Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH)

Toluene

Version number: GHS 3.1
Replaces version of: 21.03.2021 (2)

Revision: 14.06.2022

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

1.1 Product identifier

Identification of the substance	**Toluene**
Registration number (REACH)	01-2119471310-51-xxxx
EC number	203-625-9
CAS number	108-88-3
Alternative name(s)	Toluene
Product number	RDG-7702

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

Relevant identified uses	Use in coatings Use as a fuel Use in cleaning agents Manufacture of substance Distribution Use as an intermediate Formulation or re-packing Road and construction applications Use in oil and gas field drilling and production operations Use as binders and release agents Use as laboratory reagent Functional fluids Rubber production and processing

1.3 Details of the supplier of the safety data sheet

Rosneft Deutschland GmbH
Behrenstr. 18
10117 Berlin
Germany

Telephone: +49 30 70014 2597
e-mail: hseq@rosneft.de
Website: www.rosneft.de

e-mail (competent person)	hseq@rosneft.de

1.4 Emergency telephone number

Poison centre

Country	Name	Telephone	Opening hours
Germany	Giftnotruf München	0049 - 89 -19240	Mon - Fri 00:00 - 23:59

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 (CLP)

Section	Hazard class	Category	Hazard class and category	Hazard statement
2.6	flammable liquid	2	Flam. Liq. 2	H225
3.2	skin corrosion/irritation	2	Skin Irrit. 2	H315
3.7	reproductive toxicity	2	Repr. 2	H361d
3.8D	specific target organ toxicity - single exposure (narcotic effects, drowsiness)	3	STOT SE 3	H336
3.9	specific target organ toxicity - repeated exposure	2	STOT RE 2	H373
3.10	aspiration hazard	1	Asp. Tox. 1	H304
4.1C	hazardous to the aquatic environment - chronic hazard	3	Aquatic Chronic 3	H412

For full text of abbreviations: see SECTION 16.

The most important adverse physicochemical, human health and environmental effects

Delayed or immediate effects can be expected after short or long-term exposure. The product is combustible and can be ignited by potential ignition sources. Spillage and fire water can cause pollution of watercourses.

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008 (CLP)

- Signal word danger

- Pictograms

GHS02, GHS07, GHS08 

- Hazard statements

H225	Highly flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H361d	Suspected of damaging the unborn child.
H373	May cause damage to organs through prolonged or repeated exposure.
H412	Harmful to aquatic life with long lasting effects.

- Precautionary statements

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P280	Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.
P301+P310	IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P331	Do NOT induce vomiting.
P370+P378	In case of fire: Use sand, carbon dioxide or powder extinguisher to extinguish.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P403+P235	Store in a well-ventilated place. Keep cool.

2.3 Other hazards

Results of PBT and vPvB assessment

According to the results of its assessment, this substance is not a PBT or a vPvB.

SECTION 3: Composition/information on ingredients

3.1 Substances

Name of substance	toluene
Identifiers	
REACH Reg. No	01-2119471310-51-xxxx
CAS No	108-88-3
EC No	203-625-9
Index No	601-021-00-3
Purity	99,9 %
Molecular formula	C7H8
Molar mass	92,14 $^{g}/_{mol}$

SECTION 4: First aid measures

4.1 Description of first aid measures

General notes

Do not leave affected person unattended. Remove victim out of the danger area. Keep affected person warm, still and covered. Take off immediately all contaminated clothing. In all cases of doubt, or when symptoms persist, seek medical advice. In case of unconsciousness place person in the recovery position. Never give anything by mouth.

Following inhalation

If breathing is irregular or stopped, immediately seek medical assistance and start first aid actions. In case of respiratory tract irritation, consult a physician. Provide fresh air.

Following skin contact

Wash with plenty of soap and water.

Following eye contact

Remove contact lenses, if present and easy to do. Continue rinsing. Irrigate copiously with clean, fresh water for at least 10 minutes, holding the eyelids apart.

Following ingestion

Rinse mouth with water (only if the person is conscious). Do NOT induce vomiting.

4.2 Most important symptoms and effects, both acute and delayed

Narcotic effects.

4.3 Indication of any immediate medical attention and special treatment needed

none

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

Water spray, BC-powder, Carbon dioxide (CO2)

Unsuitable extinguishing media

Water jet

5.2 Special hazards arising from the substance or mixture

In case of insufficient ventilation and/or in use, may form flammable/explosive vapour-air mixture. Solvent vapours are heavier than air and may spread along floors. Places which are not ventilated, e.g. unventilated below ground level areas such as trenches, conduits and shafts, are particularly prone to the presence of flammable substances or mixtures.

Hazardous combustion products

Carbon monoxide (CO), Carbon dioxide (CO2)

5.3 Advice for firefighters

In case of fire and/or explosion do not breathe fumes. Co-ordinate firefighting measures to the fire surroundings. Do not allow firefighting water to enter drains or water courses. Collect contaminated firefighting water separately. Fight fire with normal precautions from a reasonable distance.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Remove persons to safety.

For emergency responders

Wear breathing apparatus if exposed to vapours/dust/spray/gases.

6.2 Environmental precautions

Keep away from drains, surface and ground water. Retain contaminated washing water and dispose of it.

6.3 Methods and material for containment and cleaning up

Advice on how to contain a spill

Covering of drains

Advice on how to clean up a spill

Wipe up with absorbent material (e.g. cloth, fleece). Collect spillage: sawdust, kieselgur (diatomite), sand, universal binder

Appropriate containment techniques

Use of adsorbent materials.

Other information relating to spills and releases

Place in appropriate containers for disposal. Ventilate affected area.

6.4 Reference to other sections

Hazardous combustion products: see section 5. Personal protective equipment: see section 8. Incompatible materials: see section 10. Disposal considerations: see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Recommendations

- Measures to prevent fire as well as aerosol and dust generation

Use local and general ventilation. Avoidance of ignition sources. Keep away from sources of ignition - No smoking. Take precautionary measures against static discharge. Use only in well-ventilated areas. Due to danger of explosion, prevent leakage of vapours into cellars, flues and ditches. Ground/bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting/equipment. Use only non-sparking tools.

- Specific notes/details

Places which are not ventilated, e.g. unventilated below ground level areas such as trenches, conduits and shafts, are particularly prone to the presence of flammable substances or mixtures. Vapours are heavier than air, spread along floors and form explosive mixtures with air. Vapours may form explosive mixtures with air.

Advice on general occupational hygiene

Wash hands after use. Do not eat, drink and smoke in work areas. Remove contaminated clothing and protective equipment before entering eating areas. Never keep food or drink in the vicinity of chemicals. Never place chemicals in containers that are normally used for food or drink. Keep away from food, drink and animal feedingstuffs.

7.2 Conditions for safe storage, including any incompatibilities

Managing of associated risks

- Explosive atmospheres

Keep container tightly closed and in a well-ventilated place. Use local and general ventilation. Keep cool. Protect from sunlight.

- Flammability hazards

Keep away from sources of ignition - No smoking. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Take precautionary measures against static discharge. Protect from sunlight.

- Ventilation requirements

Use local and general ventilation. Ground/bond container and receiving equipment.

- Packaging compatibilities

Only packagings which are approved (e.g. acc. to ADR) may be used.

7.3 Specific end use(s)

See section 16 for a general overview.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limit values (Workplace Exposure Limits)

Country	Name of agent	CAS No	Identifier	TWA [ppm]	TWA [mg/m³]	STEL [ppm]	STEL [mg/m³]	Ceiling-C [ppm]	Ceiling-C [mg/m³]	Notation	Source
DE	toluene	108-88-3	MAK	50	190	100	380				DFG
DE	toluene	108-88-3	AGW	50	190	100	380			H, Y	TRGS 900
EU	toluene	108-88-3	IOELV	50	192	100	384			H	2006/15/EC

Notation

Ceiling-C	ceiling value is a limit value above which exposure should not occur
H	absorbed through the skin

Notation	
STEL	short-term exposure limit: a limit value above which exposure should not occur and which is related to a 15-minute period (unless otherwise specified)
TWA	time-weighted average (long-term exposure limit): measured or calculated in relation to a reference period of 8 hours time-weighted average (unless otherwise specified)
Y	a risk of developmental toxicity does not need to be expected if the occupational exposure limit value and the biological limit value (BGW) are adhered to

Biological limit values

Country	Name of agent	Parameter	Notation	Identifier	Value	Source
DE	toluene	toluene		BAT	75 µg/l	DFG
DE	toluene	toluene		BLV	75 µg/l	TRGS 903
DE	toluene	toluene		BAT	600 µg/l	DFG
DE	toluene	toluene		BLV	600 µg/l	TRGS 903
DE	toluene	o-cresol	hydr	BAT	1,5 mg/l	DFG
DE	toluene	o-cresol	hydr	BLV	1,5 mg/l	TRGS 903

Notation	
hydr	hydrolysis

Human health values

Relevant DNELs and other threshold levels

Endpoint	Threshold level	Protection goal, route of exposure	Used in	Exposure time
DNEL	192 mg/m³	human, inhalatory	worker (industry)	chronic - systemic effects
DNEL	384 mg/m³	human, inhalatory	worker (industry)	acute - systemic effects
DNEL	192 mg/m³	human, inhalatory	worker (industry)	chronic - local effects
DNEL	384 mg/m³	human, inhalatory	worker (industry)	acute - local effects
DNEL	384 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects

8.2 Exposure controls

Appropriate engineering controls

General ventilation.

Individual protection measures (personal protective equipment)

Eye/face protection

Wear eye/face protection.

Skin protection

- Hand protection

Wear suitable gloves. Chemical protection gloves are suitable, which are tested according to EN 374. Check leak-tightness/impermeability prior to use. In the case of wanting to use the gloves again, clean them before taking off and air them well. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves.

- Other protection measures

Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended. Wash hands thoroughly after handling.

Respiratory protection

In case of inadequate ventilation wear respiratory protection.

Environmental exposure controls

Use appropriate container to avoid environmental contamination. Keep away from drains, surface and ground water.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	liquid
Colour	colourless
Odour	characteristic
Melting point/freezing point	-95 °C at 1.013 hPa
Boiling point or initial boiling point and boiling range	108 – 113 °C
Flammability	flammable liquid in accordance with GHS criteria
Lower and upper explosion limit	1,1 vol% - 7,1 vol%
Flash point	4 – 6 °C
Auto-ignition temperature	480 °C at 1.013 hPa (ECHA) (auto-ignition temperature (liquids and gases))
Decomposition temperature	not relevant
pH (value)	not determined
Kinematic viscosity	0,7 $^{mm^2}/_{s}$ at 20 °C

Solubility(ies)

Water solubility	573 $^{mg}/_{l}$ at 25 °C

Partition coefficient

Partition coefficient n-octanol/water (log value)	2,73 (pH value: 7, 20 °C) (ECHA)
Soil organic carbon/water (log KOC)	2,312 (ECHA)

Vapour pressure	0,448 PSI at 70 °F

Density and/or relative density

Density	870 $^{kg}/_{m^3}$ at 15 °C
Relative vapour density	information on this property is not available

Particle characteristics	not relevant (liquid)

9.2 Other information

Information with regard to physical hazard classes	there is no additional information

Other safety characteristics

Surface tension	27,73 $^{mN}/_{m}$ (25 °C) (ECHA)
Solvent content	100 %
Temperature class (EU, acc. to ATEX)	T1 (maximum permissible surface temperature on the equipment: 450°C)

SECTION 10: Stability and reactivity

10.1 Reactivity

Concerning incompatibility: see below "Conditions to avoid" and "Incompatible materials". It's a reactive substance. The mixture contains reactive substance(s). Risk of ignition.

If heated:

Risk of ignition

10.2 Chemical stability

See below "Conditions to avoid".

10.3 Possibility of hazardous reactions

No known hazardous reactions.

10.4 Conditions to avoid

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

Hints to prevent fire or explosion

Use explosion-proof electrical/ventilating/lighting/equipment. Use only non-sparking tools. Take precautionary measures against static discharge.

10.5 Incompatible materials

Oxidisers

10.6 Hazardous decomposition products

Reasonably anticipated hazardous decomposition products produced as a result of use, storage, spill and heating are not known. Hazardous combustion products: see section 5.

SECTION 11: Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Classification according to GHS (1272/2008/EC, CLP)

Acute toxicity

Shall not be classified as acutely toxic.

GHS of the United Nations, annex 4: May be harmful if inhaled.

Skin corrosion/irritation

Causes skin irritation.

Serious eye damage/eye irritation

Shall not be classified as seriously damaging to the eye or eye irritant.

Respiratory or skin sensitisation

Shall not be classified as a respiratory or skin sensitiser.

Germ cell mutagenicity

Shall not be classified as germ cell mutagenic.

Carcinogenicity

Shall not be classified as carcinogenic.

Reproductive toxicity

Suspected of damaging the unborn child.

Specific target organ toxicity - single exposure

May cause drowsiness or dizziness.

Specific target organ toxicity - repeated exposure

May cause damage to organs through prolonged or repeated exposure.

Aspiration hazard

May be fatal if swallowed and enters airways.

11.2 Information on other hazards

There is no additional information.

SECTION 12: Ecological information

12.1 Toxicity

Acc. to 1272/2008/EC: Harmful to aquatic life with long lasting effects.
Verordnung über Anlagen zum Umgang mit wassergefährdenden Stoffen (Ordinance on facilities for handling substances hazardous to water) (AwSV): WGK 3, highly hazardous to water (Germany)

Aquatic toxicity (chronic)

Endpoint	Value	Species	Exposure time
LC50	3,78 $^{mg}/_{l}$	aquatic invertebrates	2 d
EC50	3,23 $^{mg}/_{l}$	aquatic invertebrates	7 d

12.2 Persistence and degradability

Data are not available.

12.3 Bioaccumulative potential

Data are not available.

n-octanol/water (log KOW)	2,73 (pH value: 7, 20 °C) (ECHA)
BCF	90 (ECHA)

12.4 Mobility in soil

Henry's law constant	485 $^{Pa\ m^3}/_{mol}$
The Organic Carbon normalised adsorption coefficient	2,312 (ECHA)

12.5 Results of PBT and vPvB assessment

Data are not available.

12.6 Endocrine disrupting properties

Not listed.

12.7 Other adverse effects

Data are not available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Waste treatment-relevant information

Solvent reclamation/regeneration.

Sewage disposal-relevant information

Do not empty into drains. Avoid release to the environment. Refer to special instructions/safety data sheets.

Waste treatment of containers/packagings

It is a dangerous waste; only packagings which are approved (e.g. acc. to ADR) may be used. Completely emptied packages can be recycled. Handle contaminated packages in the same way as the substance itself.

Remarks

Please consider the relevant national or regional provisions. Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities.

SECTION 14: Transport information

14.1 UN number or ID number

ADR/RID/ADN	UN 1294
IMDG-Code	UN 1294
ICAO-TI	UN 1294

14.2 UN proper shipping name

ADR/RID/ADN	TOLUENE
IMDG-Code	TOLUENE
ICAO-TI	Toluene

14.3 Transport hazard class(es)

ADR/RID/ADN	3
IMDG-Code	3
ICAO-TI	3

14.4 Packing group

ADR/RID/ADN	II
IMDG-Code	II
ICAO-TI	II

14.5 Environmental hazards

non-environmentally hazardous acc. to the dangerous goods regulations

14.6 Special precautions for user

Provisions for dangerous goods (ADR) should be complied within the premises.

14.7 Maritime transport in bulk according to IMO instruments

The cargo is not intended to be carried in bulk.

Information for each of the UN Model Regulations

Transport of dangerous goods by road, rail and inland waterway (ADR/RID/ADN) - Additional information

Classification code	F1
Danger label(s)	3

Excepted quantities (EQ)	E2
Limited quantities (LQ)	1 L
Transport category (TC)	2
Tunnel restriction code (TRC)	D/E
Hazard identification No	33
ADN	Table C: 3+N3

International Maritime Dangerous Goods Code (IMDG) - Additional information

Marine pollutant	-
Danger label(s)	3

Special provisions (SP)	-
Excepted quantities (EQ)	E2
Limited quantities (LQ)	1 L
EmS	F-E, S-D
Stowage category	B

International Civil Aviation Organization (ICAO-IATA/DGR) - Additional information

Danger label(s)	3

Excepted quantities (EQ)	E2
Limited quantities (LQ)	1 L

SECTION 15: Regulatory information

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

Relevant provisions of the European Union (EU)

Restrictions according to REACH, Annex XVII

Dangerous substances with restrictions (REACH, Annex XVII)

Name of substance	Name acc. to inventory	CAS No	Restriction	No
toluene	toluene	108-88-3	R48	48
toluene	this product meets the criteria for classification in accordance with Regulation No 1272/2008/EC		R3	3
toluene	flammable / pyrophoric		R40	40
toluene	substances in tattoo inks and permanent make-up		R75	75

Legend

R3 1. Shall not be used in:
- ornamental articles intended to produce light or colour effects by means of different phases, for example in ornamental lamps and ashtrays,
- tricks and jokes,
- games for one or more participants, or any article intended to be used as such, even with ornamental aspects,
2. Articles not complying with paragraph 1 shall not be placed on the market.
3. Shall not be placed on the market if they contain a colouring agent, unless required for fiscal reasons, or perfume, or both, if they:
— can be used as fuel in decorative oil lamps for supply to the general public, and
— present an aspiration hazard and are labelled with H304.
4. Decorative oil lamps for supply to the general public shall not be placed on the market unless they conform to the European Standard on Decorative oil lamps (EN 14059) adopted by the European Committee for Standardisation (CEN).
5. Without prejudice to the implementation of other Union provisions relating to the classification, labelling and packaging of substances and mixtures, suppliers shall ensure, before the placing on the market, that the following requirements are met:
(a) lamp oils, labelled with H304, intended for supply to the general public are visibly, legibly and indelibly marked as follows: "Keep lamps filled with this liquid out of the reach of children"; and, by 1 December 2010, "Just a sip of lamp oil – or even sucking the wick of lamps – may lead to life-threatening lung damage";
(b) grill lighter fluids, labelled with H304, intended for supply to the general public are legibly and indelibly marked by 1 December 2010 as follows: 'Just a sip of grill lighter fluid may lead to life threatening lung damage';
(c) lamps oils and grill lighters, labelled with H304, intended for supply to the general public are packaged in black opaque containers not exceeding 1 litre by 1 December 2010.';

Legend

R40 1. Shall not be used, as substance or as mixtures in aerosol dispensers where these aerosol dispensers are intended for supply to the general public for entertainment and decorative purposes such as the following:
- metallic glitter intended mainly for decoration,
- artificial snow and frost,
- 'whoopee' cushions,
- silly string aerosols,
- imitation excrement,
- horns for parties,
- decorative flakes and foams,
- artificial cobwebs,
- stink bombs.

2. Without prejudice to the application of other Community provisions on the classification, packaging and labelling of substances, suppliers shall ensure before the placing on the market that the packaging of aerosol dispensers referred to above is marked visibly, legibly and indelibly with:
'For professional users only'.

3. By way of derogation, paragraphs 1 and 2 shall not apply to the aerosol dispensers referred to Article 8 (1a) of Council Directive 75/324/EEC (2).

4. The aerosol dispensers referred to in paragraphs 1 and 2 shall not be placed on the market unless they conform to the requirements indicated.

R48 Shall not be placed on the market, or used, as a substance or in mixtures in a concentration equal to or greater than 0,1 % by weight where the substance or mixture is used in adhesives or spray paints intended for supply to the general public.

Legend

R75 1. Shall not be placed on the market in mixtures for use for tattooing purposes, and mixtures containing any such substances shall not be used for tattooing purposes, after 4 January 2022 if the substance or substances in question is or are present in the following circumstances:
(a) in the case of a substance classified in Part 3 of Annex VI to Regulation (EC) No 1272/2008 as carcinogen category 1A, 1B or 2, or germ cell mutagen category 1A, 1B or 2, the substance is present in the mixture in a concentration equal to or greater than 0,00005 % by weight;
(b) in the case of a substance classified in Part 3 of Annex VI to Regulation (EC) No 1272/2008 as reproductive toxicant category 1A, 1B or 2, the substance is present in the mixture in a concentration equal to or greater than 0,001 % by weight;
(c) in the case of a substance classified in Part 3 of Annex VI to Regulation (EC) No 1272/2008 as skin sensitiser category 1, 1A or 1B, the substance is present in the mixture in a concentration equal to or greater than 0,001 % by weight;
(d) in the case of a substance classified in Part 3 of Annex VI to Regulation (EC) No 1272/2008 as skin corrosive category 1, 1A, 1B or 1C or skin irritant category 2, or as serious eye damage category 1 or eye irritant category 2, the substance is present in the mixture in a concentration equal to or greater than:
(i) 0,1 % by weight, if the substance is used solely as a pH regulator;
(ii) 0,01 % by weight, in all other cases;
(e) in the case of a substance listed in Annex II to Regulation (EC) No 1223/2009 (*1), the substance is present in the mixture in a concentration equal to or greater than 0,00005 % by weight;
(f) in the case of a substance for which a condition of one or more of the following kinds is specified in column g (Product type, Body parts) of the table in Annex IV to Regulation (EC) No 1223/2009, the substance is present in the mixture in a concentration equal to or greater than 0,00005 % by weight:
(i) “Rinse-off products”;
(ii) “Not to be used in products applied on mucous membranes”;
(iii) “Not to be used in eye products”;
(g) in the case of a substance for which a condition is specified in column h (Maximum concentration in ready for use preparation) or column i (Other) of the table in Annex IV to Regulation (EC) No 1223/2009, the substance is present in the mixture in a concentration, or in some other way, that does not accord with the condition specified in that column;
(h) in the case of a substance listed in Appendix 13 to this Annex, the substance is present in the mixture in a concentration equal to or greater than the concentration limit specified for that substance in that Appendix.
2. For the purposes of this entry use of a mixture “for tattooing purposes” means injection or introduction of the mixture into a person’s skin, mucous membrane or eyeball, by any process or procedure (including procedures commonly referred to as permanent make-up, cosmetic tattooing, micro-blading and micro-pigmentation), with the aim of making a mark or design on his or her body.
3. If a substance not listed in Appendix 13 falls within more than one of points (a) to (g) of paragraph 1, the strictest concentration limit laid down in the points in question shall apply to that substance. If a substance listed in Appendix 13 also falls within one or more of points (a) to (g) of paragraph 1, the concentration limit laid down in point (h) of paragraph 1 shall apply to that substance.
4. By way of derogation, paragraph 1 shall not apply to the following substances until 4 January 2023:
(a) Pigment Blue 15:3 (CI 74160, EC No 205-685-1, CAS No 147-14-8);
(b) Pigment Green 7 (CI 74260, EC No 215-524-7, CAS No 1328-53-6).
5. If Part 3 of Annex VI to Regulation (EC) No 1272/2008 is amended after 4 January 2021 to classify or re-classify a substance such that the substance then becomes caught by point (a), (b), (c) or (d) of paragraph 1 of this entry, or such that it then falls within a different one of those points from the one within which it fell previously, and the date of application of that new or revised classification is after the date referred to in paragraph 1 or, as the case may be, paragraph 4 of this entry, that amendment shall, for the purposes of applying this entry to that substance, be treated as taking effect on the date of application of that new or revised classification.
6. If Annex II or Annex IV to Regulation (EC) No 1223/2009 is amended after 4 January 2021 to list or change the listing of a substance such that the substance then becomes caught by point (e), (f) or (g) of paragraph 1 of this entry, or such that it then falls within a different one of those points from the one within which it fell previously, and the amendment takes effect after the date referred to in paragraph 1 or, as the case may be, paragraph 4 of this entry, that amendment shall, for the purposes of applying this entry to that substance, be treated as taking effect from the date falling 18 months after entry into force of the act by which that amendment was made.
7. Suppliers placing a mixture on the market for use for tattooing purposes shall ensure that, after 4 January 2022, the mixture is marked with the following information:
(a) the statement “Mixture for use in tattoos or permanent make-up”;
(b) a reference number to uniquely identify the batch;
(c) the list of ingredients in accordance with the nomenclature established in the glossary of common ingredient names pursuant to Article 33 of Regulation (EC) No 1223/2009, or in the absence of a common ingredient name, the IUPAC name. In the absence of a common ingredient name or IUPAC name, the CAS and EC number. Ingredients shall be listed in descending order by weight or volume of the ingredients at the time of formulation. “Ingredient” means any substance added during the process of formulation and present in the mixture for use for tattooing purposes. Impurities shall not be regarded as ingredients. If the name of a substance, used as ingredient within the meaning of this entry, is already required to be stated on the label in accordance with Regulation (EC) No 1272/2008, that ingredient does not need to be marked in accordance with this Regulation;
(d) the additional statement “pH regulator” for substances falling under point (d)(i) of paragraph 1;
(e) the statement "Contains nickel. Can cause allergic reactions." if the mixture contains nickel below the concentration limit specified in Appendix 13;
(f) the statement "Contains chromium (VI). Can cause allergic reactions." if the mixture contains chromium (VI) below the concentration limit specified in Appendix 13;
(g) safety instructions for use insofar as they are not already required to be stated on the label by Regulation (EC) No 1272/2008.
The information shall be clearly visible, easily legible and marked in a way that is indelible.
The information shall be written in the official language(s) of the Member State(s) where the mixture is placed on the market, unless the Member State(s) concerned provide(s) otherwise.
Where necessary because of the size of the package, the information listed in the first subparagraph, except for point (a), shall be included instead in the instructions for use.
Before using a mixture for tattooing purposes, the person using the mixture shall provide the person undergoing the procedure with the information marked on the package or included in the instructions for use pursuant to this paragraph.

Legend

8. Mixtures that do not contain the statement “Mixture for use in tattoos or permanent make-up” shall not be used for tattooing purposes.
9. This entry does not apply to substances that are gases at temperature of 20 °C and pressure of 101,3 kPa, or generate a vapour pressure of more than 300 kPa at temperature of 50 °C, with the exception of formaldehyde (CAS No 50-00-0, EC No 200-001-8).
10. This entry does not apply to the placing on the market of a mixture for use for tattooing purposes, or to the use of a mixture for tattooing purposes, when placed on the market exclusively as a medical device or an accessory to a medical device, within the meaning of Regulation (EU) 2017/745, or when used exclusively as a medical device or an accessory to a medical device, within the same meaning. Where the placing on the market or use may not be exclusively as a medical device or an accessory to a medical device, the requirements of Regulation (EU) 2017/745 and of this Regulation shall apply cumulatively.

List of substances subject to authorisation (REACH, Annex XIV) / SVHC - candidate list

not listed

Deco-Paint Directive

VOC content	100 %

Industrial Emissions Directive (IED)

VOC content	100 %

Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)

not listed

Regulation concerning the establishment of a European Pollutant Release and Transfer Register (PRTR)

Pollutant release and transfer registers (PRTR)

Name of substance	CAS No	Remarks	Threshold for releases to air (kg/year)
toluene	108-88-3	(11)	

Legend

(11) Single pollutants are to be reported if the threshold for BTEX (the sum parameter of benzene, toluene, ethyl benzene, xylenes) is exceeded

Water Framework Directive (WFD)

List of pollutants (WFD)

Name of substance	CAS No	Listed in	Remarks
toluene		a)	

Legend

A) Indicative list of the main pollutants

Regulation on persistent organic pollutants (POP)

Not listed.

National regulations (Germany)

Verordnung über Anlagen zum Umgang mit wassergefährdenden Stoffen (Ordinance on facilities for handling substances hazardous to water) (AwSV)

Wassergefährdungsklasse, WGK (water hazard class) 3 highly hazardous to water

Technical instructions on air quality control (Germany)

Number	Group of substances	Class	Conc.	Mass flow	Mass concentration	Notation
5.2.5	organic substances	class I	≥ 25 wt%	0,1 $^{kg}/_{h}$	20 $^{mg}/_{m^3}$	3)

Notation
3) a total mass flow of 0.50 kg/h or a total mass concentration of 50 mg/m³, each of which to be indicated as total carbon, shall not be exceeded (except organic particulate matter)

Storage of hazardous substances in non-stationary containers (TRGS 510) (Germany)

Storage class (LGK) 3 (flammable and desensitizing explosive liquids)

National inventories

Country	Inventory	Status
EU	REACH Reg.	substance is listed

Legend
REACH Reg. REACH registered substances

15.2 Chemical Safety Assessment

No Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

Indication of changes (revised safety data sheet)

Section	Former entry (text/value)	Actual entry (text/value)	Safety-relevant
8.1		Occupational exposure limit values (Workplace Exposure Limits): change in the listing (table)	yes
12.1	Toxicity: Acc. to 1272/2008/EC: Harmful to aquatic life with long lasting effects. Verordnung über Anlagen zum Umgang mit wassergefährdenden Stoffen (Ordinance on facilities for handling substances hazardous to water) (AwSV): WGK 2, hazardous to water (Germany)	Toxicity: Acc. to 1272/2008/EC: Harmful to aquatic life with long lasting effects. Verordnung über Anlagen zum Umgang mit wassergefährdenden Stoffen (Ordinance on facilities for handling substances hazardous to water) (AwSV): WGK 3, highly hazardous to water (Germany)	yes
15.1	Index number: 194		yes
15.1	Wassergefährdungsklasse, WGK (water hazard class): 2 hazardous to water	Wassergefährdungsklasse, WGK (water hazard class): 3 highly hazardous to water	yes

Abbreviations and acronyms

Abbr.	Descriptions of used abbreviations
2006/15/EC	Commission Directive establishing a second list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC and amending Directives 91/322/EEC and 2000/39/EC
ADN	Accord européen relatif au transport international des marchandises dangereuses par voies de navigation intérieures (European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways)

Abbr.	Descriptions of used abbreviations
ADR	Accord relatif au transport international des marchandises dangereuses par route (Agreement concerning the International Carriage of Dangerous Goods by Road)
ADR/RID/ADN	Agreements concerning the International Carriage of Dangerous Goods by Road/Rail/Inland Waterways (ADR/RID/ADN)
AGW	Workplace exposure limit
BCF	Bioconcentration factor
CAS	Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)
Ceiling-C	Ceiling value
CLP	Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures
DFG	Deutsche Forschungsgemeinschaft MAK-und BAT-Werte-Liste, Senatskommission zur Prüfung gesundheitsschädlicher Arbeitsstoffe, Wiley-VCH, Weinheim
DGR	Dangerous Goods Regulations (see IATA/DGR)
DNEL	Derived No-Effect Level
EC50	Effective Concentration 50 %. The EC50 corresponds to the concentration of a tested substance causing 50 % changes in response (e.g. on growth) during a specified time interval
EC No	The EC Inventory (EINECS, ELINCS and the NLP-list) is the source for the seven-digit EC number, an identifier of substances commercially available within the EU (European Union)
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances
EmS	Emergency Schedule
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations
IATA	International Air Transport Association
IATA/DGR	Dangerous Goods Regulations (DGR) for the air transport (IATA)
ICAO	International Civil Aviation Organization
ICAO-TI	Technical instructions for the safe transport of dangerous goods by air
IMDG	International Maritime Dangerous Goods Code
IMDG-Code	International Maritime Dangerous Goods Code
index No	The Index number is the identification code given to the substance in Part 3 of Annex VI to Regulation (EC) No 1272/2008
IOELV	Indicative occupational exposure limit value
LC50	Lethal Concentration 50%: the LC50 corresponds to the concentration of a tested substance causing 50 % lethality during a specified time interval
LGK	Lagerklasse (storage class according to TRGS 510, Germany)
NLP	No-Longer Polymer
PBT	Persistent, Bioaccumulative and Toxic
ppm	Parts per million
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals

Abbr.	Descriptions of used abbreviations
RID	Règlement concernant le transport International ferroviaire des marchandises Dangereuses (Regulations concerning the International carriage of Dangerous goods by Rail)
STEL	Short-term exposure limit
SVHC	Substance of Very High Concern
TRGS	Technische Regeln für Gefahrstoffe (technical rules for hazardous substances, Germany)
TRGS 900	Arbeitsplatzgrenzwerte (TRGS 900)
TRGS 903	Biologische Grenzwerte (TRGS 903)
TWA	Time-weighted average
VOC	Volatile Organic Compounds
vPvB	Very Persistent and very Bioaccumulative

Key literature references and sources for data

Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures. Regulation (EC) No. 1907/2006 (REACH), amended by 2020/878/EU.

Transport of dangerous goods by road, rail and inland waterway (ADR/RID/ADN). International Maritime Dangerous Goods Code (IMDG). Dangerous Goods Regulations (DGR) for the air transport (IATA).

List of relevant phrases (code and full text as stated in section 2 and 3)

Code	Text
H225	Highly flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H361d	Suspected of damaging the unborn child.
H373	May cause damage to organs through prolonged or repeated exposure.
H412	Harmful to aquatic life with long lasting effects.

Disclaimer

This information is based upon the present state of our knowledge. This SDS has been compiled and is solely intended for this product.

Annex to the extended Safety Data Sheet (eSDS)

Toluene

ROSNEFT DEUTSCHLAND

Version number: GHS 1.3 | Issue date: 2022-01-12

Exposure Scenario / ES No 1

1 TITLE SECTION

Exposure Scenario name: Use in coatings - Consumer

Sectors of use [SU]

SU21: Consumer uses.

Environmental release categories [ERC]

ERC8a: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor).
ERC8a: Wide dispersive indoor use of processing aids in open systems.
ERC8d: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor).
ERC8d: Wide dispersive outdoor use of processing aids in open systems.

Product categories [PC]

PC1: Adhesives, sealants.
PC4: Anti-freeze and de-icing products.
PC8: Biocidal product.
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 treatment products.
PC24: Lubricants, greases, release products.
PC31: Polishes and wax blends.
PC34: Textile dyes and impregnating products.

2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product characteristics	Medium volatile liquid, Water solubility (g/L): 0,573, Vapour pressure: 4030 Pa, Log KOW: 2,73, Readily biodegradable
Amounts used	
Fraction of EU tonnage used in region:	150E3 t(onnes)/year
Fraction of regional tonnage used locally:	0,002
Regional use tonnage (tons/year):	15E3
Other given operational conditions affecting environmental exposure	Prevent environmental discharge consistent with regulatory requirements
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations

2 Operational conditions and risk management measures

2.2 Control of consumer exposure

Product characteristics

Physical form of product	fluid
Vapour pressure	0.448 PSI at 70 °F
Concentration of substance in preparation/ mixture or article	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	Covers use up to 13800 g, Covers skin contact area up to 857,5 cm²
Frequency and duration of use	Covers use up to 1 times per day, Covers exposure up to 6 h/event
Other given operational conditions affecting consumers exposure	Covers use at ambient temperatures, Covers use in room size of 20 m³, Covers use under typical household ventilation

Contributing Scenarios: Operational conditions and risk management measures

Products Category: PC4: Anti-freeze and de-icing products, Washing car window

Operational conditions - Consumer: Covers concentrations up to 1 %, Covers use up to 365 Days per year, Covers use up to 1 Times per day, Covers use up to 0,5 g, Covers use in a one car garage (34m³) under typical ventilation, Covers use in room size of 34 m³, Covers exposure up to 0,02 h/event
Risk management measures (RMM): No specific risk management measure identified beyond those operational conditions stated.

Products Category: PC4: Anti-freeze and de-icing products, Pouring into radiator

Operational conditions - Consumer: Covers concentrations up to 10 %, Covers use up to 365 Days per year, Covers use up to 1 Times per day, Covers skin contact area up to 428,00 cm², Covers use up to 2000 g, Covers use in a one car garage (34m³) under typical ventilation, Covers use in room size of 34 m³, Covers exposure up to 0,17 h/event
Risk management measures (RMM): No specific measures identified.

Products Category: PC4: Anti-freeze and de-icing products, Lock de-icer

Operational conditions - Consumer: Covers concentrations up to 50 %, Covers use up to 365 Days per year, Covers use up to 1 Times per day, Covers skin contact area up to 214,40 cm², Covers use up to 4 g, Covers use in a one car garage (34m³) under typical ventilation, Covers use in room size of 34 m³, Covers exposure up to 0,25 h/event
Risk management measures (RMM): No specific measures identified.

Products Category: PC8: Biocidal products, Excipient only - Solvents, Laundry and dish washing products

Operational conditions - Consumer: Covers concentrations up to 5 %, Covers use up to 365 Days per year, Covers use up to 1 Times per day, Covers skin contact area up to 857,50 cm², Covers use up to 15 g, Covers use in room size of 20 m³, Covers exposure up to 0,50 h/event
Risk management measures (RMM): No specific measures identified.

Products Category: PC8: Biocidal products, Excipient only - Solvents, Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)

Operational conditions - Consumer: Covers concentrations up to 5 %, Covers use up to 128 Days per year, Covers use up to 1 Times per day, Covers skin contact area up to 857,50 cm², Covers use up to 27 g, Covers use in room size of 20 m³, Covers exposure up to 0,33 h/event
Risk management measures (RMM): No specific risk management measure identified beyond those operational conditions stated.

Products Category: PC8: Biocidal products, Excipient only - Solvents, Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)

Operational conditions - Consumer: Covers concentrations up to 15 %, Covers use up to 128 Days per year, Covers use up to 1 Times per day, Covers skin contact area up to 428,00 cm², Covers use up to 35 g, Covers use in room size of 20 m³, Covers exposure up to 0,17 h/event
Risk management measures (RMM): No specific risk management measure identified beyond those operational conditions stated.

Products Category: PC9a: Coatings and paints, thinners, paint removers, Fillers and putty, Waterborne latex wall paint

Operational conditions - Consumer: Covers concentrations up to 0,8 %, Covers use up to 4 Days per year, Covers use up to 1 Times per day, Covers skin contact area up to 428,75 cm², Covers use up to 2760 g, Covers use in room size of 20 m³, Covers exposure up to 2,20 h/event
Risk management measures (RMM): No specific risk management measure identified beyond those operational conditions stated.

Products Category: PC9a: Coatings and paints, thinners, paint removers, Fillers and putty, Solvent rich, high solid, water borne paint

Operational conditions - Consumer: Covers concentrations up to 2,5 %, Covers use up to 6 Days per year, Covers use up to 1 Times per day, Covers skin contact area up to 428,75 cm², Covers use up to 744 g, Covers use in room size of 20 m³, Covers exposure up to 2,20 h/event
Risk management measures (RMM): No specific risk management measure identified beyond those operational conditions stated.

Products Category: PC9a: Coatings and paints, thinners, paint removers, Fillers and putty, Removers (paint-, glue-, wall paper-, sealant-remover)

Operational conditions - Consumer: Covers concentrations up to 4 %, Covers use up to 3 Days per year, Covers use up to 1 Times per day, Covers skin contact area up to 857,50 cm², Covers use up to 491 g, Covers use in room size of 20 m³, Covers exposure up to 2,00 h/event
Risk management measures (RMM): No specific risk management measure identified beyond those operational conditions stated.

Products Category: PC9b: Fillers, putties, plasters, modelling clay, - Fillers and putty

Operational conditions - Consumer: Covers concentrations up to 2 %, Covers use up to 12 Days per year, Covers use up to 1 Times per day, Covers skin contact area up to 35,73 cm², Covers use up to 85 g, Covers use in room size of 20 m³, Covers exposure up to 2,00 h/event
Risk management measures (RMM): No specific risk management measure identified beyond those operational conditions stated.

Products Category: PC9b: Fillers, putties, plasters, modelling clay, Plasters and floor equalizers

Operational conditions - Consumer: Covers concentrations up to 0,1 %, Covers use up to 12 Days per year, Covers use up to 1 Times per day, Covers skin contact area up to 857,50 cm², Covers use up to 13800 g, Covers use in room size of 20 m³, Covers exposure up to 2,00 h/event
Risk management measures (RMM): No specific risk management measure identified beyond those operational conditions stated.

Products Category: PC9b: Fillers, putties, plasters, modelling clay, - Modelling clay

Operational conditions - Consumer: Covers concentrations up to 1 %, Covers use up to 365 Days per year, Covers use up to 1 Times per day, Covers skin contact area up to 254,40 cm², For each use event, assumes swallowed amount of .? 1 g, Covers use in room size of 20 m³, Covers exposure up to 1,00 h/event
Risk management measures (RMM): No specific risk management measure identified beyond those operational conditions stated.

Products Category: PC9c: Finger paints

Operational conditions - Consumer: Covers concentrations up to 0,1 %, Covers use up to 365 Days per year, Covers use up to 1 Times per day, Covers skin contact area up to 254,40 cm^2, For each use event, assumes swallowed amount of .? 1,35 g, Covers use in room size of 20 m^3, Covers exposure up to 1,00 h/event
Risk management measures (RMM): No specific risk management measure identified beyond those operational conditions stated.

Products Category: PC15: Non-metal surface treatment products, Waterborne latex wall paint

Operational conditions - Consumer: Covers concentrations up to 0,28 %, Covers use up to 4 Days per year, Covers use up to 1 Times per day, Covers skin contact area up to 428,75 cm^2, Covers use up to 2760 g, Covers use in room size of 20 m^3, Covers exposure up to 2,20 h/event
Risk management measures (RMM): No specific risk management measure identified beyond those operational conditions stated.

Products Category: PC15: Non-metal surface treatment products, Solvent rich, high solid, water borne paint

Operational conditions - Consumer: Covers concentrations up to 1 %, Covers use up to 6 Days per year, Covers use up to 1 Times per day, Covers skin contact area up to 428,75 cm^2, Covers use up to 744 g, Covers use in room size of 20 m^3, Covers exposure up to 2,20 h/event
Risk management measures (RMM): No specific risk management measure identified beyond those operational conditions stated.

Products Category: PC15: Non-metal surface treatment products, Aerosol spray can

Operational conditions - Consumer: Covers concentrations up to 4,5 %, Covers use up to 2 Days per year, Covers use up to 1 Times per day, Covers use up to 215 g, Covers use in a one car garage (34m^3) under typical ventilation, Covers use in room size of 34 m^3, Covers exposure up to 0,33 h/event
Risk management measures (RMM): No specific risk management measure identified beyond those operational conditions stated.

Products Category: PC15: Non-metal surface treatment products, Removers (paint-, glue-, wall paper-, sealant-remover)

Operational conditions - Consumer: Covers concentrations up to 1,5 %, Covers use up to 3 Days per year, Covers use up to 1 Times per day, Covers skin contact area up to 857,50 cm^2, Covers use up to 491 g, Covers use in room size of 20 m^3, Covers exposure up to 2,00 h/event
Risk management measures (RMM): No specific risk management measure identified beyond those operational conditions stated.

Products Category: PC18: Ink and toners,

Operational conditions - Consumer: Covers concentrations up to 10 %, Covers use up to 365 Days per year, Covers use up to 1 Times per day, Covers skin contact area up to 71,40 cm^2, Covers use up to 40 g, Covers use in room size of 20 m^3, Covers exposure up to 2,20 h/event
Risk management measures (RMM): No specific risk management measure identified beyond those operational conditions stated.

Products Category: PC23: Leather tanning, dye, finishing, impregnation and care products, Polishes, wax/cream (floor, furniture, shoes)

Operational conditions - Consumer: Covers concentrations up to 11 %, Covers use up to 29 Days per year, Covers use up to 1 Times per day, Covers skin contact area up to 430,00 cm^2, Covers use up to 56 g, Covers use in room size of 20 m^3, Covers exposure up to 1,23 h/event
Risk management measures (RMM): No specific risk management measure identified beyond those operational conditions stated.

Products Category: PC23: Leather tanning, dye, finishing, impregnation and care products, Polishes, spray (furniture, shoes)

Operational conditions - Consumer: Covers concentrations up to 8 %, Covers use up to 8 Days per year, Covers use up to 1 Times per day, Covers skin contact area up to 430,00 cm², Covers use up to 56 g, Covers use in room size of 20 m³, Covers exposure up to 0,33 h/event
Risk management measures (RMM): No specific risk management measure identified beyond those operational conditions stated.

Products Category: PC24: Lubricants, greases, release products, Liquids

Operational conditions - Consumer: Covers concentrations up to 35 %, Covers use up to 4 Days per year, Covers use up to 1 Times per day, Covers skin contact area up to 468,00 cm², Covers use up to 2200 g, Covers use in a one car garage (34m³) under typical ventilation, Covers use in room size of 34 m³, Covers exposure up to 0,17 h/event
Risk management measures (RMM): No specific risk management measure identified beyond those operational conditions stated.

Products Category: PC24: Lubricants, greases, release products, Pastes

Operational conditions - Consumer: Covers concentrations up to 20 %, Covers use up to 10 Days per year, Covers use up to 1 Times per day, Covers skin contact area up to 468,00 cm², Covers use up to 34 g, Covers use in a one car garage (34m³) under typical ventilation, Covers use in room size of 34 m³
Risk management measures (RMM): No specific risk management measure identified beyond those operational conditions stated.

Products Category: PC24: Lubricants, greases, release products, Sprays

Operational conditions - Consumer: Covers concentrations up to 5 %, Covers use up to 6 Days per year, Covers use up to 1 Times per day, Covers skin contact area up to 428,75 cm², Covers use up to 73 g, Covers use in room size of 20 m³, Covers exposure up to 0,17 h/event
Risk management measures (RMM): No specific risk management measure identified beyond those operational conditions stated.

Products Category: PC31: Polishes and wax blends, Polishes, wax/cream (floor, furniture, shoes)

Operational conditions - Consumer: Covers concentrations up to 4,5 %, Covers use up to 29 Days per year, Covers use up to 1 Times per day, Covers skin contact area up to 430,00 cm², Covers use up to 142 g, Covers use in room size of 20 m³, Covers exposure up to 1,23 h/event
Risk management measures (RMM): No specific risk management measure identified beyond those operational conditions stated.

Products Category: PC31: Polishes and wax blends, Polishes, spray (furniture, shoes)

Operational conditions - Consumer: Covers concentrations up to 14 %, Covers use up to 8 Days per year, Covers use up to 1 Times per day, Covers skin contact area up to 430,00 cm², Covers use up to 35 g, Covers use in room size of 20 m³, Covers exposure up to 0,33 h/event
Risk management measures (RMM): No specific risk management measure identified beyond those operational conditions stated.

Products Category: PC34: Textile dyes, finishing and impregnating products, Bleaching agent, Processing aid

Operational conditions - Consumer: Covers concentrations up to 5 %, Covers use up to 365 Days per year, Covers use up to 1 Times per day, Covers skin contact area up to 857,50 cm², Covers use up to 115 g, Covers use in room size of 20 m³, Covers exposure up to 1,00 h/event
Risk management measures (RMM): No specific risk management measure identified beyond those operational conditions stated.

3 Exposure estimation and reference to its source

Exposure assessment (environment)	Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented
Exposure assessment (human)	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

4 Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Health

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Annex to the extended Safety Data Sheet (eSDS)

Toluene

ROSNEFT DEUTSCHLAND

Version number: GHS 1.0 | Issue date: 2022-01-12

Exposure Scenario / ES No 2

1 TITLE SECTION

Exposure Scenario name: Use as a fuel - Consumer

Sectors of use [SU]

SU21: Consumer uses.

Environmental release categories [ERC]

ERC9a: Wide dispersive indoor use of substances in closed systems.
ERC9a: Widespread use of functional fluid (indoor).
ERC9b: Wide dispersive outdoor use of substances in closed systems.
ERC9b: Widespread use of functional fluid (outdoor).

Product categories [PC]

PC13: Fuels.

2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product characteristics	Medium volatile liquid, Water solubility (g/L): 0,573, Vapour pressure: 4030 Pa, Log KOW: 2,73, Readily biodegradable
Amounts used	
Fraction of EU tonnage used in region:	150E3 t(onnes)/year
Fraction of regional tonnage used locally:	0,002
Regional use tonnage (tons/year):	15E3
Other given operational conditions affecting environmental exposure	Soil emission controls are not applicable as there is no direct release to soil
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations

2 Operational conditions and risk management measures

2.2 Control of consumer exposure

Product characteristics	
Physical form of product	fluid
Vapour pressure	0.448 PSI at 70 °F
Concentration of substance in preparation/ mixture or article	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	Covers use up to 37500 g, Covers skin contact area up to 420 cm²
Frequency and duration of use	Covers use up to 0,143 times per day, Covers exposure up to 2 h/event

Other given operational conditions affecting consumers exposure	Covers use at ambient temperatures, Covers use in room size of 20 m³, Covers use under typical household ventilation

Contributing Scenarios: Operational conditions and risk management measures

Products Category: PC13: Fuels liquid: Automotive refuelling

Operational conditions - Consumer: Covers concentrations up to 100 %, Covers use up to 52 Days per year, Covers use up to 1 Times per day, Covers skin contact area up to 210,00 cm², For each use event, covers use amounts up to .? 37500 g, Covers outdoor use, Covers use in room size of 100 m³, Covers exposure up to 0,05 h/event
Risk management measures (RMM): No specific risk management measure identified beyond those operational conditions stated.

Products Category: PC13: Fuels liquid: Liquid Scooter Refuelling

Operational conditions - Consumer: Covers concentrations up to 100 %, Covers use up to 52 Days per year, Covers use up to 1 Times per day, Covers skin contact area up to 210,00 cm², For each use event, covers use amounts up to .? 3750 g, Covers outdoor use, Covers use in room size of 100 m³, Covers exposure up to 0,03 h/event
Risk management measures (RMM): No specific risk management measure identified beyond those operational conditions stated.

Products Category: PC13: Fuels liquid: Liquid, Garden equipment - Use

Operational conditions - Consumer: Covers concentrations up to 100 %, Covers use up to 26 Days per year, Covers use up to 1 Times per day, For each use event, covers use amounts up to .? 750 g, Covers outdoor use, Covers use in room size of 100 m³, Covers exposure up to 2,00 h/event
Risk management measures (RMM): No specific risk management measure identified beyond those operational conditions stated.

Products Category: PC13: Fuels liquid: Liquid: Garden equipment - Refuelling

Operational conditions - Consumer: Covers concentrations up to 100 %, Covers use up to 26 Days per year, Covers use up to 1 Times per day, Covers skin contact area up to 420,00 cm², For each use event, covers use amounts up to .? 750 g, Covers use in a one car garage (34m³) under typical ventilation, Covers use in room size of 34 m³, Covers exposure up to 0,03 h/event
Risk management measures (RMM): No specific risk management measure identified beyond those operational conditions stated.

Products Category: PC13: Fuels liquid: Liquid: Lamp oil

Operational conditions - Consumer: Covers concentrations up to 100 %, Covers use up to 52 Days per year, Covers use up to 1 Times per day, Covers skin contact area up to 210,00 cm², For each use event, covers use amounts up to .? 100 g, Covers use in room size of 20 m³, Covers exposure up to 0,01 h/event
Risk management measures (RMM): No specific risk management measure identified beyond those operational conditions stated.

3 Exposure estimation and reference to its source

Exposure assessment (environment)	Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented
Exposure assessment (human)	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

4 Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Health

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Annex to the extended Safety Data Sheet (eSDS)

Toluene

ROSNEFT DEUTSCHLAND

Version number: GHS 1.2 | Issue date: 2022-01-13

Exposure Scenario / ES No 3

1 TITLE SECTION

Exposure Scenario name: Road and construction applications - Professional

Sectors of use [SU]

SU22: Professional uses.

Process categories [PROC]

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.
PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities.
PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities.
PROC9: Transfer of substance or mixture 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 [ERC]

ERC8d: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor).
ERC8d: Wide dispersive outdoor use of processing aids in open systems.
ERC8f: Widespread use leading to inclusion into/onto article (outdoor).
ERC8f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix.

2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product characteristics	Medium volatile liquid, Water solubility (g/L): 0,573, Vapour pressure: 4030 Pa, Log KOW: 2,73, Readily biodegradable
Amounts used	
Fraction of EU tonnage used in region:	30E3 t(onnes)/year
Fraction of regional tonnage used locally:	2,00E-03
Regional use tonnage (tons/year):	3E3
Frequency and duration of use	
Emission days	365 days per year
Environment factors not influenced by risk management	
Local marine water dilution factor	100
Local freshwater dilution factor	10
Release fraction to air from process (initial release prior to RMM):	0,95
Release fraction to soil from process (initial release prior to RMM):	0,04
Release fraction to wastewater from process (initial release prior to RMM):	0,01

Treat air emission to provide a typical removal efficiency of (%):	>0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):	93,3
Treat air emission to provide a typical removal efficiency of (%):	99,4
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):	76,9
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	0

Organisational measures to prevent/limit release from site:

Do not apply industrial sludge to natural soils.

Conditions and measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via on-site sewage treatment (%):	93,3
Assumed on-site sewage treatment plant flow (m3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations

2 Conditions of use affecting exposure - Workers

2.2 Control of worker exposure

Product characteristics

Physical form of product	fluid
Vapour pressure	0.448 PSI at 70 °F
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other given operational conditions affecting workers exposure	Assumes use at not more than 20 °C above ambient temperature, unless stated differently Assumes a good basic standard of occupational hygiene is implemented

Contributing Scenarios: Operational conditions and risk management measures

Material transfers:	Ensure operation is undertaken outdoors. Avoid carrying out activities involving exposure for more than 4 hours.
Manual Application - Rolling, Brushing:	Ensure operation is undertaken outdoors. Wear a respirator conforming to EN140 with Type A filter or better.

Spraying/fogging by machine application:	Ensure operation is undertaken outdoors. Wear a respirator conforming to EN140 with Type A filter or better.
Dipping, immersion and pouring:	Ensure operation is undertaken outdoors
Drum/batch transfers - Dedicated facility:	Ensure material transfers are under containment or extract ventilation
Equipment cleaning and maintenance:	Provide a good standard of controlled ventilation (10 to 15 air changes per hour). Retain drain downs in sealed storage pending disposal or for subsequent recycle.
Storage:	No other specific measures identified
Storage - With occasional controlled exposure:	No other specific measures identified

3 Exposure estimation and reference to its source

Exposure assessment (environment)	Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented
Exposure assessment (human)	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

4 Guidance to check compliance with the exposure scenario

Environment

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Health

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Annex to the extended Safety Data Sheet (eSDS)

Toluene

ROSNEFT DEUTSCHLAND

Version number: GHS 1.1 | Issue date: 2022-01-14

Exposure Scenario / ES No 4

1 TITLE SECTION

Exposure Scenario name: Use in cleaning agents - Industrial

Sectors of use [SU]

SU3: Industrial uses.
SU10: Formulation [mixing] of preparations and/or re-packaging (excluding alloys).

Process categories [PROC]

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.
PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition.
PROC4: Chemical production where opportunity for exposure arises.
PROC7: Industrial spraying.
PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities.
PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities.
PROC10: Roller application or brushing.
PROC13 Treatment of articles by dipping and pouring.

Environmental release categories [ERC]

ERC4: Use of non-reactive processing aid at industrial site (no inclusion into or onto article).

2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product characteristics	Medium volatile liquid, Water solubility (g/L): 0,573, Vapour pressure: 4030 Pa, Log KOW: 2,73, Readily biodegradable
Amounts used	
Fraction of EU tonnage used in region:	15E3 t(onnes)/year
Fraction of regional tonnage used locally:	1
Regional use tonnage (tons/year):	1,5E3
Frequency and duration of use	
Emission days	300 days per year
Environment factors not influenced by risk management	
Local marine water dilution factor	100
Local freshwater dilution factor	10
Release fraction to air from process (initial release prior to RMM):	0,3
Release fraction to soil from process (initial release prior to RMM):	0
Release fraction to wastewater from process (initial release prior to RMM):	0,00003

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Soil emission controls are not applicable as there is no direct release to soil.

Treat air emission to provide a typical removal efficiency of (%):	>70
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):	Typical onsite wastewater treatment technology provides removal efficiency of (%): 93,3

Organisational measures to prevent/limit release from site:

Do not apply industrial sludge to natural soils.

Conditions and measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via on-site sewage treatment (%):	93,3
Assumed on-site sewage treatment plant flow (m3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations

2 Conditions of use affecting exposure - Workers

2.2 Control of worker exposure

Product characteristics

Physical form of product	fluid
Vapour pressure	0.448 PSI at 70 °F
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other given operational conditions affecting workers exposure	Assumes use at not more than 20 °C above ambient temperature, unless stated differently Assumes a good basic standard of occupational hygiene is implemented

Contributing Scenarios: Operational conditions and risk management measures

General exposures (closed systems):	No specific measures identified
Automated process with (semi) closed systems , Use in contained systems:	No specific measures identified
Automated process with (semi) closed systems , Use in contained systems , Drum/batch transfers:	No specific measures identified
Application of cleaning products in closed systems:	No specific measures identified
Filling / preparation of equipment from drums or containers - Dedicated facility:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)

Use in contained batch processes - Treatment by heating:	Provide extract ventilation to points where emissions occur
Bulk transfers:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Degreasing small objects in cleaning station:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Cleaning with low-pressure washers:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Cleaning with high pressure washers:	Provide a good standard of controlled ventilation (10 to 15 air changes per hour). Avoid carrying out activities involving exposure for more than 1 hour.
Manual Surfaces Cleaning - No spraying:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Equipment cleaning and maintenance:	Drain down system prior to equipment break-in or maintenance
Storage - With occasional controlled exposure:	No specific measures identified

3 Exposure estimation and reference to its source

Exposure assessment (environment)	Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented
Exposure assessment (human)	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

4 Guidance to check compliance with the exposure scenario

Environment

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Health

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Annex to the extended Safety Data Sheet (eSDS)

Toluene

Version number: GHS 1.0 Issue date: 2022-01-19

Exposure Scenario / ES No 5

1 TITLE SECTION

Exposure Scenario name: Use in cleaning agents - Professional

Sectors of use [SU]

SU22: Professional uses.

Process categories [PROC]

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.
PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition.
PROC4: Chemical production where opportunity for exposure arises.
PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities.
PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities.
PROC10: Roller application or brushing.
PROC11: Non industrial spraying.
PROC13 Treatment of articles by dipping and pouring.

Environmental release categories [ERC]

ERC8a: Wide dispersive indoor use of processing aids in open systems.
ERC8d: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor).

2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product characteristics	Medium volatile liquid, Water solubility (g/L): 0,573, Vapour pressure: 4030 Pa, Log KOW: 2,73, Readily biodegradable
Amounts used	
Fraction of EU tonnage used in region:	15E3 t(onnes)/year
Fraction of regional tonnage used locally:	2,00E-03
Regional use tonnage (tons/year):	1,5E3
Frequency and duration of use	
Emission days	365 days per year
Environment factors not influenced by risk management	
Local marine water dilution factor	100
Local freshwater dilution factor	10
Release fraction to air from process (initial release prior to RMM):	0,2
Release fraction to soil from process (initial release prior to RMM):	0
Release fraction to wastewater from process (initial release prior to RMM):	0,000001

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Soil emission controls are not applicable as there is no direct release to soil.

Treat air emission to provide a typical removal efficiency of (%):	>0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):	93,3

Organisational measures to prevent/limit release from site:

Do not apply industrial sludge to natural soils.

Conditions and measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via on-site sewage treatment (%):	93,3
Assumed on-site sewage treatment plant flow (m3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations

2 Conditions of use affecting exposure - Workers

2.2 Control of worker exposure

Product characteristics

Physical form of product	fluid
Vapour pressure	0.448 PSI at 70 °F
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other given operational conditions affecting workers exposure	Assumes use at not more than 20 °C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented. Users are advised to consider national Occupational Exposure Limits or other equivalent values.

Contributing Scenarios: Operational conditions and risk management measures

Semi-automated process (e.g.: Semi-automatic application of floor care and maintenance products):	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Automated process with (semi) closed systems , Use in contained systems:	No specific measures identified
Automated process with (semi) closed systems , Use in contained systems , Drum/batch transfers:	No specific measures identified
Filling / preparation of equipment from drums or containers - Outdoor:	Ensure operation is undertaken outdoors. Avoid carrying out operation for more than 4 hours.

Filling / preparation of equipment from drums or containers - Dedicated facility:	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)
Manual Cleaning Surfaces - Dipping, immersion and pouring:	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)
Cleaning with low-pressure washers, Rolling, Brushing - No spraying:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Wear a respirator conforming to EN140 with Type A filter or better.
Cleaning with high pressure washers, Spraying - Indoor:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) Wear a respirator conforming to EN140 with Type A filter or better
Cleaning with high pressure washers, Spraying - Outdoor:	Ensure operation is undertaken outdoors. Wear a respirator conforming to EN140 with Type A filter or better.
Manual Surfaces Cleaning - Spraying:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan Wear a respirator conforming to EN140 with Type A filter or better
Ad hoc manual application via trigger sprays, dipping, etc - Rolling, Brushing:	Provide extract ventilation to points where emissions occur. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Wear a respirator conforming to EN140 with Type A filter or better.
Application of cleaning products in closed systems - Outdoor:	Ensure operation is undertaken outdoors
Cleaning of medical devices:	Provide extract ventilation to points where emissions occur
Equipment cleaning and maintenance:	Drain down system prior to equipment break-in or maintenance
Storage - With occasional controlled exposure:	No specific measures identified

3 Exposure estimation and reference to its source

Exposure assessment (environment)	Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented
Exposure assessment (human)	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

4 Guidance to check compliance with the exposure scenario

Environment

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Health

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Annex to the extended Safety Data Sheet (eSDS)

Toluene

Exposure Scenario / ES No 6

1 TITLE SECTION

Exposure Scenario name: Uses in coatings - Industrial

Sectors of use [SU]

SU3: Industrial uses.
SU10: Formulation [mixing] of preparations and/or re-packaging (excluding alloys).

Process categories [PROC]

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.
PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition.
PROC4: Chemical production where opportunity for exposure arises.
PROC5: Mixing or blending in batch processes.
PROC7: Industrial spraying.
PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities.
PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities.
PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing).
PROC10: Roller application or brushing.
PROC13 Treatment of articles by dipping and pouring.
PROC14: Tabletting, compression, extrusion, pelletisation, granulation.
PROC15: Use as laboratory reagent.

Environmental release categories [ERC]

ERC4: Use of non-reactive processing aid at industrial site (no inclusion into or onto article).

2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product characteristics	Medium volatile liquid, Water solubility (g/L): 0,573, Vapour pressure: 4030 Pa, Log KOW: 2,73, Readily biodegradable

Amounts used

Fraction of EU tonnage used in region:	150E3 t(onnes)/year
Fraction of regional tonnage used locally:	1
Regional use tonnage (tons/year):	4,5E3

Frequency and duration of use

Emission days	300 days per year

Environment factors not influenced by risk management

Local marine water dilution factor	100
Local freshwater dilution factor	10

Release fraction to air from process (initial release prior to RMM):	0,98
Release fraction to soil from process (initial release prior to RMM):	0
Release fraction to wastewater from process (initial release prior to RMM):	0,007

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Soil emission controls are not applicable as there is no direct release to soil.

Treat air emission to provide a typical removal efficiency of (%):	>90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):	Typical onsite wastewater treatment technology provides removal efficiency of (%): 93,3

Organisational measures to prevent/limit release from site:

Do not apply industrial sludge to natural soils.

Conditions and measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via on-site sewage treatment (%):	93,3
Assumed on-site sewage treatment plant flow (m3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations

2 Conditions of use affecting exposure - Workers

2.2 Control of worker exposure

Product characteristics

Physical form of product	fluid
Vapour pressure	0.448 PSI at 70 °F
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other given operational conditions affecting workers exposure	Assumes use at not more than 20 °C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented. Users are advised to consider national Occupational Exposure Limits or other equivalent values.

Contributing Scenarios: Operational conditions and risk management measures

General exposures (closed systems):	No specific measures identified
General exposures (closed systems) - with sample collection, Use in contained systems:	No other specific measures identified

Film formation - force drying (50-100°C). Stoving (>100°C). UV/EB radiation curing:	No specific measures identified
Film formation - air drying:	No specific measures identified
Preparation of material for application , Mixing operations (open systems):	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Spraying (automatic/robotic):	Carry out in a vented booth or extracted enclosure
Manual Spraying:	Carry out in a vented booth or extracted enclosure. Provide a good standard of controlled ventilation (10 to 15 air changes per hour). Wear a respirator conforming to EN140 with Type A filter or better.
Material transfers - Non-dedicated facility:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Material transfers - Dedicated facility:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Mixing operations - Closed systems, General exposures (closed systems):	No specific measures identified
Roller, spreader, flow application:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Dipping, immersion and pouring:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Laboratory activities:	No specific measures identified
Material transfers, Drum/batch transfers , Transfer from/pouring from containers:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Production of preparations or articles by tabletting, compression, extrusion, pelletisation:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Equipment cleaning and maintenance:	Drain down system prior to equipment break-in or maintenance
Storage - With occasional controlled exposure:	No specific measures identified

3 Exposure estimation and reference to its source

Exposure assessment (environment)	Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented
Exposure assessment (human)	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

4 Guidance to check compliance with the exposure scenario

Environment

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Health

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Annex to the extended Safety Data Sheet (eSDS)

Toluene

ROSNEFT DEUTSCHLAND

Version number: GHS 1.0 | Issue date: 2022-01-19

Exposure Scenario / ES No 7

1 TITLE SECTION

Exposure Scenario name: Uses in coatings - Professional

Sectors of use [SU]

SU22: Professional uses.

Process categories [PROC]

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.
PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition.
PROC4: Chemical production where opportunity for exposure arises.
PROC5: Mixing or blending in batch processes.
PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities.
PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities.
PROC10: Roller application or brushing.
PROC11: Non industrial spraying.
PROC13 Treatment of articles by dipping and pouring.
PROC15: Use as laboratory reagent.
PROC19: Manual activities involving hand contact.

Environmental release categories [ERC]

ERC8a: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor).
ERC8a: Wide dispersive indoor use of processing aids in open systems.
ERC8d: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor).
ERC8d: Wide dispersive outdoor use of processing aids in open systems.

2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product characteristics	Medium volatile liquid, Water solubility (g/L): 0,573, Vapour pressure: 4030 Pa, Log KOW: 2,73, Readily biodegradable

Amounts used

Fraction of EU tonnage used in region:	150E3 t(onnes)/year
Fraction of regional tonnage used locally:	2,00E-03
Regional use tonnage (tons/year):	15E3

Frequency and duration of use

Emission days	365 days per year

Environment factors not influenced by risk management

Local marine water dilution factor	100
Local freshwater dilution factor	10

Release fraction to air from process (initial release prior to RMM):	0,98
Release fraction to soil from process (initial release prior to RMM):	0,01
Release fraction to wastewater from process (initial release prior to RMM):	0,01
Treat air emission to provide a typical removal efficiency of (%):	>0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):	93,3

Organisational measures to prevent/limit release from site:

Do not apply industrial sludge to natural soils.

Conditions and measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via on-site sewage treatment (%):	93,3
Assumed on-site sewage treatment plant flow (m3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations

2 Conditions of use affecting exposure - Workers

2.2 Control of worker exposure

Product characteristics

Physical form of product	fluid
Vapour pressure	0.448 PSI at 70 °F
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other given operational conditions affecting workers exposure	Assumes use at not more than 20 °C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented. Users are advised to consider national Occupational Exposure Limits or other equivalent values.

Contributing Scenarios: Operational conditions and risk management measures

General exposures (closed systems):	No specific measures identified
General exposures (closed systems) - Use in contained systems:	No specific measures identified
Film formation - air drying - Outdoor:	Ensure operation is undertaken outdoors
Film formation - air drying - Indoor:	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)

Preparation of material for application - Indoor:	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)
Preparation of material for application - Outdoor:	Ensure operation is undertaken outdoors. Avoid carrying out operation for more than 4 hours.
Preparation of material for application:	No specific measures identified
Manual Spraying - Outdoor:	Ensure operation is undertaken outdoors. Wear a respirator conforming to EN140 with Type A filter or better.
Manual Spraying - Indoor:	Carry out in a vented booth or extracted enclosure.
Material transfers - Drum/batch transfers:	Use drum pumps or carefully pour from container. Use container to collect drips.
Roller, spreader, flow application - Outdoor:	Ensure operation is undertaken outdoors. Wear a respirator conforming to EN140 with Type A filter or better.
Filling / preparation of equipment from drums or containers:	No specific measures identified
Dipping, immersion and pouring - Outdoor:	Ensure operation is undertaken outdoors. Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (type EN374) if regular skin contact likely.
Roller, spreader, flow application - Indoor:	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)
Dipping, immersion and pouring - Indoor:	Provide extract ventilation to points where emissions occur
Hand application - finger paints, pastels, adhesives - Outdoor:	Ensure operation is undertaken outdoors. Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (type EN374) if regular skin contact likely.
Laboratory activities:	No specific measures identified
Hand application - finger paints, pastels, adhesives - Indoor:	Provide a good standard of controlled ventilation (10 to 15 air changes per hour). Ensure doors and windows are opened.
Equipment cleaning and maintenance:	Drain down system prior to equipment break-in or maintenance
Storage - With occasional controlled exposure:	No specific measures identified

3 Exposure estimation and reference to its source

Exposure assessment (environment)	Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented
Exposure assessment (human)	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

4 Guidance to check compliance with the exposure scenario

Environment

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Health

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Annex to the extended Safety Data Sheet (eSDS)

Toluene

ROSNEFT DEUTSCHLAND

Version number: GHS 1.0 | Issue date: 2022-01-19

Exposure Scenario / ES No 8

1 TITLE SECTION

Exposure Scenario name: Use in oil and gas field drilling and production operations - Industrial

Sectors of use [SU]

SU3: Industrial uses.
SU10: Formulation [mixing] of preparations and/or re-packaging (excluding alloys).

Process categories [PROC]

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.
PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition.
PROC4: Chemical production where opportunity for exposure arises.
PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities.
PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities.

Environmental release categories [ERC]

ERC4: Use of non-reactive processing aid at industrial site (no inclusion into or onto article).

2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product characteristics	Medium volatile liquid, Water solubility (g/L): 0,573, Vapour pressure: 4030 Pa, Log KOW: 2,73, Readily biodegradable
Amounts used	
Fraction of EU tonnage used in region:	30E3 t(onnes)/year
Fraction of regional tonnage used locally:	1
Regional use tonnage (tons/year):	3E3
Frequency and duration of use	
Emission days	not applicable
Environment factors not influenced by risk management	
Local marine water dilution factor	not applicable
Local freshwater dilution factor	not applicable
Release fraction to air from process (initial release prior to RMM):	not applicable
Release fraction to soil from process (initial release prior to RMM):	not applicable
Release fraction to wastewater from process (initial release prior to RMM):	not applicable

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Discharge to aquatic environment is restricted by law and industry prohibits release.

Organisational measures to prevent/limit release from site:

Prevent environmental discharge consistent with regulatory requirements.

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

2 Conditions of use affecting exposure - Workers

2.2 Control of worker exposure

Product characteristics

Physical form of product	fluid
Vapour pressure	0.448 PSI at 70 °F
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other given operational conditions affecting workers exposure	Assumes use at not more than 20 °C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented. Users are advised to consider national Occupational Exposure Limits or other equivalent values.

Contributing Scenarios: Operational conditions and risk management measures

General exposures (closed systems):	No specific measures identified
General exposures (open systems):	Ensure operation is undertaken outdoors
Process sampling:	No specific measures identified
Filling / preparation of equipment from drums or containers:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Drill floor operations:	Ensure operation is undertaken outdoors. No other specific measures identified.
Operation of solids filtering equipment - aerosol exposures:	Ensure material transfers are under containment or extract ventilation
Operation of solids filtering equipment:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Operation of solids filtering equipment - vapour exposures:	Ensure material transfers are under containment or extract ventilation

Bulk transfers:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Operate activity away from sources of substance emission or release. Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (type EN374) if regular skin contact likely.
Treatment and disposal of filtered solids:	No specific measures identified
Pouring from small containers:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Wear suitable gloves tested to EN374.
Equipment cleaning and maintenance:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Wear suitable gloves tested to EN374.
Batch process:	No specific measures identified
Batch process - With occasional controlled exposure:	Provide extract ventilation to points where emissions occur

3 Exposure estimation and reference to its source

Exposure assessment (environment)	Quantitative exposure and risk assessment not possible due to lack of emissions to aquatic environment. Qualitative approach used to conclude safe use.
Exposure assessment (human)	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

4 Guidance to check compliance with the exposure scenario

Environment

Discharge to aquatic environment is restricted by law and industry prohibits release.

Health

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Exposure Scenario / ES No 9

1 TITLE SECTION

Exposure Scenario name: Use as binders and release agents - Professional

Sectors of use [SU]

SU22: Professional uses.

Process categories [PROC]

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.
PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition.
PROC4: Chemical production where opportunity for exposure arises.
PROC6: Calendering operations.
PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities.
PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities.
PROC10: Roller application or brushing.
PROC11: Non industrial spraying.
PROC14: Tabletting, compression, extrusion, pelletisation, granulation.

Environmental release categories [ERC]

ERC8a: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor).
ERC8a: Wide dispersive indoor use of processing aids in open systems.
ERC8d: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor).
ERC8d: Wide dispersive outdoor use of processing aids in open systems.

2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product characteristics	Medium volatile liquid, Water solubility (g/L): 0,573, Vapour pressure: 4030 Pa, Log KOW: 2,73, Readily biodegradable

Amounts used

Fraction of EU tonnage used in region:	15E3 t(onnes)/year
Fraction of regional tonnage used locally:	2,00E-03
Regional use tonnage (tons/year):	1,5E3

Frequency and duration of use

Emission days	365 days per year

Environment factors not influenced by risk management

Local marine water dilution factor	100
Local freshwater dilution factor	10

Release fraction to air from process (initial release prior to RMM):	0,95
Release fraction to soil from process (initial release prior to RMM):	0,025
Release fraction to wastewater from process (initial release prior to RMM):	0,025
Treat air emission to provide a typical removal efficiency of (%):	>0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):	93,3

Organisational measures to prevent/limit release from site:

Not applicable.

Conditions and measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via on-site sewage treatment (%):	93,3
Assumed on-site sewage treatment plant flow (m3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations

2 Conditions of use affecting exposure - Workers

2.2 Control of worker exposure

Product characteristics

Physical form of product	fluid
Vapour pressure	0.448 PSI at 70 °F
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other given operational conditions affecting workers exposure	Assumes use at not more than 20 °C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented. Users are advised to consider national Occupational Exposure Limits or other equivalent values.

Contributing Scenarios: Operational conditions and risk management measures

Drum/batch transfers:	Transfer materials directly to mixing vessels
Material transfers - Closed systems:	No specific measures identified
Material transfers - Closed systems - With occasional controlled exposure:	No specific measures identified
Material transfers - Closed systems - Batch process:	No specific measures identified

Mixing operations - Closed systems:	No specific measures identified
Mixing operations - Open systems,	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Article formation in mould:	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)
Casting operations - Open systems:	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)
Manual Application - Rolling, Brushing:	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)
Spraying - Manual:	Carry out in a vented booth or extracted enclosure. Provide a good standard of controlled ventilation (10 to 15 air changes per hour).
Spraying - Manual:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Wear a respirator conforming to EN140 with Type A filter or better.
Storage:	No specific measures identified
Storage - With occasional controlled exposure:	No specific measures identified

3 Exposure estimation and reference to its source

Exposure assessment (environment)	Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented
Exposure assessment (human)	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

4 Guidance to check compliance with the exposure scenario

Environment

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Health

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Exposure Scenario / ES No 10

1 TITLE SECTION

Exposure Scenario name: Use as laboratory reagent - Industrial

Sectors of use [SU]

SU3: Industrial uses.
SU10: Formulation [mixing] of preparations and/or re-packaging (excluding alloys).

Process categories [PROC]

PROC10: Roller application or brushing.
PROC15: Use as laboratory reagent.

Environmental release categories [ERC]

ERC2: Formulation into mixture.
ERC4: Use of non-reactive processing aid at industrial site (no inclusion into or onto article).

2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product characteristics	Medium volatile liquid, Water solubility (g/L): 0,573, Vapour pressure: 4030 Pa, Log KOW: 2,73, Readily biodegradable

Amounts used

Fraction of EU tonnage used in region:	15E3 t(onnes)/year
Fraction of regional tonnage used locally:	1
Regional use tonnage (tons/year):	1,5E3

Frequency and duration of use

Emission days	300 days per year

Environment factors not influenced by risk management

Local marine water dilution factor	100
Local freshwater dilution factor	10
Release fraction to air from process (initial release prior to RMM):	0,025
Release fraction to soil from process (initial release prior to RMM):	0,0001
Release fraction to wastewater from process (initial release prior to RMM):	0,02
Treat air emission to provide a typical removal efficiency of (%):	>0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):	93,3

Organisational measures to prevent/limit release from site:

Do not apply industrial sludge to natural soils.

Conditions and measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via on-site sewage treatment (%):	93,3
Assumed on-site sewage treatment plant flow (m3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations

2 Conditions of use affecting exposure - Workers

2.2 Control of worker exposure

Product characteristics

Physical form of product	fluid
Vapour pressure	0.448 PSI at 70 °F
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other given operational conditions affecting workers exposure	Assumes use at not more than 20 °C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented. Users are advised to consider national Occupational Exposure Limits or other equivalent values.

Contributing Scenarios: Operational conditions and risk management measures

Laboratory activities , Small scale, Use of small quantities within laboratory settings, including material transfers and equipment cleaning:	Handle in a fume cupboard or under extract ventilation. Avoid carrying out activities involving exposure for more than 4 hours per day.
Cleaning, Rolling, Brushing, Vessel and container cleaning, Application equipment cleaning - General ventilation 15 min- 1 h/day:	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).

3 Exposure estimation and reference to its source

Exposure assessment (environment)	Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented
Exposure assessment (human)	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

4 Guidance to check compliance with the exposure scenario

Environment

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Health

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Annex to the extended Safety Data Sheet (eSDS)

Toluene

Exposure Scenario / ES No 11

1 TITLE SECTION

Exposure Scenario name: Use as laboratory reagent - Professional

Sectors of use [SU]

SU22: Professional uses.

Process categories [PROC]

PROC10: Roller application or brushing.
PROC15: Use as laboratory reagent.

Environmental release categories [ERC]

ERC8a: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor).
ERC8a: Wide dispersive indoor use of processing aids in open systems.

2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product characteristics	Medium volatile liquid, Water solubility (g/L): 0,573, Vapour pressure: 4030 Pa, Log KOW: 2,73, Readily biodegradable

Amounts used

Fraction of EU tonnage used in region:	15E3 t(onnes)/year
Fraction of regional tonnage used locally:	2,00E-03
Regional use tonnage (tons/year):	1,5E3

Frequency and duration of use

Emission days	365 days per year

Environment factors not influenced by risk management

Local marine water dilution factor	100
Local freshwater dilution factor	10
Release fraction to air from process (initial release prior to RMM):	0,5
Release fraction to soil from process (initial release prior to RMM):	0
Release fraction to wastewater from process (initial release prior to RMM):	0,5

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Soil emission controls are not applicable as there is no direct release to soil.

Treat air emission to provide a typical removal efficiency of (%):	>0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):	93,3

Organisational measures to prevent/limit release from site:

Do not apply industrial sludge to natural soils.

Conditions and measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via on-site sewage treatment (%):	93,3
Assumed on-site sewage treatment plant flow (m3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations

2 Conditions of use affecting exposure - Workers

2.2 Control of worker exposure

Product characteristics

Physical form of product	fluid
Vapour pressure	0.448 PSI at 70 °F
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other given operational conditions affecting workers exposure	Assumes use at not more than 20 °C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented. Users are advised to consider national Occupational Exposure Limits or other equivalent values.

Contributing Scenarios: Operational conditions and risk management measures

Laboratory activities , Small scale, Use of small quantities within laboratory settings, including material transfers and equipment cleaning:	Handle in a fume cupboard or under extract ventilation. Avoid carrying out activities involving exposure for more than 4 hours per day.
Cleaning, Rolling, Brushing, Vessel and container cleaning, Application equipment cleaning - General ventilation 15 min- 1 h/day:	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).

3 Exposure estimation and reference to its source

Exposure assessment (environment)	Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented
Exposure assessment (human)	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

4 Guidance to check compliance with the exposure scenario

Environment

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Health

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Exposure Scenario / ES No 12

1 TITLE SECTION

Exposure Scenario name: Functional fluids - Industrial

Sectors of use [SU]

SU3: Industrial uses.
SU8: Manufacture of bulk, large scale chemicals (including petroleum products).
SU9: Manufacture of fine chemicals.

Process categories [PROC]

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.
PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition.
PROC4: Chemical production where opportunity for exposure arises.
PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities.
PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities.
PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing).

Environmental release categories [ERC]

ERC7: Use of functional fluid at industrial site.

2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product characteristics	Medium volatile liquid, Water solubility (g/L): 0,573, Vapour pressure: 4030 Pa, Log KOW: 2,73, Readily biodegradable
Amounts used	
Fraction of EU tonnage used in region:	15E3 t(onnes)/year
Fraction of regional tonnage used locally:	1
Regional use tonnage (tons/year):	1,5E3
Frequency and duration of use	
Emission days	300 days per year
Environment factors not influenced by risk management	
Local marine water dilution factor	100
Local freshwater dilution factor	10
Release fraction to air from process (initial release prior to RMM):	0,01
Release fraction to soil from process (initial release prior to RMM):	0,01
Release fraction to wastewater from process (initial release prior to RMM):	0,0003

Treat air emission to provide a typical removal efficiency of (%):	>0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):	Typical onsite wastewater treatment technology provides removal efficiency of (%): 93,3

Organisational measures to prevent/limit release from site:

Do not apply industrial sludge to natural soils.

Conditions and measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via on-site sewage treatment (%):	93,3
Assumed on-site sewage treatment plant flow (m3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations

2 Conditions of use affecting exposure - Workers

2.2 Control of worker exposure

Product characteristics

Physical form of product	fluid
Vapour pressure	0.448 PSI at 70 °F
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other given operational conditions affecting workers exposure	Assumes use at not more than 20 °C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented. Users are advised to consider national Occupational Exposure Limits or other equivalent values.

Contributing Scenarios: Operational conditions and risk management measures

General exposures (closed systems):	No specific measures identified
General exposures (open systems):	No specific measures identified
Remanufacture of reject articles:	Drain or remove substance from equipment prior to break-in or maintenance
Drum/batch transfers - Dedicated facility:	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings
Pelletising - Closed systems:	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings

Filling / preparation of equipment from drums or containers:	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings
Bulk transfers:	No specific measures identified
Bulk transfers - With occasional controlled exposure:	No specific measures identified
Bulk transfers - Batch process:	No specific measures identified
Equipment maintenance:	Drain down system prior to equipment break-in or maintenance
Storage:	No specific measures identified
Storage - With occasional controlled exposure:	No specific measures identified

3 Exposure estimation and reference to its source

Exposure assessment (environment)	Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented
Exposure assessment (human)	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

4 Guidance to check compliance with the exposure scenario

Environment

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Health

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Annex to the extended Safety Data Sheet (eSDS)

Toluene

ROSNEFT DEUTSCHLAND

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Exposure Scenario / ES No 13

1 TITLE SECTION

Exposure Scenario name: Functional fluids - Professional

Sectors of use [SU]

SU22: Professional uses.

Process categories [PROC]

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.
PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition.
PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities.
PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing).
PROC20: Use of functional fluids in small devices.

Environmental release categories [ERC]

ERC9a: Wide dispersive indoor use of substances in closed systems.
ERC9a: Widespread use of functional fluid (indoor).
ERC9b: Wide dispersive outdoor use of substances in closed systems.
ERC9b: Widespread use of functional fluid (outdoor).

2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product characteristics	Medium volatile liquid, Water solubility (g/L): 0,573, Vapour pressure: 4030 Pa, Log KOW: 2,73, Readily biodegradable
Amounts used	
Fraction of EU tonnage used in region:	15E3 t(onnes)/year
Fraction of regional tonnage used locally:	2,00E-03
Regional use tonnage (tons/year):	1,5E3
Frequency and duration of use	
Emission days	365 days per year
Environment factors not influenced by risk management	
Local marine water dilution factor	100
Local freshwater dilution factor	10
Release fraction to air from process (initial release prior to RMM):	0,05
Release fraction to soil from process (initial release prior to RMM):	0,025
Release fraction to wastewater from process (initial release prior to RMM):	0,025

Treat air emission to provide a typical removal efficiency of (%):	>0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):	93,3

Organisational measures to prevent/limit release from site:

Do not apply industrial sludge to natural soils.

Conditions and measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via on-site sewage treatment (%):	93,3
Assumed on-site sewage treatment plant flow (m3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations

2 Conditions of use affecting exposure - Workers

2.2 Control of worker exposure

Product characteristics

Physical form of product	fluid
Vapour pressure	0.448 PSI at 70 °F
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other given operational conditions affecting workers exposure	Assumes use at not more than 20 °C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.

Contributing Scenarios: Operational conditions and risk management measures

General exposures (closed systems):	No specific measures identified
General exposures (closed systems) - With occasional controlled exposure:	No specific measures identified
General exposures (open systems) - Elevated temperature 80 °C:	Handle substance within a predominantly closed system provided with extract ventilation
Remanufacture of reject articles:	Drain down system prior to equipment break-in or maintenance
Filling / preparation of equipment from drums or containers:	Use drum pumps or carefully pour from container
Transfer from/pouring from containers:	Use drum pumps or carefully pour from container
Use in contained batch processes:	No specific measures identified

Drum/batch transfers - Non-dedicated facility:	Use drum pumps or carefully pour from container
Equipment maintenance - Non-dedicated facility:	Drain down system prior to equipment break-in or maintenance
Storage - With occasional controlled exposure:	No specific measures identified

3 Exposure estimation and reference to its source

Exposure assessment (environment)	Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented
Exposure assessment (human)	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

4 Guidance to check compliance with the exposure scenario

Environment

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Health

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Annex to the extended Safety Data Sheet (eSDS)

Toluene

Exposure Scenario / ES No 14

1 TITLE SECTION

Exposure Scenario name: Rubber production and processing - Industrial

Sectors of use [SU]

SU3: Industrial uses.
SU10: Formulation [mixing] of preparations and/or re-packaging (excluding alloys).

Process categories [PROC]

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.
PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition.
PROC4: Chemical production where opportunity for exposure arises.
PROC5: Mixing or blending in batch processes.
PROC6: Calendering operations.
PROC7: Industrial spraying.
PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities.
PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities.
PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing).
PROC13 Treatment of articles by dipping and pouring.
PROC14: Tabletting, compression, extrusion, pelletisation, granulation.
PROC15: Use as laboratory reagent.
PROC21: Low energy manipulation of substances bound in materials and/or articles.

Environmental release categories [ERC]

ERC1: Manufacture of the substance.
ERC4: Use of non-reactive processing aid at industrial site (no inclusion into or onto article).
ERC6d Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article).

2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product characteristics	Medium volatile liquid, Water solubility (g/L): 0,573, Vapour pressure: 4030 Pa, Log KOW: 2,73, Readily biodegradable

Amounts used

Fraction of EU tonnage used in region:	60E3 t(onnes)/year
Fraction of regional tonnage used locally:	1
Regional use tonnage (tons/year):	6E3

Frequency and duration of use

Emission days	300 days per year

Environment factors not influenced by risk management

Local marine water dilution factor	100
Local freshwater dilution factor	10

Release fraction to air from process (initial release prior to RMM):	0,01
Release fraction to soil from process (initial release prior to RMM):	0,0001
Release fraction to wastewater from process (initial release prior to RMM):	0,003
Treat air emission to provide a typical removal efficiency of (%):	>0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):	93,3

Organisational measures to prevent/limit release from site:

Do not apply industrial sludge to natural soils.

Conditions and measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via on-site sewage treatment (%):	93,3
Assumed on-site sewage treatment plant flow (m3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations

2 Conditions of use affecting exposure - Workers

2.2 Control of worker exposure

Product characteristics

Physical form of product	fluid
Vapour pressure	0.448 PSI at 70 °F
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other given operational conditions affecting workers exposure	Assumes use at not more than 20 °C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.

Contributing Scenarios: Operational conditions and risk management measures

Material transfers - Batch process:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Material transfers - With occasional controlled exposure:	No specific measures identified
Material transfers - Dedicated facility:	No specific measures identified
Material transfers:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)

Rework of articles:	No specific measures identified
Bulk weighing:	No specific measures identified
Bulk weighing - With occasional controlled exposure:	No specific measures identified
Small scale weighing:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Additive premixing:	No specific measures identified.
Additive premixing - Dedicated facility:	No specific measures identified
Additive premixing:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Calendering (including Banburys):	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Pressing uncured rubber blanks:	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).
Vulcanisation:	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).
Cooling cured articles:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Laboratory activities:	No specific measures identified
Spraying:	Provide extract ventilation to points where emissions occur
Dipping, immersion and pouring:	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).
Equipment maintenance:	Drain or remove substance from equipment prior to break-in or maintenance

3 Exposure estimation and reference to its source

Exposure assessment (environment)	Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented
Exposure assessment (human)	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

4 Guidance to check compliance with the exposure scenario

Environment

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Health

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Annex to the extended Safety Data Sheet (eSDS)

Toluene

Exposure Scenario / ES No 15

1 TITLE SECTION

Exposure Scenario name: Use as binders and release agents - Industrial

Sectors of use [SU]

SU3: Industrial uses.
SU8: Manufacture of bulk, large scale chemicals (including petroleum products).
SU9: Manufacture of fine chemicals.

Process categories [PROC]

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.
PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition.
PROC4: Chemical production where opportunity for exposure arises.
PROC6: Calendering operations.
PROC7: Industrial spraying.
PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities.
PROC10: Roller application or brushing.
PROC13 Treatment of articles by dipping and pouring.
PROC14: Tabletting, compression, extrusion, pelletisation, granulation.

Environmental release categories [ERC]

ERC4: Use of non-reactive processing aid at industrial site (no inclusion into or onto article).

2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product characteristics	Medium volatile liquid, Water solubility (g/L): 0,573, Vapour pressure: 4030 Pa, Log KOW: 2,73, Readily biodegradable
Amounts used	
Fraction of EU tonnage used in region:	15E3 t(onnes)/year
Regional use tonnage (tons/year):	1,5E3
Frequency and duration of use	
Emission days	300 days per year
Environment factors not influenced by risk management	
Local marine water dilution factor	100
Local freshwater dilution factor	10
Release fraction to air from process (initial release prior to RMM):	1
Release fraction to soil from process (initial release prior to RMM):	0
Release fraction to wastewater from process (initial release prior to RMM):	0,00003

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Soil emission controls are not applicable as there is no direct release to soil.

Treat air emission to provide a typical removal efficiency of (%):	>80
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):	93,3

Organisational measures to prevent/limit release from site:

Do not apply industrial sludge to natural soils.

Conditions and measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via on-site sewage treatment (%):	93,3
Assumed on-site sewage treatment plant flow (m3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations

2 Conditions of use affecting exposure - Workers

2.2 Control of worker exposure

Product characteristics

Physical form of product	fluid
Vapour pressure	0.448 PSI at 70 °F
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other given operational conditions affecting workers exposure	Assumes use at not more than 20 °C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented. Users are advised to consider national Occupational Exposure Limits or other equivalent values.

Contributing Scenarios: Operational conditions and risk management measures

Drum/batch transfers:	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).
Material transfers:	No specific measures identified
Material transfers - Closed systems - With occasional controlled exposure:	No specific measures identified
Material transfers - Closed systems - Batch process:	No specific measures identified
Mixing operations - Closed systems:	No specific measures identified

Mixing operations - Open systems,	No specific measures identified
Article formation in mould:	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)
Casting operations:	Provide extract ventilation to points where emissions occur
Manual Application - Rolling, Brushing:	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)
Spraying - Machine:	Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings
Storage - With occasional controlled exposure:	No specific measures identified

3 Exposure estimation and reference to its source

Exposure assessment (environment)	Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented
Exposure assessment (human)	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

4 Guidance to check compliance with the exposure scenario

Environment

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Health

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Exposure Scenario / ES No 16

1 TITLE SECTION

Exposure Scenario name: Distribution of substance

Sectors of use [SU]

SU3: Industrial uses.
SU8: Manufacture of bulk, large scale chemicals (including petroleum products).
SU9: Manufacture of fine chemicals.

Process categories [PROC]

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.
PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition.
PROC4: Chemical production where opportunity for exposure arises.
PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities.
PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities.
PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing).
PROC15: Use as laboratory reagent.

Environmental release categories [ERC]

ERC1: Manufacture of the substance.
ERC2: Formulation into mixture.
ERC3: Formulation into solid matrix.
ERC3: Formulation in materials.
ERC4: Use of non-reactive processing aid at industrial site (no inclusion into or onto article).
ERC5: Industrial use resulting in inclusion into or onto a matrix.
ERC5: Use at industrial site leading to inclusion into/onto article.
ERC6a: Use of intermediate.
ERC6b: Use of reactive processing aid at industrial site (no inclusion into or onto article).
ERC6b: Industrial use of reactive processing aids.
ERC6c: Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article).
ERC6d Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article).
ERC7: Use of functional fluid at industrial site.
ERC7: Industrial use of substances in closed systems.

2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product characteristics Medium volatile liquid, Water solubility (g/L): 0,573, Vapour pressure: 4030 Pa, Log KOW: 2,73, Readily biodegradable

Amounts used

Fraction of EU tonnage used in region:	3000E3 t(onnes)/year
Fraction of regional tonnage used locally:	1
Regional use tonnage (tons/year):	300E3

Frequency and duration of use

Emission days	300 days per year

Environment factors not influenced by risk management

Local marine water dilution factor	100
Local freshwater dilution factor	10
Release fraction to air from process (initial release prior to RMM):	0,001
Release fraction to soil from process (initial release prior to RMM):	0,00001
Release fraction to wastewater from process (initial release prior to RMM):	0,00001
Treat air emission to provide a typical removal efficiency of (%):	>90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):	Typical onsite wastewater treatment technology provides removal efficiency of (%): 93,3

Organisational measures to prevent/limit release from site:

Do not apply industrial sludge to natural soils.

Conditions and measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via on-site sewage treatment (%):	93,3
Assumed on-site sewage treatment plant flow (m3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations

2 Conditions of use affecting exposure - Workers

2.2 Control of worker exposure

Product characteristics

Physical form of product	fluid
Vapour pressure	0.448 PSI at 70 °F
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)

Other given operational conditions affecting workers exposure	Assumes use at not more than 20 °C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.

Contributing Scenarios: Operational conditions and risk management measures

General exposures (closed systems):	No specific measures identified
General exposures (closed systems) - with sample collection - With occasional controlled exposure:	No specific measures identified
General exposures (closed systems) - Use in contained batch processes:	No specific measures identified
General exposures (open systems) - Batch process - With sample collection:	No specific measures identified
Process sampling:	No specific measures identified
Laboratory activities:	No specific measures identified
Bulk transfers - Open systems:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Bulk transfers - Closed systems:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Drum and small package filling:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Equipment cleaning and maintenance:	Drain down and flush system prior to equipment break-in or maintenance
Storage - With occasional controlled exposure:	No specific measures identified

3 Exposure estimation and reference to its source

Exposure assessment (environment)	Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented
Exposure assessment (human)	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

4 Guidance to check compliance with the exposure scenario

Environment

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Health

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Annex to the extended Safety Data Sheet (eSDS)

Toluene

Exposure Scenario / ES No 17

1 TITLE SECTION

Exposure Scenario name: Manufacture of substance

Sectors of use [SU]

SU3: Industrial uses.
SU8: Manufacture of bulk, large scale chemicals (including petroleum products).
SU9: Manufacture of fine chemicals.

Process categories [PROC]

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.
PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition.
PROC4: Chemical production where opportunity for exposure arises.
PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities.
PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities.
PROC15: Use as laboratory reagent.

Environmental release categories [ERC]

ERC1: Manufacture of the substance.
ERC4: Use of non-reactive processing aid at industrial site (no inclusion into or onto article).

2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product characteristics	Medium volatile liquid, Water solubility (g/L): 0,573, Vapour pressure: 4030 Pa, Log KOW: 2,73, Readily biodegradable
Amounts used	
Fraction of EU tonnage used in region:	3000E3 t(onnes)/year
Fraction of regional tonnage used locally:	1
Regional use tonnage (tons/year):	300E3
Frequency and duration of use	
Emission days	300 days per year
Environment factors not influenced by risk management	
Local marine water dilution factor	100
Local freshwater dilution factor	40
Release fraction to air from process (initial release prior to RMM):	0,05
Release fraction to soil from process (initial release prior to RMM):	0,0001
Release fraction to wastewater from process (initial release prior to RMM):	0,0001

Treat air emission to provide a typical removal efficiency of (%):	>90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):	Typical onsite wastewater treatment technology provides removal efficiency of (%): 93,3

Organisational measures to prevent/limit release from site:

Do not apply industrial sludge to natural soils.

Conditions and measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via on-site sewage treatment (%):	93,3
Assumed on-site sewage treatment plant flow (m3/d):	2000
Conditions and measures related to external treatment of waste for disposal	During manufacturing no waste of the substance is generated
Conditions and measures related to external recovery of waste	During manufacturing no waste of the substance is generated

2 Conditions of use affecting exposure - Workers

2.2 Control of worker exposure

Product characteristics

Physical form of product	fluid
Vapour pressure	0.448 PSI at 70 °F
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other given operational conditions affecting workers exposure	Assumes use at not more than 20 °C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented. Users are advised to consider national Occupational Exposure Limits or other equivalent values.

Contributing Scenarios: Operational conditions and risk management measures

General exposures (closed systems):	No specific measures identified
General exposures (closed systems) - with sample collection - With occasional controlled exposure:	No specific measures identified
General exposures (closed systems) - Use in contained batch processes:	No specific measures identified
General exposures (open systems) - Batch process - With sample collection:	No specific measures identified
Process sampling:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (type EN374) if regular skin contact likely.
Laboratory activities:	No specific measures identified

Bulk transfers - Open systems - With potential for aerosol generation:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Operate activity away from sources of substance emission or release. If above technical/organisational control measures are not feasible, then adopt following PPE: Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (type EN374) if regular skin contact likely.
Bulk transfers - Closed systems:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Operate activity away from sources of substance emission or release. If above technical/organisational control measures are not feasible, then adopt following PPE: Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (type EN374) if regular skin contact likely.
Equipment cleaning and maintenance:	Drain down and flush system prior to equipment break-in or maintenance
Storage - With occasional controlled exposure:	No specific measures identified

3 Exposure estimation and reference to its source

Exposure assessment (environment)	Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented
Exposure assessment (human)	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

4 Guidance to check compliance with the exposure scenario

Environment

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Health

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Annex to the extended Safety Data Sheet (eSDS)

Toluene

ROSNEFT DEUTSCHLAND

Version number: GHS 1.1 | Issue date: 2022-01-24

Exposure Scenario / ES No 18

1 TITLE SECTION

Exposure Scenario name: Use as an intermediate

Sectors of use [SU]

SU3: Industrial uses.
SU8: Manufacture of bulk, large scale chemicals (including petroleum products).
SU9: Manufacture of fine chemicals.

Process categories [PROC]

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.
PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition.
PROC4: Chemical production where opportunity for exposure arises.
PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities.
PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities.
PROC15: Use as laboratory reagent.

Environmental release categories [ERC]

ERC6a: Use of intermediate.

2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product characteristics	Medium volatile liquid, Water solubility (g/L): 0,573, Vapour pressure: 4030 Pa, Log KOW: 2,73, Readily biodegradable
Amounts used	
Fraction of EU tonnage used in region:	120E3 t(onnes)/year
Fraction of regional tonnage used locally:	1
Regional use tonnage (tons/year):	12E3
Frequency and duration of use	
Emission days	300 days per year
Environment factors not influenced by risk management	
Local marine water dilution factor	100
Local freshwater dilution factor	10
Release fraction to air from process (initial release prior to RMM):	0,01
Release fraction to soil from process (initial release prior to RMM):	0,001
Release fraction to wastewater from process (initial release prior to RMM):	0,003

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Prevent discharge of undissolved substance to or recover from onsite wastewater.

Treat air emission to provide a typical removal efficiency of (%):	>80
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):	Typical onsite wastewater treatment technology provides removal efficiency of (%): 93,3

Organisational measures to prevent/limit release from site:

Do not apply industrial sludge to natural soils. Sewage sludge should be incinerated, contained or reclaimed.

Conditions and measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via on-site sewage treatment (%):	93,3
Assumed on-site sewage treatment plant flow (m3/d):	2000
Conditions and measures related to external treatment of waste for disposal	This substance is consumed during use and no waste of the substance is generated
Conditions and measures related to external recovery of waste	This substance is consumed during use and no waste of the substance is generated

2 Conditions of use affecting exposure - Workers

2.2 Control of worker exposure

Product characteristics

Physical form of product	fluid
Vapour pressure	0.448 PSI at 70 °F
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other given operational conditions affecting workers exposure	Assumes use at not more than 20 °C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.

Contributing Scenarios: Operational conditions and risk management measures

General exposures (closed systems):	No specific measures identified
General exposures (closed systems) - with sample collection - With occasional controlled exposure:	No specific measures identified
General exposures (closed systems) - Use in contained batch processes:	No specific measures identified
General exposures (open systems) - Batch process - With sample collection:	No specific measures identified
Process sampling:	Provide a good standard of controlled ventilation (10 to 15 air changes per hour)
Laboratory activities:	No specific measures identified

Bulk transfers - Closed systems:	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).
Bulk transfers - Open systems - With potential for aerosol generation:	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).
Equipment cleaning and maintenance:	Drain down system prior to equipment break-in or maintenance
Storage: - With occasional controlled exposure:	No specific measures identified

3 Exposure estimation and reference to its source

Exposure assessment (environment)	Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented
Exposure assessment (human)	not applicable

4 Guidance to check compliance with the exposure scenario

Environment

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Health

not applicable

Annex to the extended Safety Data Sheet (eSDS)

Toluene

ROSNEFT DEUTSCHLAND

Version number: GHS 1.1 | Issue date: 2022-01-24

Exposure Scenario / ES No 19

1 TITLE SECTION

Exposure Scenario name: Formulation or re-packing

Sectors of use [SU]

SU3: Industrial uses.
SU10: Formulation [mixing] of preparations and/or re-packaging (excluding alloys).

Process categories [PROC]

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.
PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition.
PROC4: Chemical production where opportunity for exposure arises.
PROC5: Mixing or blending in batch processes.
PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities.
PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities.
PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing).
PROC14: Tabletting, compression, extrusion, pelletisation, granulation.
PROC15: Use as laboratory reagent.

Environmental release categories [ERC]

ERC2: Formulation into mixture.

2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product characteristics	Medium volatile liquid, Water solubility (g/L): 0,573, Vapour pressure: 4030 Pa, Log KOW: 2,73, Readily biodegradable
Amounts used:	2880E3 t(onnes)/year
Fraction of regional tonnage used locally:	0,05
Regional use tonnage (tons/year):	288E3
Frequency and duration of use	
Emission days	300 days per year
Environment factors not influenced by risk management	
Local marine water dilution factor	100
Local freshwater dilution factor	10
Release fraction to air from process (initial release prior to RMM):	0,025
Release fraction to soil from process (initial release prior to RMM):	0,0001
Release fraction to wastewater from process (initial release prior to RMM):	0,002

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Treat air emission to provide a typical removal efficiency of (%): >0

Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):	Typical onsite wastewater treatment technology provides removal efficiency of (%): 93,3

Organisational measures to prevent/limit release from site:

Do not apply industrial sludge to natural soils.

Conditions and measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via on-site sewage treatment (%):	93,3
Assumed on-site sewage treatment plant flow (m3/d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations

2 Conditions of use affecting exposure - Workers

2.2 Control of worker exposure

Product characteristics

Physical form of product	fluid
Vapour pressure	0.448 PSI at 70 °F
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other given operational conditions affecting workers exposure	Assumes use at not more than 20 °C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented. Users are advised to consider national Occupational Exposure Limits or other equivalent values.

Contributing Scenarios: Operational conditions and risk management measures

General exposures (closed systems):	No specific measures identified
General exposures (closed systems) - with sample collection - With occasional controlled exposure:	No specific measures identified
General exposures (closed systems) - Use in contained batch processes:	No specific measures identified
General exposures (open systems) - Batch process - With sample collection - With potential for aerosol generation:	No specific measures identified
Batch processes at elevated temperatures:	Ensure material transfers are under containment or extract ventilation. Provide extract ventilation to points where emissions occur.

Process sampling:	No specific measures identified
Mixing operations - Open systems:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Laboratory activities:	No specific measures identified
Bulk transfers:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Operate activity away from sources of substance emission or release. If above technical/organisational control measures are not feasible, then adopt following PPE: Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (type EN374) if regular skin contact likely.
Manual Transfer from/pouring from containers:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Drum/batch transfers:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Production of preparations or articles by tabletting, compression, extrusion, pelletisation:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
Equipment cleaning and maintenance:	Drain down and flush system prior to equipment break-in or maintenance.
Drum and small package filling:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)
Storage: - With occasional controlled exposure:	No specific measures identified

3 Exposure estimation and reference to its source

Exposure assessment (environment)	Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented
Exposure assessment (human)	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

4 Guidance to check compliance with the exposure scenario

Environment

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Health

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Annex to the extended Safety Data Sheet (eSDS)

Toluene

Version number: GHS 1.1 Issue date: 2022-01-24

Exposure Scenario / ES No 20

1 TITLE SECTION

Exposure Scenario name: Manufacture of bulk, large scale chemicals (including petroleum products)
Manufacture of fine chemicals

Sectors of use [SU]

SU3: Industrial uses.
SU8: Manufacture of bulk, large scale chemicals (including petroleum products).
SU9: Manufacture of fine chemicals.

Process categories [PROC]

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.
PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition.
PROC4: Chemical production where opportunity for exposure arises.
PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities.
PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities.
PROC15: Use as laboratory reagent.

Environmental release categories [ERC]

ERC1: Manufacture of the substance.
ERC4: Use of non-reactive processing aid at industrial site (no inclusion into or onto article).

2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product characteristics	Medium volatile liquid, Water solubility (g/L): 0,573, Vapour pressure: 4030 Pa, Log KOW: 2,73, Readily biodegradable
Amounts used	
Fraction of EU tonnage used in region:	3000 t(onnes)/year
Fraction of regional tonnage used locally:	1
Regional use tonnage (tons/year):	300
Frequency and duration of use	
Emission days	300 days per year
Environment factors not influenced by risk management	
Local marine water dilution factor	100
Local freshwater dilution factor	40

Release fraction to air from process (initial release prior to RMM):	0,05
Release fraction to soil from process (initial release prior to RMM):	0,0001
Release fraction to wastewater from process (initial release prior to RMM):	0,0001
Treat air emission to provide a typical removal efficiency of (%):	>90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):	Typical onsite wastewater treatment technology provides removal efficiency of (%): 93,3

Organisational measures to prevent/limit release from site:

Do not apply industrial sludge to natural soils.

Conditions and measures related to municipal sewage treatment plant

Estimated substance removal from wastewater via on-site sewage treatment (%):	93,3
Assumed on-site sewage treatment plant flow (m3/d):	2000
Conditions and measures related to external treatment of waste for disposal	During manufacturing no waste of the substance is generated
Conditions and measures related to external recovery of waste	During manufacturing no waste of the substance is generated

2 Conditions of use affecting exposure - Workers

2.2 Control of worker exposure

Product characteristics

Physical form of product	fluid
Vapour pressure	0.448 PSI at 70 °F
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other given operational conditions affecting workers exposure	Assumes use at not more than 20 °C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented. Users are advised to consider national Occupational Exposure Limits or other equivalent values.

Contributing Scenarios: Operational conditions and risk management measures

General exposures (closed systems):	No specific measures identified
General exposures (closed systems) - with sample collection - With occasional controlled exposure:	No specific measures identified
General exposures (closed systems) - Use in contained batch processes:	No specific measures identified
General exposures (open systems) - Batch process - With sample collection:	No specific measures identified

Process sampling:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (type EN374) if regular skin contact likely.
Laboratory activities:	No specific measures identified
Bulk transfers - Open systems - With potential for aerosol generation:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Operate activity away from sources of substance emission or release. If above technical/organisational control measures are not feasible, then adopt following PPE: Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (type EN374) if regular skin contact likely.
Bulk transfers - Closed systems:	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Operate activity away from sources of substance emission or release. If above technical/organisational control measures are not feasible, then adopt following PPE: Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (type EN374) if regular skin contact likely.
Equipment cleaning and maintenance:	Drain down system prior to equipment break-in or maintenance
Storage: - With occasional controlled exposure:	No specific measures identified

3 Exposure estimation and reference to its source

Exposure assessment (environment)	Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented
Exposure assessment (human)	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented

4 Guidance to check compliance with the exposure scenario

Environment

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Health

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.