SECTION 1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

* Chemical description : DIOXONITE (S065)

Type of product : Pure product in solution .

Reach registration number : 01-2119529240-51

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

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

* Use(s) advised against : This product is not recommended for any industrial, professional or consumer use other than identified in table on the front page of the annex.
Not for use in ornamental articles, in tricks and jokes and in games (in accordance with Annex XVII to Regulation (EC) No 1907/2006) (3. Liquid substances or mixtures, which are fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008: (a) hazard classes 2.1 to 2.4, 2.6 and 2.7, 2.8 types A and B, 2.9, 2.10, 2.12, 2.13 categories 1 and 2, 2.14 categories 1 and 2, 2.15 types A to F, (b) hazard classes 3.1 to 3.6, 3.7 adverse effects on sexual function and fertility or on development, 3.8 effects other than narcotic effects, 3.9 and 3.10, (c) hazard class 4.1, (d) hazard class 5.1).

1.3. Details of the supplier of the safety data sheet

Company identification : BRENNTAG N.V. - Nijverheidslaan 38 - BE-8540 DEERLIJK
TEL: +32(0)56/77.69.44 - FAX: +32(0)56/77/57/11
E-MAIL: info@brenntag.be - Website: www.brenntag.be

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

1.4. Emergency telephone number

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

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

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

Acute toxicity, oral - Category 4 - Warning (Acute Tox. 4, oral; H302)
Serious eye damage - Category 1 - Danger (Eye Dam. 1; H318)

2.2. Label elements

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

• Dangerous ingredient(s) : Sodium chlorite

• Hazard pictogram(s)

• Signal word : Danger

• Hazard statements : H302 - Harmful if swallowed. H318 - Causes serious eye damage. EUH032 - Contact with acids liberates very toxic gas.

SECTION 2. Hazards identification (continued)

• Precautionary statements

* - Prevention : P280 - Wear protective gloves/protective clothing/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. P310 - Immediately call a POISON CENTER/doctor/…

* - Disposal considerations : P501 - Dispose of contents and/or container in accordance with local/regional/national/international regulation.

2.3. Other hazards

Physical/chemical hazards : The substance decomposes by heating in formation of toxic vapours and oxygen which stimulates fire.
The substance decomposes by heating above the decomposition temperature.

Hazards for the health : No additional hazard.

Hazards for the environment : Product causes a strong rise of the pH-value of water and soil.
This product is no substance or contains no PBT or vPvB (in accordance with Annex XIII).

Hazards for the safety : May create with contaminations (organic substances), mixtures sensitive to blows.

SECTION 3. Composition/information on ingredients

3.1. Substances

Name component(s)		Weight %	CAS nr	EINECS nr	Index nr	Reach nr	CLASSIFICATION
Sodium chlorite	:	7.5 -8 %	7758-19-2	231-836-6	-----	01-2119529240-51	Ox. Sol. 1; H271 Acute Tox. 3 (oral); H301 Acute Tox. 2 (skin); H310 Skin Corr. 1B; H314 STOT RE 2; H373 Aquatic Acute 1; H400 Aquatic Chronic 3; H412

*

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

Note: M-factor=1

Note: SCL applicable

SECTION 4. First aid measures

4.1. Description of first aid measures

General : In case of doubt or persistent symptoms, call a physician.
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).
Consult doctor if irritation develops.

* - Eye Contact : Rinse immediately thoroughly and long (at least 15 min.) with plenty of water.
Remove contact lenses.
Immediately call a POISON CENTER or doctor/physician.
Keep rinsing or dripping the eye during transport.

SECTION 4. First aid measures (continued)

- Ingestion : DO NOT INDUCE VOMITING. Rinse mouth with water. Seek medical attention immediately 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 NVIC or the Belgian Poison center.

SECTION 5. Firefighting measures

5.1. Extinguishing media

Extinguishing Media

- Suitable : Plenty of water .
- Insuitable : Foam , Carbon dioxide (CO2) .

5.2. Special hazards arising from the substance or mixture

Special Exposure Hazards : Fire may liberate toxic gasses.

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 : 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 corrosion resistant, suitable disposal containers.
Clean up any spills as soon as possible, using an inert absorbent material.
Neutralise liquid with adapted reductor. (e.g. Sodium bisulphite)
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 : Attention : SKIN ABSORPTION !
AVOID SPREADING OF DUST !
AVOID EVERY CONTACT !!
Avoid breathing vapour and contact with skin, eyes and clothing. Wear

SECTION 7. Handling and storage (continued)

recommended personal protective equipment. (See section 8)
Avoid splashing and formation of vapour when emptying, pouring, diluting or dissolving the product.
Drums and tools used during treatment of the product may not be contaminated.
When using, do not eat, drink or smoke.
Emergency eye wash fountains and showers should be available in the immediate vicinity of any potential exposure.

7.2. Conditions for safe storage, including any incompatibilities

Storage	:	Keep only in the original, 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. Keep away from : Acids , Reducing agents , Combustibles .
Packaging Material	:	PVC , Polyethylene , Polyester , Stainless steel , Polypropylene .
Insuitable Packaging Material	:	Wood , Rubber , Aluminium , Copper (+ Alloys).

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	:	Sodium chlorite : Limit value (BE) : 0,1 ppm (0,28 mg/m³) (Chlorine dioxide) (2014) Sodium chlorite : Short time value (BE) : 0,3 ppm (0,84 mg/m³ (Chlorine dioxide) (2014)
*	Biological limit values	:	• Sodium chlorite : Biological limit values : They will be included when available.
	DNELs	:	• Sodium chlorite : Worker, acute - systemic effects, dermal : 0,58 mg/kg bw/ day • Sodium chlorite : Worker, acute - systemic effects, inhalation : 0,41 mg/m³ • Sodium chlorite : Worker, long-term - systemic effects, dermal : 0,58 mg/kg bw/ day • Sodium chlorite : Worker, long-term - systemic effects, inhalation : 0,41 mg/m³ • Sodium chlorite : Consumer, acute - systemic effects, dermal : 0,29 mg/kg bw/ day • Sodium chlorite : Consumer, acute - systemic effects, inhalation : 0,1 mg/m³ • Sodium chlorite : Consumer, long-term - systemic effects, dermal : 0,29 mg/kg bw/ day • Sodium chlorite : Consumer, acute - systemic effects, oral : 0,029 mg/kg • Sodium chlorite : Consumer, long-term - systemic effects, inhalation : 0,1 mg/m³ • Sodium chlorite : Consumer, long-term - systemic effects, oral : 0,029 mg/kg
	PNECs	:	• Sodium chlorite : Fresh water : 0,65 µg/l • Sodium chlorite : Marine water : 0,065 µg/l • Sodium chlorite : Intermittent release : 0,0065 mg/l • Sodium chlorite : Sewage treatment plant : 1 mg/l

8.2. Exposure controls

	Engineering Measures	:	Ventilation , Local exhaust .
	Personal Protection Equipment		
	- Respiratory protection	:	Respiratory protection equipment (Combination filter type B/P2).
	- Skin protection	:	Suitable protective clothing .
*	- Hand protection	:	Suitable material for safety gloves (EN 374): PVC. The suitability of the gloves and the breakthrough time for a specific workplace should be discussed with the producers of the protective gloves. - material : PVC - thickness : Depending on the duration of the contact - breakthrough time : Depending on the thickness

SECTION 8. Exposure controls/personal protection (continued)

- Eye/Face protection	: Closed safety glasses or face shield.
Environmental exposure controls	: See sections 6, 7, 12 and 13.

SECTION 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical State (20°C)	: Liquid .
Form/Colour	: Clear , Colourless .
Odour	: Odourless .
Odour threshold	: Not applicable.
pH value	: 11 - 12 (100 g/l)
Melting/Freezing point	: -2 °C (7.5%)
Boiling Point/Range (1013 hPa)	: 112 °C (300 g/l)
Flash point	: Not applicable.
Evaporation rate	: No data available.
Explosion limits in air	: Not applicable.
Vapour pressure	: No data available.
Relative vapour density (air=1)	: No data available.
Relative density of saturated vapour/air mixture (air=1)	: No data available.
Density (20°C)	: 1,07 kg/l (7.5%)
Solubility	: Not soluble in most organic solvents.
Solubility in water	: 57.2 - 80 g/100 ml
Log P Octanol/Water at 25°C	: -2,7
Auto-ignition temperature	: No data available.
Minimum ignition energy	: No data available.
Decomposition temperature	: 175 °C
Viscosity	: 2,33 mPa.s (15-25%)
Viscosity (20°C)	
Explosive properties	: No chemical groups associated with explosive properties .
Oxidizing properties	: Pure product : Strong oxidizer .

SECTION 10. Stability and reactivity

10.1. Reactivity

Reactivity	: The product is a strong oxidizer and reacts violently with combustibles and reducing agents. Reacts with : Acids .

10.2. Chemical stability

Stability	: Stable at normal circumstances .

10.3. Possibility of hazardous reactions

Hazardous reactions	: Product reacts violently and explosive when contact with organic substances, reducing substances, metals and when contamination with dust (exotherm reaction). Contact with acids liberates very toxic gas. (Chlorine dioxide).

10.4. Conditions to avoid

SECTION 10. Stability and reactivity (continued)

Conditions to avoid : High temperatures , Direct sunlight .

10.5. Incompatible materials

Materials to avoid : Acids , Reducing agents (Aluminium chloride , Aluminium sulphate , Ferric chloride , ...), Combustibles (Wood , Cellulose fibres , ...), Copper (+ Alloys).

10.6. Hazardous decomposition products

Hazardous Decomposition Products : Sodium chlorate , Chlorine dioxide .

SECTION 11. Toxicological information

11.1. Information on toxicological effects

Acute toxicity

- Inhalation : Symptoms include: Sore throat , Cough , Shortness of breath , Difficulty in breathing .
  • Sodium chlorite : LC50 (Rat, inhalation, 4 h) : No data available.
- Skin contact : Symptoms include: Redness , Pain .
  • Sodium chlorite : LD50 (Rat, dermal) : 134 mg/kg (solid)
  • Sodium chlorite : LD50 (Rat, dermal) : >2000 mg/kg (31% solution)
- Ingestion : Symptoms include:
  Harmful if swallowed. Vomiting , Abdominal cramps .
  • Sodium chlorite : LD50 (Rat, oral) : 284 mg/kg (solid)
  • Sodium chlorite : LD50 (Rat, oral) : 390 mg/kg (31% solution)

Skin corrosion/irritation : Rabbit (34.5% solution): Not irritant .

Serious eye damage/irritation : Causes serious eye damage.

Aspiration hazard : No data available .

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 : Listed not for organ toxicity .
For animals : No effects known.

Specific target organ toxicity - repeated exposure : To human : Histopathological changes in the stomach .

SECTION 12. Ecological information

12.1. Toxicity

Ecotoxicity :
• Sodium chlorite : LC50 (Fish, 96 h) : 106 mg/l (Oncorhynchus mykiss)
• Sodium chlorite : EC50 (Algae, 96 h) : 1 mg/l (Pseudokirchneriella subcapitata)
• Sodium chlorite : EC50 (Daphnia magna, 48 h) : 0,026 mg/l
• Sodium chlorite : NOEC (Daphnia magna, 21 d) : 0,025 - 0,087 mg/l

12.2. Persistence and degradability

Persistence and degradability : • Sodium chlorite : Persistence and degradability : Inorganic product .

12.3. Bioaccumulative potential

Bioaccumulation : • Sodium chlorite : Bioaccumulation : Bioaccumulation not expected .

12.4. Mobility in soil

Mobility : • Sodium chlorite : Mobility : Good soluble in water .

12.5. Results of PBT and vPvB assessment

SECTION 12. Ecological information (continued)

Evaluation : • Sodium chlorite : 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 : 1908

14.2. UN proper shipping name

ADR/RID Name : UN 1908 Chlorite solution, 8, III, (E)
ADN Name : UN 1908 Chlorite solution , 8, III
IMDG Name : UN 1908 Chlorite solution, 8, III
IATA Name : UN 1908 Chlorite solution , 8, III

14.3. Transport hazard classe(s)

Class : 8

14.4. Packing group

Packaging Group : III

14.5. Environmental hazards

Environmentally hazard : No
Marine pollutant : No

14.6. Special precautions for user

Danger number : 80
Hazard Label(s) : 8
EmS-N° : F-A , S-B

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

* Type ship : No data available for the mixture.
* Pollution category : No data available for the mixture.

SECTION 15. Regulatory information

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

Inventories : European inventory (EINECS): Not listed in inventory.

* Relevant EU Rule(s) : 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
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 273/2004 of the European Parliament and of the Council of 11 February 2004 on drug precursors
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)
Regulation (EU) No 528/2012 of the European Parliament and the Council of 22 May 2012 concerning the making available on the market and use of biocidal products

National regulations

* - Germany : WGK : No data available for the mixture.

* - Netherlands : Water damaging : B
Decontamination exertion : 2

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 (EC) No 1907/2006 and the corresponding current changes.
This safety data sheet is exclusively made for industrial/professional use.

* Has changed compared to previous revision.

* Changes : General revision

* Sources of used key data : The information contained herein is based on the present state of our knowledge (Producer(s) , Chemical cards , ...)
See also on the webaddress:
http://apps.echa.europa.eu/registered/registered-sub.aspx#search

* (EU)H-statement(s) : H271 - May cause fire or explosion; strong oxidizer.
H301 - Toxic if swallowed.
H310 - Fatal in contact with skin.
H314 - Causes severe skin burns and eye damage.
H373 - May cause damage to organs through prolonged or repeated exposure.
H400 - Very toxic to aquatic life.
H412 - Harmful to aquatic life with long lasting effects.

* Classification procedure : Acute Tox. 4, oral; H302 - Calculation method
Eye Dam. 1; H318 - Additivity method

* List of abbrevations and acronyms : Acute Tox. 2, dermal : Acute toxicity, dermal - Category 2
Acute Tox. 3, oral : Acute toxicity, oral - Category 3
Acute Tox. 4, oral : Acute toxicity, oral - Category 4
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
DNEL (Derived No Effect Level) : an estimated safe exposure level
ADR (Accord européen relatif au transport international des marchandises

SECTION 16. Other information (continued)

Dangereuses par Route) : European agreement concerning the international carriage of dangerous goods by road
Aquatic Acute 1 : Hazardous to the aquatic environment - Acute hazard - Category 1
Aquatic Chronic 1 : Hazardous to the aquatic environment - Chronic hazard - Category 1
Aquatic Chronic 3 : Hazardous to the aquatic environment - Chronic hazard - Category 3
CO : Carbon monoxide
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
Eye Dam. 1 : Serious eye damage - Category 1
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
M-Factor : a multiplying factor that is applied to the concentration of a substance classified as hazardous to the aquatic environment (Aquatic Acute 1; H400 or Aquatic Chronic 1; H410) and is used to derive by the summation method the classification of a mixture in which the substance is present
NOEC (No Observed Effect Concentration)
NVIC : National Poisoning Information Center
OECD : Organisation for Economic Cooperation and Development
Ox. Liq. 2 : Oxidizing liquids - Category 2
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 (Reciproke 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
SCL (Specific Concentration Limits)
Skin Corr. 1B : Skin corrosion - Category 1B
STEL (Short-Term Exposure Limit)
STOT RE 2 : Specific Target Organ Toxicity - Repeated exposure - Category 2
SZW-list : List of carcinogenic substances and processes as referred to in Article 4. 11 of the Working conditions decree
SZW-list : Non-limitative list of reproduction toxic substances to which the additional registration obligation applies as referred to in Article 4.2a, second paragraph of the Working conditions decree
TWA (Time-Weighted Average) : the average exposure over a specified period
WGK (Wassergefahrdungsklasse) : 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

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	NA	NA	2, 8a, 8b, 9, 15	1	NA	ES1441
2	Use as an intermediate	3	4	19	1, 2, 3, 4	6a	NA	ES1544
3	Formulation & (re)packing of substances and mixtures	3	NA	8, 19, 21, 26, 34, 37	1, 3, 5, 8a, 8b, 9, 15	2	NA	ES7711
4	Use in Cleaning Agents	22	NA	35	10, 19	8b, 8e	NA	ES1582
5	Use in Cleaning Agents	21	NA	35	NA	8b, 8e	NA	ES1584
6	Use in laboratories	3	24	21	15	6b	NA	ES1573
7	Use as water treatment chemicals	3	23	37	2	7	NA	ES1548
8	Use in paper pulp bleaching	3	6b	26	1, 2, 3, 4, 5, 8a, 8b, 9, 15	6b	NA	ES1552
9	Use in textile bleaching	3	5	34	1, 2, 3, 5, 8a, 8b	6b	NA	ES1554
10	Use in textile bleaching	22	5	34	13	8b	NA	ES1580

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	
Process categories	PROC2: Use in closed, continuous process with occasional controlled exposure 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	
2.1 Contributing scenario controlling environmental exposure for: ERC1		
Amount used	Annual site tonnage (tons/year):	6087 tonnes
	Maximum daily site tonnage (kg/day):	23530 kg
	Fraction of Regional tonnage used locally:	100
Frequency and duration of use	Continuous exposure	220 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0 %
	Emission or Release Factor: Water	0 %
	Emission or Release Factor: Soil	0 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	No releases	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Sludge Treatment	Do not apply STP sludge on agricultural soil, Do not use sludge as fertiliser, Disposal or recovery

Conditions and measures related to external recovery of waste	Recovery Methods	This substance is consumed during use and no waste of the substance is generated.
2.2 Contributing scenario controlling worker exposure for: PROC2, PROC8a, PROC8b, PROC9, PROC15		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.
	Physical Form (at time of use)	solid, liquid
Frequency and duration of use	Frequency of use	5 days/week
	Exposure duration per day	> 240 min(PROC2, PROC9)
	Exposure duration per day	15 - 60 min(PROC8a, PROC8b)
	Exposure duration per day	60 - 240 min(PROC15)
Human factors not influenced by risk management	Exposed skin areas	Two hands face side only. 480 cm² (PROC2, PROC9)
	Exposed skin areas	Two hands 960 cm² (PROC8a, PROC8b)
	Exposed skin areas	One hand, face side only. 240 cm² (PROC15)
Other operational conditions affecting workers exposure	Indoor use.	
	Assumes activities are at ambient temperature.	
Technical conditions and measures to control dispersion from source towards the worker	Ensure material transfers are under containment or extract ventilation.	
	Handle substance within a closed system.(PROC2)	
	Transfer via enclosed lines.(PROC8b)	
	Handle substance within a predominantly closed system provided with extract ventilation.(PROC9)	
	Provide local exhaust ventilation (LEV). (Efficiency: 90 %)(PROC2, PROC9, PROC8b, PROC15)	
Organisational measures to prevent /limit releases, dispersion and exposure	Segregate the activity away from other operations.	
	Ensure operatives are trained to minimise exposures.	
	Supervision in place to check that the RMMs in place are being used correctly and OC's followed	
	Clean equipment and the work area every day.	
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator conforming to EN140 with Type A/P2 filter or better. (Efficiency: 90 %)(PROC2, PROC8a, PROC8b, PROC9)	
	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency: 90 %)(PROC15)	
	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Efficiency: 95 %)(PROC2, PROC8b, PROC9)	
	Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. (Efficiency: 98 %)(PROC8a)	

3. Exposure estimation and reference to its source

Environment

Used CHESAR model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC1	---	Fresh water	---	---	0,01
ERC1	---	Marine water	---	---	0,009
ERC1	---	Sewage treatment plant (STP)	---	---	0

Workers

PROC2, PROC8a, PROC8b, PROC9, PROC15 Used CHESAR model.

PROC2, PROC8a, PROC8b, PROC9, PROC15 Use of ECETOC TRA Version 2 with modifications.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC2	solid	Inhalation worker exposure	0,005mg/m³	0,0001
PROC2	solid	Dermal worker exposure	0,137mg/kg bw/day	0,0024
PROC8a	solid	Inhalation worker exposure	0,01mg/m³	0,0002
PROC8a	solid	Dermal worker exposure	0,137mg/kg bw/day	0,0024
PROC8b	solid	Inhalation worker exposure	0,005mg/m³	0,0001
PROC8b	solid	Dermal worker exposure	0,686mg/kg bw/day	0,0118
PROC9	solid	Inhalation worker exposure	0,05mg/m³	0,0012
PROC9	solid	Dermal worker exposure	0,686mg/kg bw/day	0,0118
PROC15	solid	Inhalation worker exposure	0,03mg/m³	0,0007
PROC15	solid	Dermal worker exposure	0,034mg/kg bw/day	0,0006
PROC2	liquid	Worker - inhalative, long-term - systemic	---	0,01
PROC2	liquid	Worker - dermal, long-term - systemic	---	0,012
PROC8a	liquid	Worker - inhalative, long-term - systemic	---	0,002
PROC8a	liquid	Worker - dermal, long-term - systemic	---	0,473
PROC8b	liquid	Worker - inhalative, long-term - systemic	---	0
PROC8b	liquid	Worker - dermal, long-	---	0,059

		term - systemic		
PROC9	liquid	Worker - inhalative, long-term - systemic	---	0,01
PROC9	liquid	Worker - dermal, long-term - systemic	---	0,059
PROC15	liquid	Worker - inhalative, long-term - systemic	---	0,056
PROC15	liquid	Worker - dermal, long-term - systemic	---	0,006

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.

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	SU4: Manufacture of food products	
Chemical product category	PC19: Intermediate	
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	
Environmental Release Categories	ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)	
Activity	Note: this Exposure Scenario is only relevant for an appropriated use according to the quality grade of the substance delivered	
2.1 Contributing scenario controlling environmental exposure for: ERC6a		
Amount used	Annual site tonnage (tons/year):	100 tonnes
	Maximum daily site tonnage (kg/day):	450 kg
	Fraction of Regional tonnage used locally:	100 %
Frequency and duration of use	Continuous exposure	220 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0 %
	Emission or Release Factor: Water	0 %
	Emission or Release Factor: Soil	0 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	No releases	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d

	Degradation efficiency	100 %
	Sludge Treatment	Incineration
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.
	Physical Form (at time of use)	solid, liquid
Frequency and duration of use	Exposure duration per day	> 240 min
Human factors not influenced by risk management	Exposed skin areas	One hand, face side only. 240 cm² (PROC1, PROC3)
	Exposed skin areas	Two hands face side only. 480 cm² (PROC2, PROC4)
Other operational conditions affecting workers exposure	Indoor use.	
	Assumes activities are at ambient temperature.	
Technical conditions and measures to control dispersion from source towards the worker	Ensure material transfers are under containment or extract ventilation.	
	Handle substance within a closed system.(PROC1, PROC2)	
	Provide local exhaust ventilation (LEV). (Efficiency: 90 %)(PROC2, PROC3, PROC4)	
Organisational measures to prevent /limit releases, dispersion and exposure	Segregate the activity away from other operations.	
	Ensure operatives are trained to minimise exposures.	
	Supervision in place to check that the RMMs in place are being used correctly and OC's followed	
	Clean equipment and the work area every day.	
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator conforming to EN140 with Type A/P2 filter or better. (Efficiency: 90 %)	
	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Efficiency: 95 %)	

3. Exposure estimation and reference to its source

Environment

Used CHESAR model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC6a	---	Fresh water	---	---	0,01
ERC6a	---	Marine water	---	---	0,009
ERC6a	---	Sewage treatment plant (STP)	---	---	0,01

Workers

PROC1, PROC2, PROC3, PROC4 Used CHESAR model.

PROC1, PROC2, PROC3, PROC4 Use of ECETOC TRA Version 2 with modifications.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	solid	Inhalation worker exposure	0,001mg/m³	0,00002
PROC1	solid	Dermal worker exposure	0,343mg/kg bw/day	0,0059
PROC2	solid	Inhalation worker exposure	0,0001mg/m³	0,000002
PROC2	solid	Dermal worker exposure	0,137mg/kg bw/day	0,0024
PROC3	solid	Inhalation worker exposure	0,001mg/m³	0,00002
PROC3	solid	Dermal worker exposure	0,034mg/kg bw/day	0,00059
PROC4	solid	Inhalation worker exposure	0,005mg/m³	0,00012
PROC4	solid	Dermal worker exposure	0,686mg/kg bw/day	0,0118
PROC1	liquid	Worker - inhalative, long-term - systemic	---	0,01
PROC1	liquid	Worker - dermal, long-term - systemic	---	0,03
PROC2	liquid	Worker - inhalative, long-term - systemic	---	0,01
PROC2	liquid	Worker - dermal, long-term - systemic	---	0,012
PROC3	liquid	Worker - inhalative, long-term - systemic	---	0,01
PROC3	liquid	Worker - dermal, long-term - systemic	---	0,003
PROC4	liquid	Worker - inhalative, long-term - systemic	---	0,01
PROC4	liquid	Worker - dermal, long-term - systemic	---	0,059

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.

1. Short title of Exposure Scenario 3: 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
Chemical product category	PC8: Biocidal products PC19: Intermediate PC21: Laboratory chemicals PC26: Paper and board dye, finishing and impregnation products: including bleaches and other processing aids PC34: Textile dyes, finishing and impregnating products; including bleaches and other processing aids PC37: Water treatment chemicals
Process categories	PROC1: Use in closed process, no likelihood of 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 PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC15: Use as laboratory reagent
Environmental Release Categories	ERC2: Formulation of preparations

2.1 Contributing scenario controlling environmental exposure for: ERC2		
Amount used	Annual site tonnage (tons/year):	1000 tonnes
	Maximum daily site tonnage (kg/day):	1600 kg
Frequency and duration of use	Continuous exposure	320 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	Air	Air emission controls are not applicable as there is no direct release to air.
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d

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

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC3, PROC5, 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	< 0,01 Pa
Frequency and duration of use	Frequency of use	5 days/week
	Exposure duration per day	480 min
Human factors not influenced by risk management	Exposed skin areas	One hand, face side only. 240 cm² (PROC1, PROC3, PROC15)
	Exposed skin areas	Two hands face side only. 480 cm² (PROC5, PROC8b, PROC9)
	Exposed skin areas	Two hands 960 cm² (PROC8a)
Other operational conditions affecting workers exposure	Indoor use.	
	Assumes activities are at ambient temperature.	
Technical conditions and measures to control dispersion from source towards the worker	Handle substance within a predominantly closed system provided with extract ventilation.(PROC9)	
Organisational measures to prevent /limit releases, dispersion and exposure	Clean equipment and the work area every day.	
Conditions and measures related to personal protection, hygiene and health evaluation	Wear eye glasses with side protection according to EN 166.	
	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.	

3. Exposure estimation and reference to its source

Environment

Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC2	---	Fresh water	---	---	0,233
ERC2	---	Marine water	---	---	0,233
ERC2	---	Sewage treatment plant (STP)	---	---	0,0015

Workers

Used ECETOC TRA model.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC3, PROC5, PROC8a	---	Worker - inhalative, long-term - systemic	---	0,28
PROC3, PROC5, PROC8a	---	Worker - dermal, long-term - systemic	---	0,37
PROC9	---	Worker - inhalative, long-term - systemic	---	0,28
PROC9	---	Worker - dermal, long-term - systemic	---	0,18
PROC15	---	Worker - inhalative, long-term - systemic	---	0,28
PROC15	---	Worker - dermal, long-term - systemic	---	0,0092

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

1. Short title of Exposure Scenario 4: Use in Cleaning Agents		
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	
Chemical product category	PC35: Washing and cleaning products (including solvent based products)	
Process categories	PROC10: Roller application or brushing PROC19: Hand-mixing with intimate contact and only PPE available	
Environmental Release Categories	ERC8b: Wide dispersive indoor use of reactive substances in open systems ERC8e: Wide dispersive outdoor use of reactive substances in open systems	
2.1 Contributing scenario controlling environmental exposure for: ERC8b, ERC8e		
Amount used	Daily amount for wide dispersive uses	0,008 kg (ERC8b)
	Daily amount for wide dispersive uses	0,016 kg (ERC8e)
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0,1 % (ERC8b)
	Emission or Release Factor: Water	2 % (ERC8b)
	Emission or Release Factor: Soil	0 % (ERC8b)
	Emission or Release Factor: Air	0,1 % (ERC8e)
	Emission or Release Factor: Water	2 % (ERC8e)
	Emission or Release Factor: Soil	1 % (ERC8e)
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	87,3 %
2.2 Contributing scenario controlling worker exposure for: PROC10, PROC19		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.
	Physical Form (at time of use)	solid, liquid
Frequency and duration of use	Exposure duration per day	> 240 min

Human factors not influenced by risk management	Exposed skin areas	Two hands 960 cm²
Other operational conditions affecting workers exposure	Indoor/Outdoor use.	
	Assumes activities are at ambient temperature.	
Conditions and measures related to personal protection, hygiene and health evaluation	Wear suitable gloves tested to EN374. (Efficiency: 90 %)	

3. Exposure estimation and reference to its source

Environment

Used CHESAR model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8b	---	Fresh water	---	---	0,012
ERC8e	---	Fresh water	---	---	0,013
ERC8b	---	Marine water	---	---	0,011
ERC8e	---	Marine water	---	---	0,012
ERC8b	---	Sewage treatment plant (STP)	---	---	< 0,0001
ERC8e	---	Sewage treatment plant (STP)	---	---	< 0,0001

Workers

PROC10, PROC19 Use of ECETOC TRA Version 2 with modifications.

PROC10, PROC19 REACT (Reach Exposure Assessment Consumer Tool)

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC10, PROC19	solid	Inhalation worker exposure	0,5mg/m³	0,012
PROC10, PROC19	solid	Dermal worker exposure	0,274mg/kg bw/day	0,473
PROC10, PROC19	liquid	Worker - inhalative, short-term - systemic	---	0,032
PROC10, PROC19	liquid	Worker - dermal, short-term - systemic	---	0,032

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

1. Short title of Exposure Scenario 5: Use in Cleaning Agents		
Main User Groups	SU 21: Consumer uses: Private households (= general public = consumers)	
Chemical product category	PC35: Washing and cleaning products (including solvent based products)	
Environmental Release Categories	ERC8b: Wide dispersive indoor use of reactive substances in open systems ERC8e: Wide dispersive outdoor use of reactive substances in open systems	
2.1 Contributing scenario controlling environmental exposure for: ERC8b, ERC8e		
Amount used	Daily amount for wide dispersive uses	0,008 kg
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0,1 %
	Emission or Release Factor: Water	2 %
	Emission or Release Factor: Soil	0 %
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	87,3 %
2.2 Contributing scenario controlling consumer exposure for: PC35		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 5 %.
	Physical Form (at time of use)	liquid, solid
Frequency and duration of use	Frequency of use	365 days/year
	Exposure duration per day	20 min
Human factors not influenced by risk management	Exposed skin areas	Two hands 960 cm²
Other given operational conditions affecting consumers exposure	Indoor/Outdoor use.	
3. Exposure estimation and reference to its source		
Environment		

Used CHESAR model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8b, ERC8e	---	Fresh water	---	---	0,012
ERC8b, ERC8e	---	Marine water	---	---	0,011
ERC8b, ERC8e	---	Sewage treatment plant (STP)	---	---	< 0,0001

Consumers

REACT (Reach Exposure Assessment Consumer Tool)

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PC35	liquid	Consumer inhalation exposure	< 0,0001mg/m³	< 0,0001
PC35	liquid	Consumer dermal exposure	0,0049mg/kg bw/day	0,017

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.

1. Short title of Exposure Scenario 6: Use in laboratories		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Sectors of end-use	SU24: Scientific research and development	
Chemical product category	PC21: Laboratory chemicals	
Process categories	PROC15: Use as laboratory reagent	
Environmental Release Categories	ERC6b: Industrial use of reactive processing aids	
2.1 Contributing scenario controlling environmental exposure for: ERC6b		
Amount used	Annual amount per site	0,0005 tonnes
	Maximum daily site tonnage (kg/day):	1,4 g/day
	Fraction of Regional tonnage used locally:	10 %
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	2,5 %
	Emission or Release Factor: Water	0,05 %
	Emission or Release Factor: Soil	0 %
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	87,3 %
2.2 Contributing scenario controlling worker exposure for: PROC15		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.
	Physical Form (at time of use)	solid, liquid
Frequency and duration of use	Exposure duration per day	60 - 240 min
Human factors not influenced by risk management	Exposed skin areas	One hand, face side only. 240 cm²
Other operational conditions affecting workers exposure	Indoor use.	
Technical conditions and	Ensure material transfers are under containment or extract ventilation.	

measures to control dispersion from source towards the worker	Provide local exhaust ventilation (LEV). (Efficiency: 90 %)
Organisational measures to prevent /limit releases, dispersion and exposure	Segregate the activity away from other operations.
	Ensure operatives are trained to minimise exposures.
	Supervision in place to check that the RMMs in place are being used correctly and OC's followed
	Clean equipment and the work area every day.
Conditions and measures related to personal protection, hygiene and health evaluation	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Efficiency: 95 %)

3. Exposure estimation and reference to its source

Environment

Used CHESAR model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC6b	---	Fresh water	---	---	0,01
ERC6b	---	Marine water	---	---	0,01
ERC6b	---	Sewage treatment plant (STP)	---	---	< 0,0001

Workers

Used CHESAR model.

Use of ECETOC TRA Version 2 with modifications.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC15	solid	Inhalation worker exposure	0,006mg/m³	0,0001
PROC15	solid	Dermal worker exposure	0,034mg/kg bw/day	0,0006
PROC15	liquid	Worker - inhalative, long-term - systemic	---	0,056
PROC15	liquid	Worker - dermal, long-term - systemic	---	0,006

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.

1. Short title of Exposure Scenario 7: Use as water treatment chemicals	
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sectors of end-use	SU23: Electricity, steam, gas water supply and sewage treatment
Chemical product category	PC37: Water treatment chemicals
Process categories	PROC2: Use in closed, continuous process with occasional controlled exposure
Environmental Release Categories	ERC7: Industrial use of substances in closed systems

2.1 Contributing scenario controlling environmental exposure for: ERC7		
Amount used	Annual site tonnage (tons/year):	8148 tonnes
	Maximum daily site tonnage (kg/day):	27160 kg
	Fraction of Regional tonnage used locally:	100 %
Frequency and duration of use	Continuous exposure	300 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0 %
	Emission or Release Factor: Water	0 %
	Emission or Release Factor: Soil	0 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	No releases	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	100 %
Conditions and measures related to external recovery of waste	Recovery Methods	This substance is consumed during use and no waste of the substance is generated.

2.2 Contributing scenario controlling worker exposure for: PROC2		
Product characteristics	Concentration of the	Covers percentage substance in the product up to

	Substance in Mixture/Article	25 %.
	Physical Form (at time of use)	solid, liquid
Frequency and duration of use	Exposure duration per day	> 240 min
Human factors not influenced by risk management	Exposed skin areas	Two hands face side only. 480 cm²
Other operational conditions affecting workers exposure	Indoor use.	
Technical conditions and measures to control dispersion from source towards the worker	Ensure material transfers are under containment or extract ventilation.	
	Provide local exhaust ventilation (LEV). (Efficiency: 90 %)	
Organisational measures to prevent /limit releases, dispersion and exposure	Segregate the activity away from other operations.	
	Ensure operatives are trained to minimise exposures.	
	Supervision in place to check that the RMMs in place are being used correctly and OC's followed	
	Clean equipment and the work area every day.	
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator conforming to EN140 with Type A/P2 filter or better. (Efficiency: 90 %)	
	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Efficiency: 95 %)	

3. Exposure estimation and reference to its source

Environment

Used CHESAR model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC6b, ERC7	---	Fresh water	---	---	0,01
ERC6b, ERC7	---	Marine water	---	---	0,009
ERC6b, ERC7	---	Sewage treatment plant (STP)	---	---	0,01

Workers

Used CHESAR model. Use of ECETOC TRA Version 2 with modifications.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC2	solid	Inhalation worker exposure	0,0001mg/m³	0,000002
PROC2	solid	Dermal worker exposure	0,137mg/kg bw/day	0,0024
PROC2	liquid	Worker - inhalative, long-term - systemic	---	0,01

PROC2	liquid	Worker - dermal, long-term - systemic	---	0,012

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.

1. Short title of Exposure Scenario 8: Use in paper pulp bleaching		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Sectors of end-use	SU6b: Manufacture of pulp, paper and paper products	
Chemical product category	PC26: Paper and board dye, finishing and impregnation products: including bleaches and other processing aids	
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 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 PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC15: Use as laboratory reagent	
Environmental Release Categories	ERC6b: Industrial use of reactive processing aids	
2.1 Contributing scenario controlling environmental exposure for: ERC6b		
Amount used	Annual site tonnage (tons/year):	628,6 tonnes
	Maximum daily site tonnage (kg/day):	2850 kg
	Fraction of Regional tonnage used locally:	100 %
Frequency and duration of use	Continuous exposure	220 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0 %
	Emission or Release Factor: Water	0 %
	Emission or Release Factor: Soil	0 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and	No releases	

releases to soil Organizational measures to prevent/limit release from the site		
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	100 %
Conditions and measures related to external recovery of waste	Recovery Methods	This substance is consumed during use and no waste of the substance is generated.
2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC15		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 25 %.
	Physical Form (at time of use)	solid, liquid
Frequency and duration of use	Exposure duration per day	> 240 min(PROC1, PROC2, PROC3, PROC4, PROC5, PROC9)
	Exposure duration per day	15 - 60 min(PROC8a, PROC8b)
	Exposure duration per day	60 - 240 min(PROC15)
Human factors not influenced by risk management	Exposed skin areas	One hand, face side only. 240 cm² (PROC1, PROC3, PROC15)
	Exposed skin areas	Two hands face side only. 480 cm² (PROC2, PROC4, PROC5, PROC8b, PROC9)
	Exposed skin areas	Two hands 960 cm² (PROC8a)
Other operational conditions affecting workers exposure	Indoor use.	
Technical conditions and measures to control dispersion from source towards the worker	Ensure material transfers are under containment or extract ventilation.	
	Handle substance within a closed system.(PROC1)	
	Provide local exhaust ventilation (LEV). (Efficiency: 90 %)(PROC2, PROC3, PROC4, PROC5, PROC8b, PROC9, PROC15)	
Organisational measures to prevent /limit releases, dispersion and exposure	Segregate the activity away from other operations.	
	Ensure operatives are trained to minimise exposures.	
	Supervision in place to check that the RMMs in place are being used correctly and OC's followed	
	Clean equipment and the work area every day.	
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator conforming to EN140 with Type A/P2 filter or better. (Efficiency: 90 %)(except PROC15)	
	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency: 90 %)(PROC15)	
	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Efficiency: 95 %)(PROC1, PROC2, PROC3, PROC4, PROC5,	

PROC8b, PROC9)
Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. (Efficiency: 98 %)(PROC8a)

3. Exposure estimation and reference to its source

Environment

Used CHESAR model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC6b	---	Fresh water	---	---	0,01
ERC6b	---	Marine water	---	---	0,009
ERC6b	---	Sewage treatment plant (STP)	---	---	0,01

Workers

PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC15 Used CHESAR model.

PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC15 Use of ECETOC TRA Version 2 with modifications.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	solid	Inhalation worker exposure	0,001mg/m³	0,00002
PROC1	solid	Dermal worker exposure	0,343mg/kg bw/day	0,0059
PROC2	solid	Inhalation worker exposure	0,0001mg/m³	0,000002
PROC2	solid	Dermal worker exposure	0,0014mg/kg bw/day	0,00236
PROC3	solid	Inhalation worker exposure	0,001mg/m³	0,00002
PROC3	solid	Dermal worker exposure	0,0343mg/kg bw/day	0,00059
PROC4	solid	Inhalation worker exposure	0,005mg/m³	0,00012
PROC4	solid	Dermal worker exposure	0,686mg/kg bw/day	0,0118
PROC5	solid	Inhalation worker exposure	0,005mg/m³	0,00012
PROC5	solid	Dermal worker exposure	0,0686mg/kg bw/day	0,00118
PROC8a	solid	Inhalation worker exposure	0,01mg/m³	0,0002
PROC8a	solid	Dermal worker exposure	0,137mg/kg bw/day	0,236

PROC8b	solid	Inhalation worker exposure	0,0001mg/m³	0,000002
PROC8b	solid	Dermal worker exposure	0,686mg/kg bw/day	0,0118
PROC9	solid	Inhalation worker exposure	0,001mg/m³	0,00002
PROC9	solid	Dermal worker exposure	0,686mg/kg bw/day	0,0118
PROC15	solid	Inhalation worker exposure	0,0006mg/m³	0,00001
PROC15	solid	Dermal worker exposure	0,0343mg/kg bw/day	0,00059
PROC1	liquid	Worker - inhalative, long-term - systemic	---	0,01
PROC1	liquid	Worker - dermal, long-term - systemic	---	0,03
PROC2	liquid	Worker - inhalative, long-term - systemic	---	0,01
PROC2	liquid	Worker - dermal, long-term - systemic	---	0,012
PROC3	liquid	Worker - inhalative, long-term - systemic	---	0,01
PROC3	liquid	Worker - dermal, long-term - systemic	---	0,003
PROC4, PROC9	liquid	Worker - inhalative, long-term - systemic	---	0,01
PROC4, PROC9	liquid	Worker - dermal, long-term - systemic	---	0,059
PROC5	liquid	Worker - inhalative, long-term - systemic	---	0,01
PROC5	liquid	Worker - dermal, long-term - systemic	---	0,006
PROC8a	liquid	Worker - inhalative, long-term - systemic	---	0,002
PROC8a	liquid	Worker - dermal, long-term - systemic	---	0,473
PROC8b	liquid	Worker - inhalative, long-term - systemic	---	0,002
PROC8b	liquid	Worker - dermal, long-term - systemic	---	0,059
PROC15	liquid	Worker - inhalative, long-term - systemic	---	0,056
PROC15	liquid	Worker - dermal, long-term - systemic	---	0,006

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.

1. Short title of Exposure Scenario 9: Use in textile bleaching		
Main User Groups	SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites	
Sectors of end-use	SU5: Manufacture of textiles, leather, fur	
Chemical product category	PC34: Textile dyes, finishing and impregnating products; including bleaches and other processing aids	
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	ERC6b: Industrial use of reactive processing aids	
2.1 Contributing scenario controlling environmental exposure for: ERC6b		
Amount used	Annual site tonnage (tons/year):	695,6 tonnes
	Maximum daily site tonnage (kg/day):	3162 kg
	Fraction of Regional tonnage used locally:	100 %
Frequency and duration of use	Continuous exposure	220 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0 %
	Emission or Release Factor: Water	0 %
	Emission or Release Factor: Soil	0 %
Technical conditions and measures at process level (source) to prevent release Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Organizational measures to prevent/limit release from the site	No releases	
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant

	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	100 %

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 25 %.
	Physical Form (at time of use)	solid, liquid
Frequency and duration of use	Exposure duration per day	> 240 min(PROC1, PROC2, PROC3, PROC5)
	Exposure duration per day	15 - 60 min(PROC8a, PROC8b)
Human factors not influenced by risk management	Exposed skin areas	One hand, face side only. 240 cm² (PROC1, PROC3)
	Exposed skin areas	Two hands face side only. 480 cm² (PROC2, PROC5, PROC8b)
	Exposed skin areas	Two hands 960 cm² (PROC8a)
Other operational conditions affecting workers exposure	Indoor use.	
Technical conditions and measures to control dispersion from source towards the worker	Ensure material transfers are under containment or extract ventilation.	
	Handle substance within a closed system.(PROC1, PROC2)	
	Provide local exhaust ventilation (LEV). (Efficiency: 90 %)(PROC2, PROC3, PROC5, PROC8b)	
Organisational measures to prevent /limit releases, dispersion and exposure	Segregate the activity away from other operations.	
	Ensure operatives are trained to minimise exposures.	
	Supervision in place to check that the RMMs in place are being used correctly and OC's followed	
	Clean equipment and the work area every day.	
Conditions and measures related to personal protection, hygiene and health evaluation	Wear a respirator conforming to EN140 with Type A/P2 filter or better.	
	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Efficiency: 95 %)(PROC1, PROC2, PROC3, PROC5, PROC8b)	
	Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. (Efficiency: 98 %)(PROC8a)	

3. Exposure estimation and reference to its source

Environment

Used CHESAR model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC6b	---	Fresh water	---	---	0,01

ERC6b	---	Marine water	---	---	0,009
ERC6b	---	Sewage treatment plant (STP)	---	---	0,01

Workers

PROC1, PROC2, PROC3, PROC5, PROC8a, PROC8b Used CHESAR model.
PROC1, PROC2, PROC3, PROC5, PROC8a, PROC8b Use of ECETOC TRA Version 2 with modifications.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC1	solid	Inhalation worker exposure	0,001mg/m³	0,00002
PROC1	solid	Dermal worker exposure	0,343mg/kg bw/day	0,0059
PROC2	solid	Inhalation worker exposure	0,0001mg/m³	0,000002
PROC2	solid	Dermal worker exposure	0,0014mg/kg bw/day	0,00236
PROC3	solid	Inhalation worker exposure	0,001mg/m³	0,00002
PROC3	solid	Dermal worker exposure	0,0343mg/kg bw/day	0,00059
PROC5	solid	Inhalation worker exposure	0,005mg/m³	0,00012
PROC5	solid	Dermal worker exposure	0,0686mg/kg bw/day	0,00118
PROC8a	solid	Inhalation worker exposure	0,01mg/m³	0,0002
PROC8a	solid	Dermal worker exposure	0,137mg/kg bw/day	0,2356
PROC8b	solid	Inhalation worker exposure	0,0001mg/m³	0,000002
PROC8b	solid	Dermal worker exposure	0,686mg/kg bw/day	0,0118
PROC1	liquid	Worker - inhalative, long-term - systemic	---	0,01
PROC1	liquid	Worker - dermal, long-term - systemic	---	0,03
PROC2	liquid	Worker - inhalative, long-term - systemic	---	0,01
PROC2	liquid	Worker - dermal, long-term - systemic	---	0,012
PROC3	liquid	Worker - inhalative, long-term - systemic	---	0,01
PROC3	liquid	Worker - dermal, long-term - systemic	---	0,003

PROC5	liquid	Worker - inhalative, long-term - systemic	---	0,01
PROC5	liquid	Worker - dermal, long-term - systemic	---	0,006
PROC8a	liquid	Worker - inhalative, long-term - systemic	---	0,002
PROC8a	liquid	Worker - dermal, long-term - systemic	---	0,473
PROC8b	liquid	Worker - inhalative, long-term - systemic	---	0
PROC8b	liquid	Worker - dermal, long-term - systemic	---	0,059

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.

1. Short title of Exposure Scenario 10: Use in textile bleaching	
Main User Groups	SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Sectors of end-use	SU5: Manufacture of textiles, leather, fur
Chemical product category	PC34: Textile dyes, finishing and impregnating products; including bleaches and other processing aids
Process categories	PROC13: Treatment of articles by dipping and pouring
Environmental Release Categories	ERC8b: Wide dispersive indoor use of reactive substances in open systems

2.1 Contributing scenario controlling environmental exposure for: ERC8b		
Amount used	Daily amount for wide dispersive uses	0,055 kg
Frequency and duration of use	Continuous exposure	365 days/year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18.000 m3/d
Other given operational conditions affecting environmental exposure	Emission or Release Factor: Air	0,1 %
	Emission or Release Factor: Water	2 %
	Emission or Release Factor: Soil	0 %
Conditions and measures related to sewage treatment plant	Type of Sewage Treatment Plant	Municipal sewage treatment plant
	Flow rate of sewage treatment plant effluent	2.000 m3/d
	Degradation efficiency	87,3 %

2.2 Contributing scenario controlling worker exposure for: PROC13		
Product characteristics	Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 1 %.
	Physical Form (at time of use)	solid, liquid
Frequency and duration of use	Exposure duration per day	> 240 min
Human factors not influenced by risk management	Exposed skin areas	Two hands face side only. 480 cm²
Other operational conditions affecting workers exposure	Indoor use.	
Technical conditions and measures to control dispersion from source towards the worker	Handle substance within a closed system.	

3. Exposure estimation and reference to its source

Environment

Used CHESAR model.

Contributing Scenario	Specific conditions	Compartment	Value	Level of Exposure	RCR
ERC8b	---	Fresh water	---	---	0,021
ERC8b	---	Marine water	---	---	0,02
ERC8b	---	Sewage treatment plant (STP)	---	---	< 0,0001

Workers

Use of ECETOC TRA Version 2 with modifications.

Contributing Scenario	Specific conditions	Exposure routes	Level of Exposure	RCR
PROC13	solid	Inhalation worker exposure	0,5mg/m³	0,012
PROC13	solid	Dermal worker exposure	0,137mg/kg bw/day	0,236

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

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