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

Product identifier

DESMODUR RC

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

Use	:	Hardener for coating materials or adhesives for industrial and trade applications For details of the identified uses according to Regulation (EU) No. 1907/2006 refer to the annex of this safety data sheet.
Uses advised against	:	Not suitable for use in homeworker (DIY) applications.

Details of the supplier of the safety data sheet:
Bayer MaterialScience AG
BMS-IO-S&T-PSRA-PSI Product Safety
51368 Leverkusen

Tel.: +49 214 30 25026
Fax: +49 214 30 9650035
Email: productsafety@bayerbms.com
Emergency telephone number: Im Notfall: +49 214 30 99300 (Sicherheitszentrale Bayer)

SECTION 2: Hazards identification

Classification of the substance or mixture

Regulation (EC) No 1272/2008
Flammable liquids, Category 2 (H225)
Acute toxicity, Inhalative, Category 4 (H332)
Eye irritation, Category 2 (H319)
Sensitization of the respiratory airways, Category 1 (H334)
Sensitization of the skin, Category 1 (H317)
Specific target organ toxicity (single exposure), Category 3 (H336)

Directive 67/548/EEC or 1999/45/EC
Highly flammable.
Harmful by inhalation.
May cause sensitization by inhalation and skin contact.
Irritating to eyes.
Repeated exposure may cause skin dryness or cracking.

Label elements

Regulation (EC) No 1272/2008

Danger

Hazardous components which must be listed on the label
ethyl acetate
Aromatic polyisocyanate
Aromatic polyisocyanate

Di-isocyanatotoluene (mixture of isomers)

Hazard statements:
H225 Highly flammable liquid and vapour.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H332 Harmful if inhaled.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H336 May cause drowsiness or dizziness.

Precautionary statements:
P280 Wear protective gloves/ eye protection/ face protection.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P342 + P311 If experiencing respiratory symptoms: Call a POISON CENTER or doctor/ physician.

Supplementary hazardous characteristics and labeling elements:
EUH066 Repeated exposure may cause skin dryness or cracking.

EUH204 Contains isocyanates. May produce an allergic reaction.

Directive 67/548/EEC or 1999/45/EC
Labeling and classification in accordance with the EC Dangerous Preparations Directive (1999/45/EC) and subsequent amendments
F Highly flammable
Xn Harmful

Contains:
m-Tolylidene diisocyanate, oligomerisation product (isocyanurate type)
Aromatic polyisocyanate
Di-isocyanatotoluene (mixture of isomers)
Contains isocyanates. See information supplied by the manufacturer.

R-phrase(s)

R11	Highly flammable.
R20	Harmful by inhalation.
R36	Irritating to eyes.
R42/43	May cause sensitization by inhalation and skin contact.
R66	Repeated exposure may cause skin dryness or cracking.

S-phrase(s)

S 9	Keep container in a well-ventilated place.
S16	Keep away from sources of ignition - No smoking.
S23	Do not breathe vapour.
S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36/37	Wear suitable protective clothing and gloves.
S45	In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

SECTION 3: Composition/information on ingredients

Type of product: Mixture

aromatic polyisocyanate

ca. 35 % in ethyl acetate

Hazardous components

ethyl acetate
Concentration [wt.-%]: ca. 65
Index-No.: 607-022-00-5

EC-No.: 205-500-4
REACH Registration Number: 01-2119475103-46-0017
CAS-No.: 141-78-6
Classification (1272/2008/CE): Flam. Liq. 2 H225 Eye Irrit. 2 H319 STOT SE 3 H336
Classification (67/548/EEC): F R11 Xi R36 R66 R67

m-Tolylidene diisocyanate, oligomerisation product (isocyanurate type)
Concentration [wt.-%]: ca. 25
CAS-No.: 9017-01-0
Classification (1272/2008/CE): Skin Sens. 1B H317
Classification (67/548/EEC): Xi R43

Aromatic polyisocyanate
Concentration [wt.-%]: ca. 10
CAS-No.: 26006-20-2
Classification (1272/2008/CE): Eye Irrit. 2 H319 Skin Sens. 1 H317
Classification (67/548/EEC): Xi R36 R43

Di-isocyanatotoluene (mixture of isomers)
Concentration [wt.-%]: < 0,4
Index-No.: 615-006-00-4
EC-No.: 247-722-4
REACH Registration Number: 01-2119454791-34-0001, 01-2119454791-34-0006, 01-2119454791-34-0007
CAS-No.: 26471-62-5
Classification (1272/2008/CE): Carc. 2 H351 Acute Tox. 1 Inhalative H330 Skin Irrit. 2 H315 Eye Irrit. 2 H319 STOT SE 3 H335 Sens. Resp. 1 H334 Skin Sens. 1 H317 Aquatic Chronic 3 H412
Specific threshold concentration (GHS):
Sens. Resp. 1 H334 >= 0,1 %
Classification (67/548/EEC): Carc.Cat.3 R40 T+ R26 Xi R36/37/38 R42/43 R52 -R53
Specific threshold concentration

Xn	R20, R42	0,1 - < 1 %
T	R23, R40, R42/43	1 - < 7 %
T+	R26, R40, R42/43	7 - < 20 %
T+	R26, R36/37/38, R40, R42/43	20 - < 25 %
T+	R26, R36/37/38, R40, R42/43, R52/53	>= 25 %

Exposure scenarios are not required for the impurities of the substance according to article 3(1) of Regulation (EC) No 1907/2006 mentioned above.

SECTION 4: First aid measures

Description of first aid measures

General advice: Take off all contaminated clothing immediately.

If inhaled: If aerosol or vapor is inhaled in high concentrations: 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.

SECTION 5: Firefighting measures

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

Special hazards arising from the substance or mixture:

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

Advice for fire-fighters:

During fire-fighting respirator with independent air-supply and airtight garment is required.

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

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures: Put on protective equipment (see section 8). Keep away from sources of ignition. Ensure adequate ventilation/exhaust extraction. Keep unauthorized persons away.

Environment related measures: Do not allow to escape into waterways, wastewater or soil.

Methods and material for containment and cleaning up: Remove mechanically; cover the remainder with wet, absorbent material (e.g. sawdust, chemical binder based on calcium silicate hydrate, sand). After approx. one hour transfer to waste container and do not seal (evolution of CO2!). Keep damp in a safe ventilated area for several days.

Reference to other sections: For further disposal measures see section 13.

SECTION 7: Handling and storage

Precautions for safe handling:

If an annex according to Regulation (EU) No. 1907/2006 is attached to this MSDS, the general conditions of use are further specified in the corresponding exposure scenarios.

Provide sufficient air exchange and/or exhaust in work rooms. Exhaust ventilation necessary if product is sprayed.

In all areas where isocyanate aerosols and/or vapor concentrations are produced in elevated concentrations, exhaust ventilation must be provided in such a way that the workplace exposure limits (WEL) is not exceeded. The air should be drawn away from the personnel handling the product The threshold limit values noted in Chapter 8 must be monitored.

Explosion protection required.

The personal protective measures described in Chapter 8 must be observed. The precautions required in the handling of solvents and isocyanates must be taken. Avoid contact with skin and eyes and the inhalation of vapor.

Keep away from foodstuffs, drinks and tobacco. Wash hands before breaks and at end of work and use skin-protecting ointment. Keep working clothes separately. Take off all contaminated clothing immediately.

Conditions for safe storage, including any incompatibilities:

Keep container dry and tightly closed in a cool and well ventilated place. Further information on the storage conditions which must be observed to preserve quality can be found in our product information sheet.

Storage class (TRGS 510) :	3: Flammable liquids

SECTION 8: Exposure controls/personal protection

If an annex according to Regulation (EU) No. 1907/2006 is attached to this MSDS, the general RMMs are further specified in the corresponding exposure scenarios.

Control parameters

Components with workplace control parameters

Substance	CAS-No.	Basis	Type	Value	Ceiling Limit Value	Remarks
ethyl acetate	141-78-6	TRGS 900	TLV	400 ppm 1.500 mg/m3	2	Y
ethyl acetate	141-78-6	TRGS 900	STEL CL			Category I: substances for which the localized effect has an assigned OEL respiratory passages.
toluene 2,4-diisocyanate	584-84-9	TRGS 900	TLV	0,005 ppm 0,035 mg/m3	=4=	
toluene 2,4-diisocyanate	584-84-9	TRGS 900	STEL FAC		1	Substance listed with both Peak factor and STEL factor. The Peak factor is supplied with the AGW values.
toluene 2,4-diisocyanate	584-84-9	TRGS 900	STEL CL			Category I: substances for which the localized effect has an assigned OEL respiratory passages.
toluene 2,6-iisocyanate	91-08-7	TRGS 900	TLV	0,005 ppm 0,035 mg/m3	=4=	
toluene 2,6-iisocyanate	91-08-7	TRGS 900	STEL FAC		1	Substance listed with both Peak factor and STEL factor. The Peak factor is supplied with the AGW values.
toluene 2,6-iisocyanate	91-08-7	TRGS 900	STEL CL			Category I: substances for which the localized effect has an assigned OEL respiratory passages.

Exposition assessment value (EBW) per TGRS 430:Polyisocyanate content (TDI oligomers and/or prepolymers) 35 %. Use an exposition assessment value of 0,35 mg/m³.

Derived No Effect Level (DNEL) or Derived Minimal Effect Level (DMEL):

ethyl acetate

Value type	Route of exposure	Health Effects	Value	Remarks
Worker (short-term)				
DNEL	Dermal	- systemic effects		Not relevant
DNEL	Inhalation	- systemic effects	1468 mg/m³ air	
DNEL	Dermal	- local effects		Not relevant
DNEL	Inhalation	- local effects	1468 mg/m³ air	Most sensitive endpoint: Irritation (respiratory tract)
Worker (long-term)				
DNEL	Dermal	- systemic effects	63 mg/kg body weight/day	
DNEL	Inhalation	- systemic effects	734 mg/m³ air	Most sensitive endpoint: Irritation

				(respiratory tract)
DNEL	Dermal	- local effects		No quantitative risk assessment possible.
DNEL	Inhalation	- local effects	734 mg/m³ air	Most sensitive endpoint: Irritation (respiratory tract)
General population (short-term)				
DNEL	Dermal	- systemic effects		Not relevant
DNEL	Inhalation	- systemic effects	734 mg/m³ air	
DNEL	Oral	- systemic effects		Not relevant
DNEL	Dermal	- local effects		Not relevant
DNEL	Inhalation	- local effects	734 mg/m³ air	Most sensitive endpoint: Irritation (respiratory tract)
General population (long-term)				
DNEL	Dermal	- systemic effects	37 mg/kg body weight/day	
DNEL	Inhalation	- systemic effects	367 mg/m³ air	Most sensitive endpoint: Irritation (respiratory tract)
DNEL	Oral	- systemic effects	4,5 mg/kg body weight/day	Most sensitive endpoint: Irritation (respiratory tract)
DNEL	Dermal	- local effects		No quantitative risk assessment possible.
DNEL	Inhalation	- local effects	367 mg/m³ air	Most sensitive endpoint: Irritation (respiratory tract)

Di-isocyanatotoluene (mixture of isomers)

Value type	Route of exposure	Health Effects	Value	Remarks
Worker (short-term)				
DNEL	Dermal	- systemic effects		No quantitative risk assessment possible. Most sensitive endpoint: Irritation (skin)
DNEL	Inhalation	- systemic effects	0,14 mg/m³ air	Most sensitive endpoint: Irritation (respiratory tract)
DNEL	Dermal	- local effects		No quantitative risk assessment possible. Most sensitive endpoint: Irritation (skin)
DNEL	Inhalation	- local effects	0,14 mg/m³ air	Most sensitive endpoint: Irritation (respiratory tract)
Worker (long-term)				
DNEL	Dermal	- systemic effects		No quantitative risk assessment possible. Most sensitive endpoint: Irritation (skin)
DNEL	Inhalation	- systemic effects	0,035 mg/m³ air	Most sensitive endpoint: Irritation (respiratory tract)
DNEL	Dermal	- local effects		No quantitative risk assessment possible. Most sensitive endpoint: Irritation (skin)
DNEL	Inhalation	- local effects	0,035 mg/m³ air	Most sensitive endpoint: Irritation (respiratory tract)

Predicted No Effect Concentration (PNEC):

ethyl acetate

Compartment	Value	Remarks
Freshwater	0,26 mg/l	
Marine water	0,026 mg/l	
Water: Intermittent release	1,65 mg/l	
Fresh water sediment	1,25 mg/kg dry weight	
Marine sediment	0,125 mg/kg dry weight	
Soil	0,24 mg/kg dry weight	
STP (sewage-treatment plant)	650 mg/l	
Oral	200 mg/kg food	

Di-isocyanatotoluene (mixture of isomers)

Compartment	Value	Remarks
Freshwater	0,013 mg/l	
Marine water	0,00125 mg/l	
Sediment		Not relevant
Soil	> 1 mg/kg dry weight	
STP (sewage-treatment plant)	> 1 mg/l	
Oral		Not relevant

Exposure controls

Respiratory protection:
Respiratory protection required in insufficiently ventilated working areas and during spraying. An air-fed mask, or for short periods of work, a combination of charcoal filter and particulate filter is recommended.

Further recommendations regarding respiratory protection can be found in the individual exposure scenarios in the appendix.

In case of hypersensitivity of the respiratory tract and skin (e.g. asthmatics and those who suffer from chronic bronchitis and chronic skin complaint) it is inadvisable to work with the product.

Symptoms affecting the respiratory tract can also occur several hours after overexposure.

Hand protection:
Conditionally suitable materials for protective gloves; EN 374:
Butyl rubber - IIR: thickness >=0,5mm; breakthrough time >=60min.
Recommendation: contaminated gloves should be disposed of.

Eye protection:
Wear eye/face protection.

Skin and body protection:
Wear suitable protective clothing.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance:	liquid
Colour:	colourless
Odour:	solvent-like
Odour Threshold:	not established
pH:	not applicable

Initial boiling point:	ca. 77 °C at 1.013 hPa	
Flash point:	ca. -4 °C	DIN 51755
Evaporation rate:	not established	
Flammability (solid, gas):	not applicable	
Burning number:	not applicable	
Upper/lower flammability or explosive limits:		
ethyl acetate	upper: 11,5 %(V) / lower: 2,2 %(V)	
Vapour pressure:	ca. 97 hPa at 20 °C	
Vapour density:	not established	
Density:	ca. 1,01 g/cm³ at 20 °C	DIN 53217
Miscibility with water:	immiscible at 15 °C	
Water solubility of ingredients:		
ethyl acetate	ca. 85 g/l at 20 °C	
Surface tension:	not established	
Partition coefficient (n−octanol/water):	not established	
Auto-ignition temperature:	not applicable	
Ignition temperature:	ca. 460 °C	
Decomposition temperature:	not established	
Viscosity, dynamic:	ca. 3 mPa.s at 20 °C	DIN 53019
Explosive properties:	not established	
Dust explosion class:	not applicable	
Oxidising properties:	not established	
Other information:	The indicated values do not necessarily correspond to the product specification. Please refer to the technical information sheet for specification data.	

SECTION 10: Stability and reactivity

Possibility of hazardous reactions: Exothermic reaction with amines and alcohols; reacts with water forming CO2; in closed containers, risk of bursting owing to increase of pressure.

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.

Information on toxicological effects

Acute toxicity, oral:
ethyl acetate
LD50 rat, female: 10.170 mg/kg

m-Tolylidene diisocyanate, oligomerisation product (isocyanurate type)
LD50 rat, female: > 5.000 mg/kg
Method: OECD Test Guideline 423

Aromatic polyisocyanate
LD50 rat: > 5.000 mg/kg

Di-isocyanatotoluene (mixture of isomers)
LD50 rat, male: 5.110 mg/kg
Method: OECD Test Guideline 401

LD50 rat, female: 4.130 mg/kg
Method: OECD Test Guideline 401

Acute toxicity, dermal:
ethyl acetate
LD50 rabbit, male: > 18.000 mg/kg

m-Tolylidene diisocyanate, oligomerisation product (isocyanurate type)

Assessment: The substance or mixture has no acute dermal toxicity
Method: Expert judgement

Di-isocyanatotoluene (mixture of isomers)
LD50 rabbit, male/female: > 9.400 mg/kg
Method: OECD Test Guideline 402

Acute toxicity, inhalation:
ethyl acetate
LC50 rat: > 22,5 mg/l, 6 h
Test atmosphere: vapour

m-Tolylidene diisocyanate, oligomerisation product (isocyanurate type)
LC50 rat, male/female: > 1,839 mg/l, 4 h
Assessment: The substance or mixture has no acute inhalation toxicity
Test atmosphere: dust/mist
Method: OECD Test Guideline 403

Aromatic polyisocyanate
LC50 rat:
Assessment: The substance or mixture has no acute inhalation toxicity

Di-isocyanatotoluene (mixture of isomers)
LC50 rat, male/female: 0,47 mg/l, 1 h
Test atmosphere: vapour
Method: OECD Test Guideline 403

LC50 rat, male/female: 0,107 mg/l, 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403

Primary skin irritation:
ethyl acetate
Species: rabbit
Exposure duration: 4 h
Result: non-irritant
Classification: No skin irritation

Species: Human experience
Classification: Repeated exposure may cause skin dryness or cracking.

m-Tolylidene diisocyanate, oligomerisation product (isocyanurate type)
Species: rabbit
Result: slight irritant
Classification: No skin irritation
Method: OECD Test Guideline 404

Aromatic polyisocyanate
Species: rabbit
Exposure duration: 4 h
Result: slight irritant
Classification: No skin irritation

Di-isocyanatotoluene (mixture of isomers)
Species: rabbit
Result: severe irritant
Classification: Causes skin irritation.

Primary mucosae irritation:
ethyl acetate
Species: rabbit
Result: slight irritant
Method: OECD Test Guideline 405

Species: Human experience
In high concentrations vapor has irritating effects on eyes and mucous membranes.

m-Tolylidene diisocyanate, oligomerisation product (isocyanurate type)
Species: rabbit
Result: slight irritant
Classification: No eye irritation
Method: OECD Test Guideline 405

Aromatic polyisocyanate
Species: rabbit
Result: irritating
Classification: Causes serious eye irritation.
Method: OECD Test Guideline 405

Di-isocyanatotoluene (mixture of isomers)
Species: rabbit
Result: severe irritant
Classification: Causes serious eye irritation.

Sensitisation:
ethyl acetate
Skin sensitisation according to Magnusson/Kligmann (maximizing test):
Species: guinea pig
Result: negative
Classification: Does not cause skin sensitization.
Method: OECD Test Guideline 406

m-Tolylidene diisocyanate, oligomerisation product (isocyanurate type)
Skin sensitization (local lymph node assay (LLNA)):
Species: mouse
Result: positive
Classification: May cause sensitization by skin contact.
Method: OECD Test Guideline 429

Respiratory sensitization

No data available.

No pulmonary sensitisation observed in animal tests.
No pulmonary sensitisation potential was observed in guinea pigs after either intradermal or inhalative induction with polyisocyanate based on di-isocyanatotoluene.
Studies of a comparable product.

Aromatic polyisocyanate
Skin sensitisation:

Classification: May cause sensitization by skin contact.
Classification according to Directive 2006/121/EC Annex VI

Respiratory sensitization

Classification: No classification according to EC Directives 2006/121/EC or 1999/45/EC as respiratory sensitizer.
No pulmonary sensitisation observed in animal tests.
No pulmonary sensitisation potential was observed in guinea pigs after either intradermal or inhalative induction with polyisocyanate based on di-isocyanatotoluene.

Di-isocyanatotoluene (mixture of isomers)
Skin sensitization (local lymph node assay (LLNA)):
Species: mouse
Result: positive
Classification: May cause sensitization by skin contact.
Method: OECD Test Guideline 429

Respiratory sensitization

Classification: May cause sensitization by inhalation.
Classification according to Directive 2006/121/EC Annex VI

Subacute, subchronic and prolonged toxicity:
ethyl acetate
LOAEL (Lowest observable adverse effect level): 350 ppm
Application Route: Inhalative
Species: rat, male/female
Dose Levels: 0 - 350 - 750 - 1500 ppm
Exposure duration: 13 w
Frequency of treatment: 6 hours a day, 5 days a week
Target Organs: Nasal inner lining
Test substance: vapour
Method: OECD Test Guideline 413

NOAEL: 900 mg/kg
Application Route: Oral
Species: rat, male/female
Dose Levels: 0 - 300 - 900 - 3600 mg/kg
Exposure duration: 13 w
Frequency of treatment: daily

m-Tolylidene diisocyanate, oligomerisation product (isocyanurate type)
NOAEL: 20,6 mg/m³ air
Application Route: Inhalative
Species: rat, male/female
Dose Levels: 0 - 5 - 20 - 80 - 320 mg/m³
Exposure duration: 28 d
Frequency of treatment: 6 hours a day, 5 days a week
Test substance: as aerosol
Method: OECD Test Guideline 412

Di-isocyanatotoluene (mixture of isomers)
LOAEL (Lowest observable adverse effect level): 0,05 ppm
Application Route: Inhalative
Species: rat, male/female
Dose Levels: 0 - 0,05 - 0,15 ppm
Exposure duration: 2 a
Frequency of treatment: 6 hours a day, 5 days a week
Target Organs: Nasal inner lining
Test substance: as vapour
Method: OECD Test Guideline 453

LOAEL (Lowest observable adverse effect level): 0,05 ppm
Application Route: Inhalative
Species: mouse, male/female
Dose Levels: 0 - 0,05 - 0,15 ppm
Exposure duration: 2 a
Frequency of treatment: 6 hours a day, 5 days a week
Target Organs: Nasal inner lining, Lungs
Test substance: as vapour
Method: OECD Test Guideline 453

Carcinogenicity:
ethyl acetate
No data available.

m-Tolylidene diisocyanate, oligomerisation product (isocyanurate type)
No data available.

Di-isocyanatotoluene (mixture of isomers)
Species: rat, male/female
Application Route: Inhalative
Dose Levels: 0 - 0,05 - 0,15 ppm
Test substance: as vapour
Exposure duration: 2 a
Frequency of treatment: 6 hours/day, 5 days/week
Method: OECD Test Guideline 453
No increase in the incidence of tumors.

Species: mouse, male/female
Application Route: Inhalative
Dose Levels: 0 - 0,05 - 0,15 ppm
Test substance: as vapour
Exposure duration: 2 a
Frequency of treatment: 6 hours/day, 5 days/week
Method: OECD Test Guideline 453
No increase in the incidence of tumors.

Reproductive toxicity/Fertility:
ethyl acetate
Available data show no indications for reproductive toxicity.

m-Tolylidene diisocyanate, oligomerisation product (isocyanurate type)
Available data show no indications for reproductive toxicity.

Reproductive toxicity/Teratogenicity:
ethyl acetate
NOAEL (teratogenicity): 20000 ppm
NOAEL (maternal): 16000 ppm
NOAEL (developmental toxicity): 20000 ppm
Species: rat, female
Application Route: Inhalative
Dose Levels: 0 - 10000 - 16000 - 20000 ppm
Method: OECD Test Guideline 414
Studies of a comparable product.

m-Tolylidene diisocyanate, oligomerisation product (isocyanurate type)
Available data show no indications for reproductive toxicity.

Di-isocyanatotoluene (mixture of isomers)
NOAEL (teratogenicity): 0,5 ppm
NOAEL (maternal): 0,1 ppm
NOAEL (developmental toxicity): 0,1 ppm
Species: rat, female
Application Route: Inhalative
Dose Levels: 0 - 0,02 - 0,10 - 0,50 ppm
Frequency of treatment: 6 hours/day (Exposure duration: 10 days (day 6 - 15 p.c.))
Test period: 21 d

Test substance: as vapour
Method: OECD Test Guideline 414
Did not show teratogenic effects in animal experiments.

Genotoxicity in vitro:
ethyl acetate
Test type: Salmonella/microsome test (Ames test)
Metabolic activation: with/without
Result: No indication of mutagenic effects.
Method: OECD Test Guideline 471

Test type: In vitro mammalian cell gene mutation test
Test system: Mouse lymphoma cells
Metabolic activation: with/without
Result: negative
Method: OECD Test Guideline 476

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

m-Tolylidene diisocyanate, oligomerisation product (isocyanurate type)
Test type: Salmonella/microsome test (Ames test)
Result: No indication of mutagenic effects.
Method: OECD Test Guideline 471

Test type: In vitro mammalian cell gene mutation test
Test system: Chinese hamster V79 cell line
Result: negative
Method: OECD Test Guideline 476

Test type: Chromosome aberration test in vitro
Test system: Chinese hamster V79 cell line
Result: negative
Method: OECD Test Guideline 473

Aromatic polyisocyanate
Test type: Salmonella/microsome test (Ames test)
Result: No indication of mutagenic effects.
Method: OECD Test Guideline 471

Di-isocyanatotoluene (mixture of isomers)
Test type: Salmonella/microsome test (Ames test)
Test system: Salmonella typhimurium
Metabolic activation: without
Result: negative
Method: OECD Test Guideline 471

Test type: Salmonella/microsome test (Ames test)
Test system: Salmonella typhimurium
Metabolic activation: with
Result: positive
Method: OECD Test Guideline 471

Genotoxicity in vivo:
ethyl acetate
Test type: In vivo micronucleus test
Species: mouse, male
Application Route: intraperitoneal
Dose: 0 -100 - 200 - 400 - 800 mg/kg
Result: negative
Method: OECD Test Guideline 474

Di-isocyanatotoluene (mixture of isomers)
Test type: Micronucleus test
Species: mouse, male/female
Application Route: Inhalative
Exposure duration: 6 h
Result: negative
Method: OECD Test Guideline 474
Test substance: as vapour

STOT evaluation – one-time exposure:
ethyl acetate
May cause drowsiness or dizziness.

m-Tolylidene diisocyanate, oligomerisation product (isocyanurate type)
Based on available data, the classification criteria are not met.

Di-isocyanatotoluene (mixture of isomers)
Route of exposure: Inhalative
Target Organs: Respiratory Tract
May cause respiratory irritation.

STOT evaluation – repeated exposure:
ethyl acetate
Based on available data, the classification criteria are not met.

m-Tolylidene diisocyanate, oligomerisation product (isocyanurate type)
Based on available data, the classification criteria are not met.

Di-isocyanatotoluene (mixture of isomers)
Based on available data, the classification criteria are not met.

Aspiration toxicity:
ethyl acetate
Based on available data, the classification criteria are not met.

m-Tolylidene diisocyanate, oligomerisation product (isocyanurate type)
Based on available data, the classification criteria are not met.

Di-isocyanatotoluene (mixture of isomers)
Based on available data, the classification criteria are not met.

CMR Assessment:
ethyl acetate
Carcinogenicity: Based on available data, the classification criteria are not met.
Mutagenicity: In vitro an in vivo tests did not show mutagenic effects. On the basis of this data, the substance is not classified as mutagenic.
Teratogenicity: Based on available data, the classification criteria are not met.
Reproductive toxicity/Fertility: Based on available data, the classification criteria are not met.

m-Tolylidene diisocyanate, oligomerisation product (isocyanurate type)
Carcinogenicity: Based on available data, the classification criteria are not met.
Mutagenicity: In vitro tests did not show mutagenic effects On the basis of this data, the substance is not classified as mutagenic.
Teratogenicity: Based on available data, the classification criteria are not met.
Reproductive toxicity/Fertility: Based on available data, the classification criteria are not met.

Di-isocyanatotoluene (mixture of isomers)
Carcinogenicity: Animal testing did not show any carcinogenic effects after inhalation. The European Union classifies this product as a carcinogen. Suspected of causing cancer (Carc. 2).
Mutagenicity: In vitro tests showed mutagenic effects which were not observed with in vivo test. 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: Animal testing did not show any effects on fertility. Based on available data, the classification criteria are not met.

Toxicology Assessment:
ethyl acetate
Acute effects: Based on available data, the classification criteria are not met.
Sensitization: Based on available data, the classification criteria are not met.
Repeated dose toxicity: Repeated exposure may cause skin dryness or cracking.

m-Tolylidene diisocyanate, oligomerisation product (isocyanurate type)
Acute effects: Based on available data, the classification criteria are not met.
Sensitization: May cause sensitization by skin contact.
Repeated dose toxicity: Based on available data, the classification criteria are not met.

Di-isocyanatotoluene (mixture of isomers)
Acute effects: Fatal if inhaled. Severe skin irritation Severe eye irritation
Sensitization: May cause sensitization by inhalation and skin contact.
Repeated dose toxicity: Based on available data, the classification criteria are not met.

Additional information:
Special properties/effects: Over-exposure entails the risk of concentration-dependent irritating effects on eyes, nose throat, and respiratory tract. Delayed appearance of the complaints and development of hypersensitivity (difficult breathing, coughing, asthma) are possible. Hypersensitive persons may suffer from these effects even at low isocyanate concentrations, including concentrations below the UK Workplace Exposure Limit (WEL). Prolonged contact with the skin may cause tanning and irritant effects.

ethyl acetate : Vapours may cause drowsiness and dizziness.

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.

Toxicity

Acute Fish toxicity:
ethyl acetate
LC50 230 mg/l
Test type: flow-through test
Species: Pimephales promelas (fathead minnow)
Exposure duration: 96 h

m-Tolylidene diisocyanate, oligomerisation product (isocyanurate type)
LC50 > 100 mg/l
Species: Danio rerio (zebra fish)
Exposure duration: 72 h
Method: OECD Test Guideline 201

Aromatic polyisocyanate
No toxic effects with saturated solution. Species: Danio rerio (zebra fish)
Exposure duration: 96 h
Method: OECD Test Guideline 203

Di-isocyanatotoluene (mixture of isomers)
LC50 133 mg/l
Species: Oncorhynchus mykiss (rainbow trout)
Exposure duration: 96 h
Method: OECD Test Guideline 203

Chronic Fish toxicity:

ethyl acetate
NOEC < 9,65 mg/l
Species: Pimephales promelas (fathead minnow)
Exposure duration: 32 d
Method: Early life stage test

Acute toxicity for daphnia:
ethyl acetate
EC50 165 mg/l
Test type: Fresh water study
Species: Daphnia cucullata
Exposure duration: 48 h

EC50 346 mg/l
Test type: Salt water study
Species: Artemia salina
Exposure duration: 24 h

m-Tolylidene diisocyanate, oligomerisation product (isocyanurate type)
EC50 > 100 mg/l
Species: Daphnia magna (Water flea)
Exposure duration: 48 h
Method: OECD Test Guideline 202

Aromatic polyisocyanate
No toxic effects with saturated solution. Species: Daphnia magna (Water flea)
Exposure duration: 48 h
Method: OECD Test Guideline 202

Di-isocyanatotoluene (mixture of isomers)
EC50 12,5 mg/l
Species: Daphnia magna (Water flea)
Exposure duration: 48 h
Method: OECD Test Guideline 202

Chronic toxicity to daphnia:
ethyl acetate
NOEC (Reproduction) 2,4 mg/l
Species: Daphnia magna (Water flea)
Exposure duration: 21 d
Method: no data available

Di-isocyanatotoluene (mixture of isomers)
NOEC (Reproduction) 1,1 mg/l
Species: Daphnia magna (Water flea)
Exposure duration: 21 d

Acute toxicity for algae:
ethyl acetate
ErC50 > 100 mg/l
Test type: Growth inhibition
Species: Desmodesmus subspicatus (Green algae)
Exposure duration: 72 h
Method: OECD Test Guideline 201

m-Tolylidene diisocyanate, oligomerisation product (isocyanurate type)
ErC50 > 100 mg/l
Species: Desmodesmus subspicatus (Green algae)
Exposure duration: 72 h
Method: OECD Test Guideline 201

NOEC >= 100 mg/l
Species: Desmodesmus subspicatus (Green algae)
Exposure duration: 72 h
Method: OECD Test Guideline 201

Aromatic polyisocyanate
No toxic effects with saturated solution.
Species: scenedesmus subspicatus
Exposure duration: 72 h
Method: OECD Test Guideline 201

Di-isocyanatotoluene (mixture of isomers)
ErC50 4.300 mg/l
Species: Chlorella vulgaris (Fresh water algae)
Exposure duration: 96 h
Method: OECD Test Guideline 201

ErC50 3.230 mg/l
Species: Skeletonema costatum
Exposure duration: 96 h
Method: OECD Test Guideline 201

Acute bacterial toxicity:
ethyl acetate
NOEC 650 mg/l
Test type: Cell multiplication inhibition test
Species: Pseudomonas putida
Exposure duration: 16 h
Method: DIN 38412

m-Tolylidene diisocyanate, oligomerisation product (isocyanurate type)
EC50 > 1.000 mg/l
Species: activated sludge
Exposure duration: 3 h
Method: OECD Test Guideline 209

Aromatic polyisocyanate
EC50 > 10.000 mg/l
Species: activated sludge
Method: OECD Test Guideline 209

Di-isocyanatotoluene (mixture of isomers)
EC50 > 100 mg/l
Test type: Respiration inhibition
Species: activated sludge
Exposure duration: 3 h
Method: OECD Test Guideline 209

Toxicity to soil dwelling organisms:
Di-isocyanatotoluene (mixture of isomers)
NOEC (mortality) > 1.000 mg/kg
Species: Eisenia fetida (earthworms)
Exposure duration: 14 d
Method: OECD Test Guideline 207

Toxicity to terrestrial plants:
Di-isocyanatotoluene (mixture of isomers)
NOEC (seedling emergence) > 1.000 mg/kg
Species: Avena sativa (oats)
Exposure duration: 17 d
Method: OECD Test Guideline 208

NOEC (Growth rate) > 1.000 mg/kg
Species: Avena sativa (oats)
Exposure duration: 14 d
Method: OECD Test Guideline 208

NOEC (seedling emergence) > 1.000 mg/kg
Species: Lactuca sativa (lettuce)
Exposure duration: 17 d
Method: OECD Test Guideline 208

NOEC (Growth rate) > 1.000 mg/kg
Species: Lactuca sativa (lettuce)
Exposure duration: 14 d
Method: OECD Test Guideline 208

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

Ecotoxicology Assessment:
ethyl acetate
Acute aquatic toxicity: The substance is graded as non-critical to water organisms.
Chronic aquatic toxicity: Due to easy biodegradability, the chronic aquatic toxicity can be regarded as uncritical.
Toxicity Data on Soil: Not expected to 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.

Di-isocyanatotoluene (mixture of isomers)
Acute aquatic toxicity: Harmful to aquatic organisms.
Chronic aquatic toxicity: May cause long-term adverse effects in the aquatic environment.
Toxicity Data 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.

Persistence and degradability

Biodegradability:
ethyl acetate
Test type: aerobic
Inokulum: activated sludge
Biodegradation: ca. 69 %, 20 d, i.e. readily biodegradable

Inokulum: activated sludge
Biodegradation: 93 %, 6 d, i.e. readily biodegradable
Method: Simulation study

m-Tolylidene diisocyanate, oligomerisation product (isocyanurate type)
Biodegradation: 4 %, 28 d, i.e. not readily degradable
Method: OECD Test Guideline 301 F

Biodegradation: 8 %, 28 d, i.e. not inherently degradable
Method: OECD Test Guideline 302 C

Aromatic polyisocyanate
Biodegradation: 2 %, i.e. not readily degradable
Method: respirometer test

Di-isocyanatotoluene (mixture of isomers)
Biodegradation: 0 %, 28 d, i.e. not inherently degradable
Method: OECD Test Guideline 302 C

Stability in water:
ethyl acetate
Test type: Hydrolysis
Half life: 16 Years (pH: 5)
Hydrolytic temperature: 25 °C

Test type: Hydrolysis
Half life: 2 Years (pH: 7)
Hydrolytic temperature: 25 °C

Test type: Hydrolysis
Half life: 7,5 Days (pH: 9)
Hydrolytic temperature: 25 °C
Hydrolyses slowly on contact with water.

m-Tolylidene diisocyanate, oligomerisation product (isocyanurate type)
Test type: Hydrolysis
Half life: 24 h at 20 °C (pH: 7)
Method: OECD Test Guideline 111
The substance hydrolyzes rapidly in water.

Di-isocyanatotoluene (mixture of isomers)
Test type: Hydrolysis
Half life: 0,5 h at 27 °C
The substance hydrolyzes rapidly in water.

Photodegradation:
ethyl acetate
Test type: Phototransformation in air
Temperature: 25 °C
sensitizer: OH-radicals
Half-life indirect photolysis: 75 h
After evaporation or exposure to the air, the product will be slowly degraded by photochemical processes.

Di-isocyanatotoluene (mixture of isomers)
Test type: Phototransformation in air
Temperature: 25 °C
sensitizer: OH-radicals
Half-life indirect photolysis: 2 d
After evaporation or exposure to the air, the product will be moderately degraded by photochemical processes.

Bioaccumulative potential

Bioaccumulation:
ethyl acetate
Bioconcentration factor (BCF): 30
Species: Leuciscus idus (Golden orfe)
Exposure duration: 3 Days
Does not significantly accumulate in organisms.

m-Tolylidene diisocyanate, oligomerisation product (isocyanurate type)
The substance hydrolyzes rapidly in water.
An accumulation in aquatic organisms is not to be expected.

Di-isocyanatotoluene (mixture of isomers)
An accumulation in aquatic organisms is not to be expected.

Mobility in soil

Distribution among environmental compartments:
ethyl acetate
Adsorption/Soil
Due to the low n-octanol-water partition coefficient, an adsorption on the soil is not to be expected.
Highly mobile in soils

m-Tolylidene diisocyanate, oligomerisation product (isocyanurate type)
Adsorption/Soil
log Koc value: 5,519
Method: calculated

Di-isocyanatotoluene (mixture of isomers)
Adsorption/Soil
not applicable

Environmental distribution:
ethyl acetate
Method: (calculated)
The product will be dispersed amongst the various environmental compartments (soil/ water/ air).

Di-isocyanatotoluene (mixture of isomers)
no data available

Results of PBT and vPvB assessment

ethyl acetate
This substance does not meet the criteria for classification as PBT or vPvB.

Di-isocyanatotoluene (mixture of isomers)
This substance does not meet the criteria for classification as PBT or vPvB.

Additional information on ecotoxicology:
Isocyanate reacts with water at the interface forming CO2 and a solid insoluble product with high melting point (polyurea). This reaction is accelerated by surfactants (e.g. detergents) or by watersoluble solvents. Previous experience shows that polyurea is inert and non-degradable.

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.

Waste treatment methods
After final product withdrawal, all residues must be removed from containers (drip-free, powder-free or paste-free). Once the product residues adhering to the walls of the containers have been rendered harmless, the product and hazard labels must be invalidated. These containers can be returned for recycling to the appropriate centres 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

UN Number	:	1866
Description of the goods	:	RESIN SOLUTION
Packaging group	:	II
Hazard identification No	:	33
hazard label	:	3
Environmentally hazardous	:	no

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

ADN

UN Number	:	1866
Description of the goods	:	RESIN SOLUTION
Packaging group	:	II
Hazard identification No	:	33
hazard label	:	3
Environmentally hazardous	:	no

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

IATA

UN Number	:	1866
Description of the goods	:	RESIN SOLUTION
Class	:	3
Packaging group	:	II
hazard label	:	3
Packing instruction (cargo aircraft)	:	364
Packing instruction (passenger aircraft)	:	353

IMDG

UN Number	:	1866
Description of the goods	:	RESIN SOLUTION
Class	:	3
Packaging group	:	II
IMDG-Labels	:	3
Marine Pollutant	:	no
Special precautions for user	:	Highly flammable. Irritating to skin and eyes. Intense smelling. Keep dry. Avoid heat above +50 °C. Keep away from foodstuffs, acids and alkalis.

SECTION 15: Regulatory information

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

Subject to EU Directive 96/82 EC (Seveso II Directive):
Annex I No. 7b

TA Luft List (Germany):
Type: Organic Substances
portion Class 1: 25 %
Fraction of other substances: 75 %

Water contaminating class (Germany): 1 slightly water endangering
(in accordance with Annex 4 to the Directive on Water-Hazardous Substances)

Any existing national regulations on the handling of isocyanates and solvents must be observed.

A Chemical Safety Assessment has been carried out for:
ethyl acetate
Di-isocyanatotoluene (mixture of isomers)

SECTION 16: Other information

Full text of hazardous (H) warnings referred to under sections 2 and 3 of the CLP classification (1272/2008/CE).

H225	Highly flammable liquid and vapour.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H330	Fatal if inhaled.
H332	Harmful if inhaled.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H351	Suspected of causing cancer.
H412	Harmful to aquatic life with long lasting effects.

Full text of R-phrases referred to under sections 2 and 3 of the EU classification (67/548/EEC,1999/45/EC).

R11	Highly flammable.
R26	Very toxic by inhalation.
R36	Irritating to eyes.
R36/37/38	Irritating to eyes, respiratory system and skin.
R40	Limited evidence of a carcinogenic effect.
R42/43	May cause sensitization by inhalation and skin contact.
R43	May cause sensitization by skin contact.
R52	Harmful to aquatic organisms.
R53	May cause long-term adverse effects in the aquatic environment.
R66	Repeated exposure may cause skin dryness or cracking.
R67	Vapours may cause drowsiness and dizziness.

ISOPA Guidelines for safe loading/unloading, transport and storage of TDI and MDI. ISOPA Order No.: PSC-0005-GUIDL

The product is used mainly as a hardener in coating materials or adhesives. The handling of coating materials or adhesives containing reactive polyisocyanates and residual monomeric TDI requires appropriate protective measures referred to in this safety data sheet. These products may therefore be used only in industrial or trade applications. They are not suitable for use in homeworker (DIY) applications.

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

Further information

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 - Exposure Scenario

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

Priority substance(s), Respiratory sensitiser:
Di-isocyanatotoluene (mixture of isomers)
For RMMs see chapter 8 of the SDS.

Lead substance(s), Oral:
Not relevant

Lead substance(s), Inhalative:
ethyl acetate

Lead substance(s), Dermal:
m-Tolylidene diisocyanate, oligomerisation product (isocyanurate type)
For RMMs see chapter 8 of the SDS.

Lead substance(s), Eyes:
ethyl acetate

Lead substance(s), aquatic environment:
Not relevant

Summary of Exposure Scenarios

- Drumming and distribution: Industrial (ES1)	:	**SU 3; SU8, SU9; PROC1, PROC2, PROC8a, PROC8b, PROC9; ERC2**
- Formulation: Industrial (ES2)	:	**SU 3; SU 10; PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9; ERC2**
- Application of paints and coatings (non-spray applications): Industrial (ES3)	:	**SU 3; PROC1, PROC2, PROC5, PROC8a, PROC8b, PROC10, PROC13; ERC4**
- Application of paints, coatings and other mixtures by way of spraying: Industrial (ES4)	:	**SU 3; PROC1, PROC2, PROC7, PROC8a, PROC8b; ERC4**
- Application of paints, coatings adhesives and other mixtures/products (indoors or outdoors, spray or non-spray applications): Professional (ES5)	:	**SU 22; PROC1, PROC2, PROC5, PROC8a, PROC8b, PROC10, PROC11, PROC13; ERC8a, ERC8d**
- Use as laboratory reagent: Industrial, Professional (ES6)	:	**SU 3; SU 22; PROC15; ERC4, ERC8a**

1. Short title of Exposure Scenario: - Drumming and distribution: Industrial (ES1)

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites

Sector of use	:	**SU8:** Manufacture of bulk, large scale chemicals (including petroleum products) **SU9:** Manufacture of fine chemicals
Process category	:	**PROC1:** Use in closed process, no likelihood of exposure **PROC2:** Use in closed, continuous process with occasional controlled exposure **PROC8a:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC9:** Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Environmental release category	:	**ERC2:** Formulation of preparations

2.1 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC8a, PROC8b, PROC9 [ethyl acetate] - Drumming and distribution: Industrial

Product characteristics

Concentration of the Substance in Mixture/Article

Remarks	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Vapour pressure	:	98 hPa at 20 °C
Physical Form (at time of use)	:	Liquid substance

Frequency and duration of use

Frequency of use	:	240 days/year
General exposures	:	> 4 hours/day
PROC 8a	:	1 - 4 hours/day
PROC 8b	:	1 - 4 hours/day

Human factors not influenced by risk management

Exposed skin area	:	960 cm²

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Outdoors or in highly ventilated (open) spaces. PROC 8b and PROC 9 indoors.
Remarks	:	Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan.

These general measures are mandatory for all contributing scenarios. Additional measures are specific for the following contributing scenarios:

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities

Use with local exhaust ventilation.

PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Use with local exhaust ventilation.

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

Wear suitable gloves tested to EN374.

These general measures are mandatory for all contributing scenarios.

3. Exposure estimation and reference to its source

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterisation ratio (Exposure value/DNEL)
2.1 All PROCs			short term, inhalation	Not relevant	
2.1 All PROCs			short term, dermal	Not relevant	
2.1 PROC 1	ECETOC TRA	Outdoors: 30% reduction	long term, inhalation	0,0257 mg/m³	0,00004
2.1 PROC 2	ECETOC TRA	Outdoors: 30% reduction	long term, inhalation	128,48 mg/m³	0,176
2.1 PROC 8a	ECETOC TRA	Outdoors: 30% reduction	long term, inhalation	385,44 mg/m³	0,528
2.1 PROC 8b	ECETOC TRA	LEV: 97% efficiency	long term, inhalation	9,91 mg/m³	0,0136
2.1 PROC 9	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	73,41 mg/m³	0,1006
2.1 PROC 1	ECETOC TRA	Outdoors: 30% reduction	long term, dermal	0,343 mg/kg body weight/day	0,0054
2.1 PROC 2	ECETOC TRA	Outdoors: 30% reduction	long term, dermal	1,37 mg/kg body weight/day	0,0218
2.1 PROC 8a	ECETOC TRA	Outdoors: 30% reduction, Gloves: 80% protection	long term, dermal	13,71 mg/kg body weight/day	0,0435
2.1 PROC 8b	ECETOC TRA	LEV: 90% efficiency	long term, dermal	0,686 mg/kg body weight/day	0,0109
2.1 PROC 9	ECETOC TRA	LEV: 90% efficiency	long term, dermal	0,686 mg/kg body weight/day	0,0109

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

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

ethyl acetate

A downstream user may evaluate whether he operates within the conditions set in the exposure scenario by using the information provided in section 2. This evaluation may be based on an expert judgement or on the utilisation of risk assessment tools that are recommended by ECHA.

If the local environmental emission conditions deviate significantly from the used default values, please use the below algorithm to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)

1. Short title of Exposure Scenario: - Formulation: Industrial (ES2)

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	:	**SU 10:** Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)
Process category	:	**PROC1:** Use in closed process, no likelihood of exposure **PROC2:** Use in closed, continuous process with occasional controlled exposure **PROC3:** Use in closed batch process (synthesis or formulation) **PROC4:** Use in batch and other process (synthesis) where opportunity for exposure arises **PROC5:** Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) **PROC8a:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC9:** Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Environmental release category	:	**ERC2:** Formulation of preparations

2.1 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9 [ethyl acetate] - Formulation: Industrial

Product characteristics

Concentration of the Substance in Mixture/Article

Remarks	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Vapour pressure	:	98 hPa at 20 °C
Physical Form (at time of use)	:	Liquid substance

Frequency and duration of use

Frequency of use	:	240 days/year
General exposures	:	> 4 hours/day
PROC 8a	:	1 - 4 hours/day
PROC 8b	:	1 - 4 hours/day

Human factors not influenced by risk management

Exposed skin area	:	960 cm²

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Indoors, PROC 1 outdoors

Technical conditions and measures

Handle substance within a predominantly closed system. Ensure material transfers are under containment or extract ventilation. Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan.

These general measures are mandatory for all contributing scenarios. Additional measures are specific for the following contributing scenarios:

PROC2: Use in closed, continuous process with occasional controlled exposure

Use with local exhaust ventilation.

PROC3: Use in closed batch process (synthesis or formulation)

Use with local exhaust ventilation.

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises

Use with local exhaust ventilation.

PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)

Use with local exhaust ventilation.

PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities

Use with local exhaust ventilation.

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities

Use with local exhaust ventilation.

PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Use with local exhaust ventilation.

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

Wear suitable gloves tested to EN374.

These general measures are mandatory for all contributing scenarios.

3. Exposure estimation and reference to its source

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterisation ratio (Exposure value/DNEL)
2.1 All PROCs			short term, inhalation	Not relevant	
2.1 All PROCs			short term, dermal	Not relevant	
2.1 PROC 1	ECETOC TRA		long term, inhalation	0,0257 mg/m³	0,00004
2.1 PROC 2	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	18,35 mg/m³	0,0251
2.1 PROC 3	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	73,42 mg/m³	0,1006
2.1 PROC 4	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	73,42 mg/m³	0,1006
2.1 PROC 5	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	183,54 mg/m³	0,3017
2.1 PROC 8a	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	55,06 mg/m³	0,0754
2.1 PROC 8b	ECETOC TRA	LEV: 97% efficiency	long term, inhalation	33,04 mg/m³	0,0453
2.1 PROC 9	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	73,42 mg/m³	0,1006
2.1 PROC 1	ECETOC TRA		long term, dermal	0,343 mg/kg body weight/day	0,0054
2.1 PROC 2	ECETOC TRA	LEV: 90% efficiency	long term, dermal	0,137 mg/kg body weight/day	0,0022
2.1 PROC 3	ECETOC TRA	LEV: 90% efficiency	long term, dermal	0,034 mg/kg body weight/day	0,0005
2.1 PROC 4	ECETOC TRA	LEV: 90% efficiency	long term, dermal	0,686 mg/kg body weight/day	0,0109
2.1 PROC 5	ECETOC TRA	LEV: 99% efficiency	long term, dermal	0,069 mg/kg body weight/day	0,0011
2.1 PROC 8a	ECETOC TRA	LEV: 99% efficiency	long term, dermal	0,137 mg/kg body weight/day	0,0022
2.1 PROC 8b	ECETOC TRA	LEV: 90% efficiency	long term, dermal	0,686 mg/kg body weight/day	0,0109
2.1 PROC 9	ECETOC TRA	LEV: 90% efficiency	long term, dermal	0,686 mg/kg body weight/day	0,0109

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

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

ethyl acetate

A downstream user may evaluate whether he operates within the conditions set in the exposure scenario by using the information provided in section 2. This evaluation may be based on an expert judgement or on the utilisation of risk assessment tools that are recommended by ECHA.

If the local environmental emission conditions deviate significantly from the used default values, please use the below algorithm to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)

1. Short title of Exposure Scenario: - Application of paints and coatings (non-spray applications): Industrial (ES3)

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Process category	:	**PROC1:** Use in closed process, no likelihood of exposure **PROC2:** Use in closed, continuous process with occasional controlled exposure **PROC5:** Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) **PROC8a:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC10:** Roller application or brushing **PROC13:** Treatment of articles by dipping and pouring
Environmental release category	:	**ERC4:** Industrial use of processing aids in processes and products, not becoming part of articles

2.1 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC5, PROC8a, PROC8b, PROC10, PROC13 [ethyl acetate] - Application of paints and coatings (non-spray applications): Industrial

Product characteristics

Concentration of the Substance in Mixture/Article

Remarks	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Remarks	:	Exceptions: Maximum 25% for PROC 10 and PROC 13
Vapour pressure	:	98 hPa at 20 °C
Physical Form (at time of use)	:	Liquid substance

Frequency and duration of use

Frequency of use	:	240 days/year
General exposures	:	> 4 hours/day
PROC 8a	:	1 - 4 hours/day

Human factors not influenced by risk management

Exposed skin area	:	960 cm²

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Indoors, PROC 1 outdoors

Technical conditions and measures

Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). Provide extraction ventilation at points where emissions occur.

These general measures are mandatory for all contributing scenarios. Additional measures are specific for the following contributing scenarios:

PROC2: Use in closed, continuous process with occasional controlled exposure

Use with local exhaust ventilation.

PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities

Use with local exhaust ventilation.

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities

Use with local exhaust ventilation.

PROC10: Roller application or brushing

Use with local exhaust ventilation.

PROC13: Treatment of articles by dipping and pouring

Use with local exhaust ventilation.

Organisational measures to prevent /limit releases, dispersion and exposure

Clear spills immediately.

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

Wear suitable gloves tested to EN374.

These general measures are mandatory for all contributing scenarios.

3. Exposure estimation and reference to its source

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterisation ratio (Exposure value/DNEL)
2.1 All PROCs			short term, inhalation	Not relevant	
2.1 All PROCs			short term, dermal	Not relevant	
2.1 PROC 1	ECETOC TRA		long term, inhalation	0,026 mg/m³	0
2.1 PROC 2	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	18,354 mg/m³	0,0251

2.1 PROC 5	ECETOC TRA	LEV: 95% efficiency	long term, inhalation	Not specified.	
2.1 PROC 8a	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	55,063 mg/m³	0,0754
2.1 PROC 8b	ECETOC TRA	LEV: 97% efficiency	long term, inhalation	9,911 mg/m³	0,0136
2.1 PROC 10	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	55,063 mg/m³	0,0754
2.1 PROC 13	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	55,063 mg/m³	0,0754
2.1 PROC 1	ECETOC TRA		long term, dermal	0,343 mg/kg body weight/day	0,0054
2.1 PROC 2	ECETOC TRA	LEV: 90% efficiency	long term, dermal	0,137 mg/kg body weight/day	0,0022
2.1 PROC 5	ECETOC TRA	LEV: 95% efficiency	long term, dermal	Not specified.	
2.1 PROC 8a	ECETOC TRA	LEV: 99% efficiency	long term, dermal	0,137 mg/kg body weight/day	0,0022
2.1 PROC 8b	ECETOC TRA	LEV: 90% efficiency	long term, dermal	0,686 mg/kg body weight/day	0,0109
2.1 PROC 10	ECETOC TRA	LEV: 95% efficiency	long term, dermal	1,371 mg/kg body weight/day	0,0218
2.1 PROC 13	ECETOC TRA	LEV: 95% efficiency	long term, dermal	0,686 mg/kg body weight/day	0,0109

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

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

ethyl acetate

A downstream user may evaluate whether he operates within the conditions set in the exposure scenario by using the information provided in section 2. This evaluation may be based on an expert judgement or on the utilisation of risk assessment tools that are recommended by ECHA.

If the local environmental emission conditions deviate significantly from the used default values, please use the below algorithm to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)

1. Short title of Exposure Scenario: - Application of paints, coatings and other mixtures by way of spraying: Industrial (ES4)

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Process category	:	**PROC1:** Use in closed process, no likelihood of exposure **PROC2:** Use in closed, continuous process with occasional controlled exposure **PROC7:** Industrial spraying **PROC8a:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
Environmental release category	:	**ERC4:** Industrial use of processing aids in processes and products, not becoming part of articles

2.1 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC5, PROC7, PROC8a, PROC8b [ethyl acetate] - Application of paints, coatings and other mixtures by way of spraying: Industrial

Product characteristics

Concentration of the Substance in Mixture/Article

Remarks	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Remarks	:	Exceptions: Maximum 25% for PROC 7
Vapour pressure	:	98 hPa at 20 °C
Physical Form (at time of use)	:	Liquid substance

Frequency and duration of use

Frequency of use	:	240 days/year
General exposures	:	> 4 hours/day
PROC 8a	:	1 - 4 hours/day
PROC 8b	:	1 - 4 hours/day

Human factors not influenced by risk management

Exposed skin area	:	1500 cm²

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Indoors, PROC 1 outdoors

Technical conditions and measures

Handle substance within a predominantly closed system provided with extract ventilation. In the absence of LEV, do not carry out operation for more than 1 hour without respiratory protection (PPE).

These general measures are mandatory for all contributing scenarios. Additional measures are specific for the following contributing scenarios:

PROC2: Use in closed, continuous process with occasional controlled exposure

Use with local exhaust ventilation.

PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)

Provide extraction ventilation at points where emissions occur.

PROC7: Industrial spraying

Carry out in a vented booth provided with laminar airflow. OR Wear respiratory protection.

PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities

Use with local exhaust ventilation.

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities

Use with local exhaust ventilation.

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

Wear suitable gloves tested to EN374.

These general measures are mandatory for all contributing scenarios.

3. Exposure estimation and reference to its source

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterisation ratio (Exposure value/DNEL)
2.1 All PROCs			short term, inhalation	Not relevant	
2.1 All PROCs			short term, dermal	Not relevant	
2.1 PROC 1	ECETOC TRA		long term, inhalation	0,0257 mg/m³	0
2.1 PROC 2	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	18,35 mg/m³	0,0251
2.1 PROC 7	ECETOC TRA	LEV: 95% efficiency	long term, inhalation	55,06 mg/m³	0,0754
2.1 PROC 8a	ECETOC TRA	LEV: 90% efficiency	long term, inhalation	55,06 mg/m³	0,0754
2.1 PROC 8b	ECETOC TRA	LEV: 97% efficiency	long term, inhalation	9,91 mg/m³	0,0136

2.1 PROC 1	ECETOC TRA		long term, dermal	0,343 mg/kg body weight/day	0,0054
2.1 PROC 2	ECETOC TRA	LEV: 90% efficiency	long term, dermal	0,137 mg/kg body weight/day	0,0022
2.1 PROC 7	ECETOC TRA	LEV: 95% efficiency	long term, dermal	2,143 mg/kg body weight/day	0,0340
2.1 PROC 8a	ECETOC TRA	LEV: 99% efficiency	long term, dermal	0,137 mg/kg body weight/day	0,0022
2.1 PROC 8b	ECETOC TRA	LEV: 90% efficiency	long term, dermal	0,686 mg/kg body weight/day	0,0109

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

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

ethyl acetate

A downstream user may evaluate whether he operates within the conditions set in the exposure scenario by using the information provided in section 2. This evaluation may be based on an expert judgement or on the utilisation of risk assessment tools that are recommended by ECHA.

If the local environmental emission conditions deviate significantly from the used default values, please use the below algorithm to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)

1. Short title of Exposure Scenario: - Application of paints, coatings adhesives and other mixtures/products (indoors or outdoors, spray or non-spray applications): Professional (ES5)

Main User Groups	:	**SU 22:** Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process category	:	**PROC1:** Use in closed process, no likelihood of exposure **PROC2:** Use in closed, continuous process with occasional controlled exposure **PROC5:** Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) **PROC8a:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC10:** Roller application or brushing **PROC11:** Non industrial spraying **PROC13:** Treatment of articles by dipping and pouring
Environmental release category	:	**ERC8a:** Wide dispersive indoor use of processing aids in open systems **ERC8d:** Wide dispersive outdoor use of processing aids in open systems

2.1 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC5, PROC8a, PROC8b, PROC10, PROC11, PROC13 [ethyl acetate] - Application of paints, coatings adhesives and other mixtures/products (indoors or outdoors, spray or non-spray applications): Professional

Product characteristics

Concentration of the Substance in Mixture/Article

Remarks	:	Covers the percentage of the substance in the product up to 25 %.
Vapour pressure	:	98 hPa at 20 °C
Physical Form (at time of use)	:	Liquid substance

Frequency and duration of use

Frequency of use	:	300 days/year
General exposures	:	> 4 hours/day
PROC 5	:	< 1 hours/day
PROC 8a	:	< 1 hours/day
PROC 8b	:	< 1 hours/day
PROC 10	:	1 - 4 hours/day
PROC 11	:	1 - 4 hours/day
PROC 13	:	1 - 4 hours/day

Human factors not influenced by risk management

Exposed skin area	:	1500 cm²

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoors, PROC 1 outdoors
Remarks : Assumes activities are at ambient temperature (unless stated differently).

Technical conditions and measures

Use with local exhaust ventilation.

Organisational measures to prevent /limit releases, dispersion and exposure

Clear spills immediately.

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

Respiratory Protection Equipment with an approved standard must be used whenever inhalative exposure is not sufficiently controlled by technical measures. Wear suitable gloves tested to EN374.

3. Exposure estimation and reference to its source

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterisation ratio (Exposure value/DNEL)
2.1 All PROCs			short term, inhalation	Not relevant	
2.1 All PROCs			short term, dermal	Not relevant	
2.1 PROC 1	ECETOC TRA		long term, inhalation	0,154 mg/m³	0,0002
2.1 PROC 2	ECETOC TRA	LEV: 80% efficiency	long term, inhalation	22,025 mg/m³	0,0302
2.1 PROC 5	ECETOC TRA	LEV: 80% efficiency	long term, inhalation	44,050 mg/m³	0,0603
2.1 PROC 8a	ECETOC TRA	LEV: 80% efficiency	long term, inhalation	44,050 mg/m³	0,0603
2.1 PROC 8b	ECETOC TRA	LEV: 80% efficiency	long term, inhalation	11,013 mg/m³	0,0151
2.1 PROC 10	ECETOC TRA	LEV: 80% efficiency	long term, inhalation	132,150 mg/m³	0,1810
2.1 PROC 11	ECETOC TRA	LEV: 80% efficiency	long term, inhalation	264,300 mg/m³	0,3621
2.1 PROC 13	ECETOC TRA	LEV: 80% efficiency	long term, inhalation	66,075 mg/m³	0,0905
2.1 PROC 1	ECETOC TRA		long term, dermal	0,343 mg/kg body weight/day	0,0054
2.1 PROC 2	ECETOC TRA	LEV: 80% efficiency, Gloves: 80% protection	long term, dermal	0,137 mg/kg body weight/day	0,0022
2.1 PROC 5	ECETOC TRA	LEV: 80% efficiency, Gloves: 80% protection	long term, dermal	0,686 mg/kg body weight/day	0,0109
2.1 PROC 8a	ECETOC TRA	LEV: 80% efficiency, Gloves: 80% protection	long term, dermal	0,137 mg/kg body weight/day	0,0022
2.1 PROC 8b	ECETOC TRA	LEV: 80% efficiency, Gloves: 80% protection	long term, dermal	0,686 mg/kg body weight/day	0,0109
2.1 PROC 10	ECETOC TRA	LEV: 80% efficiency, Gloves:	long term,	1,371 mg/kg	0,0218

		80% protection	dermal	body weight/day	
2.1 PROC 11	ECETOC TRA	LEV: 80% efficiency, Gloves: 80% protection	long term, dermal	2,143 mg/kg body weight/day	0,0340
2.1 PROC 13	ECETOC TRA	LEV: 80% efficiency, Gloves: 80% protection	long term, dermal	0,686 mg/kg body weight/day	0,0109

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

ethyl acetate

A downstream user may evaluate whether he operates within the conditions set in the exposure scenario by using the information provided in section 2. This evaluation may be based on an expert judgement or on the utilisation of risk assessment tools that are recommended by ECHA.

If the local environmental emission conditions deviate significantly from the used default values, please use the below algorithm to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)

1. Short title of Exposure Scenario: - Use as laboratory reagent: Industrial, Professional (ES6)

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	:	**SU 22:** Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process category	:	**PROC15:** Use as laboratory reagent
Environmental release category	:	**ERC4:** Industrial use of processing aids in processes and products, not becoming part of articles **ERC8a:** Wide dispersive indoor use of processing aids in open systems

2.1 Contributing scenario controlling worker exposure for: PROC15 [ethyl acetate] - Use as laboratory reagent: Industrial

Product characteristics

Concentration of the Substance in Mixture/Article

Remarks	:	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Vapour pressure	:	113 hPa at 22 °C
Physical Form (at time of use)	:	Liquid substance

Frequency and duration of use

	:	4 hours/day
Frequency of use	:	240 days/year

Human factors not influenced by risk management

Exposed skin area	:	240 cm²
Remarks	:	Assumes a good basic standard of occupational hygiene is implemented.

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Indoor use
Remarks	:	Assumes activities are at ambient temperature (unless stated differently).

3. Exposure estimation and reference to its source

Workers

Contributing	Exposure	Specific conditions	Value type	Level of	Risk

Scenario	Assessment Method			Exposure	characterisation ratio (Exposure value/DNEL)
2.1 PROC 15			short term, inhalation	Not relevant	
2.1 PROC 15			short term, dermal	Not relevant	
2.1 PROC 15	ECETOC TRA		long term, inhalation	110,13 mg/m³	0,1509
2.1 PROC 15	ECETOC TRA		long term, dermal	0,343 mg/kg body weight/day	0,0054

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

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

ethyl acetate

A downstream user may evaluate whether he operates within the conditions set in the exposure scenario by using the information provided in section 2. This evaluation may be based on an expert judgement or on the utilisation of risk assessment tools that are recommended by ECHA.

If the local environmental emission conditions deviate significantly from the used default values, please use the below algorithm to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)