



BAYDUR TRIAL PRODUCT PU 1498

Version 10.1

Revision Date 08.12.2020

Print Date 17.12.2020

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

1.1 Product identifier

BAYDUR TRIAL PRODUCT PU 1498

Material number: 00870994

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

Use:

Polyol components for the production of polyurethanes

For details of the identified uses according to REACH-Regulation (EU) No. 1907/2006 refer to the annex of this safety data sheet.

1.3 Details of the supplier of the safety data sheet

Covestro Deutschland AG
COV-CTO-HSEQ-PSRA-PSI
51365 Leverkusen

Tel.: +49 214 6009 4068
Email: ProductSafetyEMLA@covestro.com

1.4 Emergency telephone number

+1-703-527-3887 (Chemtrec)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Skin corrosion, Sub-category 1C (H314)

Serious eye damage, Category 1 (H318)

Sensitization of the skin, Category 1 (H317)

Reproductive toxicity, Category 2 (H361fd)

Acute hazardous to the aquatic environment, Category 1 (H400)

Chronically hazardous to the aquatic environment, Category 1 (H410)

2.2 Label elements



Danger

Hazardous components which must be listed on the label

Polyether Polyol
Trimethylolpropane
alkylaminocarboxamide
Dimethylbis[(1-oxoneodecyl)oxy]stannane

Hazard statements:

H314 Causes severe skin burns and eye damage.

H317 May cause an allergic skin reaction.

H361fd Suspected of damaging fertility. Suspected of damaging the unborn child.

H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements:

P273 Avoid release to the environment.

P280 Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.

P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.

P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

Immediately call a POISON CENTER/ doctor.

P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.

P391 Collect spillage.

2.3 Other hazards

Possible risk of absorption through the skin of Diethylmethylbenzene diamine.

The following percentage of the mixture consists of ingredient(s) with unknown acute inhalation toxicity: 13 %

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

Type of product: Mixture

3.2 Mixtures

Polyol mixture

Hazardous components

Polyether Polyol

Concentration [wt.-%]: **>= 25 - < 50**

CAS-No.: 52624-57-4

Classification (1272/2008/CE): Eye Dam. 1 H318

Trimethylolpropane

Concentration [wt.-%]: **>= 10 - < 20**

EC-No.: 201-074-9

REACH Registration Number: 01-2119486799-10-0054

CAS-No.: 77-99-6

Classification (1272/2008/CE): Repr. 2 H361fd

Alkylaminopoly(oxyalkylen)ol

Concentration [wt.-%]: **>= 10 - < 20**

EC-No.: 500-035-6

REACH Registration Number: 01-2119471485-32-0002

CAS-No.: 25214-63-5

Classification (1272/2008/CE): Eye Irrit. 2 H319

alkylaminocarboxamide

Concentration [wt.-%]: **>= 5 - < 10**

EC-No.: 295-714-4

REACH Registration Number: 01-2119533081-53-0000

CAS-No.: 92128-22-8

Classification (1272/2008/CE): Skin Corr. 1C H314 Skin Sens. 1B H317 Eye Dam. 1 H318 Aquatic Acute 1 H400 Aquatic Chronic 1 H410

M-factor (acute aquat. tox.): 10

M-factor (chron. aquat. tox.): 10

diethylmethylbenzenediamine

Concentration [wt.-%]: **>= 5 - < 10**

Index-No.: 612-130-00-0

EC-No.: 270-877-4

REACH Registration Number: 01-2119486805-25-0002

CAS-No.: 68479-98-1

Classification (1272/2008/CE): Acute Tox. 4 Dermal H312 Acute Tox. 4 Oral H302 STOT RE 2 H373 (Pancreas) Eye Irrit. 2 H319 Aquatic Acute 1 H400 Aquatic Chronic 1 H410

M-factor (acute aquat. tox.): 1

M-factor (chron. aquat. tox.): 1

Dimethylbis[(1-oxoneodecyl)oxy]stannane

Concentration [wt.-%]: **>= 0,025 - < 0,1**

EC-No.: 273-028-6

CAS-No.: 68928-76-7

Classification (1272/2008/CE): Acute Tox. 4 Oral H302 Skin Irrit. 2 H315 Skin Sens. 1A H317 Aquatic Chronic 3 H412

Candidate List of Substances of Very High Concern for Authorisation

This product contains no substances of very high concern in concentrations where an information obligation applies (REACH Regulation (EC) No. 1907/2006, Article 59).

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice: Take off all contaminated clothing immediately.

If inhaled: Take the person into the fresh air and keep him warm, let him rest; if there is difficulty in breathing, medical advice is required.

In case of skin contact: In case of skin contact wash affected areas thoroughly with soap and plenty of water. Consult a doctor in the event of a skin reaction.

In case of eye contact: Hold the eyes open and rinse with preferably lukewarm water for a sufficiently long period of time (at least 10 minutes). Contact an ophthalmologist.

If swallowed: DO NOT induce the patient to vomit, medical advice is required.

4.2 Most important symptoms and effects, both acute and delayed

Notes to physician: Basic first aid, decontamination, symptomatic treatment.

4.3 Indication of any immediate medical attention and special treatment needed

Therapeutic measures: No information available.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media: Carbon dioxide (CO₂), Foam, extinguishing powder, in cases of larger fires, water spray should be used.

Unsuitable extinguishing media: High volume water jet

5.2 Special hazards arising from the substance or mixture

Burning releases carbon monoxide, carbon dioxide, oxides of nitrogen and traces of hydrogen cyanide. In the event of fire and/or explosion do not breathe fumes.

5.3 Advice for fire-fighters

Firemen must wear self-contained breathing apparatus.

Do not allow contaminated extinguishing water to enter the soil, ground-water or surface waters.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Put on protective equipment (see section 8). Ensure adequate ventilation/exhaust extraction. Keep unauthorized persons away.

6.2 Environment related measures

Do not allow to escape into waterways, wastewater or soil.

6.3 Methods and material for containment and cleaning up

Take up with absorbent for chemicals or, if necessary with dry sand and store in closed containers.

6.4 Reference to other sections

For further disposal measures see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

General conditions of use are further specified in the annex according to REACH-Regulation (EU) No. 1907/2006.

Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin and eyes.

In all workplaces or parts of the plant where high concentrations of aerosols and/or vapors may be generated (e.g. during pressure release, mold venting or when cleaning mixing heads with an air blast), appropriately located exhaust ventilation must be provided in such a way that the WEL is not exceeded.

The air should be drawn away from the personnel handling the product. The efficiency of the exhaust equipment should be periodically checked.

Precautions should generally be taken against electrostatic charges according to the equipment used and the way the product is handled and packaged.

Keep away from foodstuffs, drinks and tobacco. Wash hands before breaks and at the end of workday. Keep working clothes separately. Change contaminated or soaked clothing immediately.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed and dry.

Further specific information see our : "Technical Information"

Storage class (TRGS 510) : 8A: Combustible, corrosive hazardous materials

7.3 Specific end use(s)

For details of the identified uses according to REACH-Regulation (EU) No. 1907/2006 refer to the annex of this safety data sheet.

SECTION 8: Exposure controls/personal protection

Risk management measures are further specified in the annex according to REACH-Regulation (EU) No. 1907/2006.

8.1 Control parameters

Contains no substances with occupational exposure limit values.

For technical protective measures to limit exposure see also Section 7 "Handling and storage".

Derived No Effect Level (DNEL)

Trimethylolpropane

Value type	Route of exposure	Health Effects	Value	Remarks
Workers	Inhalation	Long-term systemic effects	3,3 mg/m ³	Most sensitive endpoint: Repeated dose toxicity oral
Workers	Inhalation	Acute systemic effects		No hazard identified
Workers	Inhalation	Long-term local effects		No hazard identified
Workers	Inhalation	Acute local effects		No hazard identified
Workers	Dermal	Long-term systemic effects	0,94 mg/kg bw/day	Most sensitive endpoint: Repeated dose toxicity oral
Workers	Dermal	Acute systemic effects		No hazard identified
Workers	Dermal	Long-term local effects		No hazard identified
Workers	Dermal	Acute local effects		No hazard identified
Workers	Eye contact	Local effects		No hazard identified
Consumers	Inhalation	Long-term systemic effects	0,58 mg/m ³	Most sensitive endpoint: Repeated dose toxicity oral
Consumers	Inhalation	Acute systemic effects		No hazard identified
Consumers	Inhalation	Long-term local effects		No hazard identified
Consumers	Inhalation	Acute local effects		No hazard identified
Consumers	Dermal	Long-term systemic effects	0,34 mg/kg bw/day	Most sensitive endpoint: Repeated dose toxicity oral
Consumers	Dermal	Acute systemic effects		No hazard identified
Consumers	Dermal	Long-term local effects		No hazard identified
Consumers	Dermal	Acute local effects		No hazard identified
Consumers	Oral	Long-term systemic effects	0,34 mg/kg bw/day	Most sensitive endpoint: Repeated dose toxicity oral
Consumers	Oral	Acute systemic effects		No hazard identified
Consumers	Eye contact	Local effects		No hazard identified

Alkylaminopoly(oxyalkylen)ol

Value type	Route of exposure	Health Effects	Value	Remarks
Workers	Inhalation	Long-term systemic effects	98 mg/m ³	Most sensitive endpoint: Repeated dose toxicity
Workers	Inhalation	Acute systemic effects		Not relevant
Workers	Inhalation	Long-term local effects		Not relevant
Workers	Inhalation	Acute local effects		Not relevant

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Workers	Dermal	Long-term systemic effects	13,9 mg/kg bw/day	Most sensitive endpoint: Repeated dose toxicity
Workers	Dermal	Acute systemic effects		Not relevant
Workers	Dermal	Long-term local effects		Not relevant
Workers	Dermal	Acute local effects		Not relevant
Consumers	Inhalation	Long-term systemic effects	29 mg/m3	Most sensitive endpoint: Repeated dose toxicity
Consumers	Inhalation	Acute systemic effects		Not relevant
Consumers	Inhalation	Long-term local effects		Not relevant
Consumers	Inhalation	Acute local effects		Not relevant
Consumers	Dermal	Long-term systemic effects	8,3 mg/kg bw/day	Most sensitive endpoint: Repeated dose toxicity
Consumers	Dermal	Acute systemic effects		Not relevant
Consumers	Dermal	Long-term local effects		Not relevant
Consumers	Dermal	Acute local effects		Not relevant
Consumers	Oral	Long-term systemic effects	8,3 mg/kg bw/day	Most sensitive endpoint: Repeated dose toxicity

alkylaminocarboxamide

Value type	Route of exposure	Health Effects	Value	Remarks
Workers	Inhalation	Long-term systemic effects	14,1 mg/m3	Most sensitive endpoint: Repeated dose toxicity oral
Workers	Inhalation	Acute systemic effects	14,1 mg/m3	Most sensitive endpoint: Repeated dose toxicity oral
Workers	Inhalation	Long-term local effects	1 mg/m3	Most sensitive endpoint: Irritation (respiratory tract)
Workers	Inhalation	Acute local effects	1 mg/m3	Most sensitive endpoint: Irritation (respiratory tract)
Workers	Dermal	Long-term systemic effects	2 mg/kg bw/day	Most sensitive endpoint: Repeated dose toxicity oral
Workers	Dermal	Acute systemic effects	2 mg/kg bw/day	Most sensitive endpoint: Repeated dose toxicity oral
Workers	Dermal	Long-term local effects		Medium hazard (no threshold derived) Most sensitive endpoint: skin irritation/corrosion
Workers	Dermal	Acute local effects		Medium hazard (no threshold derived) Most sensitive endpoint: skin irritation/corrosion
Workers	Eye contact	Local effects		Medium hazard (no threshold derived)
Consumers	Inhalation	Long-term systemic effects	7,1 mg/m3	Most sensitive endpoint: Repeated dose toxicity oral
Consumers	Inhalation	Acute systemic effects	7,1 mg/m3	Most sensitive endpoint: Repeated dose toxicity oral
Consumers	Inhalation	Long-term local effects	1 mg/m3	Most sensitive endpoint: Irritation (respiratory tract)
Consumers	Inhalation	Acute local effects	1 mg/m3	Most sensitive endpoint:

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				Irritation (respiratory tract)
Consumers	Dermal	Long-term systemic effects		Hazard unknown (no further information necessary)
Consumers	Dermal	Acute systemic effects		Hazard unknown (no further information necessary)
Consumers	Dermal	Long-term local effects		Hazard unknown (no further information necessary)
Consumers	Dermal	Acute local effects		Hazard unknown (no further information necessary)
Consumers	Oral	Long-term systemic effects	1 mg/kg bw/day	Most sensitive endpoint: Repeated dose toxicity oral
Consumers	Oral	Acute systemic effects	1 mg/kg bw/day	Most sensitive endpoint: Repeated dose toxicity oral
Consumers	Eye contact	Local effects		Medium hazard (no threshold derived)

diethylmethylbenzenediamine

Value type	Route of exposure	Health Effects	Value	Remarks
Workers	Inhalation	Long-term systemic effects	0,13 mg/m3	Most sensitive endpoint: Repeated dose toxicity
Workers	Inhalation	Acute systemic effects		Not relevant
Workers	Inhalation	Long-term local effects		Not relevant
Workers	Inhalation	Acute local effects		Not relevant
Workers	Dermal	Long-term systemic effects	1 mg/kg bw/day	Most sensitive endpoint: Repeated dose toxicity
Workers	Dermal	Acute systemic effects		Not relevant
Workers	Dermal	Long-term local effects		Not relevant
Workers	Dermal	Acute local effects		Not relevant
Consumers	Inhalation	Long-term systemic effects	0,1 mg/m3	Most sensitive endpoint: Repeated dose toxicity
Consumers	Inhalation	Acute systemic effects		Not relevant
Consumers	Inhalation	Long-term local effects		Not relevant
Consumers	Inhalation	Acute local effects		Not relevant
Consumers	Dermal	Long-term systemic effects	1 mg/kg bw/day	Most sensitive endpoint: Repeated dose toxicity
Consumers	Dermal	Acute systemic effects		Not relevant
Consumers	Dermal	Long-term local effects		Not relevant
Consumers	Dermal	Acute local effects		Not relevant
Consumers	Oral	Long-term systemic effects	0,1 mg/kg bw/day	Most sensitive endpoint: Repeated dose toxicity
Consumers	Oral	Acute systemic effects		Not relevant
Consumers	Oral	Local effects		Not relevant

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Predicted No Effect Concentration (PNEC)**Trimethylolpropane**

Compartment	Value	Remarks
Fresh water		No hazard identified
Fresh water sediment		No hazard identified
Marine water		No hazard identified
Marine sediment		No hazard identified
Sewage treatment plant		No hazard identified
Air		No hazard identified
Soil		No hazard identified
Oral		Does not bioaccumulate.
Intermittent use/release		No hazard identified

Alkylaminopoly(oxyalkylen)ol

Compartment	Value	Remarks
Fresh water	0,085 mg/l	
Fresh water sediment	0,340 mg/kg dry weight (d.w.)	
Fresh water sediment	0,074 mg/kg wet weight	
Marine water	0,0085 mg/l	
Marine sediment	0,340 mg/kg dry weight (d.w.)	
Marine sediment	0,0074 mg/kg wet weight	
Sewage treatment plant	70 mg/l	
Soil	0,0183 mg/kg dry weight (d.w.)	
Soil	0,0162 mg/kg wet weight	
Oral		Not relevant
Intermittent use/release	1,51 mg/l	

alkylaminocarboxamide

Compartment	Value	Remarks
Fresh water	0,031 µg/l	
Fresh water sediment	980,3 mg/kg	dry weight
Marine water	0,0031 µg/l	
Marine sediment	98,03 mg/kg	dry weight
Sewage treatment plant		No hazard identified
Air		No hazard identified
Soil	10 mg/kg	dry weight
Oral		Does not bioaccumulate.
Intermittent use/release	0,31 µg/l	

diethylmethylbenzenediamine

Compartment	Value	Remarks
Fresh water	0,0005 mg/l	
Fresh water sediment	0,029 mg/kg	dry weight

Marine water	0,00005 mg/l	
Marine sediment	0,0029 mg/kg	dry weight
Sewage treatment plant	17 mg/l	
Soil	0,0056 mg/kg	dry weight
Oral	2 mg/kg	
Intermittent use/release	0,005 mg/l	

8.2 Exposure controls**Respiratory protection**

Unless the product is entirely enclosed, do not handle it until you have studied the respiratory precautions issued by the appropriate authority or accident prevention association. If vapors form, respirators must be used. Put on full-mask respirator with filter type ABEK.

If applicable, further recommendations regarding respiratory protection can be found in the annex.

Hand protection

Conditionally suitable materials for protective gloves; EN 374:

Nitrile rubber - NBR (≥ 0.35 mm)

Breakthrough time not tested; dispose of immediately after contamination.

Eye protection

Wear eye/face protection.

Skin and body protection

Wear suitable protective clothing.

Safety precautions for handling freshly molded polyurethane parts: see section 16

SECTION 9: Physical and chemical properties**9.1 Information on basic physical and chemical properties**

Appearance:	liquid	
Colour:	yellow to brownish	
Odour:	amine-like	
Odour Threshold:	not established	
pH:	10,6 at 10 % in water	calculated
Pour point:	-20 °C	DIN 51556
Initial boiling point:	250 °C at 1.013 hPa	DIN 51751
Flash point:	184 °C at 1.013 hPa	DIN 51758
Evaporation rate:	not established	
Flammability (solid, gas):	not applicable	
Burning number:	not applicable	
Upper/lower flammability or explosive limits:		
Trimethylolpropane	upper: 11,8 %(V) / lower: 2 %(V)	
Vapour pressure:	7 hPa at 20 °C 13 hPa at 50 °C 14 hPa at 55 °C	EG A4 EG A4 EG A4
Vapour density:	not established	
Density:	1,059 g/cm ³ at 20 °C	DIN 51757
Miscibility with water:	miscible at 15 °C	
Surface tension:	not established	
Partition coefficient (n-octanol/water):	not established	
Auto-ignition temperature:	not applicable	
Ignition temperature:	420 °C	DIN 51794

Decomposition temperature:	not established
Heat of combustion:	not established
Viscosity, dynamic:	1.500 mPa.s at 20 °C

DIN 53019

9.2 Other information

The indicated values do not necessarily correspond to the product specification. Please refer to the product information sheet or the technical information sheet for specification data.

Explosive properties:	not established
Dust explosion class:	not applicable
Oxidising properties:	not established

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

This information is not available.

10.2 Chemical stability

No decomposition below initial boiling point.

10.3 Possibility of hazardous reactions

No hazardous reactions when used as directed.

10.4 Conditions to avoid

This information is not available.

10.5 Incompatible materials

This information is not available.

10.6 Hazardous decomposition products

No hazardous decomposition products when stored and handled correctly.

SECTION 11: Toxicological information

Toxicological studies on the product are not yet available.

Please find below the toxicological data available to us for the components (hazardous components).

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008**Acute toxicity, oral**

ATEmix (oral): > 2.000 mg/kg
Method: Calculation method

Polyether Polyol

LD50 rat, male/female: > 5.000 mg/kg
Method: OECD Test Guideline 401

Trimethylolpropane

LD50 rat, male: ca. 14.700 mg/kg
Assessment: The substance or mixture has no acute oral toxicity

Alkylaminopoly(oxyalkylen)ol

LD50 rat, male/female: > 2.000 mg/kg
Method: OECD Test Guideline 401

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alkylaminocarboxamide
LD50 rat, male: > 4.600 mg/kg
Method: OECD Test Guideline 401

diethylmethylbenzenediamine
LD50 rat, male/female: ca. 738 mg/kg
Method: OECD Test Guideline 401

Dimethylbis[(1-oxoneodecyl)oxy]stannane
LD50 rat, male/female: 892 mg/kg
Assessment: Harmful if swallowed.
Method: OECD Test Guideline 401

Acute toxicity, dermal

ATEmix (dermal):> 2.000 mg/kg
Method: Calculation method

Polyether Polyol
Based on available data, the classification criteria are not met.
Assessment: The substance or mixture has no acute dermal toxicity

Trimethylolpropane
LD50 rabbit: > 10.000 mg/kg
Assessment: The substance or mixture has no acute dermal toxicity

Alkylaminopoly(oxyalkylen)ol
LD50 rat, male/female: > 2.000 mg/kg
Method: OECD Test Guideline 402

alkylaminocarboxamide
LD50 rat, male/female: > 2.000 mg/kg
Method: OECD Test Guideline 402

diethylmethylbenzenediamine
LD50 rat, male/female: > 2.000 mg/kg
Assessment: Harmful in contact with skin.
Method: OECD Test Guideline 402

Assessment: Harmful in contact with skin.
Regulation (EC) No 1272/2008

Dimethylbis[(1-oxoneodecyl)oxy]stannane
Assessment: no data available
Study not required according to Regulation (EC) No. 1907/2006 (REACH).

Acute toxicity, inhalation

Polyether Polyol
Not a relevant route of exposure

Trimethylolpropane
LC50 rat, male: > 0,85 mg/l, 4 h
Test atmosphere: dust/mist
Assessment: The substance or mixture has no acute inhalation toxicity

Alkylaminopoly(oxyalkylen)ol
Assessment: Study scientifically not justified.
Not a relevant route of exposure

alkylaminocarboxamide
Study scientifically not justified.

diethylmethylbenzenediamine
Based on available data, the classification criteria are not met.

Dimethylbis[(1-oxoneodecyl)oxy]stannane
Assessment: no data available
Study not required according to Regulation (EC) No. 1907/2006 (REACH).

Primary skin irritation

Polyether Polyol

Species: rabbit

Result: non-irritant

Classification: No skin irritation

Method: OECD Test Guideline 404

Trimethylolpropane

Species: rabbit

Result: slight irritant

Classification: No skin irritation

Alkylaminopoly(oxyalkylen)ol

Species: rabbit

Result: slight irritant

Classification: No skin irritation

Method: OECD Test Guideline 404

alkylaminocarboxamide

Species: rabbit

Result: Corrosive

Classification: Causes severe skin burns and eye damage (Skin Corr. 1C).

Method: OECD Test Guideline 404

diethylmethylbenzenediamine

Species: rabbit

Exposure duration: 4 h

Result: non-irritant

Classification: No skin irritation

Method: OECD Test Guideline 404

Dimethylbis[(1-oxoneodecyl)oxy]stannane

Classification: Causes skin irritation.

Species: In vitro test system

Result: positive

Method: OECD Test Guideline 439

Species: In vitro test system

Result: negative

Method: OECD Test Guideline 431

Primary mucosae irritation

Polyether Polyol

Species: rabbit

Result: severe irritant

Classification: Causes serious eye damage.

Method: OECD Test Guideline 405

Trimethylolpropane

Species: rabbit

Result: slight irritant

Classification: No eye irritation

Alkylaminopoly(oxyalkylen)ol

Species: rabbit

Result: irritating

Classification: Causes serious eye irritation.

Method: OECD Test Guideline 405

alkylaminocarboxamide

Species: rabbit

Result: severe irritant

Method: OECD Test Guideline 405

Since this substance is already classified "corrosive", the risk of serious damage to the eyes is implicit.

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diethylmethylbenzenediamine

Species: rabbit

Result: irritating

Classification: Causes serious eye irritation.

Dimethylbis[(1-oxoneodecyl)oxy]stannane

Classification: No eye irritation

Species: In vitro test system

Result: negative

Method: OECD Test Guideline 437

Sensitisation

Polyether Polyol

Skin sensitisation:

No data available.

Respiratory sensitization

No data available.

Trimethylolpropane

Skin sensitization (local lymph node assay (LLNA)):

Species: Mouse

Result: negative

Classification: Does not cause skin sensitization.

Method: OECD Test Guideline 429

Respiratory sensitization

No data available.

Alkylaminopoly(oxyalkylen)ol

Skin sensitisation according to Magnusson/Kligmann (maximizing test):

Species: Guinea pig

Result: negative

Classification: Does not cause skin sensitization.

Method: OECD Test Guideline 406

Respiratory sensitization

No data available.

alkylaminocarboxamide

Skin sensitisation according to Magnusson/Kligmann (maximizing test):

Species: Guinea pig

Result: positive

Classification: May cause sensitization by skin contact (Sub cat. 1B)

Method: OECD Test Guideline 406

Respiratory sensitization

No data available.

diethylmethylbenzenediamine

Skin sensitisation:

Species: Guinea pig

Result: negative

Classification: Does not cause skin sensitization.

Respiratory sensitization

No data available.

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Dimethylbis[(1-oxoneodecyl)oxy]stannane

Skin sensitisation:

Species: Guinea pig

Result: positive

Classification: May cause sensitization by skin contact (Sub cat. 1A)

Studies of a comparable product.

Respiratory sensitization

No data available.

Subacute, subchronic and prolonged toxicity

Polyether Polyol

No data available.

Trimethylolpropane

NOAEL: ca. 67 mg/kg

Application Route: Oral

Species: rat, male/female

Dose Levels: 20 - 67 - 200 - 667 mg/kg/day

Exposure duration: 90 d

Alkylaminopoly(oxyalkylen)ol

NOAEL: 1.000 mg/kg

Application Route: Oral

Species: rat, male/female

Dose Levels: 0 - 100 - 300 - 1000 mg/kg

Exposure duration: 4 w

Frequency of treatment: daily

Method: OECD Test Guideline 407

Studies of a comparable product.

alkylaminocarboxamide

NOAEL: 200 mg/kg

Application Route: Oral

Species: rat, male/female

Dose Levels: 0 - 50 - 200 - 800 mg/kg

Exposure duration: 29 d

Frequency of treatment: daily

Method: OECD Test Guideline 407

NOAEL: 200 mg/kg

Application Route: Oral

Species: rat, male/female

Dose Levels: 0 - 50 - 200 - 800 mg/kg

Exposure duration: 90

Frequency of treatment: daily

Method: OECD Test Guideline 408

diethylmethylbenzenediamine

NOAEL: 3 mg/kg

LOAEL (Lowest observable adverse effect level): 8 mg/kg

Application Route: Oral

Species: rat, male/female

Dose Levels: 0 - 50 - 125 - 320 ppm

Exposure duration: 90 d

Frequency of treatment: daily

Target Organs: Pancreas

Method: OECD Test Guideline 408

NOAEL: 0,4 mg/kg

LOAEL (Lowest observable adverse effect level): 3,2 mg/kg

Application Route: Oral

Species: rat, male/female

Dose Levels: 0 - 10 - 35 - 70 ppm

Exposure duration: 2 a

Frequency of treatment: daily

Target Organs: Pancreas

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Method: OECD Test Guideline 453

NOAEL: 100 mg/kg

Application Route: Dermal

Species: rabbit, male/female

Dose Levels: 0 - 1 - 10 - 100 mg/kg

Exposure duration: 21 d

Frequency of treatment: 6 hours a day, 5 days a week

Dimethylbis[(1-oxoneodecyl)oxy]stannane

No data available.

Carcinogenicity

Polyether Polyol

No data available.

Trimethylolpropane

No data available.

Alkylaminopoly(oxyalkylen)ol

No data available.

alkylaminocarboxamide

Study scientifically not justified.

diethylmethylbenzenediamine

Species: rat, male/female

Application Route: Oral

Dose Levels: 0 - 40 - 120 ppm

Exposure duration: 2 a

Frequency of treatment: daily

Result:

negative

Species: rat, male/female

Application Route: Oral

Dose Levels: 0 - 10 - 35 - 70 ppm

Exposure duration: 2 a

Frequency of treatment: daily

Method: OECD Test Guideline 451

Result:

The study is insufficient for a clear evaluation.

On the basis of these data labeling as carcinogenic is therefore not required.

Dimethylbis[(1-oxoneodecyl)oxy]stannane

No data available.

Reproductive toxicity/Fertility

Polyether Polyol

No data available.

Trimethylolpropane

NOAEL (parents, generally toxicity): 74 mg/kg body weight/day

NOAEL (parents, fertility): 225 mg/kg body weight/day

NOAEL (offspring): < 74 mg/kg body weight/day

Test type: extended one-generation study

Species: rat, male/female

Application Route: Oral

Dose Levels: 0 - 74 - 225 - 750 mg/kg

Method: OECD Test Guideline 443

Alkylaminopoly(oxyalkylen)ol

NOAEL (parents, generally toxicity): 1000 mg/kg

NOAEL (parents, fertility): 1000 mg/kg

NOAEL (offspring): 1000 mg/kg

Species: rat, male/female

Application Route: Oral

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Dose Levels: 0 - 100 - 300 - 1000 mg/kg
Exposure duration: males: 28 days, females: 58 days
Frequency of treatment: daily
Exposure time before mating - Male: 14 d
Exposure time before mating - Female: 14 d
Method: OECD Test Guideline 421
No toxicity to reproduction
Studies of a comparable product.

alkylaminocarboxamide
Study scientifically not justified.

diethylmethylbenzenediamine
Available data show no indications for reproductive toxicity.

Dimethylbis[(1-oxoneodecyl)oxy]stannane
No data available.

Reproductive toxicity/Developmental Toxicity/Teratogenicity

Polyether Polyol
No data available.

Trimethylolpropane
NOAEL (maternal): 74 mg/kg
NOAEL (developmental toxicity): 225 mg/kg body weight/day
LOAEL (teratogenicity): 74 mg/kg
Species: rat, male and female
Application Route: Oral
Dose Levels: 0 - 74 - 225 - 750 mg/kg body weight/day

NOAEL (teratogenicity): 100 mg/kg
NOAEL (maternal): 100 mg/kg
NOAEL (developmental toxicity): 100 mg/kg body weight/day
Species: rat, female
Application Route: Oral
Dose Levels: 0 - 100 - 300 - 1000 mg/kg body weight/day
Method: OECD Test Guideline 414

Alkylaminopoly(oxyalkylen)ol
NOAEL (maternal): 1.000 mg/kg
NOAEL (developmental toxicity): 1000 mg/kg
Species: rat, female
Application Route: Oral
Dose Levels: 0 - 100 - 300 - 1000 mg/kg
Exposure duration: 58 d
Method: OECD Test Guideline 421
Based on available data, the classification criteria are not met.
Studies of a comparable product.

alkylaminocarboxamide
NOAEL (teratogenicity): 1.000 mg/kg
NOAEL (maternal): 100 mg/kg
NOAEL (developmental toxicity): 100 mg/kg
Species: rat
Application Route: Oral
Dose Levels: 0 - 100 - 300 - 1000 mg/kg
Test period: 21 d
Method: OECD Test Guideline 414
Did not show teratogenic effects in animal experiments.

NOAEL (teratogenicity): 100 mg/kg
NOAEL (maternal): 100 mg/kg
NOAEL (developmental toxicity): 100 mg/kg
Species: rabbit
Application Route: Oral
Dose Levels: 0 - 30 - 100 - 300 mg/kg
Test period: 29 d
Method: OECD Test Guideline 414

Did not show teratogenic effects in animal experiments.

diethylmethylbenzenediamine
NOAEL (maternal): 2,63 mg/kg
NOAEL (developmental toxicity): 7,83 mg/kg
Species: rat, female
Application Route: Oral
Dose Levels: 0 - 2,63 - 7,83 - 20,45 mg/kg body weight/day
Method: OECD Test Guideline 414

Dimethylbis[(1-oxoneodecyl)oxy]stannane
No data available.

Genotoxicity in vitro

Polyether Polyol
Test type: Ames test
Metabolic activation: with/without
Result: negative

Trimethylolpropane
Test type: Ames test
Test system: Salmonella typhimurium
Metabolic activation: with/without
Result: negative
Method: OECD Test Guideline 471

Test type: Ames test
Test system: Escherichia coli
Metabolic activation: with/without
Result: negative
Method: OECD Test Guideline 471

Test type: Chromosome aberration test in vitro
Test system: Chinese hamster lung cells
Metabolic activation: with/without
Result: negative
Method: OECD Test Guideline 473

Test type: In vitro mammalian cell gene mutation test
Test system: Chinese hamster V79 cell line
Metabolic activation: with/without
Result: negative
Method: OECD Test Guideline 476

Alkylaminopoly(oxyalkylen)ol
Test type: Ames test
Test system: Salmonella typhimurium
Metabolic activation: with/without
Result: negative
Method: OECD Test Guideline 471

Test type: Chromosome aberration test in vitro
Test system: Chinese hamster V79 cell line
Metabolic activation: with/without
Result: negative
Method: OECD Test Guideline 473
Studies of a comparable product.

Test type: In vitro mammalian cell gene mutation test
Test system: Chinese hamster V79 cell line
Metabolic activation: with/without
Result: negative
Method: OECD Test Guideline 476
Studies of a comparable product.

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alkylaminocarboxamide

Test type: Ames test

Test system: Salmonella typhimurium

Metabolic activation: with/without

Result: negative

Method: OECD Test Guideline 471

Test type: Point mutation in mammalian cells (HPRT test)

Test system: Chinese hamster V79 cell line

Metabolic activation: with/without

Result: negative

Method: OECD Test Guideline 476

Test type: Chromosome aberration test in vitro

Test system: Chinese hamster V79 cell line

Metabolic activation: with/without

Result: negative

Method: OECD Test Guideline 473

diethylmethylbenzenediamine

Test type: Ames test

Test system: Salmonella typhimurium

Metabolic activation: without

Result: No indication of mutagenic effects.

Test type: Ames test

Test system: Salmonella typhimurium

Metabolic activation: with

Result: positive

Test type: In vitro mammalian cell gene mutation test

Test system: Mouse lymphoma cells

Metabolic activation: without

Result: negative

Method: OECD Test Guideline 476

Test type: In vitro mammalian cell gene mutation test

Test system: Mouse lymphoma cells

Metabolic activation: with

Result: positive

Method: OECD Test Guideline 476

Test type: Chromosome aberration test in vitro

Test system: Human lymphocytes

Metabolic activation: with/without

Result: Ambiguous.

Method: OECD Test Guideline 473

Dimethylbis[(1-oxoneodecyl)oxy]stannane

Test type: Ames test

Test system: Salmonella typhimurium

Metabolic activation: with/without

Result: negative

Method: OECD Test Guideline 471

Test type: Ames test

Test system: Escherichia coli

Metabolic activation: with/without

Result: negative

Method: OECD Test Guideline 471

Genotoxicity in vivo

Polyether Polyol

No data available.

Trimethylolpropane

No data available.

Alkylaminopoly(oxyalkylen)ol
No data available.

alkylaminocarboxamide
Study scientifically not justified.

diethylmethylbenzenediamine
Test type: Micronucleus test
Species: Mouse, male/female
Application Route: Oral
Dose: 0 - 125 - 250 - 500 mg/kg
Result: negative
Method: OECD Test Guideline 474

Dimethylbis[(1-oxoneodecyl)oxy]stannane
No data available.

STOT evaluation – one-time exposure

Polyether Polyol
no data available

Trimethylolpropane
Based on available data, the classification criteria are not met.

Alkylaminopoly(oxyalkylen)ol
Based on available data, the classification criteria are not met.

alkylaminocarboxamide
Based on available data, the classification criteria are not met.

diethylmethylbenzenediamine
Based on available data, the classification criteria are not met.

Dimethylbis[(1-oxoneodecyl)oxy]stannane
No data available.

STOT evaluation – repeated exposure

Polyether Polyol
no data available

Trimethylolpropane
Based on available data, the classification criteria are not met.

Alkylaminopoly(oxyalkylen)ol
Based on available data, the classification criteria are not met.

alkylaminocarboxamide
Based on available data, the classification criteria are not met.

diethylmethylbenzenediamine
Target Organs: Pancreas
May cause damage to organs through prolonged or repeated exposure.

Dimethylbis[(1-oxoneodecyl)oxy]stannane
No data available.

Aspiration toxicity

Polyether Polyol
No data available.

Trimethylolpropane
No data available.

Alkylaminopoly(oxyalkylen)ol
Based on available data, the classification criteria are not met.

alkylaminocarboxamide

Based on available data, the classification criteria are not met.

diethylmethylbenzenediamine

Based on available data, the classification criteria are not met.

Dimethylbis[(1-oxoneodecyl)oxy]stannane

Based on available data, the classification criteria are not met.

CMR Assessment

Polyether Polyol

Carcinogenicity: No data available.

Mutagenicity: Based on available data, the classification criteria are not met.

Teratogenicity: No data available.

Reproductive toxicity/Fertility: No data available.

Trimethylolpropane

Carcinogenicity: No data available.

Mutagenicity: Based on available data, the classification criteria are not met.

Teratogenicity: Suspected of damaging the unborn child (Repr. 2).

Reproductive toxicity/Fertility: Suspected of damaging fertility (Repr. 2).

Alkylaminopoly(oxyalkylen)ol

Carcinogenicity: Based on available data, the classification criteria are not met.

Mutagenicity: Based on available data, the classification criteria are not met.

Teratogenicity: Based on available data, the classification criteria are not met.

Reproductive toxicity/Fertility: Based on available data, the classification criteria are not met.

alkylaminocarboxamide

Carcinogenicity: Based on available data, the classification criteria are not met.

Mutagenicity: In vitro tests did not show mutagenic effects Based on available data, the classification criteria are not met.

Teratogenicity: Did not show teratogenic effects in animal experiments. Based on available data, the classification criteria are not met.

Reproductive toxicity/Fertility: Based on available data, the classification criteria are not met.

diethylmethylbenzenediamine

Carcinogenicity: Based on available data, the classification criteria are not met.

Mutagenicity: The mutagenic effect of this substance was investigated in various in vitro tests on bacteria and mammal cell cultures. The result were inconsistent. In vivo tests did not show mutagenic effects Based on available data, the classification criteria are not met.

Teratogenicity: Based on available data, the classification criteria are not met.

Reproductive toxicity/Fertility: Based on available data, the classification criteria are not met.

Dimethylbis[(1-oxoneodecyl)oxy]stannane

Carcinogenicity: No data available.

Mutagenicity: Based on available data, the classification criteria are not met.

Teratogenicity: No data available.

Reproductive toxicity/Fertility: No data available.

Toxicology Assessment

Polyether Polyol

Acute effects: Causes serious eye damage.

Sensitization: Based on available data, the classification criteria are not met.

Trimethylolpropane

Acute effects: Based on available data, the classification criteria are not met.

Sensitization: Based on available data, the classification criteria are not met.

Alkylaminopoly(oxyalkylen)ol

Acute effects: Causes serious eye irritation.

Sensitization: Based on available data, the classification criteria are not met.

alkylaminocarboxamide

Acute effects: Causes severe skin burns and eye damage.

Sensitization: May cause an allergic skin reaction.

diethylmethylbenzenediamine

Acute effects: Harmful if swallowed or in contact with skin Causes serious eye irritation.

Sensitization: Based on available data, the classification criteria are not met.

Dimethylbis[(1-oxoneodecyl)oxy]stannane

Acute effects: Causes skin irritation. Harmful if swallowed.

Sensitization: May cause an allergic skin reaction.

11.2 Information on other hazards

Other information

diethylmethylbenzenediamine

Special properties/effects: Risk of cutaneous absorption.

SECTION 12: Ecological information

Ecotoxicological studies of the product are not available.

Do not allow to escape into waterways, wastewater or soil.

Please find below the ecotoxicological data available to us for the components.

12.1 Toxicity

Acute Fish toxicity

Polyether Polyol

LC50 > 10.000 mg/l

Species: Leuciscus idus (Golden orfe)

Exposure duration: 96 h

Trimethylolpropane

LC50 1.000 mg/l

Species: Fish

Exposure duration: 96 h

Alkylaminopoly(oxyalkylen)ol

LC50 4.600 mg/l

Test type: flow-through test

Species: Leuciscus idus (Golden orfe)

Exposure duration: 96 h

Method: DIN 38412

LC50 4.870 mg/l

Test type: static test

Species: Danio rerio (zebra fish)

Exposure duration: 96 h

Method: DIN 38412

alkylaminocarboxamide

LC50 2,5 mg/l

Species: Danio rerio (zebra fish)

Exposure duration: 96 h

Method: Directive 67/548/EEC, Annex V, C.1.

diethylmethylbenzenediamine

LC50 200 mg/l

Species: Leuciscus idus (Golden orfe)

Exposure duration: 48 h

Method: DIN 38412

Dimethylbis[(1-oxoneodecyl)oxy]stannane

No data available.

Chronic Fish toxicity

Polyether Polyol

No data available.

Trimethylolpropane
No data available.

Alkylaminopoly(oxyalkylen)ol
No data available.

alkylaminocarboxamide
No data available.

diethylmethylbenzenediamine
No data available.

Dimethylbis[(1-oxoneodecyl)oxy]stannane
No data available.

Acute toxicity for daphnia

Polyether Polyol
No data available.

Trimethylolpropane
EC50 13.000 mg/l
Species: Daphnia magna (Water flea)
Exposure duration: 48 h
Method: OECD Test Guideline 202

Alkylaminopoly(oxyalkylen)ol
EC50 > 100 mg/l
Test type: Acute toxicity for daphnia
Species: Daphnia magna (Water flea)
Exposure duration: 48 h
Method: Directive 67/548/EEC, Annex V, C.2.

alkylaminocarboxamide
EC50 0,11 mg/l
Test type: Immobilization
Species: Daphnia magna (Water flea)
Exposure duration: 48 h
Method: Directive 67/548/EEC, Annex V, C.2.

diethylmethylbenzenediamine
EC50 0,5 mg/l
Test type: Immobilization
Species: Daphnia magna (Water flea)
Exposure duration: 48 h
Method: Directive 67/548/EEC, Annex V, C.2.

Dimethylbis[(1-oxoneodecyl)oxy]stannane
EC50 39 mg/l
Species: Daphnia magna (Water flea)
Exposure duration: 48 h
Method: OECD Test Guideline 202

Chronic toxicity to daphnia

Polyether Polyol
No data available.

Trimethylolpropane
NOEC > 1.000 mg/l
Species: Daphnia magna (Water flea)
Exposure duration: 21 d

Alkylaminopoly(oxyalkylen)ol
NOEC (Reproduction) >= 10 mg/l
Species: Daphnia magna (Water flea)
Exposure duration: 21 d
Method: OECD Test Guideline 211

alkylaminocarboxamide
No data available.

diethylmethylbenzenediamine
No data available.

Dimethylbis[(1-oxoneodecyl)oxy]stannane
No data available.

Acute toxicity for algae

Polyether Polyol
No data available.

Trimethylolpropane
ErC50 > 1.000 mg/l
Species: algae
Exposure duration: 72 h

Alkylaminopoly(oxyalkylen)ol
ErC50 150,67 mg/l
Test type: Growth inhibition
Species: *Desmodesmus subspicatus* (Green algae)
Exposure duration: 72 h
Method: Directive 67/548/EEC, Annex V, C.3.

alkylaminocarboxamide
ErC50 0,03 mg/l
endpoint: Growth inhibition
Species: *Desmodesmus subspicatus* (Green algae)
Exposure duration: 72 h
Method: OECD Test Guideline 201

EC10 8 µg/l
endpoint: Growth inhibition
Species: *Desmodesmus subspicatus* (Green algae)
Exposure duration: 72 h
Method: OECD Test Guideline 201

ErC50 0,53 mg/l
endpoint: Growth inhibition
Species: *Desmodesmus subspicatus* (Green algae)
Exposure duration: 72 h
Method: Directive 67/548/EEC, Annex V, C.3.

diethylmethylbenzenediamine
ErC50 104 mg/l
Test type: Growth inhibition
Species: *Desmodesmus subspicatus* (Green algae)
Exposure duration: 72 h
Method: OECD Test Guideline 201

Dimethylbis[(1-oxoneodecyl)oxy]stannane
EC50 7,6 mg/l
Species: *Pseudokirchneriella subcapitata* (green algae)
Exposure duration: 72 h
Method: OECD Test Guideline 201

NOEC 1,2 mg/l
Species: *Pseudokirchneriella subcapitata* (green algae)
Exposure duration: 72 h
Method: OECD Test Guideline 201

Acute bacterial toxicity

Polyether Polyol
EC20 > 1.000 mg/l
Species: activated sludge
Exposure duration: 0,5 h
Method: OECD Test Guideline 209

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Trimethylolpropane
EC50 > 1.000 mg/l
Species: activated sludge
Exposure duration: 3 h

Alkylaminopoly(oxyalkylen)ol
NOEC 700 mg/l
Test type: Respiration inhibition
Species: activated sludge
Exposure duration: 3 h
Method: ISO test method 8192-1986 E

alkylaminocarboxamide
EC50 211 mg/l
Test type: Respiration inhibition
Species: activated sludge
Exposure duration: 3 h
Method: OECD Test Guideline 209

diethylmethylbenzenediamine
EC50 > 170 mg/l
Test type: Cell multiplication inhibition test
Species: *Pseudomonas putida*
Exposure duration: 24 h
Method: DIN 38412

Dimethylbis[(1-oxoneodecyl)oxy]stannane
No data available, supplier information

Toxicity to soil dwelling organisms

alkylaminocarboxamide
NOEC 500 mg/kg
Species: *Eisenia fetida* (earthworms)
Exposure duration: 56 d
Method: OECD Test Guideline 222

NOEC >= 500 mg/kg
Species: soil
Exposure duration: 28 d
Method: OECD Test Guideline 216

Toxicity to terrestrial plants

alkylaminocarboxamide
NOEC (seedling emergence) >= 1.000 mg/kg
Species: *Allium cepa* (onion)
Test period: 14 d
Method: OECD Test Guideline 208

NOEC (seedling emergence) >= 1.000 mg/kg
Species: *Avena sativa* (oats)
Test period: 14 d
Method: OECD Test Guideline 208

NOEC (seedling emergence) >= 1.000 mg/kg
Species: *Brassica napus* (rape)
Test period: 14 d
Method: OECD Test Guideline 208

NOEC (seedling emergence) >= 1.000 mg/kg
Species: *Cucumis sativus* (cucumber)
Test period: 14 d
Method: OECD Test Guideline 208

NOEC (seedling emergence) $\geq$ 1.000 mg/kg
 Species: Pisum sativum (pea)
 Test period: 14 d
 Method: OECD Test Guideline 208

NOEC (seedling emergence) $\geq$ 1.000 mg/kg
 Species: Lycopersicon esculentum
 Test period: 14 d
 Method: OECD Test Guideline 208

Sediment Toxicity

Alkylaminopoly(oxyalkylen)ol

Due to the low n-octanol-water partition coefficient, an adsorption on the sediment is not to be expected.

Ecotoxicology Assessment

Polyether Polyol

Acute aquatic toxicity: Based on available data, the classification criteria are not met.

Chronic aquatic toxicity: Based on available data, the classification criteria are not met.

Trimethylolpropane

Acute aquatic toxicity: Based on available data, the classification criteria are not met.

Chronic aquatic toxicity: Based on available data, the classification criteria are not met.

Alkylaminopoly(oxyalkylen)ol

Acute aquatic toxicity: Based on available data, the classification criteria are not met.

Chronic aquatic toxicity: Based on available data, the classification criteria are not met.

Toxicity Data on Soil: Will not adsorb on soil.

Impact on Sewage Treatment: Because of the low bacterial toxicity, there is no risk of an adverse effect on the performance of biological waste water treatment plants.

alkylaminocarboxamide

Acute aquatic toxicity: Very toxic to aquatic life.

Chronic aquatic toxicity: Very toxic to aquatic life with long lasting effects.

Toxicity Data on Soil: Adsorbs on soil. The substance is graded as non-critical to soil-dwelling organisms.

Impact on Sewage Treatment: Because of the low bacterial toxicity, there is no risk of an adverse effect on the performance of biological waste water treatment plants.

diethylmethylbenzenediamine

Acute aquatic toxicity: Very toxic to aquatic organisms.

Chronic aquatic toxicity: Very toxic to aquatic life with long lasting effects.

Dimethylbis[(1-oxoneodecyl)oxy]stannane

Acute aquatic toxicity: Based on available data, the classification criteria are not met.

Chronic aquatic toxicity: Harmful to aquatic life with long lasting effects.

M-Factor

alkylaminocarboxamide

M-factor (acute aquat. tox.): 10

M-factor (chron. aquat. tox.): 10

diethylmethylbenzenediamine

M-factor (acute aquat. tox.): 1

M-factor (chron. aquat. tox.): 1

12.2 Persistence and degradability

Biodegradability

Polyether Polyol

Biodegradation: ca. 60 %, 28 d, i.e. not readily degradable

Method: OECD Test Guideline 301 A

Trimethylolpropane

Test type: aerobic

Inoculum: activated sludge, non-adapted

Biodegradation: 6 %, 28 d, i.e. not readily degradable

Method: OECD Test Guideline 301 E

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Test type: aerobic
Inoculum: activated sludge
Biodegradation: 70 %, 7 d, i.e. inherently degradable
Method: OECD Test Guideline 302 B

Alkylaminopoly(oxyalkylen)ol
Test type: aerobic
Inoculum: activated sludge
Biodegradation: 9 %, 28 d, i.e. not readily degradable
Method: Directive 67/548/EEC Annex V, C.4.D.

Test type: aerobic
Inoculum: activated sludge
Biodegradation: 36 %, 28 d, i.e. not inherently degradable
Method: OECD Test Guideline 302 B

alkylaminocarboxamide
Inoculum: activated sludge
Biodegradation: 33 %, 28 d, i.e. not readily degradable
Method: Directive 67/548/EEC Annex V, C.4.E.

Inoculum: activated sludge
Biodegradation: 97 %, 28 d, i.e. inherently degradable
Method: OECD Test Guideline 302 C

diethylmethylbenzenediamine
Test type: Closed Bottle test
Biodegradation: < 1 %, 28 d, i.e. not readily degradable
Method: Directive 67/548/EEC Annex V, C.4.E.

Dimethylbis[(1-oxoneodecyl)oxy]stannane
Test type: aerobic
Inoculum: activated sludge
Biodegradation: 0 %, 28 d, i.e. not readily degradable
Method: OECD Test Guideline 301 B

Stability in water

Alkylaminopoly(oxyalkylen)ol
Test type: Hydrolysis
Half life: > 120 h (pH: 4)
Hydrolytic temperature: 50 °C
Hydrolysis duration: 120 h
Method: OECD Test Guideline 111
The substance is hydrolytically stable.

Test type: Hydrolysis
Half life: > 120 h (pH: 7)
Hydrolytic temperature: 50 °C
Hydrolysis duration: 120 h
Method: OECD Test Guideline 111
The substance is hydrolytically stable.

Test type: Hydrolysis
Half life: > 120 h (pH: 9)
Hydrolytic temperature: 50 °C
Hydrolysis duration: 120 h
Method: OECD Test Guideline 111
The substance is hydrolytically stable.

alkylaminocarboxamide
Test type: Hydrolysis
Half life: 140 h at 65 °C (pH: 7)
Method: OECD Test Guideline 111
Hydrolyses slowly.

Test type: Hydrolysis
Half life: 140 h at 65 °C (pH: 9)
Method: OECD Test Guideline 111

Hydrolyses slowly.

diethylmethylbenzenediamine

Test type: Hydrolysis

not applicable

Photodegradation

Alkylaminopoly(oxyalkylen)ol

Test type: Phototransformation in air

Temperature: 25 °C

sensitizer: OH-radicals

Concentration sensibilisator: 500.000 1/cm³

Half-life indirect photolysis: 1,1 - 3,1 h

Method: SRC - AOP (calculation)

After evaporation or exposure to the air, the product will be rapidly degraded by photochemical processes.

diethylmethylbenzenediamine

Test type: Phototransformation in air

Temperature: 25 °C

sensitizer: OH-radicals

Concentration sensibilisator: 1.500.000 1/cm³

Half-life indirect photolysis: 1,48 h

Method: SRC - AOP (calculation)

After evaporation or exposure to the air, the product will be rapidly degraded by photochemical processes.

Volatility (Henry's Law constant)

alkylaminocarboxamide

0,008 Pa*m³/mol at 20 °C

Method: calculated

The substance has to be scored as non-volatile from water.

diethylmethylbenzenediamine

0,000266 Pa*m³/mol at 25 °C

Method: calculated

The substance has to be scored as non-volatile from water.

12.3 Bioaccumulative potential

Bioaccumulation

Trimethylolpropane

Bioconcentration factor (BCF): < 17

Species: Cyprinus carpio (Carp)

Exposure duration: 6 Weeks

Method: OECD Test Guideline 305 C

Alkylaminopoly(oxyalkylen)ol

Bioaccumulation is unlikely.

alkylaminocarboxamide

Bioconcentration factor (BCF): 70,79

Method: (calculated)

An accumulation in aquatic organisms is not to be expected.

diethylmethylbenzenediamine

Bioconcentration factor (BCF): 2,75

Method: (calculated)

An accumulation in aquatic organisms is not to be expected.

Dimethylbis[(1-oxoneodecyl)oxy]stannane

no data available

Partition coefficient (n-octanol/water)

alkylaminocarboxamide

log Pow: 4,3 - 5,6

Method: EG A8

diethylmethylbenzenediamine

log Pow: 1,16

12.4 Mobility in soil

Distribution among environmental compartments

Alkylaminopoly(oxyalkylen)ol

Adsorption/Soil

Koc value: 4,1 - 116

log Koc value: 0,6 - 2,1

Method: calculated

Mobile in soils

alkylaminocarboxamide

Adsorption

Medium: Soil

log Koc value: 8,2 - 8,5

Method: OECD Test Guideline 121

immobile

diethylmethylbenzenediamine

Adsorption/Soil

Koc value: 551

Method: calculated

Moderately mobile in soils

Environmental distribution

alkylaminocarboxamide

medium air: 0,04 %

Medium water: 13,72 %

Medium soil: 43,23 %

Medium sediment: 43,67 %

Medium suspended sediment: 0,28 %

Medium biota: 0,03 %

Medium aerosol: 0,02 %

Method: Calculation according to Mackay, Level I

The target compartments are soil and sediment.

diethylmethylbenzenediamine

Method: (calculated)

The product will be dispersed amongst the various environmental compartments (soil/ water/ air).

12.5 Results of PBT and vPvB assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Endocrine disrupting properties

No data available.

12.7 Other adverse effects

No data available.

SECTION 13: Disposal considerations

Dispose in accordance with applicable international, national and local laws, ordinances and statutes.

For disposal within the EC, the appropriate code according to the European Waste Catalogue (EWC) should be used.

13.1 Waste treatment methods

After containers have been emptied as thoroughly as possible (e.g. by pouring, scraping or draining until "drip-dry"), they can be sent to an appropriate collection point set up within the framework of the existing take-back scheme of the chemical industry. Containers must be recycled in compliance with national

legislation and environmental regulations.

None disposal into waste water.

SECTION 14: Transport information

ADR/RID

14.1 UN number : 2735
 14.2 UN proper shipping name : AMINES, LIQUID, CORROSIVE, N.O.S.
 (Alkylaminocarboxamide)
 14.3 Transport hazard class(es) : 8
 Hazard Identification Number : 80
 14.4 Packing group : II
 14.5 Environmental hazards : yes

Limited quantity regulations applicable in accordance with chapter 3.4 ADR/RID in compliance with threshold value

ADN

14.1 UN number : 2735
 14.2 UN proper shipping name : AMINES, LIQUID, CORROSIVE, N.O.S.
 (Alkylaminocarboxamide)
 14.3 Transport hazard class(es) : 8
 Hazard Identification Number : 80
 14.4 Packing group : II
 14.5 Environmental hazards : yes

This classification data does not apply to transportation by tanker. If required, additional information can be requested from the manufacturer.

IATA

14.1 UN number : 2735
 14.2 UN proper shipping name : AMINES, LIQUID, CORROSIVE, N.O.S.
 (Alkylaminocarboxamide)
 14.3 Transport hazard class(es) : 8
 14.4 Packing group : II
 14.5 Environmental hazards : yes

IMDG

14.1 UN number : 2735
 14.2 UN proper shipping name : AMINES, LIQUID, CORROSIVE, N.O.S.
 (Alkylaminocarboxamide)
 14.3 Transport hazard class(es) : 8
 14.4 Packing group : II
 14.5 Marine pollutant : yes
 EmS Code : F-A - S-B
 Segregation Group IMDG: : 18

14.6 Special precautions for user

See section 6 - 8.

Additional information : Corrosive. Environmentally hazardous substance.
 Keep dry. Avoid heat above +50 °C.
 Keep away from foodstuffs, acids and alkalis.

14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not applicable.

SECTION 15: Regulatory information

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

Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances.

E1 Environmental hazards

Quantity1: 100 t Quantity2: 200 t

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, preparations and articles (Annex XVII)

Conditions of restriction for the following entries should be considered: 3, 40

This product contains substances subject to EU Regulation 1907/2006 (REACH), Annex XVII.

Triethylenediamine

CAS-No.: 280-57-9, EC-No.: 205-999-9

Subject to REACH Annex XVII, No. 40

TA Luft List (Germany)

Type: Organic Substances

portion Class 1: 0,05 %

Fraction of other substances: 88,01 %

Type: Toxic to reproduction

Fraction of other substances: 11,73 %

Water contaminating class (Germany)

3 highly water endangering

Classification according to AwSV, Annex 1 (5.2)

Any national regulations for the handling of hazardous substances must be observed.

Other regulations

Take note of Directive 94/33/EC on the protection of young people at work or stricter national regulations, where applicable.

Take note of Law on the protection of mothers at work, in education and in studies (Maternity Protection Act - MuSchG).

15.2 Chemical Safety Assessment**A Chemical Safety Assessment has been carried out for:**

Trimethylolpropane

Alkylaminopoly(oxyalkylen)ol

alkylaminocarboxamide

diethylmethylbenzenediamine

SECTION 16: Other information**Full text of the hazard statements of the CLP classification (1272/2008/CE) referred to under sections 2, 3 and 10.**

H302	Harmful if swallowed.
H312	Harmful in contact with skin.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H361fd	Suspected of damaging fertility. Suspected of damaging the unborn child.
H373	May cause damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.

Safety precautions for handling freshly molded polyurethane parts:

Depending on the production parameters, any uncovered surfaces of freshly molded polyurethane parts using this raw material may contain traces of substances (e. g. starting and reaction products, catalysts, release agents) with hazardous characteristics. Skin contact with traces of these substances must be avoided. Therefore, during demolding or other handling of fresh molded parts, protective gloves tested according to DIN-EN 374 (e.g. nitrile rubber $\geq 0,35$ mm thick, breakthrough time ≥ 480 min, or according to recommendations from glove makers thinner gloves that need to be changed in compliance with breakthrough times more frequently) must be used. Depending on formulation and processing conditions, the requirements may be different from handling of the pure substances. Closed protective clothing is required for the protection of other areas of skin.

Abbreviations and acronyms

ADN	Accord européen relatif au transport international des marchandises Dangereuses par voie de Navigation intérieure
ADR	Accord européen relatif au transport international des marchandises Dangereuses par Route
ANSI	American National Standards Institute
ASTM	American Society of Testing and Materials (US)
ATE	Acute Toxic Estimate
AwSv	Verordnung über Anlagen zum Umgang mit wassergefährdenden Stoffen
BCF	Bioconcentration Factor
CAS	Chemical Abstract Service
CLP	Regulation on Classification, Labelling and Packaging of Substances and Mixtures
CMR	Cancerogenic Mutagenic Reprotoxic
DIN	Deutsches Institut für Normung
DNEL	Derived No-Effect Level
EC...	Effect Concentration ... %
EWC	European Waste Catalogue
IATA	International Air Transport Association
IBC	Intermediate Bulk Container
ICAO	International Civil Aviation Organization
IMDG	International Maritime Dangerous Goods
IMO	International Maritime Organization
ISO	International Organization for Standardization
IUPAC	International Union of Pure and Applied Chemistry
LOAEL	Lowest Observable Adverse Effect Level
LC...	Lethal Concentration, ...%
LD...	Lethal Dose, ...%
MARPOL	International Convention for the Prevention of Pollution From Ships
NOAEL	No Observed Adverse Effect Level
NOEL/NOEC	No Observed Effect Level/Concentration
OECD	Organisation for Economic Co-operation and Development
PBT	persistent, bioaccumulative, toxic
PNEC	Predicted No-Effect Concentration
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RID	Règlement concernant le transport International ferroviaire de marchandises Dangereuses
STOT	Specific Target Organ Toxicity
TRGS	Technische Regeln für Gefahrstoffe
vPvB	very Persistent, very Bioaccumulative
WGK	Wassergefährdungsklasse

Relevant changes since the last version are highlighted in the margin. This version replaces all previous versions.

Further information

Classification of the mixture:

Skin Corr. 1C H314

Eye Dam. 1 H318

Skin Sens. 1 H317

Repr. 2 H361fd

Aquatic Acute 1 H400

Aquatic Chronic 1 H410

Classification procedure:

Calculation method

Calculation method

Calculation method

Calculation method

Calculation method

Calculation method

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Annex

The operational conditions and the implementation of Risk Management Measures (RMM) are dependent on the following priority-/lead substances for the respective exposure routes:

Lead substance(s), aquatic environment:

alkylaminocarboxamide

Lead substance(s), ozone layer:

Not relevant

Lead substance(s), Inhalation:

diethylmethylbenzenediamine

Lead substance(s), Dermal:

Trimethylolpropane

Lead substance(s), Oral:

Not relevant

Local effects, Skin:

alkylaminocarboxamide

RMMs/OCs for lead component(s) driving the hazards for local effects on skin are sufficiently covered by the lead component(s) which drive the hazards for systemic dermal effects.

Local effects, Inhalation:

Not relevant

Local effects, Eyes:

Polyether Polyol

For RMMs see chapter 8 of the SDS.

Exposure Scenario

Number	Title
ES1	Formulation or re-packing
ES2	Use at industrial sites; Use in PUR parts.
ES3	Use at industrial sites; Use in coatings.
ES4	Use at industrial sites; Adhesives, sealants.

ES1: Formulation or re-packing**1.1. Title section**

Exposure Scenario name	: Formulation
Structured Short Title	: Formulation or re-packing

Environment		
CS1	Formulation & (re)packing of substances and mixtures [alkylaminocarboxamide]	ERC2
Worker		
CS2	Use in closed process, no likelihood of exposure [diethylmethylbenzenediamine]	PROC1
CS3	Formulation into mixture [Trimethylolpropane]	PROC1
CS4	Formulation into solid matrix [Trimethylolpropane]	PROC1
CS5	Use in closed batch process (synthesis or formulation) [diethylmethylbenzenediamine]	PROC3
CS6	Formulation into mixture [Trimethylolpropane]	PROC3
CS7	Formulation into solid matrix [Trimethylolpropane]	PROC3
CS8	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) [diethylmethylbenzenediamine]	PROC5
CS9	Formulation into mixture [Trimethylolpropane]	PROC5, PROC8a
CS10	Formulation into solid matrix [Trimethylolpropane]	PROC5, PROC8a
CS11	Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities [diethylmethylbenzenediamine]	PROC8a
CS12	Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities [diethylmethylbenzenediamine]	PROC8b
CS13	Formulation into mixture [Trimethylolpropane]	PROC8b
CS14	Formulation into solid matrix [Trimethylolpropane]	PROC8b
CS15	Transfer of substance or preparation into small containers (dedicated filling line, including weighing) [diethylmethylbenzenediamine]	PROC9
CS16	Formulation into mixture [Trimethylolpropane]	PROC9
CS17	Formulation into solid matrix [Trimethylolpropane]	PROC9
CS18	Use as laboratory reagent [diethylmethylbenzenediamine]	PROC15

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CS19	Formulation into mixture [Trimethylolpropane]	PROC15
CS20	Formulation into solid matrix [Trimethylolpropane]	PROC15
Further information		
The formulation of tyres is covered in this scenario		

1.2. Conditions of use affecting exposure**1.2.1. Control of environmental exposure: Formulation of preparations (ERC2)**
[alkylaminocarboxamide]

Product (article) characteristics	
Molar Mass	: 309 g/mol
Vapour pressure	: 0,000392 Pa at 25 °C
Water solubility	: 10,3 mg/l at 20 °C
Partition coefficient (n-octanol/water)	: log Pow: 5,6 at: 20 °C
Biodegradation	: Inherently biodegradable.
Amount used, frequency and duration of use (or from service life)	
Fraction of EU tonnage used in region:	: 1
Annual amount per site	: <= 2000 tonnes/year (t/y)
Daily amount per site	: <= 20 t/day
Technical and organisational conditions and measures	
Air Waste gas treatment - condensation. Waste gases are directed to thermal incineration.	
Soil Sealing of all relevant soil surfaces in the facility is required.	
Conditions and measures related to sewage treatment plant	
STP type	: Biological sewage treatment plant
STP sludge treatment	: No application of sewage sludge to agricultural soil.
STP effluent	: 2.000 m3/d
Effectiveness (of a measure)	: 91,99 %
Conditions and measures related to treatment of waste (including article waste)	
Waste treatment	: No specific measures identified. Low risk assumed for waste life stage.
Other conditions affecting environmental exposure	
Receiving surface water flow	: 18.000 m3/d

1.2.2. Control of worker exposure: Use in closed process, no likelihood of exposure (PROC1)
[diethylmethylbenzenediamine]

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Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: 5 - 50%
Molar Mass	: 178,28 g/mol
Vapour pressure	: 0,0000971 kPa at 25 °C
Vapour pressure	: 0,000391 kPa at 35 °C Highest ambient temperature for workers.
Physical form of product	: Liquid substance
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: > 4 hours/day
Frequency of use	: daily
Technical and organisational conditions and measures	
Good work practice should be used, which may include: Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing. Systems in place to ensure correct use of RMMs and that OCs are being followed. Training for staff on good practice. Careful attention to industrial and personal hygiene is essential. Procedures and training for emergency decontamination and disposal. Recording of any "near miss" situations.	
Handle substance within a closed system. Ensure material transfers are under containment or extract ventilation.	
Conditions and measures related to personal protection, hygiene and health evaluation	
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. Wash hands thoroughly after handling. Wear protective gloves/ protective clothing/ eye protection/ face protection. Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

1.2.3. Control of worker exposure: Use in closed process, no likelihood of exposure (PROC1) [Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Physical form of product	: Solid, low dustiness
Process Temperature	: <= 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day

Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	
No specific measures identified.	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

1.2.4. Control of worker exposure: Use in closed process, no likelihood of exposure (PROC1)
[Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Physical form of product	: Solid, low dustiness
Process Temperature	: <= 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	
No specific measures identified.	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

1.2.5. Control of worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)
[diethylmethylbenzenediamine]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: 5 - 50%
Molar Mass	: 178,28 g/mol
Vapour pressure	: 0,0000971 kPa at 25 °C
Vapour pressure	: 0,000391 kPa at 35 °C Highest ambient temperature for workers.
Physical form of product	: Liquid substance
Amount used, frequency and duration of use (or from service life)	

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Duration of the activity	: > 4 hours/day
Frequency of use	: daily
Technical and organisational conditions and measures	
Good work practice should be used, which may include: Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing. Systems in place to ensure correct use of RMMs and that OCs are being followed. Training for staff on good practice. Careful attention to industrial and personal hygiene is essential. Procedures and training for emergency decontamination and disposal. Recording of any "near miss" situations.	
Handle substance within a predominantly closed system. Ensure material transfers are under containment or extract ventilation. Local exhaust ventilation is required.	
Conditions and measures related to personal protection, hygiene and health evaluation	
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. Wash hands thoroughly after handling. Wear protective gloves/ protective clothing/ eye protection/ face protection. Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

1.2.6. Control of worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)
[Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Physical form of product	: Solid, low dustiness
Process Temperature	: <= 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear suitable gloves tested to EN374. Dermal - minimum efficiency of 80 %	
Other conditions affecting workers exposure	

Indoor or outdoor use	: Indoor use
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**1.2.7. Control of worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)
[Trimethylolpropane]**

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Physical form of product	: Solid, low dustiness
Process Temperature	: <= 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear suitable gloves tested to EN374. Dermal - minimum efficiency of 80 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

**1.2.8. Control of worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) (PROC5)
[diethylmethylbenzenediamine]**

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: 5 - 50%
Molar Mass	: 178,28 g/mol
Vapour pressure	: 0,0000971 kPa at 25 °C
Vapour pressure	: 0,000391 kPa at 35 °C Highest ambient temperature for workers.
Physical form of product	: Liquid substance
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: 1 - 4 hours/day
Frequency of use	: daily
Technical and organisational conditions and measures	
Good work practice should be used, which may include: Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing.	

Systems in place to ensure correct use of RMMs and that OCs are being followed.
 Training for staff on good practice.
 Careful attention to industrial and personal hygiene is essential.
 Procedures and training for emergency decontamination and disposal.
 Recording of any "near miss" situations.

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

Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
 Wash hands thoroughly after handling.
 Wear protective gloves/ protective clothing/ eye protection/ face protection.
 Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

1.2.9. Control of worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) (PROC5) / Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a) [Trimethylolpropane]

Product (article) characteristics

Concentration of the Substance in Mixture/Article : <= 100%
 Molar Mass : 134,1 g/mol
 Vapour pressure : 0,00016 hPa at 40 °C
 Physical form of product : Solid, low dustiness
 Process Temperature : <= 40 °C

Amount used, frequency and duration of use (or from service life)

Duration of the activity : <= 8 hours/day

Technical and organisational conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).

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

Wear suitable protective clothing.
 Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
 Dermal - minimum efficiency of 95 %

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

1.2.10. Control of worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) (PROC5) / Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a) [Trimethylolpropane]

Product (article) characteristics

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Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Physical form of product	: Solid, low dustiness
Process Temperature	: <= 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

1.2.11. Control of worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)
[diethylmethybenzenediamine]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: 5 - 50%
Molar Mass	: 178,28 g/mol
Vapour pressure	: 0,0000971 kPa at 25 °C
Vapour pressure	: 0,000391 kPa at 35 °C Highest ambient temperature for workers.
Physical form of product	: Liquid substance
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: 1 - 4 hours/day
Frequency of use	: daily
Technical and organisational conditions and measures	
Good work practice should be used, which may include: Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing. Systems in place to ensure correct use of RMMs and that OCs are being followed. Training for staff on good practice. Careful attention to industrial and personal hygiene is essential. Procedures and training for emergency decontamination and disposal. Recording of any "near miss" situations.	
Conditions and measures related to personal protection, hygiene and health evaluation	

Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
 Wash hands thoroughly after handling.
 Wear protective gloves/ protective clothing/ eye protection/ face protection.
 Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

1.2.12. Control of worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b) [diethylmethylbenzenediamine]

Product (article) characteristics

Concentration of the Substance in Mixture/Article : 5 - 50%

Molar Mass : 178,28 g/mol

Vapour pressure : 0,0000971 kPa at 25 °C

Vapour pressure : 0,000391 kPa at 35 °C Highest ambient temperature for workers.

Physical form of product : Liquid substance

Amount used, frequency and duration of use (or from service life)

Duration of the activity : < 1 hours/day

Frequency of use : daily

Technical and organisational conditions and measures

Good work practice should be used, which may include:
 Ensure all equipment is well maintained.
 Regular cleaning of equipment, work area and clothing.
 Systems in place to ensure correct use of RMMs and that OCs are being followed.
 Training for staff on good practice.
 Careful attention to industrial and personal hygiene is essential.
 Procedures and training for emergency decontamination and disposal.
 Recording of any "near miss" situations.

Fill containers/cans at dedicated fill points supplied with local extract ventilation.
 Provide extract ventilation to material transfer points and other openings.

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

Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
 Wash hands thoroughly after handling.
 Wear protective gloves/ protective clothing/ eye protection/ face protection.
 Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

1.2.13. Control of worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b) [Trimethylolpropane]

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Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Physical form of product	: Solid, low dustiness
Process Temperature	: <= 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

1.2.14. Control of worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)
[Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Physical form of product	: Solid, low dustiness
Process Temperature	: <= 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Other conditions affecting workers exposure	

Indoor or outdoor use	: Indoor use
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1.2.15. Control of worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9)
[diethylmethybenzenediamine]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: 5 - 50%
Molar Mass	: 178,28 g/mol
Vapour pressure	: 0,0000971 kPa at 25 °C
Vapour pressure	: 0,000391 kPa at 35 °C Highest ambient temperature for workers.
Physical form of product	: Liquid substance
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: 1 - 4 hours/day
Frequency of use	: daily
Technical and organisational conditions and measures	
Good work practice should be used, which may include: Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing. Systems in place to ensure correct use of RMMs and that OCs are being followed. Training for staff on good practice. Careful attention to industrial and personal hygiene is essential. Procedures and training for emergency decontamination and disposal. Recording of any "near miss" situations.	
Fill containers/cans at dedicated fill points supplied with local extract ventilation. Provide extract ventilation to material transfer points and other openings.	
Conditions and measures related to personal protection, hygiene and health evaluation	
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. Wash hands thoroughly after handling. Wear protective gloves/ protective clothing/ eye protection/ face protection. Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

1.2.16. Control of worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9)
[Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C

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Physical form of product	: Solid, low dustiness
Process Temperature	: <= 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

1.2.17. Control of worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9)
[Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Physical form of product	: Solid, low dustiness
Process Temperature	: <= 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

1.2.18. Control of worker exposure: Use as laboratory reagent (PROC15)
[diethylmethylbenzenediamine]

Product (article) characteristics
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Concentration of the Substance in Mixture/Article	: 5 - 50%
Molar Mass	: 178,28 g/mol
Vapour pressure	: 0,0000971 kPa at 25 °C
Vapour pressure	: 0,000391 kPa at 35 °C Highest ambient temperature for workers.
Physical form of product	: Liquid substance
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: > 4 hours/day
Frequency of use	: daily
Technical and organisational conditions and measures	
Good work practice should be used, which may include: Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing. Systems in place to ensure correct use of RMMs and that OCs are being followed. Training for staff on good practice. Careful attention to industrial and personal hygiene is essential. Procedures and training for emergency decontamination and disposal. Recording of any "near miss" situations.	
Carry out in a vented booth or extracted enclosure. Ensure samples are obtained under containment or extract ventilation. Local exhaust ventilation is required.	
Conditions and measures related to personal protection, hygiene and health evaluation	
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. Wash hands thoroughly after handling. Wear protective gloves/ protective clothing/ eye protection/ face protection. Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

1.2.19. Control of worker exposure: Use as laboratory reagent (PROC15)
[Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Physical form of product	: Solid, low dustiness
Process Temperature	: <= 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

1.2.20. Control of worker exposure: Use as laboratory reagent (PROC15) [Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Physical form of product	: Solid, low dustiness
Process Temperature	: <= 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

1.3. Exposure estimation and reference to its source

1.3.1. Environmental release and exposure: Formulation of preparations (ERC2) [alkylaminocarboxamide]

Release route	Release rate	Release estimation method	Remarks
Water	0 %	Estimated release factor	release before RMM, release after RMM, No release to waste water under normal circumstances.
Air	0 %	Estimated release factor	release before RMM, release after RMM

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Soil	0 %	Estimated release factor	release after RMM
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Compartment	Exposure level	RCR	Remarks
Freshwater	0,000000012 mg/L (EUSES v2.1.2)	< 0,01	
Freshwater sediment	0,379 mg/kg dry weight (EUSES v2.1.2)	< 0,01	
Marine water	0,00000292 µg/L (EUSES v2.1.2)	< 0,01	
Marine sediment	0,092 mg/kg dry weight (EUSES v2.1.2)	< 0,01	
Agricultural soil	0,0000304 mg/kg dry weight (EUSES v2.1.2)	< 0,01	
Man via environment - Inhalation	negligible (EUSES v2.1.2)	< 0,01	
Man via environment - Oral	negligible (EUSES v2.1.2)	< 0,01	

Additional information on exposure estimation

Based on the applied RMMs the risk towards environment is sufficiently controlled (RCR ≤ 1).

**1.3.2. Worker exposure: Use in closed process, no likelihood of exposure (PROC1)
[diethylmethybenzenediamine]**

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0743 mg/m ³ (ECETOC TRA was used with modifications.)	0,572	
long term, dermal, systemic,	0,00343 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,00343	Gloves: 99% protection

Additional information on exposure estimation

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

**1.3.3. Worker exposure: Use in closed process, no likelihood of exposure (PROC1)
[Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,01 mg/m ³ (ECETOC TRA v3.0, Worker)	< 0,01	
dermal, systemic, long-term	0,034 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,036	

Additional information on exposure estimation

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

**1.3.4. Worker exposure: Use in closed process, no likelihood of exposure (PROC1)
[Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic,	0,01 mg/m ³ (ECETOC TRA	< 0,01	

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long-term	v3.0, Worker)		
dermal, systemic, long-term	0,034 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,036	

Additional information on exposure estimationBased on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).**1.3.5. Worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)
[diethylmethylenediamine]**

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0743 mg/m ³ (ECETOC TRA was used with modifications.)	0,572	LEV: 90% efficiency
long term, dermal, systemic,	0,000343 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,000343	Gloves: 99% protection, LEV: 90% efficiency

Additional information on exposure estimationBased on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).**1.3.6. Worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)
[Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	
dermal, systemic, long-term	0,138 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,147	

Additional information on exposure estimationBased on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).**1.3.7. Worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)
[Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	
dermal, systemic, long-term	0,138 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,147	

Additional information on exposure estimationBased on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).**1.3.8. Worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) (PROC5)
[diethylmethylenediamine]**

Exposure route	Exposure level	RCR	Remarks
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long term, inhalative, systemic,	0,0153 mg/m ³ (ECETOC TRA was used with modifications.)	0,112	
long term, dermal, systemic,	0,137 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,137	Gloves: 99% protection

Additional information on exposure estimation

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

1.3.9. Worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) (PROC5) / Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,5 mg/m ³ (ECETOC TRA v3.0, Worker)	0,152	
dermal, systemic, long-term	0,686 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,729	

Additional information on exposure estimation

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

1.3.10. Worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) (PROC5) / Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,5 mg/m ³ (ECETOC TRA v3.0, Worker)	0,152	
dermal, systemic, long-term	0,686 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,729	

Additional information on exposure estimation

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

1.3.11. Worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)
[diethylmethylenediamine]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0025 mg/m ³ (ECETOC TRA was used with modifications.)	0,0192	
long term, dermal, systemic,	0,137 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,137	Gloves: 99% protection

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).

1.3.12. Worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)
[diethylmethylenediamine]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0153 mg/m ³ (ECETOC TRA was used with modifications.)	0,118	
long term, dermal, systemic,	0,0686 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,0686	Gloves: 99% protection

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).

1.3.13. Worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	
dermal, systemic, long-term	0,686 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,729	

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).

1.3.14. Worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	
dermal, systemic, long-term	0,686 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,729	

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).

1.3.15. Worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9)
[diethylmethylenediamine]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0153 mg/m ³ (ECETOC TRA was used with modifications.)	0,118	
long term, dermal, systemic,	0,0686 mg/kg body	0,0686	Gloves: 99% protection

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	weight/day (ECETOC TRA was used with modifications.)		
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Additional information on exposure estimationBased on the applied RMMs the risk towards humans is sufficiently controlled ($RCR \leq 1$).
1.3.16. Worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	
dermal, systemic, long-term	0,343 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,365	

Additional information on exposure estimationBased on the applied RMMs the risk towards humans is sufficiently controlled ($RCR \leq 1$).
1.3.17. Worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	
dermal, systemic, long-term	0,343 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,365	

Additional information on exposure estimationBased on the applied RMMs the risk towards humans is sufficiently controlled ($RCR \leq 1$).
1.3.18. Worker exposure: Use as laboratory reagent (PROC15)
[diethylmethylenediamine]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0743 mg/m ³ (ECETOC TRA was used with modifications.)	0,572	LEV: 90% efficiency
long term, dermal, systemic,	0,000343 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,000343	Gloves: 99% protection, LEV: 90% efficiency

Additional information on exposure estimationBased on the applied RMMs the risk towards humans is sufficiently controlled ($RCR \leq 1$).
1.3.19. Worker exposure: Use as laboratory reagent (PROC15)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic,	0,1 mg/m ³ (ECETOC TRA	0,03	

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long-term	v3.0, Worker)		
dermal, systemic, long-term	0,034 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,036	

Additional information on exposure estimationBased on the applied RMMs the risk towards humans is sufficiently controlled ($RCR \leq 1$).**1.3.20. Worker exposure: Use as laboratory reagent (PROC15)
[Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	
dermal, systemic, long-term	0,034 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,036	

Additional information on exposure estimationBased on the applied RMMs the risk towards humans is sufficiently controlled ($RCR \leq 1$).**1.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES**

The risk management measures given in this exposure scenario apply to the specified substance in a concentration as indicated in the scenario. The concentration of the substance in the product may differ. A downstream user should evaluate if the risk management measures may be adapted accordingly.

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

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

If further details are needed, please contact us.

diethylmethylbenzenediamine

The exposure estimates have been assessed using ECETOC TRA (2010) with Tier 2 refinements.

Inhalation exposure was estimated by the saturated vapour concentration (SVC). The SVC depends on its amount in the formulations, the molecular weight of the solvent (≥ 1000 g/mol) and the ambient temperature (assumed to be 35 °C as a conservative worst case approach).

ES2: Use at industrial sites; Use in PUR parts.**2.1. Title section**

Exposure Scenario name	: Use in PUR parts
Structured Short Title	: Use at industrial sites; Use in PUR parts.

Environment		
CS1	Use of preparations containing the substance [alkylaminocarboxamide]	ERC5
Worker		
CS2	Use in PUR parts [diethylmethylbenzenediamine]	PROC1
CS3	Use as an intermediate [Trimethyloolpropane]	PROC1
CS4	Polymerisation, Monomers [Trimethyloolpropane]	PROC1
CS5	Use in PUR parts [diethylmethylbenzenediamine]	PROC2
CS6	Polymerisation, Monomers [Trimethyloolpropane]	PROC2
CS7	Use in PUR parts [diethylmethylbenzenediamine]	PROC3
CS8	Use as an intermediate [Trimethyloolpropane]	PROC3
CS9	Polymerisation, Monomers [Trimethyloolpropane]	PROC3
CS10	Use in PUR parts [diethylmethylbenzenediamine]	PROC4
CS11	Use as an intermediate [Trimethyloolpropane]	PROC4
CS12	Polymerisation, Monomers [Trimethyloolpropane]	PROC4
CS13	Use in PUR parts [diethylmethylbenzenediamine]	PROC5, PROC8a
CS14	Polymerisation, Monomers [Trimethyloolpropane]	PROC5
CS15	Use at industrial site leading to inclusion into/onto article [Trimethyloolpropane]	PROC5, PROC8a
CS16	Use as an intermediate [Trimethyloolpropane]	PROC8a
CS17	Polymerisation, Monomers [Trimethyloolpropane]	PROC8a
CS18	Use in PUR parts [diethylmethylbenzenediamine]	PROC8b
CS19	Use as an intermediate [Trimethyloolpropane]	PROC8b
CS20	Polymerisation, Monomers	PROC8b

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[Trimethylolpropane]		
CS21	Use at industrial site leading to inclusion into/onto article [Trimethylolpropane]	PROC8b
CS22	Use in PUR parts [diethylmethylbenzenediamine]	PROC9
CS23	Use as an intermediate [Trimethylolpropane]	PROC9
CS24	Polymerisation, Monomers [Trimethylolpropane]	PROC9
CS25	Use at industrial site leading to inclusion into/onto article [Trimethylolpropane]	PROC9
CS26	Use in PUR parts [diethylmethylbenzenediamine]	PROC14
CS27	Polymerisation, Monomers [Trimethylolpropane]	PROC14
CS28	Use at industrial site leading to inclusion into/onto article [Trimethylolpropane]	PROC14
CS29	Use in PUR parts [diethylmethylbenzenediamine]	PROC15
CS30	Use as an intermediate [Trimethylolpropane]	PROC15
CS31	Polymerisation, Monomers [Trimethylolpropane]	PROC15
Further information		
Use of TMP in tyres is covered in this scenario		

2.2. Conditions of use affecting exposure**2.2.1. Control of environmental exposure: Industrial use resulting in inclusion into or onto a matrix (ERC5)**
[alkylaminocarboxamide]

Product (article) characteristics	
Molar Mass	: 309 g/mol
Vapour pressure	: 0,000392 Pa at 25 °C
Water solubility	: 10,3 mg/l at 20 °C
Partition coefficient (n-octanol/water)	: log Pow: 5,6 at: 20 °C
Biodegradation	: Inherently biodegradable.
Amount used, frequency and duration of use (or from service life)	
Fraction of EU tonnage used in region:	: 1
Annual amount per site	: <= 2000 tonnes/year (t/y)
Daily amount per site	: <= 20 t/day
Technical and organisational conditions and measures	
Air Waste gases are directed to thermal incineration.	

Soil Sealing of all relevant soil surfaces in the facility is required.	
Conditions and measures related to sewage treatment plant	
STP type	: Biological sewage treatment plant
STP sludge treatment	: No application of sewage sludge to agricultural soil.
STP effluent	: 2.000 m3/d
Effectiveness (of a measure)	: 91,99 %
Conditions and measures related to treatment of waste (including article waste)	
Waste treatment	: No specific measures identified. Low risk assumed for waste life stage.
Other conditions affecting environmental exposure	
Receiving surface water flow	: 18.000 m3/d

2.2.2. Control of worker exposure: Use in closed process, no likelihood of exposure (PROC1)
[diethylmethylbenzenediamine]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: 50%
Molar Mass	: 178,28 g/mol
Vapour pressure	: 0,0000971 kPa at 25 °C
Vapour pressure	: 0,000391 kPa at 35 °C Highest ambient temperature for workers.
Physical form of product	: Liquid substance
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: > 4 hours/day
Frequency of use	: daily
Technical and organisational conditions and measures	
Good work practice should be used, which may include: Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing. Systems in place to ensure correct use of RMMs and that OCs are being followed. Training for staff on good practice. Careful attention to industrial and personal hygiene is essential. Procedures and training for emergency decontamination and disposal. Recording of any "near miss" situations.	
Handle substance within a closed system. Ensure material transfers are under containment or extract ventilation.	
Conditions and measures related to personal protection, hygiene and health evaluation	
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. Wash hands thoroughly after handling. Wear protective gloves/ protective clothing/ eye protection/ face protection. Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.	

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor/Outdoor use

**2.2.3. Control of worker exposure: Use in closed process, no likelihood of exposure (PROC1)
[Trimethylolpropane]****Product (article) characteristics**

Concentration of the Substance in Mixture/Article : ≤ 100%

Molar Mass : 134,1 g/mol

Vapour pressure : 0,00016 hPa at 40 °C

Vapour pressure : 100 hPa at 120 °C

Physical form of product : Solid, low dustiness

Physical form of product : Liquid

Process Temperature : ≤ 40 °C

Process Temperature : ≤ 120 °C

Amount used, frequency and duration of use (or from service life)

Duration of the activity : ≤ 8 hours/day

Technical and organisational conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).

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

No specific measures identified.

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

**2.2.4. Control of worker exposure: Use in closed process, no likelihood of exposure (PROC1)
[Trimethylolpropane]****Product (article) characteristics**

Concentration of the Substance in Mixture/Article : ≤ 100%

Molar Mass : 134,1 g/mol

Vapour pressure : 0,00016 hPa at 40 °C

Vapour pressure : 100 hPa at 120 °C

Physical form of product : Solid, low dustiness

Physical form of product : Liquid

Process Temperature : ≤ 40 °C

Process Temperature : ≤ 120 °C

Amount used, frequency and duration of use (or from service life)

Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	
No specific measures identified.	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

2.2.5. Control of worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC2)

[diethylmethylenediamine]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: 50%
Molar Mass	: 178,28 g/mol
Vapour pressure	: 0,0000971 kPa at 25 °C
Vapour pressure	: 0,000391 kPa at 35 °C Highest ambient temperature for workers.
Physical form of product	: Liquid substance
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: > 4 hours/day
Frequency of use	: daily
Technical and organisational conditions and measures	
Good work practice should be used, which may include: Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing. Systems in place to ensure correct use of RMMs and that OCs are being followed. Training for staff on good practice. Careful attention to industrial and personal hygiene is essential. Procedures and training for emergency decontamination and disposal. Recording of any "near miss" situations.	
Handle substance within a predominantly closed system. Ensure material transfers are under containment or extract ventilation.	
Conditions and measures related to personal protection, hygiene and health evaluation	
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. Wash hands thoroughly after handling. Wear protective gloves/ protective clothing/ eye protection/ face protection. Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor/Outdoor use

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2.2.6. Control of worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC2)**[Trimethylolpropane]**

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Vapour pressure	: < 1 hPa at 120 °C
Physical form of product	: Solid, low dustiness
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Process Temperature	: <= 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
40 °C Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
120 °C Room ventilation rate of 3 air changes per hour (ACH) is required. Demonstrable and effective housekeeping practices in place. Provide a high level containment. Inhalation - minimum efficiency of 99,9 %	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
Other conditions affecting workers exposure	
Open surface	: > 3 m ²
Remarks	: 120 °C
Indoor or outdoor use	: Indoor use
Remarks	: 40 °C, 120 °C
Room size	: 300 m ³
Remarks	: 120 °C

2.2.7. Control of worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)**[diethylmethylbenzenediamine]**

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: 50%
Molar Mass	: 178,28 g/mol
Vapour pressure	: 0,0000971 kPa at 25 °C

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Vapour pressure	: 0,000391 kPa at 35 °C	Highest ambient temperature for workers.
Physical form of product	: Liquid substance	
Amount used, frequency and duration of use (or from service life)		
Duration of the activity	: > 4 hours/day	
Frequency of use	: daily	
Technical and organisational conditions and measures		
Good work practice should be used, which may include: Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing. Systems in place to ensure correct use of RMMs and that OCs are being followed. Training for staff on good practice. Careful attention to industrial and personal hygiene is essential. Procedures and training for emergency decontamination and disposal. Recording of any "near miss" situations.		
Handle substance within a predominantly closed system. Ensure material transfers are under containment or extract ventilation. Local exhaust ventilation is required.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. Wash hands thoroughly after handling. Wear protective gloves/ protective clothing/ eye protection/ face protection. Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.		
Other conditions affecting workers exposure		
Indoor or outdoor use	: Indoor/Outdoor use	

2.2.8. Control of worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)
[Trimethylolpropane]

Product (article) characteristics		
Concentration of the Substance in Mixture/Article	: <= 100%	
Molar Mass	: 134,1 g/mol	
Vapour pressure	: 0,00016 hPa at 40 °C	
Vapour pressure	: < 1 hPa at 120 °C	
Physical form of product	: Solid, low dustiness	
Physical form of product	: Liquid	
Process Temperature	: <= 40 °C	
Process Temperature	: <= 120 °C	
Amount used, frequency and duration of use (or from service life)		
Duration of the activity	: <= 8 hours/day	
Technical and organisational conditions and measures		

40 °C	Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).
120 °C	Room ventilation rate of 3 air changes per hour (ACH) is required. Demonstrable and effective housekeeping practices in place. Provide a high level containment. Inhalation - minimum efficiency of 99,9 %
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
Other conditions affecting workers exposure	
Open surface	: > 3 m ²
Remarks	: 120 °C
Indoor or outdoor use	: Indoor use
Remarks	: 40 °C, 120 °C
Room size	: 300 m ³
Remarks	: 120 °C

2.2.9. Control of worker exposure: Use in closed batch process (synthesis or formulation) (PROC3) [Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Vapour pressure	: < 1 hPa at 120 °C
Physical form of product	: Solid, low dustiness
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Process Temperature	: <= 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
40 °C	Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).
120 °C	Room ventilation rate of 3 air changes per hour (ACH) is required. Demonstrable and effective housekeeping practices in place. Provide a high level containment. Inhalation - minimum efficiency of 99,9 %
Conditions and measures related to personal protection, hygiene and health evaluation	

Wear suitable protective clothing.
 Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
 Dermal - minimum efficiency of 90 %

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Remarks : 40 °C, 120 °C

Room size : 300 m³

Remarks : 120 °C

2.2.10. Control of worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC4)**[diethylmethybenzenediamine]****Product (article) characteristics**

Concentration of the Substance in Mixture/Article : 50%

Molar Mass : 178,28 g/mol

Vapour pressure : 0,0000971 kPa at 25 °C

Vapour pressure : 0,000391 kPa at 35 °C Highest ambient temperature for workers.

Physical form of product : Liquid substance

Amount used, frequency and duration of use (or from service life)

Duration of the activity : > 4 hours/day

Frequency of use : daily

Technical and organisational conditions and measures

Good work practice should be used, which may include:
 Ensure all equipment is well maintained.
 Regular cleaning of equipment, work area and clothing.
 Systems in place to ensure correct use of RMMs and that OCs are being followed.
 Training for staff on good practice.
 Careful attention to industrial and personal hygiene is essential.
 Procedures and training for emergency decontamination and disposal.
 Recording of any "near miss" situations.

Provide extraction ventilation at points where emissions occur.
 Ensure material transfers are under containment or extract ventilation.
 Ensure samples are obtained under containment or extract ventilation.
 Local exhaust ventilation is required.

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

Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
 Wash hands thoroughly after handling.
 Wear protective gloves/ protective clothing/ eye protection/ face protection.
 Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor/Outdoor use

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2.2.11. Control of worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC4)**[Trimethylolpropane]**

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Vapour pressure	: < 1 hPa at 120 °C
Physical form of product	: Solid, low dustiness
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Process Temperature	: <= 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
40 °C Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
120 °C Room ventilation rate of 3 air changes per hour (ACH) is required. Demonstrable and effective housekeeping practices in place. Provide a medium level containment. Inhalation - minimum efficiency of 99 %	
Conditions and measures related to personal protection, hygiene and health evaluation	
40 °C Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
120 °C Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use
Remarks	: 40 °C, 120 °C
Room size	: 300 m ³
Remarks	: 120 °C

2.2.12. Control of worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC4)**[Trimethylolpropane]**

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%

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Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Vapour pressure	: < 1 hPa at 120 °C
Physical form of product	: Solid, low dustiness
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Process Temperature	: <= 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
40 °C Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
120 °C Room ventilation rate of 3 air changes per hour (ACH) is required. Demonstrable and effective housekeeping practices in place. Provide a medium level containment. Inhalation - minimum efficiency of 99 %	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use
Remarks	: 40 °C, 120 °C
Room size	: 300 m³
Remarks	: 120 °C

2.2.13. Control of worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) (PROC5) / Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)
[diethylmethylbenzenediamine]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: 50%
Molar Mass	: 178,28 g/mol
Vapour pressure	: 0,0000971 kPa at 25 °C
Vapour pressure	: 0,000391 kPa at 35 °C Highest ambient temperature for workers.
Physical form of product	: Liquid substance
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: < 1 hours/day
Frequency of use	: daily

Technical and organisational conditions and measures	
Good work practice should be used, which may include: Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing. Systems in place to ensure correct use of RMMs and that OCs are being followed. Training for staff on good practice. Careful attention to industrial and personal hygiene is essential. Procedures and training for emergency decontamination and disposal. Recording of any "near miss" situations.	
Conditions and measures related to personal protection, hygiene and health evaluation	
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. Wash hands thoroughly after handling. Wear protective gloves/ protective clothing/ eye protection/ face protection. Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor/Outdoor use

2.2.14. Control of worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) (PROC5)
[Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Vapour pressure	: < 1 hPa at 120 °C
Physical form of product	: Solid, low dustiness
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Process Temperature	: <= 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
40 °C Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
120 °C Room ventilation rate of 3 air changes per hour (ACH) is required. Demonstrable and effective housekeeping practices in place. Provide a medium level containment. Inhalation - minimum efficiency of 99 %	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing.	

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Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Dermal - minimum efficiency of 95 %

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Remarks : 40 °C, 120 °C

Room size : 300 m³

Remarks : 120 °C

2.2.15. Control of worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) (PROC5) / Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)
[Trimethylolpropane]

Product (article) characteristics

Concentration of the Substance in Mixture/Article : ≤ 100%

Molar Mass : 134,1 g/mol

Vapour pressure : 0,00016 hPa at 40 °C

Physical form of product : Solid, low dustiness

Process Temperature : ≤ 40 °C

Amount used, frequency and duration of use (or from service life)

Duration of the activity : ≤ 8 hours/day

Technical and organisational conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).

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

Wear suitable protective clothing.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Dermal - minimum efficiency of 95 %

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

2.2.16. Control of worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)
[Trimethylolpropane]

Product (article) characteristics

Concentration of the Substance in Mixture/Article : ≤ 100%

Molar Mass : 134,1 g/mol

Vapour pressure : 0,00016 hPa at 40 °C

Vapour pressure : < 1 hPa at 120 °C

Physical form of product : Solid, low dustiness

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Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Process Temperature	: <= 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
40 °C Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
120 °C Room ventilation rate of 3 air changes per hour (ACH) is required. Demonstrable and effective housekeeping practices in place. Provide a medium level containment. Inhalation - minimum efficiency of 99 %	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Other conditions affecting workers exposure	
Material transfers	: 100 - 1000 L/min
Remarks	: 120 °C
Indoor or outdoor use	: Indoor use
Remarks	: 40 °C, 120 °C
Room size	: 300 m ³
Remarks	: 120 °C

2.2.17. Control of worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)
[Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Vapour pressure	: < 1 hPa at 120 °C
Physical form of product	: Solid, low dustiness
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Process Temperature	: <= 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day

Technical and organisational conditions and measures	
40 °C	Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).
120 °C	Room ventilation rate of 3 air changes per hour (ACH) is required. Demonstrable and effective housekeeping practices in place. Provide a medium level containment. Inhalation - minimum efficiency of 99 %
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Other conditions affecting workers exposure	
Material transfers	: 100 - 1000 L/min
Remarks	: 120 °C
Indoor or outdoor use	: Indoor use
Remarks	: 40 °C, 120 °C
Room size	: 300 m ³
Remarks	: 120 °C

2.2.18. Control of worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)
[diethylmethylbenzenediamine]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: 50%
Molar Mass	: 178,28 g/mol
Vapour pressure	: 0,0000971 kPa at 25 °C
Vapour pressure	: 0,000391 kPa at 35 °C Highest ambient temperature for workers.
Physical form of product	: Liquid substance
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: 1 - 4 hours/day
Frequency of use	: daily
Technical and organisational conditions and measures	
Good work practice should be used, which may include: Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing. Systems in place to ensure correct use of RMMs and that OCs are being followed. Training for staff on good practice. Careful attention to industrial and personal hygiene is essential. Procedures and training for emergency decontamination and disposal. Recording of any "near miss" situations.	
Fill containers/cans at dedicated fill points supplied with local extract ventilation. Provide extract ventilation to material transfer points and other openings.	

Conditions and measures related to personal protection, hygiene and health evaluation	
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. Wash hands thoroughly after handling. Wear protective gloves/ protective clothing/ eye protection/ face protection. Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor/Outdoor use

2.2.19. Control of worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)
[Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Vapour pressure	: < 1 hPa at 120 °C
Physical form of product	: Solid, low dustiness
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Process Temperature	: <= 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
40 °C Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
120 °C Room ventilation rate of 3 air changes per hour (ACH) is required. Demonstrable and effective housekeeping practices in place. Provide a medium level containment. Inhalation - minimum efficiency of 99 %	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Other conditions affecting workers exposure	
Material transfers	: 100 - 1000 L/min
Remarks	: 120 °C
Indoor or outdoor use	: Indoor use
Remarks	: 40 °C, 120 °C

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Room size	: 300 m³
Remarks	: 120 °C

2.2.20. Control of worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)
[Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: ≤ 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Vapour pressure	: < 1 hPa at 120 °C
Physical form of product	: Solid, low dustiness
Physical form of product	: Liquid
Process Temperature	: ≤ 40 °C
Process Temperature	: ≤ 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: ≤ 8 hours/day
Technical and organisational conditions and measures	
40 °C Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
120 °C Room ventilation rate of 3 air changes per hour (ACH) is required. Demonstrable and effective housekeeping practices in place. Provide a medium level containment. Inhalation - minimum efficiency of 99 %	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Other conditions affecting workers exposure	
Material transfers	: 100 - 1000 L/min
Remarks	: 120 °C
Indoor or outdoor use	: Indoor use
Remarks	: 40 °C, 120 °C
Room size	: 300 m³
Remarks	: 120 °C

2.2.21. Control of worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)
[Trimethylolpropane]

Product (article) characteristics

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Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Physical form of product	: Solid, low dustiness
Process Temperature	: <= 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

2.2.22. Control of worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9)
[diethylmethylbenzenediamine]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: 50%
Molar Mass	: 178,28 g/mol
Vapour pressure	: 0,0000971 kPa at 25 °C
Vapour pressure	: 0,000391 kPa at 35 °C Highest ambient temperature for workers.
Physical form of product	: Liquid substance
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: < 1 hours/day
Frequency of use	: daily
Technical and organisational conditions and measures	
Good work practice should be used, which may include: Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing. Systems in place to ensure correct use of RMMs and that OCs are being followed. Training for staff on good practice. Careful attention to industrial and personal hygiene is essential. Procedures and training for emergency decontamination and disposal. Recording of any "near miss" situations.	
Fill containers/cans at dedicated fill points supplied with local extract ventilation. Provide extract ventilation to material transfer points and other openings. Local exhaust ventilation is required.	

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

Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
 Wash hands thoroughly after handling.
 Wear protective gloves/ protective clothing/ eye protection/ face protection.
 Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor/Outdoor use

2.2.23. Control of worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9)
[Trimethylolpropane]

Product (article) characteristics

Concentration of the Substance in Mixture/Article : <= 100%

Molar Mass : 134,1 g/mol

Vapour pressure : 0,00016 hPa at 40 °C

Vapour pressure : < 1 hPa at 120 °C

Physical form of product : Solid, low dustiness

Physical form of product : Liquid

Process Temperature : <= 40 °C

Process Temperature : <= 120 °C

Amount used, frequency and duration of use (or from service life)

Duration of the activity : <= 8 hours/day

Technical and organisational conditions and measures

40 °C
 Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).

120 °C
 Room ventilation rate of 3 air changes per hour (ACH) is required.
 Demonstrable and effective housekeeping practices in place.
 Provide a medium level containment.
 Inhalation - minimum efficiency of 99 %

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

40 °C
 Wear suitable protective clothing.
 Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
 Dermal - minimum efficiency of 95 %

120 °C
 Wear suitable protective clothing.
 Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
 Dermal - minimum efficiency of 90 %

Other conditions affecting workers exposure

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Material transfers	: 10 - 100 L/min
Remarks	: 120 °C
Indoor or outdoor use	: Indoor use
Remarks	: 40 °C, 120 °C
Room size	: 300 m³
Remarks	: 120 °C

**2.2.24. Control of worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9)
[Trimethylolpropane]**

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Vapour pressure	: < 1 hPa at 120 °C
Physical form of product	: Solid, low dustiness
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Process Temperature	: <= 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
40 °C Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
120 °C Room ventilation rate of 3 air changes per hour (ACH) is required. Demonstrable and effective housekeeping practices in place. Provide a medium level containment. Inhalation - minimum efficiency of 99 %	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Other conditions affecting workers exposure	
Material transfers	: 10 - 100 L/min
Remarks	: 120 °C
Indoor or outdoor use	: Indoor use
Remarks	: 40 °C, 120 °C
Room size	: 300 m³
Remarks	: 120 °C

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**2.2.25. Control of worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9)
[Trimethylolpropane]**

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: ≤ 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Physical form of product	: Solid, low dustiness
Process Temperature	: ≤ 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: ≤ 8 hours/day
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

**2.2.26. Control of worker exposure: Production of preparations or articles by tableting, compression, extrusion, pelletisation (PROC14)
[diethylmethylbenzenediamine]**

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: 50%
Molar Mass	: 178,28 g/mol
Vapour pressure	: 0,0000971 kPa at 25 °C
Vapour pressure	: 0,000391 kPa at 35 °C Highest ambient temperature for workers.
Physical form of product	: Liquid substance
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: > 4 hours/day
Frequency of use	: daily
Technical and organisational conditions and measures	
Good work practice should be used, which may include: Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing. Systems in place to ensure correct use of RMMs and that OCs are being followed. Training for staff on good practice.	

Careful attention to industrial and personal hygiene is essential.
Procedures and training for emergency decontamination and disposal.
Recording of any "near miss" situations.

Local exhaust ventilation is required.

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

Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
Wash hands thoroughly after handling.
Wear protective gloves/ protective clothing/ eye protection/ face protection.
Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.

Wear respiratory protection.

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor/Outdoor use

2.2.27. Control of worker exposure: Production of preparations or articles by tableting, compression, extrusion, pelletisation (PROC14) [Trimethylolpropane]

Product (article) characteristics

Concentration of the Substance in Mixture/Article : <= 100%

Molar Mass : 134,1 g/mol

Vapour pressure : 0,00016 hPa at 40 °C

Physical form of product : Solid, low dustiness

Process Temperature : <= 40 °C

Amount used, frequency and duration of use (or from service life)

Duration of the activity : <= 8 hours/day

Technical and organisational conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).

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

Wear suitable protective clothing.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Dermal - minimum efficiency of 95 %

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

2.2.28. Control of worker exposure: Production of preparations or articles by tableting, compression, extrusion, pelletisation (PROC14) [Trimethylolpropane]

Product (article) characteristics

Concentration of the Substance in : <= 100%

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Mixture/Article	
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Vapour pressure	: < 0,1 hPa at 120 °C
Physical form of product	: Solid, low dustiness
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Process Temperature	: <= 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
40 °C Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
120 °C Room ventilation rate of 3 air changes per hour (ACH) is required. Demonstrable and effective housekeeping practices in place. Provide a medium level containment. Inhalation - minimum efficiency of 99 %	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use
Remarks	: 40 °C, 120 °C
Room size	: 300 m ³
Remarks	: 120 °C

2.2.29. Control of worker exposure: Use as laboratory reagent (PROC15)
[diethylmethylbenzenediamine]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: 50%
Molar Mass	: 178,28 g/mol
Vapour pressure	: 0,0000971 kPa at 25 °C
Vapour pressure	: 0,000391 kPa at 35 °C Highest ambient temperature for workers.
Physical form of product	: Liquid substance
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: 1 - 4 hours/day
Frequency of use	: daily

Technical and organisational conditions and measures	
Good work practice should be used, which may include: Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing. Systems in place to ensure correct use of RMMs and that OCs are being followed. Training for staff on good practice. Careful attention to industrial and personal hygiene is essential. Procedures and training for emergency decontamination and disposal. Recording of any "near miss" situations.	
Carry out in a vented booth or extracted enclosure. Ensure samples are obtained under containment or extract ventilation.	
Conditions and measures related to personal protection, hygiene and health evaluation	
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. Wash hands thoroughly after handling. Wear protective gloves/ protective clothing/ eye protection/ face protection. Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor/Outdoor use

2.2.30. Control of worker exposure: Use as laboratory reagent (PROC15) [Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Physical form of product	: Solid, low dustiness
Process Temperature	: <= 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

2.2.31. Control of worker exposure: Use as laboratory reagent (PROC15) [Trimethylolpropane]

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Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: ≤ 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Physical form of product	: Solid, low dustiness
Process Temperature	: ≤ 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: ≤ 8 hours/day
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

2.3. Exposure estimation and reference to its source**2.3.1. Environmental release and exposure: Industrial use resulting in inclusion into or onto a matrix (ERC5) [alkylaminocarboxamide]**

Release route	Release rate	Release estimation method	Remarks
Water	0 %	Estimated release factor	release before RMM, release after RMM, No release to waste water under normal circumstances.
Air	0 %	Estimated release factor	release before RMM, release after RMM
Soil	0 %	Estimated release factor	release after RMM

Compartment	Exposure level	RCR	Remarks
Freshwater	0,000000012 mg/L (EUSES v2.1.2)	< 0,01	
Freshwater sediment	0,379 mg/kg dry weight (EUSES v2.1.2)	< 0,01	
Marine water	0,00000292 µg/L (EUSES v2.1.2)	< 0,01	
Marine sediment	0,092 mg/kg dry weight (EUSES v2.1.2)	< 0,01	
Agricultural soil	0,0000304 mg/kg dry weight (EUSES v2.1.2)	< 0,01	

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Man via environment - Inhalation	negligible (EUSES v2.1.2)	< 0,01	
Man via environment - Oral	negligible (EUSES v2.1.2)	< 0,01	

Additional information on exposure estimation

Based on the applied RMMS the risk towards environment is sufficiently controlled (RCR ≤ 1).

2.3.2. Worker exposure: Use in closed process, no likelihood of exposure (PROC1)**[diethylmethylbenzenediamine]**

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0743 mg/m ³ (ECETOC TRA was used with modifications.)	0,572	
long term, dermal, systemic,	0,00343 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,00343	Gloves: 99% protection

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled (RCR ≤ 1).

2.3.3. Worker exposure: Use in closed process, no likelihood of exposure (PROC1)**[Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,01 mg/m ³ (ECETOC TRA v3.0, Worker)	< 0,01	40 °C
inhalative, systemic, long-term	0,056 mg/m ³ (ECETOC TRA v3.0, Worker)	0,017	120 °C
dermal, systemic, long-term	0,034 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,036	40 °C, 120 °C

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled (RCR ≤ 1).

2.3.4. Worker exposure: Use in closed process, no likelihood of exposure (PROC1)**[Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,01 mg/m ³ (ECETOC TRA v3.0, Worker)	< 0,01	40 °C
inhalative, systemic, long-term	0,056 mg/m ³ (ECETOC TRA v3.0, Worker)	0,017	120 °C
dermal, systemic, long-term	0,034 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,036	40 °C, 120 °C

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled (RCR ≤ 1).

2.3.5. Worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC2)**[diethylmethylbenzenediamine]**

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Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0411 mg/m ³ (ECETOC TRA was used with modifications.)	0,316	
long term, dermal, systemic,	0,0137 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,0137	Gloves: 99% protection

Additional information on exposure estimation

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

2.3.6. Worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC2) [Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,01 mg/m ³ (ECETOC TRA v3.0, Worker)	< 0,01	40 °C
inhalative, systemic, long-term	0,000071 mg/m ³ (Advanced REACH Tool (ART) v1.5)	< 0,01	120 °C
dermal, systemic, long-term	0,137 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,146	40 °C, 120 °C

Additional information on exposure estimation

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

2.3.7. Worker exposure: Use in closed batch process (synthesis or formulation) (PROC3) [diethylmethylbenzenediamine]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0743 mg/m ³ (ECETOC TRA was used with modifications.)	0,572	LEV: 90% efficiency
long term, dermal, systemic,	0,000343 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,000343	Gloves: 99% protection, LEV: 90% efficiency

Additional information on exposure estimation

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

2.3.8. Worker exposure: Use in closed batch process (synthesis or formulation) (PROC3) [Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	40 °C
inhalative, systemic, long-term	0,00019 mg/m ³ (Advanced REACH Tool (ART) v1.5)	< 0,01	120 °C
dermal, systemic, long-term	0,069 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,073	40 °C, 120 °C

Additional information on exposure estimationBased on the applied RMMs the risk towards humans is sufficiently controlled ($RCR \leq 1$).**2.3.9. Worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)
[Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	40 °C
inhalative, systemic, long-term	0,00019 mg/m ³ (Advanced REACH Tool (ART) v1.5)	< 0,01	120 °C
dermal, systemic, long-term	0,069 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,073	40 °C, 120 °C

Additional information on exposure estimationBased on the applied RMMs the risk towards humans is sufficiently controlled ($RCR \leq 1$).**2.3.10. Worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC4)
[diethylmethylenbenzenediamine]**

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0743 mg/m ³ (ECETOC TRA was used with modifications.)	0,572	LEV: 90% efficiency
long term, dermal, systemic,	0,00686 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,00686	Gloves: 99% protection, LEV: 90% efficiency

Additional information on exposure estimationBased on the applied RMMs the risk towards humans is sufficiently controlled ($RCR \leq 1$).**2.3.11. Worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC4)
[Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,5 mg/m ³ (ECETOC TRA v3.0, Worker)	0,152	40 °C
inhalative, systemic, long-term	0,72 mg/m ³ (Advanced REACH Tool (ART) v1.5)	0,218	120 °C
dermal, systemic, long-term	0,343 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,365	40 °C
dermal, systemic, long-term	0,686 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,73	120 °C

Additional information on exposure estimationBased on the applied RMMs the risk towards humans is sufficiently controlled ($RCR \leq 1$).

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2.3.12. Worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC4)**[Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,5 mg/m ³ (ECETOC TRA v3.0, Worker)	0,152	40 °C
inhalative, systemic, long-term	0,72 mg/m ³ (Advanced REACH Tool (ART) v1.5)	0,218	120 °C
dermal, systemic, long-term	0,343 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,365	40 °C, 120 °C

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled (RCR ≤ 1).

2.3.13. Worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) (PROC5) / Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)**[diethylmethylbenzenediamine]**

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0411 mg/m ³ (ECETOC TRA was used with modifications.)	0,316	
long term, dermal, systemic,	0,137 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,137	Gloves: 99% protection

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled (RCR ≤ 1).

2.3.14. Worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) (PROC5)**[Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,5 mg/m ³ (ECETOC TRA v3.0, Worker)	0,152	40 °C
inhalative, systemic, long-term	0,24 mg/m ³ (Advanced REACH Tool (ART) v1.5)	0,073	120 °C
dermal, systemic, long-term	0,686 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,729	40 °C, 120 °C

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled (RCR ≤ 1).

2.3.15. Worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) (PROC5) / Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)**[Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic,	0,5 mg/m ³ (ECETOC TRA	0,152	

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long-term	v3.0, Worker)		
dermal, systemic, long-term	0,686 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,729	

Additional information on exposure estimationBased on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).

2.3.16. Worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,5 mg/m ³ (ECETOC TRA v3.0, Worker)	0,152	40 °C
inhalative, systemic, long-term	0,19 mg/m ³ (Advanced REACH Tool (ART) v1.5)	0,058	120 °C
dermal, systemic, long-term	0,686 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,729	40 °C, 120 °C

Additional information on exposure estimationBased on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).

2.3.17. Worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,5 mg/m ³ (ECETOC TRA v3.0, Worker)	0,152	40 °C
inhalative, systemic, long-term	0,19 mg/m ³ (Advanced REACH Tool (ART) v1.5)	0,058	120 °C
dermal, systemic, long-term	0,686 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,729	40 °C, 120 °C

Additional information on exposure estimationBased on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).

2.3.18. Worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)
[diethylmethylbenzenediamine]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0411 mg/m ³ (ECETOC TRA was used with modifications.)	0,316	
long term, dermal, systemic,	0,0686 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,0686	Gloves: 99% protection

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).

2.3.19. Worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	40 °C
inhalative, systemic, long-term	0,19 mg/m ³ (Advanced REACH Tool (ART) v1.5)	0,058	120 °C
dermal, systemic, long-term	0,686 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,729	40 °C, 120 °C

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).

2.3.20. Worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	40 °C
inhalative, systemic, long-term	0,19 mg/m ³ (Advanced REACH Tool (ART) v1.5)	0,058	120 °C
dermal, systemic, long-term	0,686 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,729	40 °C, 120 °C

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).

2.3.21. Worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	
dermal, systemic, long-term	0,686 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,729	

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).

2.3.22. Worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9)
[diethylmethylbenzenediamine]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0149 mg/m ³ (ECETOC TRA was used with	0,115	LEV: 90% efficiency

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long term, dermal, systemic,	0,00686 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,00686	Gloves: 99% protection, LEV: 90% efficiency

Additional information on exposure estimationBased on the applied RMMs the risk towards humans is sufficiently controlled ($RCR \leq 1$).

2.3.23. Worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	40 °C
inhalative, systemic, long-term	0,019 mg/m ³ (Advanced REACH Tool (ART) v1.5)	< 0,01	120 °C
dermal, systemic, long-term	0,343 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,365	40 °C
dermal, systemic, long-term	0,686 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,73	120 °C

Additional information on exposure estimationBased on the applied RMMs the risk towards humans is sufficiently controlled ($RCR \leq 1$).

2.3.24. Worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	40 °C
inhalative, systemic, long-term	0,019 mg/m ³ (Advanced REACH Tool (ART) v1.5)	< 0,01	120 °C
dermal, systemic, long-term	0,343 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,365	40 °C, 120 °C

Additional information on exposure estimationBased on the applied RMMs the risk towards humans is sufficiently controlled ($RCR \leq 1$).

2.3.25. Worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	
dermal, systemic, long-term	0,343 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,365	

Additional information on exposure estimationBased on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).**2.3.26. Worker exposure: Production of preparations or articles by tableting, compression, extrusion, pelletisation (PROC14)
[diethylmethylenediamine]**

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0743 mg/m ³ (ECETOC TRA was used with modifications.)	0,572	LEV: 90% efficiency, Respirator: 90% protection
long term, dermal, systemic,	0,00343 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,00343	Gloves: 99% protection, LEV: 90% efficiency

Additional information on exposure estimationBased on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).**2.3.27. Worker exposure: Production of preparations or articles by tableting, compression, extrusion, pelletisation (PROC14)
[Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	
dermal, systemic, long-term	0,172 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,182	

Additional information on exposure estimationBased on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).**2.3.28. Worker exposure: Production of preparations or articles by tableting, compression, extrusion, pelletisation (PROC14)
[Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	40 °C
inhalative, systemic, long-term	0,099 mg/m ³ (Advanced REACH Tool (ART) v1.5)	0,03	120 °C
dermal, systemic, long-term	0,172 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,182	40 °C, 120 °C

Additional information on exposure estimationBased on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).**2.3.29. Worker exposure: Use as laboratory reagent (PROC15)
[diethylmethylenediamine]**

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0412 mg/m ³ (ECETOC TRA was used with	0,317	

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	modifications.)		
long term, dermal, systemic,	0,00343 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,00343	Gloves: 99% protection

Additional information on exposure estimationBased on the applied RMMs the risk towards humans is sufficiently controlled ($RCR \leq 1$).**2.3.30. Worker exposure: Use as laboratory reagent (PROC15)
[Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	
dermal, systemic, long-term	0,034 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,036	

Additional information on exposure estimationBased on the applied RMMs the risk towards humans is sufficiently controlled ($RCR \leq 1$).**2.3.31. Worker exposure: Use as laboratory reagent (PROC15)
[Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	
dermal, systemic, long-term	0,034 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,036	

Additional information on exposure estimationBased on the applied RMMs the risk towards humans is sufficiently controlled ($RCR \leq 1$).**2.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES**

The risk management measures given in this exposure scenario apply to the specified substance in a concentration as indicated in the scenario. The concentration of the substance in the product may differ. A downstream user should evaluate if the risk management measures may be adapted accordingly.

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

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

If further details are needed, please contact us.

diethylmethylbenzenediamine

The exposure estimates have been assessed using ECETOC TRA (2010) with Tier 2 refinements.

Inhalation exposure was estimated by the saturated vapour concentration (SVC). The SVC depends on its amount in the formulations, the molecular weight of the solvent (≥ 1000 g/mol) and the ambient temperature (assumed to be 35 °C as a conservative worst case approach).

ES3: Use at industrial sites; Use in coatings.**3.1. Title section**

Exposure Scenario name	: Use in coatings
Structured Short Title	: Use at industrial sites; Use in coatings.

Environment		
CS1	Use of preparations containing the substance [alkylaminocarboxamide]	ERC5
Worker		
CS2	Use in coatings [diethylmethylbenzenediamine]	PROC1
CS3	Use as an intermediate [Trimethylolpropane]	PROC1
CS4	Polymerisation, Monomers [Trimethylolpropane]	PROC1
CS5	Use in coatings [diethylmethylbenzenediamine]	PROC2
CS6	Polymerisation, Monomers [Trimethylolpropane]	PROC2
CS7	Use in coatings [diethylmethylbenzenediamine]	PROC3
CS8	Use as an intermediate [Trimethylolpropane]	PROC3
CS9	Polymerisation, Monomers [Trimethylolpropane]	PROC3
CS10	Use in coatings [diethylmethylbenzenediamine]	PROC4
CS11	Use as an intermediate [Trimethylolpropane]	PROC4
CS12	Polymerisation, Monomers [Trimethylolpropane]	PROC4
CS13	Use in coatings [diethylmethylbenzenediamine]	PROC5
CS14	Polymerisation, Monomers [Trimethylolpropane]	PROC5
CS15	Use at industrial site leading to inclusion into/onto article [Trimethylolpropane]	PROC5, PROC8a
CS16	Use in coatings [diethylmethylbenzenediamine]	PROC8a
CS17	Use as an intermediate [Trimethylolpropane]	PROC8a
CS18	Polymerisation, Monomers [Trimethylolpropane]	PROC8a
CS19	Use in coatings [diethylmethylbenzenediamine]	PROC8b
CS20	Use as an intermediate	PROC8b

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[Trimethylolpropane]		
CS21	Polymerisation, Monomers [Trimethylolpropane]	PROC8b
CS22	Use at industrial site leading to inclusion into/onto article [Trimethylolpropane]	PROC8b
CS23	Use in coatings [diethylmethylbenzenediamine]	PROC9
CS24	Use as an intermediate [Trimethylolpropane]	PROC9
CS25	Polymerisation, Monomers [Trimethylolpropane]	PROC9
CS26	Use at industrial site leading to inclusion into/onto article [Trimethylolpropane]	PROC9
CS27	Use in coatings [diethylmethylbenzenediamine]	PROC15
CS28	Use as an intermediate [Trimethylolpropane]	PROC15
CS29	Polymerisation, Monomers [Trimethylolpropane]	PROC15
Further information		
Use of TMP in tyres is covered in this scenario		

3.2. Conditions of use affecting exposure**3.2.1. Control of environmental exposure: Industrial use resulting in inclusion into or onto a matrix (ERC5)
[alkylaminocarboxamide]**

Product (article) characteristics	
Molar Mass	: 309 g/mol
Vapour pressure	: 0,000392 Pa at 25 °C
Water solubility	: 10,3 mg/l at 20 °C
Partition coefficient (n-octanol/water)	: log Pow: 5,6 at: 20 °C
Biodegradation	: Inherently biodegradable.
Amount used, frequency and duration of use (or from service life)	
Fraction of EU tonnage used in region:	: 1
Annual amount per site	: <= 2000 tonnes/year (t/y)
Daily amount per site	: <= 20 t/day
Technical and organisational conditions and measures	
Air Waste gases are directed to thermal incineration.	
Soil Sealing of all relevant soil surfaces in the facility is required.	
Conditions and measures related to sewage treatment plant	

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STP type	:	Biological sewage treatment plant
STP sludge treatment	:	No application of sewage sludge to agricultural soil.
STP effluent	:	2.000 m3/d
Effectiveness (of a measure)	:	91,99 %
Conditions and measures related to treatment of waste (including article waste)		
Waste treatment	:	No specific measures identified. Low risk assumed for waste life stage.
Other conditions affecting environmental exposure		
Receiving surface water flow	:	18.000 m3/d

3.2.2. Control of worker exposure: Use in closed process, no likelihood of exposure (PROC1)
[diethylmethylbenzenediamine]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: 25 - 40%
Molar Mass	: 178,28 g/mol
Vapour pressure	: 0,0000971 kPa at 25 °C
Vapour pressure	: 0,000391 kPa at 35 °C Highest ambient temperature for workers.
Physical form of product	: Liquid substance
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: > 4 hours/day
Frequency of use	: daily
Technical and organisational conditions and measures	
Good work practice should be used, which may include: Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing. Systems in place to ensure correct use of RMMs and that OCs are being followed. Training for staff on good practice. Careful attention to industrial and personal hygiene is essential. Procedures and training for emergency decontamination and disposal. Recording of any "near miss" situations.	
Handle substance within a closed system. Ensure material transfers are under containment or extract ventilation.	
Conditions and measures related to personal protection, hygiene and health evaluation	
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. Wash hands thoroughly after handling. Wear protective gloves/ protective clothing/ eye protection/ face protection. Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor/Outdoor use

3.2.3. Control of worker exposure: Use in closed process, no likelihood of exposure (PROC1)
[Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Vapour pressure	: 100 hPa at 120 °C
Physical form of product	: Solid, low dustiness
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Process Temperature	: <= 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	
No specific measures identified.	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

3.2.4. Control of worker exposure: Use in closed process, no likelihood of exposure (PROC1)
[Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Vapour pressure	: 100 hPa at 120 °C
Physical form of product	: Solid, low dustiness
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Process Temperature	: <= 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	

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Conditions and measures related to personal protection, hygiene and health evaluation	
No specific measures identified.	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

3.2.5. Control of worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC2)
[diethylmethylbenzenediamine]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: 25 - 40%
Molar Mass	: 178,28 g/mol
Vapour pressure	: 0,0000971 kPa at 25 °C
Vapour pressure	: 0,000391 kPa at 35 °C Highest ambient temperature for workers.
Physical form of product	: Liquid substance
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: > 4 hours/day
Frequency of use	: daily
Technical and organisational conditions and measures	
Good work practice should be used, which may include: Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing. Systems in place to ensure correct use of RMMs and that OCs are being followed. Training for staff on good practice. Careful attention to industrial and personal hygiene is essential. Procedures and training for emergency decontamination and disposal. Recording of any "near miss" situations.	
Handle substance within a predominantly closed system. Ensure material transfers are under containment or extract ventilation. Local exhaust ventilation is required.	
Conditions and measures related to personal protection, hygiene and health evaluation	
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. Wash hands thoroughly after handling. Wear protective gloves/ protective clothing/ eye protection/ face protection. Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor/Outdoor use

3.2.6. Control of worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC2)
[Trimethylolpropane]

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Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: ≤ 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Vapour pressure	: < 1 hPa at 120 °C
Physical form of product	: Solid, low dustiness
Physical form of product	: Liquid
Process Temperature	: ≤ 40 °C
Process Temperature	: ≤ 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: ≤ 8 hours/day
Technical and organisational conditions and measures	
40 °C Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
120 °C Room ventilation rate of 3 air changes per hour (ACH) is required. Demonstrable and effective housekeeping practices in place. Provide a high level containment. Inhalation - minimum efficiency of 99,9 %	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
Other conditions affecting workers exposure	
Open surface	: > 3 m ²
Remarks	: 120 °C
Indoor or outdoor use	: Indoor use
Remarks	: 40 °C, 120 °C
Room size	: 300 m ³
Remarks	: 120 °C

**3.2.7. Control of worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)
[diethylmethybenzenediamine]**

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: 25 - 40%
Molar Mass	: 178,28 g/mol
Vapour pressure	: 0,0000971 kPa at 25 °C
Vapour pressure	: 0,000391 kPa at 35 °C Highest ambient temperature for workers.
Physical form of product	: Liquid substance

Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: > 4 hours/day
Frequency of use	: daily
Technical and organisational conditions and measures	
Good work practice should be used, which may include: Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing. Systems in place to ensure correct use of RMMs and that OCs are being followed. Training for staff on good practice. Careful attention to industrial and personal hygiene is essential. Procedures and training for emergency decontamination and disposal. Recording of any "near miss" situations.	
Handle substance within a predominantly closed system. Ensure material transfers are under containment or extract ventilation. Local exhaust ventilation is required.	
Conditions and measures related to personal protection, hygiene and health evaluation	
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. Wash hands thoroughly after handling. Wear protective gloves/ protective clothing/ eye protection/ face protection. Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor/Outdoor use

3.2.8. Control of worker exposure: Use in closed batch process (synthesis or formulation) (PROC3) [Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: ≤ 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Vapour pressure	: < 1 hPa at 120 °C
Physical form of product	: Solid, low dustiness
Physical form of product	: Liquid
Process Temperature	: ≤ 40 °C
Process Temperature	: ≤ 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: ≤ 8 hours/day
Technical and organisational conditions and measures	
40 °C Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
120 °C	

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Room ventilation rate of 3 air changes per hour (ACH) is required.
 Demonstrable and effective housekeeping practices in place.
 Provide a high level containment.
 Inhalation - minimum efficiency of 99,9 %

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

Wear suitable protective clothing.
 Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
 Dermal - minimum efficiency of 90 %

Other conditions affecting workers exposure

Open surface : > 3 m²

Remarks : 120 °C

Indoor or outdoor use : Indoor use

Remarks : 40 °C, 120 °C

Room size : 300 m³

Remarks : 120 °C

**3.2.9. Control of worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)
[Trimethylolpropane]****Product (article) characteristics**

Concentration of the Substance in Mixture/Article : <= 100%

Molar Mass : 134,1 g/mol

Vapour pressure : 0,00016 hPa at 40 °C

Vapour pressure : < 1 hPa at 120 °C

Physical form of product : Solid, low dustiness

Physical form of product : Liquid

Process Temperature : <= 40 °C

Process Temperature : <= 120 °C

Amount used, frequency and duration of use (or from service life)

Duration of the activity : <= 8 hours/day

Technical and organisational conditions and measures

40 °C
 Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).

120 °C
 Room ventilation rate of 3 air changes per hour (ACH) is required.
 Demonstrable and effective housekeeping practices in place.
 Provide a high level containment.
 Inhalation - minimum efficiency of 99,9 %

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

Wear suitable protective clothing.
 Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
 Dermal - minimum efficiency of 90 %

Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use
Remarks	: 40 °C, 120 °C
Room size	: 300 m³
Remarks	: 120 °C

3.2.10. Control of worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC4)
[diethylmethylbenzenediamine]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: 25 - 40%
Molar Mass	: 178,28 g/mol
Vapour pressure	: 0,0000971 kPa at 25 °C
Vapour pressure	: 0,000391 kPa at 35 °C Highest ambient temperature for workers.
Physical form of product	: Liquid substance
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: > 4 hours/day
Frequency of use	: daily
Technical and organisational conditions and measures	
Good work practice should be used, which may include: Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing. Systems in place to ensure correct use of RMMs and that OCs are being followed. Training for staff on good practice. Careful attention to industrial and personal hygiene is essential. Procedures and training for emergency decontamination and disposal. Recording of any "near miss" situations.	
Provide extraction ventilation at points where emissions occur. Ensure material transfers are under containment or extract ventilation. Ensure samples are obtained under containment or extract ventilation. Local exhaust ventilation is required.	
Conditions and measures related to personal protection, hygiene and health evaluation	
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. Wash hands thoroughly after handling. Wear protective gloves/ protective clothing/ eye protection/ face protection. Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor/Outdoor use

3.2.11. Control of worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC4)
[Trimethylolpropane]

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Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Vapour pressure	: < 1 hPa at 120 °C
Physical form of product	: Solid, low dustiness
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Process Temperature	: <= 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
40 °C Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
120 °C Room ventilation rate of 3 air changes per hour (ACH) is required. Demonstrable and effective housekeeping practices in place. Provide a medium level containment. Inhalation - minimum efficiency of 99 %	
Conditions and measures related to personal protection, hygiene and health evaluation	
40 °C Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
120 °C Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use
Remarks	: 40 °C, 120 °C
Room size	: 300 m ³
Remarks	: 120 °C

3.2.12. Control of worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC4)
[Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C

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Vapour pressure	: < 1 hPa at 120 °C
Physical form of product	: Solid, low dustiness
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Process Temperature	: <= 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
40 °C Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
120 °C Room ventilation rate of 3 air changes per hour (ACH) is required. Demonstrable and effective housekeeping practices in place. Provide a medium level containment. Inhalation - minimum efficiency of 99 %	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use
Remarks	: 40 °C, 120 °C
Room size	: 300 m ³
Remarks	: 120 °C

3.2.13. Control of worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) (PROC5)
[diethylmethylbenzenediamine]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: 25 - 40%
Molar Mass	: 178,28 g/mol
Vapour pressure	: 0,0000971 kPa at 25 °C
Vapour pressure	: 0,000391 kPa at 35 °C Highest ambient temperature for workers.
Physical form of product	: Liquid substance
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: > 4 hours/day
Frequency of use	: daily
Technical and organisational conditions and measures	
Good work practice should be used, which may include:	

Ensure all equipment is well maintained.
 Regular cleaning of equipment, work area and clothing.
 Systems in place to ensure correct use of RMMs and that OCs are being followed.
 Training for staff on good practice.
 Careful attention to industrial and personal hygiene is essential.
 Procedures and training for emergency decontamination and disposal.
 Recording of any "near miss" situations.

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

Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
 Wash hands thoroughly after handling.
 Wear protective gloves/ protective clothing/ eye protection/ face protection.
 Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor/Outdoor use

3.2.14. Control of worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) (PROC5) [Trimethylolpropane]

Product (article) characteristics

Concentration of the Substance in Mixture/Article : <= 100%
 Molar Mass : 134,1 g/mol
 Vapour pressure : 0,00016 hPa at 40 °C
 Vapour pressure : < 1 hPa at 120 °C
 Physical form of product : Solid, low dustiness
 Physical form of product : Liquid
 Process Temperature : <= 40 °C
 Process Temperature : <= 120 °C

Amount used, frequency and duration of use (or from service life)

Duration of the activity : <= 8 hours/day

Technical and organisational conditions and measures

40 °C
 Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).

120 °C
 Room ventilation rate of 3 air changes per hour (ACH) is required.
 Demonstrable and effective housekeeping practices in place.
 Provide a medium level containment.
 Inhalation - minimum efficiency of 99 %

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

Wear suitable protective clothing.
 Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
 Dermal - minimum efficiency of 95 %

Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use
Remarks	: 40 °C, 120 °C
Room size	: 300 m³
Remarks	: 120 °C

3.2.15. Control of worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) (PROC5) / Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)
[Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Physical form of product	: Solid, low dustiness
Process Temperature	: <= 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

3.2.16. Control of worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)
[diethylmethylbenzenediamine]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: 25 - 40%
Molar Mass	: 178,28 g/mol
Vapour pressure	: 0,0000971 kPa at 25 °C
Vapour pressure	: 0,000391 kPa at 35 °C Highest ambient temperature for workers.
Physical form of product	: Liquid substance
Amount used, frequency and duration of use (or from service life)	

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Duration of the activity	: 1 - 4 hours/day
Frequency of use	: daily
Technical and organisational conditions and measures	
Good work practice should be used, which may include: Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing. Systems in place to ensure correct use of RMMs and that OCs are being followed. Training for staff on good practice. Careful attention to industrial and personal hygiene is essential. Procedures and training for emergency decontamination and disposal. Recording of any "near miss" situations.	
Conditions and measures related to personal protection, hygiene and health evaluation	
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. Wash hands thoroughly after handling. Wear protective gloves/ protective clothing/ eye protection/ face protection. Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor/Outdoor use

3.2.17. Control of worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)
[Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Vapour pressure	: < 1 hPa at 120 °C
Physical form of product	: Solid, low dustiness
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Process Temperature	: <= 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
40 °C Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
120 °C Room ventilation rate of 3 air changes per hour (ACH) is required. Demonstrable and effective housekeeping practices in place. Provide a medium level containment. Inhalation - minimum efficiency of 99 %	

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Other conditions affecting workers exposure	
Material transfers	: 100 - 1000 L/min
Remarks	: 120 °C
Indoor or outdoor use	: Indoor use
Remarks	: 40 °C, 120 °C
Room size	: 300 m³
Remarks	: 120 °C

3.2.18. Control of worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)
[Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Vapour pressure	: < 1 hPa at 120 °C
Physical form of product	: Solid, low dustiness
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Process Temperature	: <= 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
40 °C Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
120 °C Room ventilation rate of 3 air changes per hour (ACH) is required. Demonstrable and effective housekeeping practices in place. Provide a medium level containment. Inhalation - minimum efficiency of 99 %	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Other conditions affecting workers exposure	
Material transfers	: 100 - 1000 L/min

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Remarks	: 120 °C
Indoor or outdoor use	: Indoor use
Remarks	: 40 °C, 120 °C
Room size	: 300 m³
Remarks	: 120 °C

3.2.19. Control of worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)
[diethylmethylbenzenediamine]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: 25 - 40%
Molar Mass	: 178,28 g/mol
Vapour pressure	: 0,0000971 kPa at 25 °C
Vapour pressure	: 0,000391 kPa at 35 °CHighest ambient temperature for workers.
Physical form of product	: Liquid substance
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: 1 - 4 hours/day
Frequency of use	: daily
Technical and organisational conditions and measures	
Good work practice should be used, which may include: Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing. Systems in place to ensure correct use of RMMs and that OCs are being followed. Training for staff on good practice. Careful attention to industrial and personal hygiene is essential. Procedures and training for emergency decontamination and disposal. Recording of any "near miss" situations.	
Fill containers/cans at dedicated fill points supplied with local extract ventilation. Provide extract ventilation to material transfer points and other openings.	
Conditions and measures related to personal protection, hygiene and health evaluation	
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. Wash hands thoroughly after handling. Wear protective gloves/ protective clothing/ eye protection/ face protection. Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor/Outdoor use

3.2.20. Control of worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)
[Trimethylolpropane]

Product (article) characteristics

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Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Vapour pressure	: < 1 hPa at 120 °C
Physical form of product	: Solid, low dustiness
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Process Temperature	: <= 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
40 °C Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
120 °C Room ventilation rate of 3 air changes per hour (ACH) is required. Demonstrable and effective housekeeping practices in place. Provide a medium level containment. Inhalation - minimum efficiency of 99 %	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Other conditions affecting workers exposure	
Material transfers	: 100 - 1000 L/min
Remarks	: 120 °C
Indoor or outdoor use	: Indoor use
Remarks	: 40 °C, 120 °C
Room size	: 300 m³
Remarks	: 120 °C

3.2.21. Control of worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)
[Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Vapour pressure	: < 1 hPa at 120 °C
Physical form of product	: Solid, low dustiness
Physical form of product	: Liquid

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Process Temperature	: <= 40 °C
Process Temperature	: <= 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
40 °C Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
120 °C Room ventilation rate of 3 air changes per hour (ACH) is required. Demonstrable and effective housekeeping practices in place. Provide a medium level containment. Inhalation - minimum efficiency of 99 %	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Other conditions affecting workers exposure	
Material transfers	: 100 - 1000 L/min
Remarks	: 120 °C
Indoor or outdoor use	: Indoor use
Remarks	: 40 °C, 120 °C
Room size	: 300 m³
Remarks	: 120 °C

3.2.22. Control of worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)
[Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Physical form of product	: Solid, low dustiness
Process Temperature	: <= 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	

Wear suitable protective clothing.
 Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
 Dermal - minimum efficiency of 95 %

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

3.2.23. Control of worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9) [diethylmethylbenzenediamine]

Product (article) characteristics

Concentration of the Substance in Mixture/Article : 25 - 40%

Molar Mass : 178,28 g/mol

Vapour pressure : 0,0000971 kPa at 25 °C

Vapour pressure : 0,000391 kPa at 35 °C Highest ambient temperature for workers.

Physical form of product : Liquid substance

Amount used, frequency and duration of use (or from service life)

Duration of the activity : > 4 hours/day

Frequency of use : daily

Technical and organisational conditions and measures

Good work practice should be used, which may include:
 Ensure all equipment is well maintained.
 Regular cleaning of equipment, work area and clothing.
 Systems in place to ensure correct use of RMMs and that OCs are being followed.
 Training for staff on good practice.
 Careful attention to industrial and personal hygiene is essential.
 Procedures and training for emergency decontamination and disposal.
 Recording of any "near miss" situations.

Fill containers/cans at dedicated fill points supplied with local extract ventilation.
 Provide extract ventilation to material transfer points and other openings.

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

Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
 Wash hands thoroughly after handling.
 Wear protective gloves/ protective clothing/ eye protection/ face protection.
 Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor/Outdoor use

3.2.24. Control of worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9) [Trimethylolpropane]

Product (article) characteristics

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Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Vapour pressure	: < 1 hPa at 120 °C
Physical form of product	: Solid, low dustiness
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Process Temperature	: <= 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
40 °C Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
120 °C Room ventilation rate of 3 air changes per hour (ACH) is required. Demonstrable and effective housekeeping practices in place. Provide a medium level containment. Inhalation - minimum efficiency of 99 %	
Conditions and measures related to personal protection, hygiene and health evaluation	
40 °C Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
120 °C Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
Other conditions affecting workers exposure	
Material transfers	: 10 - 100 L/min
Remarks	: 120 °C
Indoor or outdoor use	: Indoor use
Remarks	: 40 °C, 120 °C
Room size	: 300 m³
Remarks	: 120 °C

3.2.25. Control of worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9)
[Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol

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Vapour pressure	: 0,00016 hPa at 40 °C
Vapour pressure	: < 1 hPa at 120 °C
Physical form of product	: Solid, low dustiness
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Process Temperature	: <= 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
40 °C Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
120 °C Room ventilation rate of 3 air changes per hour (ACH) is required. Demonstrable and effective housekeeping practices in place. Provide a medium level containment. Inhalation - minimum efficiency of 99 %	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Other conditions affecting workers exposure	
Material transfers	: 10 - 100 L/min
Remarks	: 120 °C
Indoor or outdoor use	: Indoor use
Remarks	: 40 °C, 120 °C
Room size	: 300 m ³
Remarks	: 120 °C

3.2.26. Control of worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9)
[Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Physical form of product	: Solid, low dustiness
Process Temperature	: <= 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day

Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

3.2.27. Control of worker exposure: Use as laboratory reagent (PROC15) [diethylmethylbenzenediamine]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: 25 - 40%
Molar Mass	: 178,28 g/mol
Vapour pressure	: 0,0000971 kPa at 25 °C
Vapour pressure	: 0,000391 kPa at 35 °C Highest ambient temperature for workers.
Physical form of product	: Liquid substance
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: > 4 hours/day
Frequency of use	: daily
Technical and organisational conditions and measures	
Good work practice should be used, which may include: Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing. Systems in place to ensure correct use of RMMs and that OCs are being followed. Training for staff on good practice. Careful attention to industrial and personal hygiene is essential. Procedures and training for emergency decontamination and disposal. Recording of any "near miss" situations.	
Carry out in a vented booth or extracted enclosure. Ensure samples are obtained under containment or extract ventilation. Local exhaust ventilation is required.	
Conditions and measures related to personal protection, hygiene and health evaluation	
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. Wash hands thoroughly after handling. Wear protective gloves/ protective clothing/ eye protection/ face protection. Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor/Outdoor use

3.2.28. Control of worker exposure: Use as laboratory reagent (PROC15)
[Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Physical form of product	: Solid, low dustiness
Process Temperature	: <= 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

3.2.29. Control of worker exposure: Use as laboratory reagent (PROC15)
[Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Physical form of product	: Solid, low dustiness
Process Temperature	: <= 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

3.3. Exposure estimation and reference to its source**3.3.1. Environmental release and exposure: Industrial use resulting in inclusion into or onto a matrix (ERC5) [alkylaminocarboxamide]**

Release route	Release rate	Release estimation method	Remarks
Water	0 %	Estimated release factor	release before RMM, release after RMM, No release to waste water under normal circumstances.
Air	0 %	Estimated release factor	release before RMM, release after RMM
Soil	0 %	Estimated release factor	release after RMM

Compartment	Exposure level	RCR	Remarks
Freshwater	0,00000012 mg/L (EUSES v2.1.2)	< 0,01	
Freshwater sediment	0,379 mg/kg dry weight (EUSES v2.1.2)	< 0,01	
Marine water	0,00000292 µg/L (EUSES v2.1.2)	< 0,01	
Marine sediment	0,092 mg/kg dry weight (EUSES v2.1.2)	< 0,01	
Agricultural soil	0,0000304 mg/kg dry weight (EUSES v2.1.2)	< 0,01	
Man via environment - Inhalation	negligible (EUSES v2.1.2)	< 0,01	
Man via environment - Oral	negligible (EUSES v2.1.2)	< 0,01	

Additional information on exposure estimation

Based on the applied RMMs the risk towards environment is sufficiently controlled (RCR ≤ 1).

3.3.2. Worker exposure: Use in closed process, no likelihood of exposure (PROC1) [diethylmethylbenzenediamine]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0743 mg/m ³ (ECETOC TRA was used with modifications.)	0,572	
long term, dermal, systemic,	0,00343 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,00343	Gloves: 99% protection

Additional information on exposure estimation

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

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3.3.3. Worker exposure: Use in closed process, no likelihood of exposure (PROC1)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,01 mg/m ³ (ECETOC TRA v3.0, Worker)	< 0,01	40 °C
inhalative, systemic, long-term	0,056 mg/m ³ (ECETOC TRA v3.0, Worker)	0,017	120 °C
dermal, systemic, long-term	0,034 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,036	40 °C, 120 °C

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled (RCR ≤ 1).

3.3.4. Worker exposure: Use in closed process, no likelihood of exposure (PROC1)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,01 mg/m ³ (ECETOC TRA v3.0, Worker)	< 0,01	40 °C
inhalative, systemic, long-term	0,056 mg/m ³ (ECETOC TRA v3.0, Worker)	0,017	120 °C
dermal, systemic, long-term	0,034 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,036	40 °C, 120 °C

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled (RCR ≤ 1).

3.3.5. Worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC2)
[diethylmethylbenzenediamine]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0743 mg/m ³ (ECETOC TRA was used with modifications.)	0,572	LEV: 90% efficiency
long term, dermal, systemic,	0,00137 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,00137	Gloves: 99% protection, LEV: 90% efficiency

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled (RCR ≤ 1).

3.3.6. Worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC2)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,01 mg/m ³ (ECETOC TRA v3.0, Worker)	< 0,01	40 °C
inhalative, systemic, long-term	0,000071 mg/m ³ (Advanced REACH Tool (ART) v1.5)	< 0,01	120 °C
dermal, systemic, long-term	0,137 mg/kg bw/day (ECETOC TRA v3.0,	0,146	40 °C, 120 °C

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Additional information on exposure estimationBased on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).**3.3.7. Worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)
[diethylmethylenediamine]**

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0743 mg/m ³ (ECETOC TRA was used with modifications.)	0,572	LEV: 90% efficiency
long term, dermal, systemic,	0,000343 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,000343	Gloves: 99% protection, LEV: 90% efficiency

Additional information on exposure estimationBased on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).**3.3.8. Worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)
[Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	40 °C
inhalative, systemic, long-term	0,00019 mg/m ³ (Advanced REACH Tool (ART) v1.5)	< 0,01	120 °C
dermal, systemic, long-term	0,069 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,073	40 °C, 120 °C

Additional information on exposure estimationBased on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).**3.3.9. Worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)
[Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	40 °C
inhalative, systemic, long-term	0,00019 mg/m ³ (Advanced REACH Tool (ART) v1.5)	< 0,01	120 °C
dermal, systemic, long-term	0,069 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,073	40 °C, 120 °C

Additional information on exposure estimationBased on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).**3.3.10. Worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC4)
[diethylmethylenediamine]**

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Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0743 mg/m ³ (ECETOC TRA was used with modifications.)	0,572	LEV: 90% efficiency
long term, dermal, systemic,	0,00686 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,00686	Gloves: 99% protection, LEV: 90% efficiency

Additional information on exposure estimation

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

3.3.11. Worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC4)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,5 mg/m ³ (ECETOC TRA v3.0, Worker)	0,152	40 °C
inhalative, systemic, long-term	0,72 mg/m ³ (Advanced REACH Tool (ART) v1.5)	0,218	120 °C
dermal, systemic, long-term	0,343 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,365	40 °C
dermal, systemic, long-term	0,686 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,73	120 °C

Additional information on exposure estimation

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

3.3.12. Worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC4)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,5 mg/m ³ (ECETOC TRA v3.0, Worker)	0,152	40 °C
inhalative, systemic, long-term	0,72 mg/m ³ (Advanced REACH Tool (ART) v1.5)	0,218	120 °C
dermal, systemic, long-term	0,343 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,365	40 °C, 120 °C

Additional information on exposure estimation

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

3.3.13. Worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) (PROC5)
[diethylmethylbenzenediamine]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0289 mg/m ³ (ECETOC TRA was used with modifications.)	0,222	

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long term, dermal, systemic,	0,137 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,137	Gloves: 99% protection
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Additional information on exposure estimationBased on the applied RMMs the risk towards humans is sufficiently controlled ($RCR \leq 1$).
3.3.14. Worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) (PROC5)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,5 mg/m ³ (ECETOC TRA v3.0, Worker)	0,152	40 °C
inhalative, systemic, long-term	0,24 mg/m ³ (Advanced REACH Tool (ART) v1.5)	0,073	120 °C
dermal, systemic, long-term	0,686 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,729	40 °C, 120 °C

Additional information on exposure estimationBased on the applied RMMs the risk towards humans is sufficiently controlled ($RCR \leq 1$).
3.3.15. Worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) (PROC5) / Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,5 mg/m ³ (ECETOC TRA v3.0, Worker)	0,152	
dermal, systemic, long-term	0,686 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,729	

Additional information on exposure estimationBased on the applied RMMs the risk towards humans is sufficiently controlled ($RCR \leq 1$).
3.3.16. Worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)
[diethylmethylbenzenediamine]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0289 mg/m ³ (ECETOC TRA was used with modifications.)	0,222	
long term, dermal, systemic,	0,137 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,137	Gloves: 99% protection

Additional information on exposure estimationBased on the applied RMMs the risk towards humans is sufficiently controlled ($RCR \leq 1$).

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3.3.17. Worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,5 mg/m ³ (ECETOC TRA v3.0, Worker)	0,152	40 °C
inhalative, systemic, long-term	0,19 mg/m ³ (Advanced REACH Tool (ART) v1.5)	0,058	120 °C
dermal, systemic, long-term	0,686 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,729	40 °C, 120 °C

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled (RCR ≤ 1).

3.3.18. Worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,5 mg/m ³ (ECETOC TRA v3.0, Worker)	0,152	40 °C
inhalative, systemic, long-term	0,19 mg/m ³ (Advanced REACH Tool (ART) v1.5)	0,058	120 °C
dermal, systemic, long-term	0,686 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,729	40 °C, 120 °C

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled (RCR ≤ 1).

3.3.19. Worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)
[diethylmethylbenzenediamine]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0289 mg/m ³ (ECETOC TRA was used with modifications.)	0,222	
long term, dermal, systemic,	0,0686 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,0686	Gloves: 99% protection

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled (RCR ≤ 1).

3.3.20. Worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	40 °C

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inhalative, systemic, long-term	0,19 mg/m ³ (Advanced REACH Tool (ART) v1.5)	0,058	120 °C
dermal, systemic, long-term	0,686 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,729	40 °C, 120 °C

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled (RCR ≤ 1).

3.3.21. Worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	40 °C
inhalative, systemic, long-term	0,19 mg/m ³ (Advanced REACH Tool (ART) v1.5)	0,058	120 °C
dermal, systemic, long-term	0,686 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,729	40 °C, 120 °C

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled (RCR ≤ 1).

3.3.22. Worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	
dermal, systemic, long-term	0,686 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,729	

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled (RCR ≤ 1).

3.3.23. Worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9)
[diethylmethylbenzenediamine]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0289 mg/m ³ (ECETOC TRA was used with modifications.)	0,222	
long term, dermal, systemic,	0,0686 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,0686	Gloves: 99% protection

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled (RCR ≤ 1).

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**3.3.24. Worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9)
[Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	40 °C
inhalative, systemic, long-term	0,019 mg/m ³ (Advanced REACH Tool (ART) v1.5)	< 0,01	120 °C
dermal, systemic, long-term	0,343 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,365	40 °C
dermal, systemic, long-term	0,686 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,73	120 °C

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled (RCR ≤ 1).

**3.3.25. Worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9)
[Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	40 °C
inhalative, systemic, long-term	0,019 mg/m ³ (Advanced REACH Tool (ART) v1.5)	< 0,01	120 °C
dermal, systemic, long-term	0,343 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,365	40 °C, 120 °C

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled (RCR ≤ 1).

**3.3.26. Worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9)
[Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	
dermal, systemic, long-term	0,343 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,365	

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled (RCR ≤ 1).

**3.3.27. Worker exposure: Use as laboratory reagent (PROC15)
[diethylmethylbenzenediamine]**

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0743 mg/m ³ (ECETOC TRA was used with	0,572	LEV: 90% efficiency

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	modifications.)		
long term, dermal, systemic,	0,00343 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,00343	Gloves: 99% protection, LEV: 90% efficiency

Additional information on exposure estimationBased on the applied RMMs the risk towards humans is sufficiently controlled ($RCR \leq 1$).**3.3.28. Worker exposure: Use as laboratory reagent (PROC15)
[Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	
dermal, systemic, long-term	0,034 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,036	

Additional information on exposure estimationBased on the applied RMMs the risk towards humans is sufficiently controlled ($RCR \leq 1$).**3.3.29. Worker exposure: Use as laboratory reagent (PROC15)
[Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	
dermal, systemic, long-term	0,034 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,036	

Additional information on exposure estimationBased on the applied RMMs the risk towards humans is sufficiently controlled ($RCR \leq 1$).**3.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES**

The risk management measures given in this exposure scenario apply to the specified substance in a concentration as indicated in the scenario. The concentration of the substance in the product may differ. A downstream user should evaluate if the risk management measures may be adapted accordingly.

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

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

If further details are needed, please contact us.

diethylmethylbenzenediamine

The exposure estimates have been assessed using ECETOC TRA (2010) with Tier 2 refinements.

Inhalation exposure was estimated by the saturated vapour concentration (SVC). The SVC depends on its amount in the formulations, the molecular weight of the solvent (≥ 1000 g/mol) and the ambient temperature (assumed to be 35 °C as a conservative worst case approach).

ES4: Use at industrial sites; Adhesives, sealants.**4.1. Title section**

Exposure Scenario name	: Adhesives, sealants
Structured Short Title	: Use at industrial sites; Adhesives, sealants.

Environment		
CS1	Use of preparations containing the substance [alkylaminocarboxamide]	ERC5
Worker		
CS2	Adhesives, sealants [diethylmethylbenzenediamine]	PROC1
CS3	Use as an intermediate [Trimethylolpropane]	PROC1
CS4	Polymerisation, Monomers [Trimethylolpropane]	PROC1
CS5	Adhesives, sealants [diethylmethylbenzenediamine]	PROC2
CS6	Polymerisation, Monomers [Trimethylolpropane]	PROC2
CS7	Adhesives, sealants [diethylmethylbenzenediamine]	PROC3
CS8	Use as an intermediate [Trimethylolpropane]	PROC3
CS9	Polymerisation, Monomers [Trimethylolpropane]	PROC3
CS10	Adhesives, sealants [diethylmethylbenzenediamine]	PROC4
CS11	Use as an intermediate [Trimethylolpropane]	PROC4
CS12	Polymerisation, Monomers [Trimethylolpropane]	PROC4
CS13	Adhesives, sealants [diethylmethylbenzenediamine]	PROC5
CS14	Polymerisation, Monomers [Trimethylolpropane]	PROC5
CS15	Use at industrial site leading to inclusion into/onto article [Trimethylolpropane]	PROC5, PROC8a
CS16	Adhesives, sealants [diethylmethylbenzenediamine]	PROC8a
CS17	Use as an intermediate [Trimethylolpropane]	PROC8a
CS18	Polymerisation, Monomers [Trimethylolpropane]	PROC8a
CS19	Adhesives, sealants [diethylmethylbenzenediamine]	PROC8b
CS20	Use as an intermediate	PROC8b

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	[Trimethylolpropane]	
CS21	Polymerisation, Monomers [Trimethylolpropane]	PROC8b
CS22	Use at industrial site leading to inclusion into/onto article [Trimethylolpropane]	PROC8b
CS23	Adhesives, sealants [diethylmethylbenzenediamine]	PROC9
CS24	Use as an intermediate [Trimethylolpropane]	PROC9
CS25	Polymerisation, Monomers [Trimethylolpropane]	PROC9
CS26	Use at industrial site leading to inclusion into/onto article [Trimethylolpropane]	PROC9
CS27	Adhesives, sealants [diethylmethylbenzenediamine]	PROC14
CS28	Polymerisation, Monomers [Trimethylolpropane]	PROC14
CS29	Use at industrial site leading to inclusion into/onto article [Trimethylolpropane]	PROC14
CS30	Adhesives, sealants [diethylmethylbenzenediamine]	PROC15
CS31	Use as an intermediate [Trimethylolpropane]	PROC15
CS32	Polymerisation, Monomers [Trimethylolpropane]	PROC15
Further information		
Use of TMP in tyres is covered in this scenario		

4.2. Conditions of use affecting exposure**4.2.1. Control of environmental exposure: Industrial use resulting in inclusion into or onto a matrix (ERC5)
[alkylaminocarboxamide]**

Product (article) characteristics	
Molar Mass	: 309 g/mol
Vapour pressure	: 0,000392 Pa at 25 °C
Water solubility	: 10,3 mg/l at 20 °C
Partition coefficient (n-octanol/water)	: log Pow: 5,6 at: 20 °C
Biodegradation	: Inherently biodegradable.
Amount used, frequency and duration of use (or from service life)	
Fraction of EU tonnage used in region:	: 1
Annual amount per site	: <= 2000 tonnes/year (t/y)
Daily amount per site	: <= 20 t/day
Technical and organisational conditions and measures	

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Air Waste gases are directed to thermal incineration.	
Soil Sealing of all relevant soil surfaces in the facility is required.	
Conditions and measures related to sewage treatment plant	
STP type	: Biological sewage treatment plant
STP sludge treatment	: No application of sewage sludge to agricultural soil.
STP effluent	: 2.000 m3/d
Effectiveness (of a measure)	: 91,99 %
Conditions and measures related to treatment of waste (including article waste)	
Waste treatment	: No specific measures identified. Low risk assumed for waste life stage.
Other conditions affecting environmental exposure	
Receiving surface water flow	: 18.000 m3/d

4.2.2. Control of worker exposure: Use in closed process, no likelihood of exposure (PROC1) [diethylmethylbenzenediamine]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: 25 - 60%
Molar Mass	: 178,28 g/mol
Vapour pressure	: 0,0000971 kPa at 25 °C
Vapour pressure	: 0,000391 kPa at 35 °C Highest ambient temperature for workers.
Physical form of product	: Liquid substance
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: > 4 hours/day
Frequency of use	: daily
Technical and organisational conditions and measures	
Good work practice should be used, which may include: Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing. Systems in place to ensure correct use of RMMs and that OCs are being followed. Training for staff on good practice. Careful attention to industrial and personal hygiene is essential. Procedures and training for emergency decontamination and disposal. Recording of any "near miss" situations.	
Handle substance within a closed system. Ensure material transfers are under containment or extract ventilation.	
Conditions and measures related to personal protection, hygiene and health evaluation	
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. Wash hands thoroughly after handling. Wear protective gloves/ protective clothing/ eye protection/ face protection.	

Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor/Outdoor use

4.2.3. Control of worker exposure: Use in closed process, no likelihood of exposure (PROC1) [Trimethylolpropane]

Product (article) characteristics

Concentration of the Substance in Mixture/Article : <= 100%

Molar Mass : 134,1 g/mol

Vapour pressure : 0,00016 hPa at 40 °C

Vapour pressure : 100 hPa at 120 °C

Physical form of product : Solid, low dustiness

Physical form of product : Liquid

Process Temperature : <= 40 °C

Process Temperature : <= 120 °C

Amount used, frequency and duration of use (or from service life)

Duration of the activity : <= 8 hours/day

Technical and organisational conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).

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

No specific measures identified.

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

4.2.4. Control of worker exposure: Use in closed process, no likelihood of exposure (PROC1) [Trimethylolpropane]

Product (article) characteristics

Concentration of the Substance in Mixture/Article : <= 100%

Molar Mass : 134,1 g/mol

Vapour pressure : 0,00016 hPa at 40 °C

Vapour pressure : 100 hPa at 120 °C

Physical form of product : Solid, low dustiness

Physical form of product : Liquid

Process Temperature : <= 40 °C

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Process Temperature	: <= 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	
No specific measures identified.	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

4.2.5. Control of worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC2)**[diethylmethybenzenediamine]**

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: 25 - 60%
Molar Mass	: 178,28 g/mol
Vapour pressure	: 0,0000971 kPa at 25 °C
Vapour pressure	: 0,000391 kPa at 35 °C Highest ambient temperature for workers.
Physical form of product	: Liquid substance
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: > 4 hours/day
Frequency of use	: daily
Technical and organisational conditions and measures	
Good work practice should be used, which may include: Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing. Systems in place to ensure correct use of RMMs and that OCs are being followed. Training for staff on good practice. Careful attention to industrial and personal hygiene is essential. Procedures and training for emergency decontamination and disposal. Recording of any "near miss" situations.	
Handle substance within a predominantly closed system. Ensure material transfers are under containment or extract ventilation. Local exhaust ventilation is required.	
Conditions and measures related to personal protection, hygiene and health evaluation	
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. Wash hands thoroughly after handling. Wear protective gloves/ protective clothing/ eye protection/ face protection. Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.	

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor/Outdoor use

4.2.6. Control of worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC2)**[Trimethylolpropane]****Product (article) characteristics**

Concentration of the Substance in Mixture/Article : ≤ 100%

Molar Mass : 134,1 g/mol

Vapour pressure : 0,00016 hPa at 40 °C

Vapour pressure : < 1 hPa at 120 °C

Physical form of product : Solid, low dustiness

Physical form of product : Liquid

Process Temperature : ≤ 40 °C

Process Temperature : ≤ 120 °C

Amount used, frequency and duration of use (or from service life)

Duration of the activity : ≤ 8 hours/day

Technical and organisational conditions and measures

40 °C
Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).

120 °C
Room ventilation rate of 3 air changes per hour (ACH) is required.
Demonstrable and effective housekeeping practices in place.
Provide a high level containment.
Inhalation - minimum efficiency of 99,9 %

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

Wear suitable protective clothing.
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Dermal - minimum efficiency of 90 %

Other conditions affecting workers exposure

Open surface : > 3 m²

Remarks : 120 °C

Indoor or outdoor use : Indoor use

Remarks : 40 °C, 120 °C

Room size : 300 m³

Remarks : 120 °C

4.2.7. Control of worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)
[diethylmethylbenzenediamine]

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Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: 25 - 60%
Molar Mass	: 178,28 g/mol
Vapour pressure	: 0,0000971 kPa at 25 °C
Vapour pressure	: 0,000391 kPa at 35 °C Highest ambient temperature for workers.
Physical form of product	: Liquid substance
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: > 4 hours/day
Frequency of use	: daily
Technical and organisational conditions and measures	
Good work practice should be used, which may include: Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing. Systems in place to ensure correct use of RMMs and that OCs are being followed. Training for staff on good practice. Careful attention to industrial and personal hygiene is essential. Procedures and training for emergency decontamination and disposal. Recording of any "near miss" situations.	
Handle substance within a predominantly closed system. Ensure material transfers are under containment or extract ventilation. Local exhaust ventilation is required.	
Conditions and measures related to personal protection, hygiene and health evaluation	
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. Wash hands thoroughly after handling. Wear protective gloves/ protective clothing/ eye protection/ face protection. Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor/Outdoor use

4.2.8. Control of worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)
[Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Vapour pressure	: < 1 hPa at 120 °C
Physical form of product	: Solid, low dustiness
Physical form of product	: Liquid
Process Temperature	: <= 40 °C

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Process Temperature	: <= 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
40 °C Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
120 °C Room ventilation rate of 3 air changes per hour (ACH) is required. Demonstrable and effective housekeeping practices in place. Provide a high level containment. Inhalation - minimum efficiency of 99,9 %	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
Other conditions affecting workers exposure	
Open surface	: > 3 m ²
Remarks	: 120 °C
Indoor or outdoor use	: Indoor use
Remarks	: 40 °C, 120 °C
Room size	: 300 m ³
Remarks	: 120 °C

4.2.9. Control of worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)
[Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Vapour pressure	: < 1 hPa at 120 °C
Physical form of product	: Solid, low dustiness
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Process Temperature	: <= 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
40 °C Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	

120 °C
 Room ventilation rate of 3 air changes per hour (ACH) is required.
 Demonstrable and effective housekeeping practices in place.
 Provide a high level containment.
 Inhalation - minimum efficiency of 99,9 %

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

Wear suitable protective clothing.
 Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
 Dermal - minimum efficiency of 90 %

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Remarks : 40 °C, 120 °C

Room size : 300 m³

Remarks : 120 °C

4.2.10. Control of worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC4) [diethylmethylbenzenediamine]

Product (article) characteristics

Concentration of the Substance in Mixture/Article : 25 - 60%

Molar Mass : 178,28 g/mol

Vapour pressure : 0,0000971 kPa at 25 °C

Vapour pressure : 0,000391 kPa at 35 °C Highest ambient temperature for workers.

Physical form of product : Liquid substance

Amount used, frequency and duration of use (or from service life)

Duration of the activity : > 4 hours/day

Frequency of use : daily

Technical and organisational conditions and measures

Good work practice should be used, which may include:
 Ensure all equipment is well maintained.
 Regular cleaning of equipment, work area and clothing.
 Systems in place to ensure correct use of RMMs and that OCs are being followed.
 Training for staff on good practice.
 Careful attention to industrial and personal hygiene is essential.
 Procedures and training for emergency decontamination and disposal.
 Recording of any "near miss" situations.

Provide extraction ventilation at points where emissions occur.
 Ensure material transfers are under containment or extract ventilation.
 Ensure samples are obtained under containment or extract ventilation.
 Local exhaust ventilation is required.

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

Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
 Wash hands thoroughly after handling.
 Wear protective gloves/ protective clothing/ eye protection/ face protection.

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Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor/Outdoor use

4.2.11. Control of worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC4)
[Trimethylolpropane]

Product (article) characteristics

Concentration of the Substance in Mixture/Article : ≤ 100%

Molar Mass : 134,1 g/mol

Vapour pressure : 0,00016 hPa at 40 °C

Vapour pressure : < 1 hPa at 120 °C

Physical form of product : Solid, low dustiness

Physical form of product : Liquid

Process Temperature : ≤ 40 °C

Process Temperature : ≤ 120 °C

Amount used, frequency and duration of use (or from service life)

Duration of the activity : ≤ 8 hours/day

Technical and organisational conditions and measures

40 °C
Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).

120 °C
Room ventilation rate of 3 air changes per hour (ACH) is required.
Demonstrable and effective housekeeping practices in place.
Provide a medium level containment.
Inhalation - minimum efficiency of 99 %

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

40 °C
Wear suitable protective clothing.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Dermal - minimum efficiency of 95 %

120 °C
Wear suitable protective clothing.
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Dermal - minimum efficiency of 90 %

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Remarks : 40 °C, 120 °C

Room size : 300 m³

Remarks : 120 °C

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4.2.12. Control of worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC4)
[Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: ≤ 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Vapour pressure	: < 1 hPa at 120 °C
Physical form of product	: Solid, low dustiness
Physical form of product	: Liquid
Process Temperature	: ≤ 40 °C
Process Temperature	: ≤ 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: ≤ 8 hours/day
Technical and organisational conditions and measures	
40 °C Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
120 °C Room ventilation rate of 3 air changes per hour (ACH) is required. Demonstrable and effective housekeeping practices in place. Provide a medium level containment. Inhalation - minimum efficiency of 99 %	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use
Remarks	: 40 °C, 120 °C
Room size	: 300 m ³
Remarks	: 120 °C

4.2.13. Control of worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) (PROC5)
[diethylmethylbenzenediamine]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: 25 - 60%
Molar Mass	: 178,28 g/mol
Vapour pressure	: 0,0000971 kPa at 25 °C
Vapour pressure	: 0,000391 kPa at 35 °C Highest ambient temperature for workers.

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Physical form of product	: Liquid substance
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: < 1 hours/day
Frequency of use	: daily
Technical and organisational conditions and measures	
Good work practice should be used, which may include: Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing. Systems in place to ensure correct use of RMMs and that OCs are being followed. Training for staff on good practice. Careful attention to industrial and personal hygiene is essential. Procedures and training for emergency decontamination and disposal. Recording of any "near miss" situations.	
Conditions and measures related to personal protection, hygiene and health evaluation	
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. Wash hands thoroughly after handling. Wear protective gloves/ protective clothing/ eye protection/ face protection. Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor/Outdoor use

4.2.14. Control of worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) (PROC5)
[Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Vapour pressure	: < 1 hPa at 120 °C
Physical form of product	: Solid, low dustiness
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Process Temperature	: <= 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
40 °C Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
120 °C Room ventilation rate of 3 air changes per hour (ACH) is required.	

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Demonstrable and effective housekeeping practices in place.
Provide a medium level containment.
Inhalation - minimum efficiency of 99 %

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

Wear suitable protective clothing.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Dermal - minimum efficiency of 95 %

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

Remarks : 40 °C, 120 °C

Room size : 300 m³

Remarks : 120 °C

4.2.15. Control of worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) (PROC5) / Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)
[Trimethylolpropane]

Product (article) characteristics

Concentration of the Substance in Mixture/Article : <= 100%

Molar Mass : 134,1 g/mol

Vapour pressure : 0,00016 hPa at 40 °C

Physical form of product : Solid, low dustiness

Process Temperature : <= 40 °C

Amount used, frequency and duration of use (or from service life)

Duration of the activity : <= 8 hours/day

Technical and organisational conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).

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

Wear suitable protective clothing.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Dermal - minimum efficiency of 95 %

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

4.2.16. Control of worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)
[diethylmethylbenzenediamine]

Product (article) characteristics

Concentration of the Substance in : 25 - 60%

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Mixture/Article	
Molar Mass	: 178,28 g/mol
Vapour pressure	: 0,0000971 kPa at 25 °C
Vapour pressure	: 0,000391 kPa at 35 °C Highest ambient temperature for workers.
Physical form of product	: Liquid substance
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: 1 - 4 hours/day
Frequency of use	: daily
Technical and organisational conditions and measures	
Good work practice should be used, which may include: Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing. Systems in place to ensure correct use of RMMs and that OCs are being followed. Training for staff on good practice. Careful attention to industrial and personal hygiene is essential. Procedures and training for emergency decontamination and disposal. Recording of any "near miss" situations.	
Conditions and measures related to personal protection, hygiene and health evaluation	
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. Wash hands thoroughly after handling. Wear protective gloves/ protective clothing/ eye protection/ face protection. Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor/Outdoor use

4.2.17. Control of worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)
[Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Vapour pressure	: < 1 hPa at 120 °C
Physical form of product	: Solid, low dustiness
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Process Temperature	: <= 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day

Technical and organisational conditions and measures	
40 °C	Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).
120 °C	Room ventilation rate of 3 air changes per hour (ACH) is required. Demonstrable and effective housekeeping practices in place. Provide a medium level containment. Inhalation - minimum efficiency of 99 %
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Other conditions affecting workers exposure	
Material transfers	: 100 - 1000 L/min
Remarks	: 120 °C
Indoor or outdoor use	: Indoor use
Remarks	: 40 °C, 120 °C
Room size	: 300 m³
Remarks	: 120 °C

4.2.18. Control of worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)
[Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Vapour pressure	: < 1 hPa at 120 °C
Physical form of product	: Solid, low dustiness
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Process Temperature	: <= 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
40 °C	Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).
120 °C	Room ventilation rate of 3 air changes per hour (ACH) is required. Demonstrable and effective housekeeping practices in place. Provide a medium level containment. Inhalation - minimum efficiency of 99 %

Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Other conditions affecting workers exposure	
Material transfers	: 100 - 1000 L/min
Remarks	: 120 °C
Indoor or outdoor use	: Indoor use
Remarks	: 40 °C, 120 °C
Room size	: 300 m³
Remarks	: 120 °C

4.2.19. Control of worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)
[diethylmethylbenzenediamine]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: 25 - 60%
Molar Mass	: 178,28 g/mol
Vapour pressure	: 0,0000971 kPa at 25 °C
Vapour pressure	: 0,000391 kPa at 35 °C Highest ambient temperature for workers.
Physical form of product	: Liquid substance
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: 1 - 4 hours/day
Frequency of use	: daily
Technical and organisational conditions and measures	
Good work practice should be used, which may include: Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing. Systems in place to ensure correct use of RMMs and that OCs are being followed. Training for staff on good practice. Careful attention to industrial and personal hygiene is essential. Procedures and training for emergency decontamination and disposal. Recording of any "near miss" situations.	
Fill containers/cans at dedicated fill points supplied with local extract ventilation. Provide extract ventilation to material transfer points and other openings.	
Conditions and measures related to personal protection, hygiene and health evaluation	
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. Wash hands thoroughly after handling. Wear protective gloves/ protective clothing/ eye protection/ face protection. Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.	

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor/Outdoor use

**4.2.20. Control of worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)
[Trimethylolpropane]****Product (article) characteristics**

Concentration of the Substance in Mixture/Article : <= 100%

Molar Mass : 134,1 g/mol

Vapour pressure : 0,00016 hPa at 40 °C

Vapour pressure : < 1 hPa at 120 °C

Physical form of product : Solid, low dustiness

Physical form of product : Liquid

Process Temperature : <= 40 °C

Process Temperature : <= 120 °C

Amount used, frequency and duration of use (or from service life)

Duration of the activity : <= 8 hours/day

Technical and organisational conditions and measures

40 °C
Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).

120 °C
Room ventilation rate of 3 air changes per hour (ACH) is required.
Demonstrable and effective housekeeping practices in place.
Provide a medium level containment.
Inhalation - minimum efficiency of 99 %

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

Wear suitable protective clothing.
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Dermal - minimum efficiency of 95 %

Other conditions affecting workers exposure

Material transfers : 100 - 1000 L/min

Remarks : 120 °C

Indoor or outdoor use : Indoor use

Remarks : 40 °C, 120 °C

Room size : 300 m³

Remarks : 120 °C

**4.2.21. Control of worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)
[Trimethylolpropane]**

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Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Vapour pressure	: < 1 hPa at 120 °C
Physical form of product	: Solid, low dustiness
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Process Temperature	: <= 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
40 °C Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
120 °C Room ventilation rate of 3 air changes per hour (ACH) is required. Demonstrable and effective housekeeping practices in place. Provide a medium level containment. Inhalation - minimum efficiency of 99 %	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Other conditions affecting workers exposure	
Material transfers	: 100 - 1000 L/min
Remarks	: 120 °C
Indoor or outdoor use	: Indoor use
Remarks	: 40 °C, 120 °C
Room size	: 300 m³
Remarks	: 120 °C

4.2.22. Control of worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)
[Trimethylolpropane]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Physical form of product	: Solid, low dustiness

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Process Temperature	: <= 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

**4.2.23. Control of worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9)
[diethylmethylbenzenediamine]**

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: 25 - 60%
Molar Mass	: 178,28 g/mol
Vapour pressure	: 0,0000971 kPa at 25 °C
Vapour pressure	: 0,000391 kPa at 35 °C Highest ambient temperature for workers.
Physical form of product	: Liquid substance
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: > 4 hours/day
Frequency of use	: daily
Technical and organisational conditions and measures	
Good work practice should be used, which may include: Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing. Systems in place to ensure correct use of RMMs and that OCs are being followed. Training for staff on good practice. Careful attention to industrial and personal hygiene is essential. Procedures and training for emergency decontamination and disposal. Recording of any "near miss" situations.	
Fill containers/cans at dedicated fill points supplied with local extract ventilation. Provide extract ventilation to material transfer points and other openings. Local exhaust ventilation is required.	
Conditions and measures related to personal protection, hygiene and health evaluation	
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. Wash hands thoroughly after handling. Wear protective gloves/ protective clothing/ eye protection/ face protection. Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to	

keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor/Outdoor use

4.2.24. Control of worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9) [Trimethylolpropane]

Product (article) characteristics

Concentration of the Substance in Mixture/Article : <= 100%

Molar Mass : 134,1 g/mol

Vapour pressure : 0,00016 hPa at 40 °C

Vapour pressure : < 1 hPa at 120 °C

Physical form of product : Solid, low dustiness

Physical form of product : Liquid

Process Temperature : <= 40 °C

Process Temperature : <= 120 °C

Amount used, frequency and duration of use (or from service life)

Duration of the activity : <= 8 hours/day

Technical and organisational conditions and measures

40 °C

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).

120 °C

Room ventilation rate of 3 air changes per hour (ACH) is required.

Demonstrable and effective housekeeping practices in place.

Provide a medium level containment.

Inhalation - minimum efficiency of 99 %

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

40 °C

Wear suitable protective clothing.

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.

Dermal - minimum efficiency of 95 %

120 °C

Wear suitable protective clothing.

Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

Dermal - minimum efficiency of 90 %

Other conditions affecting workers exposure

Material transfers : 10 - 100 L/min

Remarks : 120 °C

Indoor or outdoor use : Indoor use

Remarks : 40 °C, 120 °C

Room size : 300 m³

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Remarks	: 120 °C
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**4.2.25. Control of worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9)
[Trimethylolpropane]**

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: <= 100%
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Vapour pressure	: < 1 hPa at 120 °C
Physical form of product	: Solid, low dustiness
Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Process Temperature	: <= 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
40 °C Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
120 °C Room ventilation rate of 3 air changes per hour (ACH) is required. Demonstrable and effective housekeeping practices in place. Provide a medium level containment. Inhalation - minimum efficiency of 99 %	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Other conditions affecting workers exposure	
Material transfers	: 10 - 100 L/min
Remarks	: 120 °C
Indoor or outdoor use	: Indoor use
Remarks	: 40 °C, 120 °C
Room size	: 300 m³
Remarks	: 120 °C

**4.2.26. Control of worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9)
[Trimethylolpropane]**

Product (article) characteristics	
Concentration of the Substance in	: <= 100%

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Mixture/Article	
Molar Mass	: 134,1 g/mol
Vapour pressure	: 0,00016 hPa at 40 °C
Physical form of product	: Solid, low dustiness
Process Temperature	: ≤ 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: ≤ 8 hours/day
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

4.2.27. Control of worker exposure: Production of preparations or articles by tableting, compression, extrusion, pelletisation (PROC14)
[diethylmethylbenzenediamine]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: 25 - 60%
Molar Mass	: 178,28 g/mol
Vapour pressure	: 0,0000971 kPa at 25 °C
Vapour pressure	: 0,000391 kPa at 35 °C Highest ambient temperature for workers.
Physical form of product	: Liquid substance
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: > 4 hours/day
Frequency of use	: daily
Technical and organisational conditions and measures	
Good work practice should be used, which may include: Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing. Systems in place to ensure correct use of RMMs and that OCs are being followed. Training for staff on good practice. Careful attention to industrial and personal hygiene is essential. Procedures and training for emergency decontamination and disposal. Recording of any "near miss" situations.	
Local exhaust ventilation is required.	
Conditions and measures related to personal protection, hygiene and health evaluation	

Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
 Wash hands thoroughly after handling.
 Wear protective gloves/ protective clothing/ eye protection/ face protection.
 Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.

Wear respiratory protection.

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor/Outdoor use

4.2.28. Control of worker exposure: Production of preparations or articles by tableting, compression, extrusion, pelletisation (PROC14) [Trimethylolpropane]

Product (article) characteristics

Concentration of the Substance in Mixture/Article : <= 100%

Molar Mass : 134,1 g/mol

Vapour pressure : 0,00016 hPa at 40 °C

Physical form of product : Solid, low dustiness

Process Temperature : <= 40 °C

Amount used, frequency and duration of use (or from service life)

Duration of the activity : <= 8 hours/day

Technical and organisational conditions and measures

Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).

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

Wear suitable protective clothing.
 Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
 Dermal - minimum efficiency of 95 %

Other conditions affecting workers exposure

Indoor or outdoor use : Indoor use

4.2.29. Control of worker exposure: Production of preparations or articles by tableting, compression, extrusion, pelletisation (PROC14) [Trimethylolpropane]

Product (article) characteristics

Concentration of the Substance in Mixture/Article : <= 100%

Molar Mass : 134,1 g/mol

Vapour pressure : 0,00016 hPa at 40 °C

Vapour pressure : < 0,1 hPa at 120 °C

Physical form of product : Solid, low dustiness

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Physical form of product	: Liquid
Process Temperature	: <= 40 °C
Process Temperature	: <= 120 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: <= 8 hours/day
Technical and organisational conditions and measures	
40 °C Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
120 °C Room ventilation rate of 3 air changes per hour (ACH) is required. Demonstrable and effective housekeeping practices in place. Provide a medium level containment. Inhalation - minimum efficiency of 99 %	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Dermal - minimum efficiency of 95 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use
Remarks	: 40 °C, 120 °C
Room size	: 300 m ³
Remarks	: 120 °C

4.2.30. Control of worker exposure: Use as laboratory reagent (PROC15)
[diethylmethylbenzenediamine]

Product (article) characteristics	
Concentration of the Substance in Mixture/Article	: 25 - 60%
Molar Mass	: 178,28 g/mol
Vapour pressure	: 0,0000971 kPa at 25 °C
Vapour pressure	: 0,000391 kPa at 35 °C Highest ambient temperature for workers.
Physical form of product	: Liquid substance
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: > 4 hours/day
Frequency of use	: daily
Technical and organisational conditions and measures	
Good work practice should be used, which may include: Ensure all equipment is well maintained. Regular cleaning of equipment, work area and clothing. Systems in place to ensure correct use of RMMs and that OCs are being followed. Training for staff on good practice. Careful attention to industrial and personal hygiene is essential.	

Procedures and training for emergency decontamination and disposal. Recording of any "near miss" situations.
Carry out in a vented booth or extracted enclosure. Ensure samples are obtained under containment or extract ventilation. Local exhaust ventilation is required.
Conditions and measures related to personal protection, hygiene and health evaluation
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. Wash hands thoroughly after handling. Wear protective gloves/ protective clothing/ eye protection/ face protection. Respiratory Protective Equipment [RPE] should be used when no LEV can be used or LEV is not efficient enough to keep exposure below the relevant acute and long-term DNEL values, unless it can be demonstrated, e.g. by workplace monitoring, that exposures are below the acute and long-term worker DNEL values.
Other conditions affecting workers exposure
Indoor or outdoor use : Indoor/Outdoor use

4.2.31. Control of worker exposure: Use as laboratory reagent (PROC15) [Trimethylolpropane]

Product (article) characteristics
Concentration of the Substance in Mixture/Article : <= 100%
Molar Mass : 134,1 g/mol
Vapour pressure : 0,00016 hPa at 40 °C
Physical form of product : Solid, low dustiness
Process Temperature : <= 40 °C
Amount used, frequency and duration of use (or from service life)
Duration of the activity : <= 8 hours/day
Technical and organisational conditions and measures
Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %
Other conditions affecting workers exposure
Indoor or outdoor use : Indoor use

4.2.32. Control of worker exposure: Use as laboratory reagent (PROC15) [Trimethylolpropane]

Product (article) characteristics
Concentration of the Substance in Mixture/Article : <= 100%
Molar Mass : 134,1 g/mol

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Vapour pressure	: 0,00016 hPa at 40 °C
Physical form of product	: Solid, low dustiness
Process Temperature	: ≤ 40 °C
Amount used, frequency and duration of use (or from service life)	
Duration of the activity	: ≤ 8 hours/day
Technical and organisational conditions and measures	
Provide a good standard of general ventilation (not less than 1 to 3 air changes per hour).	
Conditions and measures related to personal protection, hygiene and health evaluation	
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %	
Other conditions affecting workers exposure	
Indoor or outdoor use	: Indoor use

4.3. Exposure estimation and reference to its source**4.3.1. Environmental release and exposure: Industrial use resulting in inclusion into or onto a matrix (ERC5) [alkylaminocarboxamide]**

Release route	Release rate	Release estimation method	Remarks
Water	0 %	Estimated release factor	release before RMM, release after RMM, No release to waste water under normal circumstances.
Air	0 %	Estimated release factor	release before RMM, release after RMM
Soil	0 %	Estimated release factor	release after RMM

Compartment	Exposure level	RCR	Remarks
Freshwater	0,000000012 mg/L (EUSES v2.1.2)	< 0,01	
Freshwater sediment	0,379 mg/kg dry weight (EUSES v2.1.2)	< 0,01	
Marine water	0,00000292 µg/L (EUSES v2.1.2)	< 0,01	
Marine sediment	0,092 mg/kg dry weight (EUSES v2.1.2)	< 0,01	
Agricultural soil	0,0000304 mg/kg dry weight (EUSES v2.1.2)	< 0,01	
Man via environment - Inhalation	negligible (EUSES v2.1.2)	< 0,01	
Man via environment - Oral	negligible (EUSES v2.1.2)	< 0,01	

Additional information on exposure estimation

Based on the applied RMMS the risk towards environment is sufficiently controlled ($RCR \leq 1$).

4.3.2. Worker exposure: Use in closed process, no likelihood of exposure (PROC1)
[diethylmethylbenzenediamine]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0743 mg/m ³ (ECETOC TRA was used with modifications.)	0,572	
long term, dermal, systemic,	0,00343 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,00343	Gloves: 99% protection

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).

4.3.3. Worker exposure: Use in closed process, no likelihood of exposure (PROC1)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,01 mg/m ³ (ECETOC TRA v3.0, Worker)	< 0,01	40 °C
inhalative, systemic, long-term	0,056 mg/m ³ (ECETOC TRA v3.0, Worker)	0,017	120 °C
dermal, systemic, long-term	0,034 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,036	40 °C, 120 °C

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).

4.3.4. Worker exposure: Use in closed process, no likelihood of exposure (PROC1)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,01 mg/m ³ (ECETOC TRA v3.0, Worker)	< 0,01	40 °C
inhalative, systemic, long-term	0,056 mg/m ³ (ECETOC TRA v3.0, Worker)	0,017	120 °C
dermal, systemic, long-term	0,034 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,036	40 °C, 120 °C

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).

4.3.5. Worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC2)
[diethylmethylbenzenediamine]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0743 mg/m ³ (ECETOC TRA was used with modifications.)	0,572	LEV: 90% efficiency

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long term, dermal, systemic,	0,00137 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,00137	Gloves: 99% protection, LEV: 90% efficiency
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Additional information on exposure estimationBased on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).**4.3.6. Worker exposure: Use in closed, continuous process with occasional controlled exposure (PROC2) [Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,01 mg/m ³ (ECETOC TRA v3.0, Worker)	< 0,01	40 °C
inhalative, systemic, long-term	0,000071 mg/m ³ (Advanced REACH Tool (ART) v1.5)	< 0,01	120 °C
dermal, systemic, long-term	0,137 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,146	40 °C, 120 °C

Additional information on exposure estimationBased on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).**4.3.7. Worker exposure: Use in closed batch process (synthesis or formulation) (PROC3) [diethylmethylbenzenediamine]**

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0743 mg/m ³ (ECETOC TRA was used with modifications.)	0,572	LEV: 90% efficiency
long term, dermal, systemic,	0,000343 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,000343	Gloves: 99% protection, LEV: 90% efficiency

Additional information on exposure estimationBased on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).**4.3.8. Worker exposure: Use in closed batch process (synthesis or formulation) (PROC3) [Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	40 °C
inhalative, systemic, long-term	0,00019 mg/m ³ (Advanced REACH Tool (ART) v1.5)	< 0,01	120 °C
dermal, systemic, long-term	0,069 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,073	40 °C, 120 °C

Additional information on exposure estimationBased on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).

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4.3.9. Worker exposure: Use in closed batch process (synthesis or formulation) (PROC3)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	40 °C
inhalative, systemic, long-term	0,00019 mg/m ³ (Advanced REACH Tool (ART) v1.5)	< 0,01	120 °C
dermal, systemic, long-term	0,069 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,073	40 °C, 120 °C

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled (RCR ≤ 1).

4.3.10. Worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC4)
[diethylmethylbenzenediamine]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0743 mg/m ³ (ECETOC TRA was used with modifications.)	0,572	LEV: 90% efficiency
long term, dermal, systemic,	0,00686 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,00686	Gloves: 99% protection, LEV: 90% efficiency

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled (RCR ≤ 1).

4.3.11. Worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC4)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,5 mg/m ³ (ECETOC TRA v3.0, Worker)	0,152	40 °C
inhalative, systemic, long-term	0,72 mg/m ³ (Advanced REACH Tool (ART) v1.5)	0,218	120 °C
dermal, systemic, long-term	0,343 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,365	40 °C
dermal, systemic, long-term	0,686 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,73	120 °C

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled (RCR ≤ 1).

4.3.12. Worker exposure: Use in batch and other process (synthesis) where opportunity for exposure arises (PROC4)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
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inhalative, systemic, long-term	0,5 mg/m ³ (ECETOC TRA v3.0, Worker)	0,152	40 °C
inhalative, systemic, long-term	0,72 mg/m ³ (Advanced REACH Tool (ART) v1.5)	0,218	120 °C
dermal, systemic, long-term	0,343 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,365	40 °C, 120 °C

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled (RCR ≤ 1).

4.3.13. Worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) (PROC5)
[diethylmethylenediamine]

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0289 mg/m ³ (ECETOC TRA was used with modifications.)	0,222	
long term, dermal, systemic,	0,137 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,137	Gloves: 99% protection

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled (RCR ≤ 1).

4.3.14. Worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) (PROC5)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,5 mg/m ³ (ECETOC TRA v3.0, Worker)	0,152	40 °C
inhalative, systemic, long-term	0,24 mg/m ³ (Advanced REACH Tool (ART) v1.5)	0,073	120 °C
dermal, systemic, long-term	0,686 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,729	40 °C, 120 °C

Additional information on exposure estimation

Based on the applied RMMS the risk towards humans is sufficiently controlled (RCR ≤ 1).

4.3.15. Worker exposure: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) (PROC5) / Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,5 mg/m ³ (ECETOC TRA v3.0, Worker)	0,152	
dermal, systemic, long-term	0,686 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,729	

Additional information on exposure estimationBased on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).**4.3.16. Worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)
[diethylmethylenediamine]**

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0289 mg/m ³ (ECETOC TRA was used with modifications.)	0,222	
long term, dermal, systemic,	0,137 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,137	Gloves: 99% protection

Additional information on exposure estimationBased on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).**4.3.17. Worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)
[Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,5 mg/m ³ (ECETOC TRA v3.0, Worker)	0,152	40 °C
inhalative, systemic, long-term	0,19 mg/m ³ (Advanced REACH Tool (ART) v1.5)	0,058	120 °C
dermal, systemic, long-term	0,686 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,729	40 °C, 120 °C

Additional information on exposure estimationBased on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).**4.3.18. Worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities (PROC8a)
[Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,5 mg/m ³ (ECETOC TRA v3.0, Worker)	0,152	40 °C
inhalative, systemic, long-term	0,19 mg/m ³ (Advanced REACH Tool (ART) v1.5)	0,058	120 °C
dermal, systemic, long-term	0,686 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,729	40 °C, 120 °C

Additional information on exposure estimationBased on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).**4.3.19. Worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)
[diethylmethylenediamine]**

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Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0289 mg/m ³ (ECETOC TRA was used with modifications.)	0,222	
long term, dermal, systemic,	0,0686 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,0686	Gloves: 99% protection

Additional information on exposure estimationBased on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).
4.3.20. Worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	40 °C
inhalative, systemic, long-term	0,19 mg/m ³ (Advanced REACH Tool (ART) v1.5)	0,058	120 °C
dermal, systemic, long-term	0,686 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,729	40 °C, 120 °C

Additional information on exposure estimationBased on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).
4.3.21. Worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	40 °C
inhalative, systemic, long-term	0,19 mg/m ³ (Advanced REACH Tool (ART) v1.5)	0,058	120 °C
dermal, systemic, long-term	0,686 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,729	40 °C, 120 °C

Additional information on exposure estimationBased on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).
4.3.22. Worker exposure: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities (PROC8b)
[Trimethylolpropane]

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	
dermal, systemic, long-term	0,686 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,729	

Additional information on exposure estimationBased on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).**4.3.23. Worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9)
[diethylmethylenediamine]**

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0743 mg/m ³ (ECETOC TRA was used with modifications.)	0,572	LEV: 90% efficiency
long term, dermal, systemic,	0,00686 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,00686	Gloves: 99% protection, LEV: 90% efficiency

Additional information on exposure estimationBased on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).**4.3.24. Worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9)
[Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	40 °C
inhalative, systemic, long-term	0,019 mg/m ³ (Advanced REACH Tool (ART) v1.5)	< 0,01	120 °C
dermal, systemic, long-term	0,343 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,365	40 °C
dermal, systemic, long-term	0,686 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,73	120 °C

Additional information on exposure estimationBased on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).**4.3.25. Worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9)
[Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	40 °C
inhalative, systemic, long-term	0,019 mg/m ³ (Advanced REACH Tool (ART) v1.5)	< 0,01	120 °C
dermal, systemic, long-term	0,343 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,365	40 °C, 120 °C

Additional information on exposure estimationBased on the applied RMMS the risk towards humans is sufficiently controlled ($RCR \leq 1$).

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**4.3.26. Worker exposure: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9)
[Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	
dermal, systemic, long-term	0,343 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,365	

Additional information on exposure estimation

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

**4.3.27. Worker exposure: Production of preparations or articles by tableting, compression, extrusion, pelletisation (PROC14)
[diethylmethylbenzenediamine]**

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0743 mg/m ³ (ECETOC TRA was used with modifications.)	0,572	LEV: 90% efficiency, Respirator: 90% protection
long term, dermal, systemic,	0,00343 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,00343	Gloves: 99% protection, LEV: 90% efficiency

Additional information on exposure estimation

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

**4.3.28. Worker exposure: Production of preparations or articles by tableting, compression, extrusion, pelletisation (PROC14)
[Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	
dermal, systemic, long-term	0,172 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,182	

Additional information on exposure estimation

Based on the applied RMMs the risk towards humans is sufficiently controlled (RCR ≤ 1).

**4.3.29. Worker exposure: Production of preparations or articles by tableting, compression, extrusion, pelletisation (PROC14)
[Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	40 °C
inhalative, systemic, long-term	0,099 mg/m ³ (Advanced REACH Tool (ART) v1.5)	0,03	120 °C
dermal, systemic, long-term	0,172 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,182	40 °C, 120 °C

Additional information on exposure estimationBased on the applied RMMs the risk towards humans is sufficiently controlled ($RCR \leq 1$).**4.3.30. Worker exposure: Use as laboratory reagent (PROC15)
[diethylmethylbenzenediamine]**

Exposure route	Exposure level	RCR	Remarks
long term, inhalative, systemic,	0,0743 mg/m ³ (ECETOC TRA was used with modifications.)	0,572	LEV: 90% efficiency
long term, dermal, systemic,	0,000343 mg/kg body weight/day (ECETOC TRA was used with modifications.)	0,000343	Gloves: 99% protection, LEV: 90% efficiency

Additional information on exposure estimationBased on the applied RMMs the risk towards humans is sufficiently controlled ($RCR \leq 1$).**4.3.31. Worker exposure: Use as laboratory reagent (PROC15)
[Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	
dermal, systemic, long-term	0,034 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,036	

Additional information on exposure estimationBased on the applied RMMs the risk towards humans is sufficiently controlled ($RCR \leq 1$).**4.3.32. Worker exposure: Use as laboratory reagent (PROC15)
[Trimethylolpropane]**

Exposure route	Exposure level	RCR	Remarks
inhalative, systemic, long-term	0,1 mg/m ³ (ECETOC TRA v3.0, Worker)	0,03	
dermal, systemic, long-term	0,034 mg/kg bw/day (ECETOC TRA v3.0, Worker)	0,036	

Additional information on exposure estimationBased on the applied RMMs the risk towards humans is sufficiently controlled ($RCR \leq 1$).**4.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES**

The risk management measures given in this exposure scenario apply to the specified substance in a concentration as indicated in the scenario. The concentration of the substance in the product may differ. A downstream user should evaluate if the risk management measures may be adapted accordingly.

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

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

If further details are needed, please contact us.

diethylmethylbenzenediamine

The exposure estimates have been assessed using ECETOC TRA (2010) with Tier 2 refinements.

Inhalation exposure was estimated by the saturated vapour concentration (SVC). The SVC depends on its amount in the formulations, the molecular weight of the solvent (≥ 1000 g/mol) and the ambient temperature (assumed to be 35 °C as a conservative worst case approach).