for: PC24: Sprays**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	73 g
Frequency and duration of use	Frequency of use	6 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	10,2 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 428,75 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m <sup>3</sup>
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

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

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Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	142 g
Frequency and duration of use	Frequency of use	29 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	73,8 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 430 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**2.25 Contributing scenario controlling consumer exposure for: PC31: Polishes, spray (furniture, shoes)**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	35 g
Frequency and duration of use	Frequency of use	8 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	19,8 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 430 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

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**2.26 Contributing scenario controlling consumer exposure for: PC34**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 10%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	115 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	60 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 857,5 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m <sup>3</sup>
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

**Consumers**

The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated. Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

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

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**1. Short title of Exposure Scenario 11: 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

**2.1 Contributing scenario controlling environmental exposure for: ERC4**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC10, 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
Frequency and duration of use	Frequency of use	8 hours/day
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	Bulk transfers	Clear transfer lines prior to de-coupling.(PROC8a)
	Filling / preparation of equipment from drums or containers	Clear transfer lines prior to de-coupling.(PROC8b)
	Cleaning with high pressure washers	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).(PROC7)
Conditions and measures related to personal protection, hygiene and health evaluation	<p>Use suitable eye protection.</p> <p>Avoid direct eye contact with product, also via contamination on hands.</p>	

**3. Exposure estimation and reference to its source**

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**Environment**

No exposure assessment presented for the environment.

**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**

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.  
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.  
For scaling see: <http://www.ecetoc.org/tra>  
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

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**1. Short title of Exposure Scenario 12: 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>

**2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, 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
Frequency and duration of use	Frequency of use	8 hours/day
Human factors not influenced by risk management	Assumes use at not more than 20°C above ambient temperature.	
Other operational conditions affecting workers exposure	Limit the substance content in the mixture to 1 %, Avoid carrying out activities involving exposure for more than 15 minutes.(PROC11)	
Technical conditions and measures to control dispersion from source towards the worker	Cleaning with high pressure washers	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. Ensure operation is undertaken outdoors.(PROC11)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.	



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**3. Exposure estimation and reference to its source****Environment**

No exposure assessment presented for the environment.

**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**

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.

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.

For scaling see: <http://www.ecetoc.org/tra>

Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

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**1. Short title of Exposure Scenario 13: Use in Cleaning Agents**

Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)
Chemical product category	PC3: Air care products PC4: Anti-freeze and de-icing products PC8: Biocidal products PC9a: Coatings and paints, thinners, paint removers PC24: Lubricants, greases, release products PC35: Washing and cleaning products (including solvent based products) PC38: Welding and soldering products (with flux coatings or flux cores), flux products
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

**2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**2.2 Contributing scenario controlling consumer exposure for: PC3: Aircare, instant action (aerosol sprays)**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	0,1 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	4 Times per day
	Exposure duration per event	15 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 857,5 cm <sup>2</sup>
	Other given operational conditions affecting consumers exposure	Room size 20 m <sup>3</sup> Covers use under typical household ventilation., Covers use at ambient temperatures.
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**2.3 Contributing scenario controlling consumer exposure for: PC3: Aircare, continuous action (solid & liquid)**

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Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 10%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	0,48 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	480 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 35,7 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m <sup>3</sup>
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**2.4 Contributing scenario controlling consumer exposure for: PC4: Washing car window**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	0,5 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	1,2 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 857,5 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	34 m <sup>3</sup>
	Covers use under typical household ventilation., Covers use at ambient temperatures., Covers use in a one car garage (34 m <sup>3</sup> ) under typical ventilation.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

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**2.5 Contributing scenario controlling consumer exposure for: PC4: Pouring into radiator**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	2000 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	10,2 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 428 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	34 m3
	Covers use under typical household ventilation., 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)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

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

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	4 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	15 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 214,4 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	34 m3
	Covers use under typical household ventilation., 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	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

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

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	15 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	30 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 857,5 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m <sup>3</sup>
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**2.8 Contributing scenario controlling consumer exposure for: PC8: Cleaners, liquids**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	27 g
Frequency and duration of use	Frequency of use	128 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	19,8 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 857,5 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m <sup>3</sup>
	Covers use under typical household ventilation., Covers use at ambient temperatures.	

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

Consumer Measures

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

**2.9 Contributing scenario controlling consumer exposure for: PC8: Cleaners, trigger sprays**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa

Amount used	Amount used per event	35 g
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Frequency and duration of use	Frequency of use	128 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	10,2 min

Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 428 cm <sup>2</sup>
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Other given operational conditions affecting consumers exposure	Room size	20 m <sup>3</sup>
	Covers use under typical household ventilation., Covers use at ambient temperatures.	

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

Consumer Measures

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

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

Product characteristics	Concentration of the Substance in Mixture/Article	Covers concentrations up to 27,5%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa

Amount used	Amount used per event	744 g
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Frequency and duration of use	Frequency of use	6 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	132 min

Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 428,75 cm <sup>2</sup>
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Other given operational	Room size	20 m <sup>3</sup>
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conditions affecting consumers exposure	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**2.11 Contributing scenario controlling consumer exposure for: PC9a: Aerosol spray can**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	215 g
Frequency and duration of use	Frequency of use	2 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	19,8 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 857,5 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	34 m <sup>3</sup>
		Covers use under typical household ventilation., Covers use at ambient temperatures., Covers use in a one car garage (34 m <sup>3</sup> ) under typical ventilation.
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

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

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	491 g
Frequency and duration of use	Frequency of use	3 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	120 min
Human factors not influenced by	Exposed skin areas	Covers skin contact area up to 857,5 cm <sup>2</sup>

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Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**2.13 Contributing scenario controlling consumer exposure for: PC24: Liquids**

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
Amount used	Amount used per event	2200 g
Frequency and duration of use	Frequency of use	4 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	10,2 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 468 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	34 m3
	Covers use under typical household ventilation., 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)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**2.14 Contributing scenario controlling consumer exposure for: PC24: Pastes**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 20%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	34 g
Frequency and duration of use	Frequency of use	10 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	240 min



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Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 468 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m <sup>3</sup>
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**2.15 Contributing scenario controlling consumer exposure for: PC24: Sprays**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	73 g
Frequency and duration of use	Frequency of use	6 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	10,2 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 428,75 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m <sup>3</sup>
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**2.16 Contributing scenario controlling consumer exposure for: PC35: Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners )**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 5%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	27 g
Frequency and duration of use	Frequency of use	128 days/year

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	Frequency of use	1 Times per day
	Exposure duration per event	19,8 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 857,5 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m <sup>3</sup>
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.
<b>2.17 Contributing scenario controlling consumer exposure for: PC35: Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)</b>		
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	0,5 - 10 kPa
Amount used	Amount used per event	35 g
Frequency and duration of use	Frequency of use	128 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	10,2 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 428 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m <sup>3</sup>
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.
<b>2.18 Contributing scenario controlling consumer exposure for: PC38</b>		
Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
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Amount used	Amount used per event	12 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	60 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 857,5 cm <sup>2</sup>
	Other given operational conditions affecting consumers exposure	Room size 20 m <sup>3</sup> Covers use under typical household ventilation., Covers use at ambient temperatures.
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

**Consumers**

The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated. Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

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

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**1. Short title of Exposure Scenario 14: 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>PROC14: Production of preparations or articles by tableting, compression, extrusion, pelettisation</p>
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

**2.1 Contributing scenario controlling environmental exposure for: ERC4**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC6, PROC7, PROC8b, PROC10, PROC14**

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
Frequency and duration of use	Frequency of use	8 hours/day
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	Material transfers	Clear transfer lines prior to de-coupling.(PROC1, PROC2, PROC3)
	Casting operations (open systems)	Provide extraction ventilation at points where emissions occur.(PROC6)
	Spraying Machine	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Automate activity where possible.(PROC7)
	Spraying Manual	Carry out in a vented booth or extracted enclosure.(PROC7)
	Storage	Store substance within a closed system.(PROC1,

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	PROC2)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

**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**

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.  
 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.  
 For scaling see: <http://www.ecetoc.org/tra>  
 Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

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**1. Short title of Exposure Scenario 15: Use as binders and release agents**

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) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC6: Calendering operations PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC10: Roller application or brushing PROC11: Non industrial spraying PROC14: Production of preparations or articles by tableting, compression, extrusion, pelettisation
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

**2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC6, PROC8b, PROC10, PROC11, PROC14, PROC1, PROC2, PROC3, PROC4**

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
Frequency and duration of use	Frequency of use	8 hours/day
Human factors not influenced by risk management	Assumes use at not more than 20°C above ambient temperature.	
Other operational conditions affecting workers exposure	Limit the substance content in the mixture to 25 %.(PROC6)	
Technical conditions and measures to control dispersion from source towards the worker	Material transfers (closed systems)	Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC1, PROC2, PROC3)
	Casting operations (open systems)	Provide extraction ventilation at points where emissions occur.(PROC6)
	Spraying Machine	Minimise exposure by extracted full enclosure for the operation or equipment.(PROC11)
	Spraying	Carry out in a vented booth or extracted

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	Manual	enclosure.(PROC11)
	Batch process	Store substance within a closed system.(PROC1, PROC2)
Organisational measures to prevent /limit releases, dispersion and exposure	Spraying Machine	Segregate the activity away from other operations.(PROC11)
	Spraying Manual	Segregate the activity away from other operations.(PROC11)
Conditions and measures related to personal protection, hygiene and health evaluation	Spraying Manual	Wear a respirator conforming to EN140 with Type A/P2 filter or better.(PROC11)
	Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.	

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

**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**

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.  
 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.  
 For scaling see: <http://www.ecetoc.org/tra>  
 Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

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**1. Short title of Exposure Scenario 16: Use in agrochemicals**

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 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 PROC11: Non industrial spraying PROC13: Treatment of articles by dipping and pouring
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

**2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC4, PROC8a, PROC8b, 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
Frequency and duration of use	Frequency of use	8 hours/day
	Frequency of use	< 4 hours/day(PROC11)
Human factors not influenced by risk management	Assumes use at not more than 20°C above ambient temperature.	
Other operational conditions affecting workers exposure	Limit the substance content in the mixture to 25 %.(PROC11)	
Technical conditions and measures to control dispersion from source towards the worker	Spraying/fogging by machine application	Apply within a vented cab supplied with filtered air under positive pressure and with a protection factor of >20.(PROC11)
	Operation of equipment containing engine oils and similar	Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a)
	Disposal of wastes	Clear up spills immediately and dispose of waste safely.(PROC8a)
	Storage	Store substance within a closed system.(PROC1,



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	PROC2)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

**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**

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.  
 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.  
 For scaling see: <http://www.ecetoc.org/tra>  
 Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

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**1. Short title of Exposure Scenario 17: Use in agrochemicals**

Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)
Chemical product category	PC12: Lawn and garden preparations, including fertilizers (- Fertilizers) PC27: Plant protection products
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

**2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**2.2 Contributing scenario controlling consumer exposure for: PC12, PC27**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	0,3 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 857,5 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m <sup>3</sup>
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

**Consumers**

The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated. Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

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

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**1. Short title of Exposure Scenario 18: 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

**2.1 Contributing scenario controlling environmental exposure for: ERC7**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**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
Frequency and duration of use	Frequency of use	8 hours/day
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	Bulk transfers	Handle substance within a closed system. Clear transfer lines prior to de-coupling.(PROC8b)
	Drum/batch transfers	Avoid spillage when withdrawing pump. Use drum pumps or carefully pour from container.(PROC8b)
	General exposures (open systems) (closed systems)	Handle substance within a closed system.(PROC1, PROC2)
	Equipment cleaning and maintenance	Apply vessel entry procedures including use of supplied compressed air. Retain drain downs in sealed storage pending disposal or for subsequent recycle. Drain down system prior to equipment break-in or maintenance.(PROC8a)

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	Vessel and container cleaning	Apply vessel entry procedures including use of supplied compressed air. Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a)
	Storage	Store substance within a closed system. Avoid dip sampling.(PROC1, PROC2)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.	

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

**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**

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.  
 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.  
 For scaling see: <http://www.ecetoc.org/tra>  
 Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

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**1. Short title of Exposure Scenario 19: 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

**2.1 Contributing scenario controlling environmental exposure for: ERC9a, ERC9b**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**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
Frequency and duration of use	Frequency of use	8 hours/day
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	Bulk transfers	Handle substance within a closed system. Clear transfer lines prior to de-coupling.(PROC8b)
	Drum/batch transfers	Avoid spillage when withdrawing pump.(PROC8b)
	refuelling aircraft	Avoid spillage when withdrawing pump.(PROC8a)
	General exposures (closed systems)	Handle substance within a closed system.(PROC3)
	General exposures (open systems) (closed systems)	Handle substance within a closed system.(PROC16)
	Equipment cleaning and maintenance	Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a)
	Vessel and container cleaning	Apply vessel entry procedures including use of supplied compressed air.

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		Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a)
	Storage	Store substance within a closed system.(PROC1, PROC2)

Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection.
	Avoid direct eye contact with product, also via contamination on hands.

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

**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**

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.  
 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.  
 For scaling see: <http://www.ecetoc.org/tra>  
 Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

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**1. Short title of Exposure Scenario 20: Use as a fuel**

Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)
Chemical product category	PC13: Fuels
Environmental Release Categories	ERC9a: Wide dispersive indoor use of substances in closed systems ERC9b: Wide dispersive outdoor use of substances in closed systems

**2.1 Contributing scenario controlling environmental exposure for: ERC9a, ERC9b**

**2.2 Contributing scenario controlling consumer exposure for: PC13: Liquid: Automotive Refuelling**

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
Amount used	Amount used per event	37500 g
Frequency and duration of use	Frequency of use	52 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	3 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 210 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Outdoor use.	
	Room size	100 m3
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**2.3 Contributing scenario controlling consumer exposure for: PC13: Liquid: Scooter Refuelling**

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
Amount used	Amount used per event	3750 g
Frequency and duration of use	Frequency of use	52 days/year



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	Frequency of use	1 Times per day
	Exposure duration per event	1,8 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 210 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Outdoor use.	
	Room size	100 m <sup>3</sup>
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**2.4 Contributing scenario controlling consumer exposure for: PC13: Liquid: Garden Equipment - Use**

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
Amount used	Amount used per event	750 g
Frequency and duration of use	Frequency of use	26 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	120 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 420 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Outdoor use.	
	Room size	100 m <sup>3</sup>
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**2.5 Contributing scenario controlling consumer exposure for: PC13: Liquid: Garden Equipment - Refueling**

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

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	use)	
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	750 g
Frequency and duration of use	Frequency of use	26 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	1,8 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 420 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	34 m3
	Covers use under typical household ventilation., 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)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.
<b>2.6 Contributing scenario controlling consumer exposure for: PC13: Liquid: home space heater fuel</b>		
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
Amount used	Amount used per event	750 g
Frequency and duration of use	Frequency of use	26 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	1,8 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 210 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.
<b>2.7 Contributing scenario controlling consumer exposure for: PC13: Liquid: Lamp oil</b>		
Product characteristics	Concentration of the	Covers percentage substance in the product up to
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	Substance in Mixture/Article	100 % (unless stated differently).
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	100 g
Frequency and duration of use	Frequency of use	52 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	0,6 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 210 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m <sup>3</sup>
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

**Consumers**

The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated. Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

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

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**1. Short title of Exposure Scenario 21: Use as lubricants**

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>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p>PROC10: Roller application or brushing</p> <p>PROC13: Treatment of articles by dipping and pouring</p> <p>PROC17: Lubrication at high energy conditions and in partly open process</p> <p>PROC18: Greasing at high energy conditions</p>
Environmental Release Categories	<p>ERC4: Industrial use of processing aids in processes and products, not becoming part of articles</p> <p>ERC7: Industrial use of substances in closed systems</p>

**2.1 Contributing scenario controlling environmental exposure for: ERC4, ERC7**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC17, PROC18**

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
Frequency and duration of use	Frequency of use	8 hours/day
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 exposures (closed systems)	Handle substance within a closed system.(PROC1, PROC2, PROC3)
	Bulk transfers	Clear transfer lines prior to de-coupling. Clear spills immediately. Remotely vent displaced vapours.(PROC8b)
	Operation and lubrication	Provide extract ventilation to points where

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	of high energy open equipment	emissions occur. Restrict area of openings to equipment.(PROC17, PROC18)
	Spraying	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Automate activity where possible. Clear transfer lines prior to de-coupling.(PROC7)
	Maintenance (of larger plant items) and machine set up	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Automate activity where possible.(PROC8b)
	Maintenance of small items	Avoid manual contact with wet work pieces. Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a)
	Remanufacture of reject articles	Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC9)
	Storage	Store substance within a closed system. Avoid dip sampling.(PROC1, PROC2)
Conditions and measures related to personal protection, hygiene and health evaluation	Bulk transfers	Wear suitable gloves tested to EN374.(PROC8b)
		Wear suitable gloves tested to EN374.(PROC8b)
		Use suitable eye protection.
		Avoid direct eye contact with product, also via contamination on hands.

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

**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**

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.  
 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.  
 For scaling see: <http://www.ecetoc.org/tra>  
 Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

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**1. Short title of Exposure Scenario 22: Use as lubricants**

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>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</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>PROC17: Lubrication at high energy conditions and in partly open process</p> <p>PROC18: Greasing at high energy conditions</p> <p>PROC20: Heat and pressure transfer fluids in dispersive, professional use but closed systems</p>
Environmental Release Categories	<p>ERC8a: Wide dispersive indoor use of processing aids in open systems</p> <p>ERC9a: Wide dispersive indoor use of substances in closed systems</p> <p>ERC9b: Wide dispersive outdoor use of substances in closed systems</p> <p>ERC8d: Wide dispersive outdoor use of processing aids in open systems</p>

**2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d, ERC9a, ERC9b**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17, PROC18, PROC20**

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
Frequency and duration of use	Frequency of use	8 hours/day
	Frequency of use	4 hours/day (PROC8a, PROC11, PROC17, PROC18)
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	General exposures (closed systems)	Handle substance within a closed system. (PROC1, PROC2, PROC3)

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from source towards the worker	Operation and lubrication of high energy open equipment Indoor	Restrict area of openings to equipment. Provide extraction ventilation at points where emissions occur.(PROC17, PROC18)
	Operation and lubrication of high energy open equipment Outdoor.	Ensure operation is undertaken outdoors.(PROC17)
	Maintenance (of larger plant items) and machine set up	Provide extract ventilation to emission points when contact with warm (>50oC) product is likely.(PROC8b)
	Maintenance of small items	Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a)
	Spraying	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.(PROC11)
	Treatment by dipping and pouring	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Allow time for product to drain from workpiece.(PROC13)
	Treatment by dipping and pouring	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. Allow time for product to drain from workpiece.(PROC13)
	Storage	Store substance within a closed system.(PROC1, PROC2)
Conditions and measures related to personal protection, hygiene and health evaluation	Maintenance of small items	Wear a respirator conforming to EN140 with Type A/P2 filter or better.(PROC8a)
	Spraying	Wear a respirator conforming to EN140 with Type A/P2 filter or better.(PROC11)
	Treatment by dipping and pouring	Wear a respirator conforming to EN140 with Type A/P2 filter or better.(PROC13)
	Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.	

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

**Workers**

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



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

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.

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.

For scaling see: <http://www.ecetoc.org/tra>

Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

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**1. Short title of Exposure Scenario 23: Use as lubricants**

Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)
Chemical product category	PC1: Adhesives, sealants 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 ERC9a: Wide dispersive indoor use of substances in closed systems ERC9b: Wide dispersive outdoor use of substances in closed systems

**2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d, ERC9a, ERC9b**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**2.2 Contributing scenario controlling consumer exposure for: PC1: Glues, hobby use**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 30%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	9 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	240 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 35,73 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m <sup>3</sup>
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**2.3 Contributing scenario controlling consumer exposure for: PC1: Glues DIY-use (carpet glue, tile glue, wood parquet glue)**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 30%
	Physical Form (at time of use)	liquid

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	use)	
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	6390 g
Frequency and duration of use	Frequency of use	1 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	360 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 110 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**2.4 Contributing scenario controlling consumer exposure for: PC1: Glue from spray**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 30%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	85,05 g
Frequency and duration of use	Frequency of use	6 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	240 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 35,73 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**2.5 Contributing scenario controlling consumer exposure for: PC1: Sealants**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 30%
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	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	75 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	60 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 35,73 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m <sup>3</sup>
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**2.6 Contributing scenario controlling consumer exposure for: PC24: Liquids**

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
Amount used	Amount used per event	2200 g
Frequency and duration of use	Frequency of use	4 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	10,2 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 468 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	34 m <sup>3</sup>
	Covers use under typical household ventilation., Covers use at ambient temperatures., Covers use in a one car garage (34 m <sup>3</sup> ) under typical ventilation.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**2.7 Contributing scenario controlling consumer exposure for: PC24: Pastes**

Product characteristics	Concentration of the Substance in	Concentration of substance in product : 0% - 20%
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	Mixture/Article	
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	34 g
Frequency and duration of use	Frequency of use	10 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	360 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 468 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**2.8 Contributing scenario controlling consumer exposure for: PC24: Sprays**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	73 g
Frequency and duration of use	Frequency of use	6 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	10,2 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 428,75 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

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

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Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	142 g
Frequency and duration of use	Frequency of use	29 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	73,8 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 430 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**2.10 Contributing scenario controlling consumer exposure for: PC31: Polishes, spray (furniture, shoes)**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 50%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	35 g
Frequency and duration of use	Frequency of use	8 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	19,8 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 430 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m3
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

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protection and hygiene)

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

**Consumers**

The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated. Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

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

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

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**1. Short title of Exposure Scenario 24: Use as Functional Fluids**

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>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>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p>
Environmental Release Categories	ERC7: Industrial use of substances in closed systems

**2.1 Contributing scenario controlling environmental exposure for: ERC7**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, 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
Frequency and duration of use	Frequency of use	8 hours/day
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	Bulk transfers (closed systems)	Transfer via enclosed lines. Clear transfer lines prior to de-coupling.(PROC1, PROC2)
	Filling / preparation of equipment from drums or containers	Carefully pour from containers.(PROC8a)
	Remanufacture of reject articles	Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC9)
	Equipment maintenance	Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a)
	Storage	Store substance within a closed system.(PROC1, PROC2)
Conditions and measures related	Use suitable eye protection.	



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to personal protection, hygiene  
and health evaluation

Avoid direct eye contact with product, also via contamination on hands.

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

**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**

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.  
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.  
For scaling see: <http://www.ecetoc.org/tra>  
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

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**1. Short title of Exposure Scenario 25: 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

**2.1 Contributing scenario controlling environmental exposure for: ERC9a, ERC9b**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC8a, PROC9, PROC20**

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
Frequency and duration of use	Frequency of use	8 hours/day
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	Transfer from/pouring from containers	Avoid spillage when withdrawing pump.(PROC9)
	Remanufacture of reject articles	Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC9)
	Equipment maintenance	Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a)
	Storage	Store substance within a closed system.(PROC1, PROC2)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection.	
	Avoid direct eye contact with product, also via contamination on hands.	

**3. Exposure estimation and reference to its source**

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**Environment**

No exposure assessment presented for the environment.

**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**

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.  
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.  
For scaling see: <http://www.ecetoc.org/tra>  
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

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**1. Short title of Exposure Scenario 26: Use as Functional Fluids**

Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)
Chemical product category	PC16: Heat transfer fluids PC17: Hydraulic fluids
Environmental Release Categories	ERC9a: Wide dispersive indoor use of substances in closed systems ERC9b: Wide dispersive outdoor use of substances in closed systems

**2.1 Contributing scenario controlling environmental exposure for: ERC9a, ERC9b**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**2.2 Contributing scenario controlling consumer exposure for: PC16, PC17**

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
Amount used	Amount used per event	2200 g
Frequency and duration of use	Frequency of use	4 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	10,2 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 468 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	34 m3
	Covers use under typical household ventilation., 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)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

**Consumers**

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The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated. Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

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

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**1. Short title of Exposure Scenario 27: 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

**2.1 Contributing scenario controlling environmental exposure for: ERC2, ERC4**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**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
Frequency and duration of use	Frequency of use	8 hours/day
	Frequency of use	< 4 hours/day(PROC15)
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	Laboratory activities	Automate activity where possible. Restrict area of openings to equipment. Handle substance within a closed system. Clear spills immediately. Remotely vent displaced vapours. Use dedicated equipment.(PROC15)
	cleaning	Drain down system prior to equipment break-in or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle. Automate activity where possible. Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).(PROC10)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection.	
	Avoid direct eye contact with product, also via contamination on hands.	

**3. Exposure estimation and reference to its source**

**Environment**

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No exposure assessment presented for the environment.

**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**

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.

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.

For scaling see: <http://www.ecetoc.org/tra>

Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

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**1. Short title of Exposure Scenario 28: 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	ERC8a: Wide dispersive indoor use of processing aids in open systems

**2.1 Contributing scenario controlling environmental exposure for: ERC8a**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**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
Frequency and duration of use	Frequency of use	8 hours/day
	Frequency of use	< 4 hours/day(PROC15)
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	Laboratory activities	Handle substance within a closed system. Clear transfer lines prior to de-coupling. Clear spills immediately. Remotely vent displaced vapours. Use dedicated equipment. Restrict area of openings to equipment. Allow time for product to drain from workpiece. Automate activity where possible.(PROC15)
	cleaning	Automate activity where possible. Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC10)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection.	
	Avoid direct eye contact with product, also via contamination on hands.	

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.



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**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**

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.  
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.  
For scaling see: <http://www.ecetoc.org/tra>  
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

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**1. Short title of Exposure Scenario 29: Use in metal working fluids / rolling oils**

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>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p>PROC10: Roller application or brushing</p> <p>PROC13: Treatment of articles by dipping and pouring</p> <p>PROC17: Lubrication at high energy conditions and in partly open process</p>
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

**2.1 Contributing scenario controlling environmental exposure for: ERC4**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC17**

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
Frequency and duration of use	Frequency of use	8 hours/day
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 exposures (closed systems)	Handle substance within a closed system.(PROC1, PROC2, PROC3)
	Bulk transfers	Clear transfer lines prior to de-coupling. Clear spills immediately. Remotely vent displaced vapours.(PROC8b)
	Process sampling	Use dedicated equipment.(PROC8b)

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Metal machining operations	Restrict area of openings to equipment.(PROC17)
Treatment by dipping and pouring	Allow time for product to drain from workpiece. Automate activity where possible.(PROC13)
Spraying	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Automate activity where possible.(PROC7)
Rolling, Brushing Manual	Avoid splashing.(PROC10)
Semi-automated metal rolling/forming	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Automate activity where possible.(PROC17)
Equipment cleaning and maintenance Dedicated facility	Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8b)
Equipment cleaning and maintenance Non-dedicated facility	Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a)
Storage	Store substance within a closed system.(PROC1, PROC2)

Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection.
	Avoid direct eye contact with product, also via contamination on hands.

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

**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**

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. 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. For scaling see: <http://www.ecetoc.org/tra> Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are

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within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

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**1. Short title of Exposure Scenario 30: Use in metal working fluids / rolling oils**

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>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>PROC10: Roller application or brushing</p> <p>PROC11: Non industrial spraying</p> <p>PROC13: Treatment of articles by dipping and pouring</p> <p>PROC17: Lubrication at high energy conditions and in partly open process</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>

**2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC17**

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
Frequency and duration of use	Frequency of use	8 hours/day
	Frequency of use	< 1 hours/day(PROC8a)
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 exposures (closed systems)	Handle substance within a closed system.(PROC1, PROC2, PROC3)
	Bulk transfers	Clear transfer lines prior to de-coupling.(PROC8b)
	Filling / preparation of equipment from drums or containers Dedicated facility	Clear transfer lines prior to de-coupling.(PROC8b)
	Metal machining operations	Provide enhanced general ventilation by mechanical means.(PROC17)

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	Spraying	Provide enhanced general ventilation by mechanical means.(PROC11)
	Treatment by dipping and pouring	Allow time for product to drain from workpiece.(PROC13)
	Equipment cleaning and maintenance Non-dedicated facility	Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a)
	Equipment cleaning and maintenance Dedicated facility	Clear transfer lines prior to de-coupling.(PROC8b)
	Storage	Handle substance within a closed system.(PROC1, PROC2)
Conditions and measures related to personal protection, hygiene and health evaluation	Spraying	Wear a respirator conforming to EN140 with Type A/P2 filter or better.(PROC11)
		Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

**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**

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.  
 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.  
 For scaling see: <http://www.ecetoc.org/tra>  
 Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

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**1. Short title of Exposure Scenario 31: Blowing agents**

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 PROC3: Use in closed batch process (synthesis or formulation) PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC12: use of blowing agents in manufacture of foam
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

**2.1 Contributing scenario controlling environmental exposure for: ERC4**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC3, PROC8b, PROC12**

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
Frequency and duration of use	Frequency of use	8 hours/day
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	Bulk transfers	Use vapour recovery units when necessary Clear transfer lines prior to de-coupling.(PROC8b)
	Organisational measures to prevent /limit releases, dispersion and exposure	Extrusion and expansion of polymer mass

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

**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**

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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.  
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.  
For scaling see: <http://www.ecetoc.org/tra>  
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.



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**1. Short title of Exposure Scenario 32: Use in de-icing and anti-icing applications**

Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process categories	PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC11: Non industrial spraying
Environmental Release Categories	ERC8d: Wide dispersive outdoor use of processing aids in open systems

**2.1 Contributing scenario controlling environmental exposure for: ERC8d**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**2.2 Contributing scenario controlling worker exposure for: PROC8b, PROC11**

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
Frequency and duration of use	Frequency of use	8 hours/day
	Frequency of use	< 1 hours/day(PROC11)
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	Bulk transfers	Clear transfer lines prior to de-coupling.(PROC8b)
	Material transfers	Clear transfer lines prior to de-coupling.(PROC8b)
	Spraying/fogging by machine application	Ensure operation is undertaken outdoors.(PROC11)
Organisational measures to prevent /limit releases, dispersion and exposure	Spraying/fogging by machine application	Stay upwind/ keep distance from source.(PROC11)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection.	
	Avoid direct eye contact with product, also via contamination on hands.	

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

**Workers**

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

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

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.

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.

For scaling see: <http://www.ecetoc.org/tra>

Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

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**1. Short title of Exposure Scenario 33: Use in de-icing and anti-icing applications**

Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)
Chemical product category	PC4: Anti-freeze and de-icing products
Environmental Release Categories	ERC8d: Wide dispersive outdoor use of processing aids in open systems

**2.1 Contributing scenario controlling environmental exposure for: ERC8d**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**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	0,5 - 10 kPa
Amount used	Amount used per event	0,5 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	1,2 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 428 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	34 m <sup>3</sup>
	Covers use under typical household ventilation., Covers use at ambient temperatures., Covers use in a one car garage (34 m <sup>3</sup> ) under typical ventilation.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	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	Concentration of substance in product : 0% - 10%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	2000 g

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Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	10,2 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 428 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	34 m <sup>3</sup>
	Covers use under typical household ventilation., Covers use at ambient temperatures., Covers use in a one car garage (34 m <sup>3</sup> ) under typical ventilation.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	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	Concentration of substance in product : 0% - 40%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	4 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
	Exposure duration per event	15 min
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 214,4 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	34 m <sup>3</sup>
	Covers use under typical household ventilation., Covers use at ambient temperatures., Covers use in a one car garage (34 m <sup>3</sup> ) under typical ventilation.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

**Consumers**

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The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated. Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

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

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**1. Short title of Exposure Scenario 34: 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**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**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
Frequency and duration of use	Frequency of use	8 hours/day
Human factors not influenced by risk management	Assumes use at not more than 20°C above ambient temperature.	
Other operational conditions affecting workers exposure	Operation is carried out at elevated temperature (> 20°C above ambient temperature).(PROC8b)	
Technical conditions and measures to control dispersion from source towards the worker	Drum/batch transfers Dedicated facility	Use dedicated equipment. Clear transfer lines prior to de-coupling.(PROC8b)
	Spraying/fogging by machine application	Automate activity where possible.(PROC11)
	Equipment cleaning and maintenance	Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a)
Organisational measures to prevent /limit releases, dispersion and exposure	Spraying/fogging by machine application	Stay upwind/ keep distance from source.(PROC11)
Conditions and measures related to personal protection, hygiene	Drum/batch transfers	Wear a respirator conforming to EN140 with Type A

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and health evaluation

Dedicated facility	filter or better.(PROC8b)
Spraying/fogging by machine application	Wear a respirator conforming to EN140 with Type A filter or better.(PROC11)

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

**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**

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.  
 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.  
 For scaling see: <http://www.ecetoc.org/tra>  
 Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

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**1. Short title of Exposure Scenario 35: Use as water treatment chemicals**

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 PROC13: Treatment of articles by dipping and pouring
Environmental Release Categories	ERC3: Formulation in materials ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

**2.1 Contributing scenario controlling environmental exposure for: ERC3, ERC4**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, 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
Frequency and duration of use	Frequency of use	8 hours/day
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	Bulk transfers	Handle substance within a closed system. Clear transfer lines prior to de-coupling.(PROC2)
	Drum/batch transfers	Avoid spillage when withdrawing pump.(PROC8b)
	General exposures (open systems)	Restrict area of openings to equipment.(PROC4)
	Pouring from small containers	Use drum pumps or carefully pour from container.(PROC13)
	Batch process	Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a)
	Storage	Store substance within a closed system.(PROC1)
Conditions and measures related	Use suitable eye protection.	



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to personal protection, hygiene  
and health evaluation

Avoid direct eye contact with product, also via contamination on hands.

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

**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**

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.  
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.  
For scaling see: <http://www.ecetoc.org/tra>  
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

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**1. Short title of Exposure Scenario 36: Use as water treatment chemicals**

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 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 PROC13: Treatment of articles by dipping and pouring
Environmental Release Categories	ERC8f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix

**2.1 Contributing scenario controlling environmental exposure for: ERC8f**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC3, PROC4, PROC8a, PROC8b, 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
Frequency and duration of use	Frequency of use	8 hours/day
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	Drum/batch transfers	Avoid spillage when withdrawing pump. Clear transfer lines prior to de-coupling. Use drum pumps or carefully pour from container.(PROC8b)
	General exposures (open systems)	Restrict area of openings to equipment.(PROC4)
	Pouring from small containers	Carefully pour from containers. Avoid spillage when withdrawing pump.(PROC13)
	Equipment maintenance	Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a)
	Storage	Store substance within a closed system.(PROC1)
Conditions and measures related to personal protection, hygiene and health evaluation	Use suitable eye protection.	
	Avoid direct eye contact with product, also via contamination on hands.	

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**3. Exposure estimation and reference to its source****Environment**

No exposure assessment presented for the environment.

**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**

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.

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.

For scaling see: <http://www.ecetoc.org/tra>

Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

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**1. Short title of Exposure Scenario 37: Use as water treatment chemicals**

Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)
Chemical product category	PC36: Water softeners PC37: Water treatment chemicals
Environmental Release Categories	ERC8f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix

**2.1 Contributing scenario controlling environmental exposure for: ERC8f**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**2.2 Contributing scenario controlling consumer exposure for: PC36**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 20%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa
Amount used	Amount used per event	10 g
	Amount used per event (oral exposure)	0,000015 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 6600 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m <sup>3</sup>
	Covers use under typical household ventilation., Covers use at ambient temperatures.	
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**2.3 Contributing scenario controlling consumer exposure for: PC37**

Product characteristics	Concentration of the Substance in Mixture/Article	Concentration of substance in product : 0% - 20%
	Physical Form (at time of use)	liquid
	Vapour pressure	0,5 - 10 kPa

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Amount used	Amount used per event	10 g
	Amount used per event (oral exposure)	0,000154 g
Frequency and duration of use	Frequency of use	365 days/year
	Frequency of use	1 Times per day
Human factors not influenced by risk management	Exposed skin areas	Covers skin contact area up to 6600 cm <sup>2</sup>
Other given operational conditions affecting consumers exposure	Room size	20 m <sup>3</sup>
		Covers use under typical household ventilation., Covers use at ambient temperatures.
Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)	Consumer Measures	No specific risk management measure identified beyond those operational conditions stated.

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

**Consumers**

The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated. Predicted exposures are not expected to exceed the applicable exposure limits when the operational conditions/risk management measures given in section 2 are implemented.

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

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

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**1. Short title of Exposure Scenario 38: 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	<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>
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

**2.1 Contributing scenario controlling environmental exposure for: ERC4**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**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
Frequency and duration of use	Frequency of use	8 hours/day
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	Bulk transfers from tote tanks and supply vessels	Handle substance within a closed system.(PROC8b)
	Filling / preparation of equipment from drums or containers	Handle substance within a closed system.(PROC8b)
	Drilling mud (re-)formulation	Handle substance within a closed system.(PROC3)
	Process sampling	Clear transfer lines prior to de-coupling. Clear spills immediately. Remotely vent displaced vapours.(PROC3)

**3. Exposure estimation and reference to its source**

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**Environment**

No exposure assessment presented for the environment.

**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**

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.

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.

For scaling see: <http://www.ecetoc.org/tra>

Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

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**1. Short title of Exposure Scenario 39: Use as mining chemicals**

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>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>
Environmental Release Categories	ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

**2.1 Contributing scenario controlling environmental exposure for: ERC4**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, 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
Frequency and duration of use	Frequency of use	8 hours/day
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	Bulk transfers	Handle substance within a closed system. Clear transfer lines prior to de-coupling.(PROC2)
	Drum/batch transfers	Avoid spillage when withdrawing pump.(PROC8b)
	Pouring from small containers	Handle all packages and containers carefully to minimise spills.(PROC9)
	Equipment cleaning and maintenance	Retain drain downs in sealed storage pending disposal or for subsequent recycle.(PROC8a)
	Storage	Store substance within a closed system.(PROC1)

**3. Exposure estimation and reference to its source**

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**Environment**

No exposure assessment presented for the environment.

**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**

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.

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.

For scaling see: <http://www.ecetoc.org/tra>

Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

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**1. Short title of Exposure Scenario 40: Explosives manufacture & use**

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) PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) 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	ERC8d: Wide dispersive outdoor use of processing aids in open systems

**2.1 Contributing scenario controlling environmental exposure for: ERC8d**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC5, 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
Frequency and duration of use	Frequency of use	8 hours/day
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	Bulk transfers	Handle substance within a closed system. Clear transfer lines prior to de-coupling. Remotely vent displaced vapours.(PROC3)
	Transfer from/pouring from containers Non-dedicated facility	Avoid spillage when withdrawing pump.(PROC8a)
	Storage	Store substance within a closed system.(PROC1, PROC2)

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

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**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**

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.  
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.  
For scaling see: <http://www.ecetoc.org/tra>  
Only properly trained persons shall make use of scaling methods while checking whether the OC and RMM are within the boundaries set by the ES

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Assumes a good basic standard of occupational hygiene is implemented.

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**1. Short title of Exposure Scenario 41: Other consumer uses**

Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)
Chemical product category	PC28: Perfumes, fragrances PC39: Cosmetics, personal care products
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

**2.1 Contributing scenario controlling environmental exposure for: ERC8a, ERC8d**

As no environmental hazard was identified no environmental related exposure assessment and risk characterization was performed.

**2.2 Contributing scenario controlling consumer exposure for: PC28, PC39**

Consumer uses e.g. as a carrier in cosmetics/personal care products, perfumes and fragrances. Note: For cosmetic and personal care products, risk assessment only required for the environment under REACH as human health is covered by alternative legislation.

**3. Exposure estimation and reference to its source**

**Environment**

No exposure assessment presented for the environment.

**Consumers**

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

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

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

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<b>QUALITY SYSTEMS</b>		
ISO 9001	Yes	Yes
ISO 14001	Yes	Yes
ISO 22000	Yes	Yes
FSSC 22000	Yes	Yes
GMP+ -feed	Yes	Yes
OHSAS18001	-	Yes
ESAD	Yes	Yes
other	-	AEO