

SIBUR-NEFTEKHIM JSC

SAFETY DATA SHEET

According to Regulations (EC) 1907/2006 (REACH), (EC) 1272/2008 (CLP) & (EU) 2015/830

2-ETHYLHEXYL ACRYLATE

Version: 2.0
Date created: 14/05/2019

SECTION 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING

1.1. Product identifier

Product form:	Substance
Substance name:	2-ethylhexyl acrylate
Chemical name:	2-ethylhexyl acrylate
EC index No.:	607-107-00-7
EC No.:	203-080-7
CAS-No.:	103-11-7
REACH registration No:	01-2119453158-37-0040
Formula:	C ₁₁ H ₂₀ O ₂
Synonyms:	2-propenoic acid, 2-ethylhexyl ester, 2EHA, EHA, AE2H
Trade names:	2-ethylhexyl acrylate

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

1.2.1. Relevant identified uses

Use of the substance/mixture:	Manufacture and distribution of the substance Polymerisation at production facilities Polymerisation at downstream user facilities Industrial production of preparations containing up to 21% 2-EHA Industrial and professional use of preparations containing up to 21% 2-EHA Use as laboratory reagent For the detailed identified uses of the product see Annex. The use of the substance should be limited to those specified in Annex.
Most common technical function of substance:	Intermediate, laboratory reagent, binding agent, monomer.

1.2.2. Uses advised against

Restrictions on use:	Uses other than those given in section 1.2.1 are not recommended unless an assessment is completed, prior to commencement of that use, which demonstrates that the use will be controlled.
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1.3. Details of the supplier of the safety data sheet

Only representative

Company name:	Gazprom Marketing and Trading France
Address:	68 avenue des Champs-Élysées, 75008, Paris, France
Contact Telephone:	+33 1 42 99 73 50
Fax:	+33 1 42 99 73 99
Email Address:	didier.lebout@gazprom-mt.com

Manufacturer

Company name: SIBUR-NEFTEKHIM JSC
Address: 390, Eastern Industrial area, Dzerzhinsk, Nizhniy Novgorod region,
606000, Russian Federation
Contact phone: +7 8313 27-59-09
Fax: +7 8313 27-59-99
Email Address: infosnh@snh.sibur.ru
techservice@sibur.ru
Emergency Telephone: +7 8313 27-52-98 (office hours only, GMT+3)
Importer: List of importers is available with the Only Representative

1.4. Emergency telephone number

Emergency phone in the country of delivery 112 (Please note that emergency numbers may vary depending upon the country of delivery though 112 remains valid as universal number)

SECTION 2. HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

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

Skin Irrit. 2. H315: Causes skin irritation.
Skin Sens. 1. H317: May cause an allergic skin reaction.
STOT Single Exp. 3. H335: May cause respiratory irritation. Specific target organ toxicity - single (affected organs: respiratory tract).
Aquatic Chronic 3. H412: Harmful to aquatic life with long lasting effects.
Full text of hazard classes and H-statements : see section 16

2.2. Label elements

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

Hazard pictograms (CLP):



GHS07

Signal word (CLP): **Warning**
Hazard statements (CLP): H315: Causes skin irritation.
H317: May cause an allergic skin reaction.
H335: May cause respiratory irritation. Specific target organ toxicity - single (affected organs: respiratory tract).
H412: Harmful to aquatic life with long lasting effects.
Precautionary statements (CLP): P261 Avoid breathing dust/fume/gas/mist/vapours/ spray.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P273 Avoid release to the environment.
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor/physician if you feel unwell.
P333+P313 If skin irritation or rash occurs: Get medical advice/attention.
P302 + P352 IF ON SKIN: Wash with plenty of water/soap.
EUH-statements: Not applicable.

2.3. Other hazards

Other hazards not contributing to the classification: Risk of hazardous polymerization under certain conditions (e.g. elevated temperatures, low inhibitor and oxygen concentration). Polymerization can degenerate into an uncontrolled reaction.

Assessment PBT / vPvB: According to Annex XIII of Regulation (EC) No.1907/2006 (REACH): not fulfilling PBT (persistent/bioaccumulative/toxic) criteria; not fulfilling vPvB (very persistent/very bioaccumulative) criteria.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

Name	Product identifier	%	Classification [CLP]
2-ethylhexyl acrylate	(CAS-No.) 103-11-7 (EC No.) 203-080-7 (EC index No.) 607-107-00-7 (REACH-no) 01-2119453158-37-0040	≥99.5	H315; H317; H335; H412
Additives (this stabilizer inhibits polymerization of acrylic acid)			
Mequinol	(CAS-No.) 150-76-5 (EC No.) 205-769-8 (EC index No.) 604-044-00-7	10-20 ppm	H302, H317, H319

The product does not contain impurities or additives that could affect product's labelling and classification according to Regulation (EC) No 1272/2008 (CLP).

3.2. Mixtures

Not applicable

SECTION 4. FIRST-AID MEASURES

4.1. Description of first aid measures

First-aid measures general

Immediately remove contaminated clothing. If danger of loss of consciousness, place patient in recovery position and transport accordingly. Apply artificial respiration if necessary. First aid personnel should pay attention to their own safety.

First-aid measures after inhalation

Keep patient calm, remove to fresh air. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. Keep person warm and at rest. Loosen tight clothing such as a collar, tie, belt or waistband. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Get medical attention. If unconscious, place in recovery position and get medical attention immediately.

First-aid measures after skin contact

Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

First-aid measures after eye contact

Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 15 minutes. Get medical attention.

First-aid measures after ingestion

Immediately rinse mouth and then drink 200-300 ml of water, seek medical attention. Do NOT induce vomiting.

Move exposed person to fresh air. Keep person warm and at rest. If not breathing, if breathing is

irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/effects:	Overexposure may cause:., convulsions, lethargy
Symptoms/effects after inhalation:	When inhaled, causes cough, sore throat, disturbed breathing rhythms, cramping in the stomach, vomiting.
Symptoms/effects after skin contact:	Redness. Pain. Short-term exposure: May cause severe skin irritation.
Symptoms/effects after eye contact:	Redness. Pain. Short-term exposure: May cause slightly eye irritation.
Symptoms/effects after ingestion:	Abdominal pain, vomiting.

4.3. Indication of any immediate medical attention and special treatment needed

Indication of any immediate medical attention and special treatment is needed.

May aggravate pre-existing skin conditions, allergies and eczema. Treat according to symptoms (decontamination, vital functions), no known specific antidote.

SECTION 5. FIRE-FIGHTING MEASURES

5.1. Extinguishing media

Suitable extinguishing media	<i>Small fire:</i> Dry chemical, CO ₂ , water spray or regular foam. <i>Large fire:</i> Water spray, fog or regular foam.
Unsuitable extinguishing media	Do not use high volume water jet.

5.2. Special hazards arising from the substance or mixture

Fire hazard:	Risk of violent self-polymerization if overheated in a container. Combustible liquid. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion.
Unusual Fire and Explosion hazard:	Container may vent and/or rupture due to fire. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.
Hazardous decomposition products in case of fire:	Decomposition products may include the following materials: carbon dioxide, carbon monoxide.

5.3. Advice for firefighters

Firefighting instructions:	In case of a fire in the vicinity a restabilization system should be used if the temperature in the storage container reaches 45°C. Evacuate area of all unnecessary personnel. In case of a fire in the vicinity evacuate all personnel in a greater area if the temperature in the storage container reaches 60°C Cool surrounding containers with water spray. If possible, take container out of dangerous zone. Heating causes a rise in pressure, risk of bursting and explosion. Spontaneous polymerization. Shut off sources of ignition. Beware of backfire. Stay on upwind side.
Protection during firefighting:	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Wear suitable, tightly sealed protective clothing. Full protective suit.

Further information: Thermal decomposition products : irritating, corrosive and/or toxic gases, Carbon oxides
Vapours are heavier than air and may accumulate in low areas and travel a considerable distance up to the source of ignition. Fight fire from maximum distance.

SECTION 6. ACCIDENTAL RELEASE MEASURE

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Emergency procedures No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

6.1.2. For emergency responders

Emergency procedures Ensure adequate ventilation. Use personal protective clothing. Breathing protection required. Wear personal protective equipment (respiratory protection, eye protection, hand protection, body protection). If exposed to material during clean-up operations, immediately remove all contaminated clothing and wash exposed skin areas with soap and water.

6.2. Environmental precautions

Shut off all ignition sources. Evacuate area and warn affected surroundings. Do not allow entrance in soil, stretches of water, ground water, drainage systems, and surface water.

6.3. Methods and material for containment and cleaning up

Use mechanical handling equipment. Pump off larger quantities. Dilute smaller quantities with plenty of water or absorb spilt liquid with an absorbent (e.g. diatomite, vermiculite, sand). Use spark-proof tools and explosion-proof equipment. Fill into marked, sealable containers. Dispose according to regulations. Add inhibitor to prevent polymerization. Afterwards ventilate area and wash spill site. Inform responsible authorities if necessary.

6.4. Reference to other sections

SECTION 8: Exposure controls/personal protection. SECTION 13: Disposal considerations.

SECTION 7. HANDLING AND STORAGE

7.1. Precautions for safe handling

Precautions for safe handling Put on appropriate personal protective equipment (see section 8). Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.

Hygiene measures Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Persons with a history of skin sensitization problems

should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapor or mist.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions	Minimize sources of ignition, such as static build-up, heat, spark or flame. Keep container closed. Store in a dry place. Store away from direct sunlight or ultraviolet light. Store away from incompatible materials. Maintain inhibitor and dissolved oxygen level. Do not purge containers of this material with nitrogen. Recommended inhibitor level is: 10 to 20 ppm. Recommended oxygen level is: 5 to 21 vol. %. Provide electrical earthing of equipment and electrical equipment usable in explosive atmospheres. Provide a catch-tank in a bunded area. Inhibitor levels should be maintained. Monitor the product clarity. Continuously monitor product temperature. Do not store above: 30 °C
Incompatible materials	Avoid contact with oxidizing materials, polyvalent heavy metal ions (e.g. copper, cobalt, nickel, chromium and iron). Avoid contact with: Aldehydes and some ketones. Amines. Azides. Ethers. Free radical initiators. Halides. Iron oxides (rust). Mercaptans. Mineral acids. Peroxides. Strong inorganic bases. Avoid contact with metals such as: Brass. Copper. Avoid unintended contact with: Activated carbon. Silica gel. Caustics. Aluminum oxide. Avoid contact with absorbent materials such as: Clay-based absorbents.
Storage area	Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition. Protect against light. Keep under atmospheric oxygen (air), never use inert atmosphere: stabilizer is only effective in presence of oxygen.
Packaging materials	Store in the following material(s): stainless steel, ordinary steel, aluminium, high density polyethylene (HDPE), polypropylene, Polytetrafluoroethylene (PTFE). To be avoided: Rubber Do not store in: iron, carbon-less (mild) steel, copper, brass and their alloys. Translucent container.
Shelf life:	Avoid long storage period.

7.3. Specific end use(s)

Please check the identified uses given in Section 1.2 of this safety data sheet.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

8.1.1. Occupational Exposure Limits

2-ethylhexyl acrylate (CAS# 103-11-7)

	LTEL TWA ppm	LTEL TWA mg/m ³	STEL ppm	STEL mg/m ³	Note
European Union					
Austria	10	82	10	82	
Germany (AGS)	5 (1)	38 (1)	5 (1)(2)	38(1)(2)	
<i>(1) Inhalable aerosol and vapour. (2) 15 minutes reference period.</i>					
Germany (DFG)	5 (1)	38 (1)	5 (1)(2)	38(1)(2)	
<i>(1) Inhalable fraction and vapour. (2) 15 minutes reference period</i>					
Latvia		1			
Poland		35		70	
Switzerland	5	38	5	38	

GESTIS International Limit values: <http://limitvalue.ifa.dguv.de>

8.1.2. DNEL/ PNEC values	
<i>2-ethylhexyl acrylate (CAS# 103-11-7)</i>	
DNEL/DMEL (Workers)	
Acute - systemic effects, dermal	No hazard identified
Acute - systemic effects, inhalation	No hazard identified
Acute - local effects, dermal	(DNEL) 0.242 mg/cm ² sensitisation (skin)
Acute - local effects, inhalation	Low hazard (no threshold derived)
Long-term - systemic effects, dermal	No hazard identified
Long-term - systemic effects, inhalation	No hazard identified
Long-term - local effects, dermal	No hazard identified
Long-term - local effects, inhalation	(DNEL) 37.5 mg/m ³ irritation (respiratory tract)
Eyes, local effects	No hazard identified
DNEL/DMEL (General population)	
Acute - systemic effects, dermal	No hazard identified
Acute - systemic effects, inhalation	No hazard identified
Acute - systemic effects, oral	No hazard identified
Acute - local effects, dermal	(DNEL) 0.242 mg/cm ² sensitisation (skin)
Acute - local effects, inhalation	Low hazard (no threshold derived)
Long-term - systemic effects, dermal	No hazard identified
Long-term - systemic effects, inhalation	No hazard identified
Long-term - systemic effects, oral	No hazard identified
Long-term - local effects, dermal	No hazard identified
Long-term - local effects, inhalation	(DNEL) 4.5 mg/m ³ irritation (respiratory tract)
Eyes, local effects	No hazard identified
PNEC (water)	
PNEC aqua (freshwater)	2.72 µg/L
PNEC aqua (marine water)	0.272 µg/L
PNEC aqua (intermittent, freshwater)	11 µg/L
PNEC (Sediment)	
PNEC sediment (freshwater)	0.126 mg/kg sediment dw
PNEC sediment (marine water)	12.6 µg/kg sediment dw
PNEC (Soil)	
PNEC soil	1 mg/kg soil dw
PNEC (Oral)	
PNEC oral (secondary poisoning)	No data
PNEC (STP)	
PNEC sewage treatment plant	2.3 mg/L

8.2. Exposure controls

Appropriate engineering controls:

Ventilation: Use engineering controls to maintain airborne level below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use only with adequate ventilation. Install a local exhaust ventilation system as well as a general ventilation system to prevent exposure to mists or vapors. Use explosion-proof electrical/ventilating/lighting equipment. Take precautionary measures against static discharge. Install a hand wash basin, eye wash fountain and shower near the handling area. Indicate their locations clearly.

Hand protection:

Use chemical resistant gloves classified under Standard EN374: Protective gloves against chemicals and micro-organisms. Examples of preferred glove barrier materials include: Chlorinated

polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl alcohol ("PVA"). Styrene/butadiene rubber. Examples of acceptable glove barrier materials include: Butyl rubber. Natural rubber ("latex"). Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyvinyl chloride ("PVC" or "vinyl"). Viton.

Avoid gloves made of: Neoprene. When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended. When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended. NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Eye protection:

Safety glasses with side-shields (frame goggles) (e.g. EN 166). If exposure causes eye discomfort, use a full-face respirator.

Skin and body protection:

Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task. Remove contaminated clothing immediately, wash skin area with soap and water, and launder clothing before reuse or dispose of properly. Items which cannot be decontaminated, such as shoes, belts and watchbands, should be removed and disposed of properly.

Respiratory protection:

Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use an approved respirator. Selection of air-purifying or positive-pressure supplied-air will depend on the specific operation and the potential airborne concentration of the material. For emergency conditions, use an approved positive-pressure self-contained breathing apparatus. Use the following CE approved air-purifying respirator: Organic vapor cartridge, type A (boiling point >65 °C).

Environmental exposure controls:

Do not allow penetration of the product into water reservoirs, surface and ground water, sewer ducts and soil. Preventing disposal into water reservoirs of contaminated water without treatment. Monitor content of hazardous substances in the air. Provide sealing of process equipment.

For more information please see the relevant exposure scenario in Annex of this SDS.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES	
9.1. Information on basic physical and chemical properties	
Physical state at 20 °C and 1013 hPa	liquid
Colour:	Colourless
Odour	Sweetish odour
Melting / freezing point	- 90 °C (183.15 K at 1013 hPa)
Boiling point	215 °C (488 K at 1013 hPa)
Relative density	0.88 g/cm ³ at 20 °C
Vapour pressure	0.24 hPa at 25 °C
Surface tension	Not surface active. The surface tension of 2-ethylhexyl acrylate (90% saturation) was measured at 68.2 mN/m @ 20°C.
Water solubility	9.6 mg/L at 25 °C

Partition coefficient n-octanol/water (log value)	4 at 20 °C
Flash point	closed cup 86 °C (303.2 K at 1013 hPa)
Flammability	Combustible liquid. The substance has no pyrophoric properties and does not liberate flammable gases on contact with water. Substance is a flammable liquid cat.: 4 (EU GHS) because the flash point is >60 °C and <93 °C. Based on chemical structure pyrophoric properties and flammability in contact with water are not to be expected.
Lower explosion limit	0.8 (%)
Upper explosion limit	6.0 (%)
Explosive properties	Non explosive
Self-ignition temperature	252 °C (525.2 K at 1013 hPa)
Oxidising properties	No oxidising properties The Substance is incapable of reacting exothermically with combustible materials on the basis of the chemical structure.
Viscosity	1.75 mPa.s at 20°C
Granulometry	Not applicable. Substance is marketed or used in a non solid or granular form.
Stability in organic solvents and identity of relevant degradation products	Not applicable. The stability of the substance is not considered as critical.
Dissociation constant	Not applicable. The substance does not contain any ionic structure.

9.2. Other information

Self-accelerating polymerisation temperature (SAPT)
 > 50 °C at the inhibitor level not less than 13 ppm

SECTION 10. STABILITY AND REACTIVITY

10.1. Reactivity

2-ethylhexyl acrylate has a high reactivity in the presence of free radicals. Free radicals can be generated by heat, light or irradiation of X-rays and by activation of radical forming materials. The most frequent cause of an untimely polymerization is overheating (e.g. by storing close to a heat source).

10.2. Chemical stability

Stable under recommended storage conditions. Unstable at elevated temperatures. Hygroscopic.

10.3. Possibility of hazardous reactions

Hazardous polymerization may occur. Store under an oxygen containing atmosphere to maintain sufficient dissolved oxygen. Do not heat, do not use an inert blanket and do not purge with inert gas. Avoid temperatures above 38 °C. Higher temperatures may lead to a higher consumption rate of the stabilizer system (consisting of MeHQ and oxygen) and consequently to an untimely polymerization. 2-EHA is inhibited with monomethyl ether of hydroquinone (MEHQ) to prevent polymerization. The product is stable if inhibitor concentration is maintained at 15 mg/kg. Check the inhibitor concentration at intervals and add inhibitor as needed.

10.4. Conditions to avoid

Exposure to elevated temperatures can cause product to decompose. Avoid static discharge. Avoid moisture. Do not blanket or purge with an inert gas to avoid depleting the oxygen concentration.

Avoid direct sunlight or ultraviolet sources.

10.5. Incompatible materials

Avoid contact with oxidizing materials, polyvalent heavy metal ions (e.g. copper, cobalt, nickel, chromium and iron). Avoid contact with: Aldehydes and some ketones. Amines. Azides. Ethers. Free radical initiators. Halides. Iron oxides (rust). Mercaptans. Mineral acids. Peroxides. Strong inorganic bases. Avoid contact with metals such as: Brass. Copper. Avoid unintended contact with: Activated carbon. Silica gel. Caustics. Aluminum oxide. Avoid contact with absorbent materials such as: Clay-based absorbents.

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced

At high temperature (by combustion): Carbon Monoxide, Carbon Dioxide

SECTION 11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Acute toxicity

The substance is of low toxicity after a single ingestion and virtually nontoxic after a single skin contact. The inhalation of a highly saturated vapour-air-mixture represents an unlikely acute hazard.

<i>2-ethylhexyl acrylate (CAS 103-11-7)</i>	
LD50, oral, rat, male/female	ca. 4435 mg/kg bw (OECD Guideline 401) Relatively harmless
LC50, inhalation, rat, male/female	> 1.19 mg/L air (8 h) (nominal) (OECD Guideline 403)
LD50, dermal, rabbit	ca. 7522 mg/kg bw (occlusive) Practically nontoxic

Skin corrosion/irritation	Adverse effect observed (irritating). CLP classification (Regulation (EC) No 1272/2008): Skin corrosion/irritation: Category 2
Additional information	Erythema score: 1.8 of max. 4 (mean (2 animals)) (Time point: 24-48-72 h) (not fully reversible within: 8 d) 2.8 of max. 4 (mean (2 animals)) (Time point: 24-48-72 h) (not fully reversible within: 8 d) (1st trial) 2.2 of max. 4 (mean (2 animals)) (Time point: 24-48-72 h) (not fully reversible within: 8 d) (2nd trial) Edema score: 0 of max. 4 (mean (2 animals)) (Time point: 24-48-72 h) (fully reversible) 1.3 of max. 4 (mean (2 animals)) (Time point: 24-48-72 h) (not fully reversible within: 8 d) (1st trial) 0.8 of max. 4 (mean (2 animals)) (Time point: 24-48-72 h) (not fully reversible within: 8 d) (2nd trial) (OECD Guideline 404)
Serious eye damage/irritation	CLP classification (Regulation (EC) No 1272/2008): no classification required. Not irritating
Additional information	Cornea score: 0 of max. 4 (mean (2 animals)) (Time point: 24-48 h) (fully reversible) Iris score: 0 of max. 2 (mean (2 animals)) (Time point: 24-48 h) (fully reversible) Conjunctivae score: 0.25 of max. 3 (mean (2 animals)) (Time point: 24-48 h) (fully reversible within: 48 h) Chemosis score:

0 of max. 4 (mean (2 animals)) (Time point: 24-48 h) (fully reversible within: 24 h)

(OECD Guideline 405)

Respiratory or skin sensitisation

Adverse effect observed (skin sensitising). CLP classification (Regulation (EC) No 1272/2008): Skin Sensitization: Category 1

Additional information

There is no information available on respiratory sensitisation.

Germ cell mutagenicity

Genetic toxicity: no adverse effect observed (negative). CLP classification (Regulation (EC) No 1272/2008): no classification required.

Additional information

In-vitro studies (bacterial systems): negative.

2-EHA was negative in the four Salmonella tester strains used with and without metabolic activation. (NTP protocol)

In-vitro studies (Mammalian cell gene mutation test): negative.

2-EHA seems to have a weak potential of induction of cytogenicity in mammalian cell systems, this effect is limited to doses with strong cytotoxicity.

In vivo studies: negative.

In vivo no genotoxic potential was observed in a cytogenetic test in mice and in an UDS assay in rats. (OECD Guideline 486).

Carcinogenicity

CLP classification (Regulation (EC) No 1272/2008): no classification required.

<i>2-ethylhexyl acrylate (CAS 103-11-7)</i>	
NOAEL (carcinogenicity), dermal, mouse, male	919 mg/kg bw/day (nominal) (Effect type: carcinogenicity)
LOAEL (carcinogenicity) dermal, mouse, male	217 mg/kg mg/kg bw/day (nominal) Local non-neoplastic skin effects

Toxicity for reproduction

CLP classification (Regulation (EC) No 1272/2008): no classification required. No indications of a developmental toxic / teratogenic effect were seen in animal studies with 2-ethylhexyl acrylate and its structural analogue.

<i>2-ethylhexyl acrylate (CAS 103-11-7)</i>	
NOEC (effects on fertility) inhalation, rat, male/female	ca. 0.269 mg/L air = 75 ppm (<i>methyl acrylate</i>) (OECD TG 416; EPA OPPTS 870.3800)
NOAEC (developmental toxicity), inhalation, rat	ca. 0.56 mg/L air (nominal, maternal toxicity)
NOAEC (developmental toxicity), inhalation, rat	ca. 0.75 mg/L air (nominal, teratogenicity)
NOAEL (developmental toxicity, inhalation, rabbit)	15 ppm (<i>methyl acrylate</i>) (maternal toxicity) (OECD Guideline 414, EPA OPPTS 870.3700)
NOAEL (developmental toxicity, inhalation, rabbit)	45 ppm (<i>methyl acrylate</i>) (developmental toxicity) (OECD Guideline 414, EPA OPPTS 870.3700)

STOT-single exposure

STOT Single Exp. 3. H335: May cause respiratory irritation.

Affected organs: Respiratory tract. Route of exposure: Inhalation

Repeated dose toxicity

CLP classification (Regulation (EC) No 1272/2008): Specific Target Organ Toxicity: Repeated Exposure: no classification required.

Inhalation - systemic effects (target organ) digestive: liver; respiratory: nose

<i>2-ethylhexyl acrylate (CAS 103-11-7)</i>	
NOAEC, subchronic, inhalation, rat, male/female	0.075 mg/L (10 ppm) air (nominal) (Local effects: degeneration of the olfactory epithelial layer in the cranial part of the nasal cavity)

	(OECD Guideline 413)
NOAEC subchronic, inhalation, rat, male/female	0.226 mg/L (30 ppm) air (nominal) (Systemic effects: Clinical chemistry: elevated activities of transaminase and alkaline phosphatase (OECD Guideline 413)
LOAEC subchronic, inhalation, rat, male/female	0.226 mg/L (30 ppm) air (nominal) (Local effects: degeneration of the olfactory epithelial layer in the cranial part of the nasal cavity) (OECD Guideline 413)
LOAEC subchronic, inhalation, rat, male/female	0.753 mg/L (100 ppm) (nominal) (Systemic effects: Clinical chemistry: elevated activities of transaminase and alkaline phosphatase) (OECD Guideline 413)
NOAEL, subchronic, dermal, mouse, male	170 mg/kg bw/day (nominal) (Local skin effects)

Aspiration hazard No data available.

Additional information

SECTION 12. ECOLOGICAL INFORMATION

12.1. Toxicity

2-ethylhexyl acrylate (CAS 103-11-7)

Fish (Short-term toxicity)

LC50 (96h)	1.81 mg/L - <i>Oncorhynchus mykiss</i> (freshwater) (semi-static) (OECD Guideline 203)
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Fish (Long-term toxicity)

Not applicable.

Aquatic invertebrates (Short-term toxicity)

EC50 (48 h)	1.3 mg/L - <i>Daphnia magna</i> (freshwater) (static) (closed system) (OECD Guideline 202)
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Aquatic invertebrates (Long-term toxicity)

NOEC (21 d)	0.19 mg/L (<i>ethyl acrylate</i>) - <i>Daphnia magna</i> (freshwater) (flow-through) (EPA OTS 797.1330)
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NOEC (21 d)	0.136 mg/L (<i>n-butyl acrylate</i>) - <i>Daphnia magna</i> (freshwater) (semi-static)(OECD Guideline 211)
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Algae and aquatic plants

EC50 (72h)	1.71 mg/L - <i>Desmodesmus subspicatus</i> , (freshwater) (static) (OECD Guideline 201)
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NOEC (72h)	0.45 mg/L - <i>Desmodesmus subspicatus</i> (freshwater) (static) (OECD Guideline 201)
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Toxicity to aquatic micro-organisms

EC20 (30 min)	> 1000 mg/L activated sludge, domestic (ISO 8192)
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TTC	2.3 mg/L - <i>Chilomonas paramecium</i> (cell multiplication inhibition test)
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Toxicity to soil micro-organisms

EC50 (28 d)	> 1000 mg/kg soil dw (<i>methyl acrylate</i>) (OECD Guideline 217)
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12.2. Persistence and degradability

Abiotic degradation:	2-Ethylhexyl acrylate will be rapidly degraded by photochemical processes after exposure to the air reacting with the photochemically produced hydroxyl radicals and with ozone. <u>Hydrolysis</u> Half-life of 2-Ethylhexyl acrylate in water at pH 7 and 25 °C was determined to be approximately 9 d (= 210 h)
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	Hydrolysis rate constant: 210 d at 25 °C (EPA OTS 796.3500) <u>Phototransformation/ photolysis in air</u> Half-life (DT50): 19.15 h (24-h day) (QSAR data)
Biodegradation	<u>Biodegradation in water:</u> Readily biodegradable. % Degradation of test substance: 70-80 % after 15 d (O2 consumption, EU Method C.4-D) <u>Biodegradation in soil:</u> 2-Ethylhexyl acrylate is expected to be biodegradable in soil.
Persistence and degradability	In contact with water 2-Ethylhexyl acrylate will hydrolyse slowly. Based on the compound's vapour pressure and Henry's Law constant, slow evaporation from the water surface can be expected. Thus, photodegradation may play a considerable role under environmental conditions. 2-Ethylhexyl acrylate is readily biodegradable according to OECD criteria.

12.3. Bioaccumulative potential

Aquatic bioaccumulation:	Limited potential for bioaccumulation BCF: 270 (log Pow) (The BCF was calculated based on the log Pow = 4.09.)
Secondary poisoning:	Based on the available information, the potential for bioaccumulation or biomagnification along the food chain is low.

12.4. Environmental distribution

Adsorption/ desorption soil	Adsorption of 2-Ethylhexyl acrylate to solid soil phase is not expected. log Koc = 2.63; Koc = 429 (QSAR)
Volatilization	From the water surface, 2-Ethylhexyl acrylate will slowly evaporate into the atmosphere. Henry's Law constant H: 68 Pa m ³ /mol at 25 °C (QSAR)
Environmental distribution	Percent distribution in media: Air (%): 91 Water (%): 1.12 Soil (%): 3.88 Sediment (%): 3.92 Susp. sediment (%): 0.03 Biota (%): 0 Aerosol (%): 0

12.5. Results of PBT and vPvB assessment

Regarding all available data on biotic and abiotic degradation, bioaccumulation and toxicity it can be stated that the substance does not fulfil the PBT criteria (not PBT) and not the vPvB criteria (not vPvB).

12.6. Other adverse effects

Not available.

SECTION 13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Waste disposal recommendations	This product, when being disposed of in its unused and uncontaminated state should be treated as a hazardous waste according to EC Directive 91/689/EEC. Any disposal practices must be in compliance with all national and provincial laws and any municipal or local by-laws governing hazardous waste. For used, contaminated and residual materials additional evaluations may be required. Do not dump into any sewers, on the ground, or into any body of water. <u>Waste treatment methods</u> Must be sent to a suitable incineration plant, observing local authority regulations. <u>Contaminated packaging</u> Dispose of as unused product. CONTAINERS MAY
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BE HAZARDOUS WHEN EMPTY. Since emptied containers retain product residue follow all SDS and label warnings even after container is emptied. Do not burn, or use a cutting torch on, the empty drum. Pursue safe, legal methods for recycle of empty containers. Improper disposal or re-use of this container may be dangerous and illegal. Refer to applicable local, state and federal regulations.

European List of Waste (LoW) code European Waste Catalogue (2000/532/EC)
 The definitive assignment of this material to the appropriate EWC group and thus its proper EWC code will depend on the use that is made of this material.
 Contact the authorized waste disposal services.

SECTION 14. TRANSPORT INFORMATION	
14.1. Land transport (ADR/ RID)	
UN-No.	Not applicable.
Proper Shipping Name:	Not regulated.
Hazard class:	Not applicable.
Packing group:	Not applicable.
Hazard label:	Not applicable.
Classification Code:	Not applicable.
Hazard identification number (HIN):	Not applicable.
Tunnel restriction code (ADR)	Not applicable.
Environmental hazard:	Not applicable.
14.2. Inland waterway transport (ADN)	
UN-No.	Not applicable.
Proper Shipping Name:	Not regulated.
Hazard class:	Not applicable.
Packing group:	Not applicable.
Hazard label:	Not applicable.
Classification Code:	Not applicable.
Hazard identification number (HIN):	Not applicable.
Environmental hazard:	Not applicable.
14.3. Sea transport (IMDG)	
UN-No.	Not applicable.
Proper Shipping Name:	Not regulated.
Hazard class:	Not applicable
Packing group:	Not applicable
Hazard label:	Not applicable
EmS-No. (Fire)	Not applicable
EmS-No. (Spillage)	Not applicable
Marine pollutant:	Not applicable
14.4. Air transport (IATA/ICAO)	
UN-No.	Not applicable
Proper Shipping Name:	Not regulated.
Hazard class:	Not applicable
Packing group:	Not applicable
Hazard label:	Not applicable
ERG Code	Not applicable
Environmental hazard:	Not applicable

14.5. Special precautions for user

Always transport in closed containers. Ensure that persons transporting the product know what to do in the event of an accident or spillage. For information regarding Exposure Controls/Personal Protection see Section 8 of the SDS

14.6. Transport in bulk according to Annex II of Marpol and the IBC Code

No data available

SECTION 15. REGULATORY INFORMATION

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

15.1.1. EU-Regulations

Authorisations and/or restrictions on use (Annex XVII): Not applicable.

2-ethylhexyl acrylate (CAS 103-11-7) is not on the REACH Candidate List.

2-ethylhexyl acrylate (CAS 103-11-7) is not on the REACH Annex XIV List.

Other information, restriction and prohibition regulations
 Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex I and Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer. Annex II - Not listed.

Directive 2013/39/EU priority substances in the field of water policy (amending Directive 2006/60/EC – Water Framework Directive and Directive 2008/105/EC on environmental quality standards in the field of water policy): Not listed.

Regulation (EC) No 850/2004 on persistent organic pollutants: Annex III – Not listed.

Regulation (EC) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of dangerous chemicals: Not listed.

Comission Regulation (EU) No. 10/2011 Plastics in contact with food: Listed. Annex 1. Use as additive or polymer production aid -no. Use as monomer or other starting substance or macromolecule obtained from microbial fermentation - yes. FRF not applicable. SML=0,05 mg/kg.

15.1.2. National regulations

Germany AwSV: WGK 1 - low hazard to waters

Germany BfR: V. Polysterene produced exclusively from the Polymerisation of Sterene. VI. Styrene Copolymers and Graft Polymers, and Mixtures of Polysterene with other polymers.

Sweden
 PRIO database listed. Priority Level: Priority risk reduction substance; Criteria: Allergenic

Switzerland
 Packaging inks
 Annex 10 listed. Part A: evaluation substances. List 1. Specific migration limit= 0,05 mg/kg.

15.2. Chemical safety assessment

Chemical Safety Report has been performed for 2-ethylhexyl acrylate (CAS 103-11-7).

SECTION 16. OTHER INFORMATION

16.1. Indication of changes

Version	Date of change	Section	Description of changes
1.0	25/01/2017	All	Initial SDS.
1.1	07/12/2018	9	Physical and chemical properties were updated.
2.0	14/05/2019	1-16, Annex	SDS have been corrected in according to new data of Registration dossier, Chemical Safety Report

16.2. Abbreviations and acronyms		
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road	
AGS	The German Committee on Hazardous Substances (Ausschuss für Gefahrstoffe – AGS)	
BCF	Bioconcentration factor	
DFG	Germany Research Foundation	
DNEL	Derived No Effect Level	
IMDG	International Maritime Dangerous Goods	
ICAO-TI	Technical Instructions for the Safe Transport of Dangerous Goods by Air	
K _{oc}	Adsorption coefficient	
K _{ow}	octanol-water partition coefficient	
LC50	Lethal Concentration to 50 % of a test population	
LD50	Lethal Dose to 50% of a test population (Median Lethal Dose)	
LOAEC	Lowest Observable Adverse Effect Concentration	
LTEL	Long Term Exposure Limit	
NIOSH	National Institute for Occupational Safety and Health (<i>USA CDC</i>)	
NOEC	No Observed Effect Concentration	
NOAEL	No Observed Adverse Effect Level	
OECD	Organization for Economic Co-operation and Development	
OSHA	Occupational Safety & Health Administration (<i>USA</i>)	
PNEC	Predicted No Effect Concentration	
PBT	Persistent, bioaccumulative, toxic chemical	
vPvB	Very Persistent, Very Bioaccumulative	
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail	
SCOEL	Scientific Committee on Occupational Exposure Limits	
STEL	Short Term Exposure Limit	
STP	sewage treatment plant	
STOT	Specific Target Organ Toxicity	
(STOT) RE	Repeated Exposure	
(STOT) SE	Single Exposure	
TWA	Time Weighted Average	
UN	United Nations	
WGK	Wassergefährdungsklasse (<i>German: Water Hazard Class</i>)	
16.3. Full text of H- and EUH-statements:		
H315	Skin Irrit. 2	Causes skin irritation
H317	Skin Sens. 1	May cause an allergic skin reaction.
H335	STOT Single Exp. 3	May cause respiratory irritation. Specific target organ toxicity - single (affected organs: respiratory tract).
H412	Aquatic Chronic 3.	Harmful to aquatic life with long lasting effects.
H302:	Acute Tox. 4	Harmful if swallowed
H319	Eye Irrit. 2	Causes serious eye irritation.
16.4. List of ES (exposure scenario) given in Appendix I to the extended SDS		
ES1	Manufacture and distribution of the substance	
ES2	Polymerisation at production facilities	

ES3	Polymerisation at downstream user facilities
ES4a	Formulation of monomeric 2-EHA up to 21% in paints and adhesives
ES4b	Use of formulated monomeric 2-EHA up to 21% in paints and adhesives
ES5	Use as laboratory reagent

16.5. Key literature references and sources

DOCUMENTS, PROVIDED BY CONSORTIUM:

CHEMICAL SAFETY REPORT to 2-ethylhexyl acrylate (CAS 103-11-7)

EU DIRECTIVES

REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.

Regulation (EC) No 1272/2008 REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006.

Regulations. Commission regulation (EU) no 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH).

COMMISSION DECISION of 16 January 2001 amending Decision 2000/532/EC as regards the list of wastes (notified under document number (2001/118/EC).

UK REGULATORY REFERENCES

Chemicals (Hazard Information & Packaging) Regulations. The Control of Substances Hazardous to Health Regulations 1988. Health and Safety at Work Act 1974.

ENVIRONMENTAL LISTING

Control of Pollution Act 1974.

STATUTORY INSTRUMENTS

Notification of New Substances Regulations (NONS) 1993. The Export and Import of Dangerous Chemicals Regulations 2005 number 928.

APPROVED CODE OF PRACTICE

Classification and Labelling of Substances and Preparations Dangerous for Supply (EU 2001/59/EC). Safety Data Sheets for Substances and Preparations (REACH).

GUIDANCE NOTES

Workplace Exposure Limits EH40. Introduction to Local Exhaust Ventilation HS(G)37. CHIP for everyone HSG(108).

Training advice

Personnel handling the product has to be acquainted demonstrably with its hazardous properties, with health and environmental protection principles related to the product and first aid principles.

DISCLAIMER

This information is based on our current level of knowledge. This information may be subject to revision as new knowledge and experience becomes available, and SIBUR makes no warranties and assumes no liability in connection with any use of this information. Since SIBUR cannot be aware of all aspects of your business and the impact the REACH Regulation has for your company, SIBUR strongly encourages you to get familiar with the REACH Regulation in order to comply with its requirements and timelines.

ANNEX. EXPOSURE SCENARIOS

Exposure Scenario 1 (ES1): Manufacture and distribution of the substance

Free short title	Manufacture and distribution of the substance			
Systematic title based on use descriptor	ERC 1; PROC 1, 2, 3, 8a, 8b, and 9			
Name of contributing environmental scenario and corresponding ERC	ERC 1 - Production of a chemical substance.			
Name(s) of contributing worker scenarios and corresponding PROCs	PROC1: Use in closed process, no likelihood of exposure; Industrial setting. PROC2: Use in closed, continuous process with occasional controlled exposure (e.g. sampling); Industrial setting. PROC3: Use in closed batch process (synthesis or formulation); Industrial setting. 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).			
Operational conditions and risk management measures				
Industrial dedicated processes Manufacture of the substance is limited to 3 production sites in Europe.				
Contributing Scenario (1) controlling environmental exposure for ERC 1				
Free short title	Production 2-EHA at production sites			
Use descriptor covered	ERC 1			
Description	Production of organic and inorganic substances in chemical, petrochemical, primary metals and minerals industry including intermediates, monomers using continuous processes or batch processes applying dedicated or multi-purpose equipment, either technically controlled or operated by manual interventions.			
Assessment Method	EUSES v2.1.2			
Product characteristics				
Physical state	liquid			
Concentration of substance	100%			
Amounts used				
	Site X	Site Y	Site Z	(Total in Europe)
Daily use at a site (tons/day production)	314	145	24.2	-
Annual use at a site (kilotons/year)	94.2	43.5	7.25	145 (total)
Fraction of the main local source	1	1	1	
Frequency and duration of use	300 days (no. of emission days/year)			
Pattern of release to the environment	Continuous			
Environment factors not influenced by risk management				
Receiving surface water flow rate	≥ 18000 m ³ /d (default)			
Other given operational conditions affecting environmental exposure				

Industry category	3: Chemical industry: chemicals used in synthesis			
Use category	33: Intermediates			
Main category industrial use	Ic: Intermediates stored off-site/dedicated equipment.			
Extra details on use category	Wet process Substance processed elsewhere (internal and external polymerisation being subject to separate ES below)			
Emission tables	Production: A1.2, B1.6			
Release fraction to air from process (production)				1E-04 (default)
Release fraction to wastewater from process (production)				3E-03 (default)
Release fraction to industrial soil from process (production)				1E-04 (default)
Technical conditions and measures at process level (source) to prevent release				
Not relevant				
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil				
Not relevant				
Organizational measures to prevent/limit release from site				
Not relevant				
Conditions and measures related to municipal sewage treatment plant				
Sewage Treatment Plant (STP)	Yes (freshwater and marine assessment)			
Discharge rate of the STP	≥ 2000 m ³ /d (default)			
STP sludge fate	Do not spread on agricultural soil.			
Concentration of chemical (total) in the STP effluent *	≤10 µg/L, based on measures			
Conditions and measures related to external treatment of waste for disposal				
Not relevant				
Conditions and measures related to external recovery of waste				
Not relevant				
Exposure for environment				
Site	X	Y	Z	Units
Compartment	PEC	PEC	PEC	
STP	1E-02	1E-02	1E-02	mg/L
Freshwater	1.43E-03	1.43E-03	1.43E-03	mg/L
Freshwater sediment	0.0145	0.0145	0.0145	mg/kg wwt
Soil (agricultural)	2.64E-03	1.22E-03	2.03E-04	mg/kg wwt
Marine water	1.32E-04	1.32E-04	1.32E-04	mg/l
Marine water sediment	1.33E-03	1.33E-03	1.33E-03	mg/kg wwt
Local total daily intake man via environment	7.57E-03	3.81E-03	1.13E-03	mg/kg bw/d
Air	0.0207	9.55E-03	1.59E-03	mg/m ³
* Analytical monitoring of the plant effluent and STP effluent at all 3 production sites of 2-EHA in Europe were performed, revealing no concentrations above the limit of quantification of 1 µg/l. Based on these results, an overestimate of 0.01 mg.L-1 (10 µg/l) was input into EUSES as the concentration in STP effluent at all production sites. This assumption of 10 µg/l is considered conservative since measured values were all below 1 µg/l.				
Contributing Scenario (2) controlling industrial worker exposure for PROC 1				
Workers related free short title	Use in closed process, no likelihood of exposure.			
Use descriptor covered	PROC 1			

Processes, tasks, activities covered	Use of the substance in high integrity contained system where little potential exists for exposures, e.g. any sampling via closed loop systems.	
Assessment Method	ECETOC TRA 2.0	
Product characteristic		
Physical state	liquid	
Concentration of substance	100%	
Amounts used		
This information is not relevant for assessment of worker's exposure.		
Operational conditions affecting workers exposure		
Location	Inside	<i>Outdoor location is covered by this worst case inside location.</i>
Domain	Industrial	
Frequency and duration of use/exposure		
Duration of exposure	> 4 hours/day	<i>Lower durations of exposure are covered by this worst case duration</i>
Frequency of exposure	Not specified (exposure every day is covered)	
Human factors not influenced by risk management		
Exposed skin surface	Palm of one hand (240 cm ²)	
Technical conditions and measures to control dispersion from source towards the worker		
Not applicable – closed system		
Organisational measures to prevent /limit releases, dispersion and exposure		
Training of operators, supervision, risk management systems		
Conditions and measures related to personal protection, hygiene and health evaluation		
Gloves (90% effectiveness)	yes	
Exposure concentrations for workers		
Route of exposure	Concentration	
	level	units
Exposure, local, dermal	10	µg/cm ²
Exposure, local, inhalative	0.0768	mg/m ³
Contributing Scenario (3) controlling industrial worker exposure for PROC 2		
Workers related free short title	Use in closed, continuous process with occasional controlled exposure (e.g. sampling).	
Use descriptor covered	PROC 2	
Processes, tasks, activities covered	Continuous process but where the design philosophy is not specifically aimed at minimizing emissions. It is not high integrity and occasional exposure will arise e.g. through maintenance, sampling and equipment breakings.	
Assessment Method	ECETOC TRA 2.0	
Product characteristic		
Physical state	liquid	
Concentration of substance	100%	
Amounts used		
This information is not relevant for assessment of worker's exposure.		

Operational conditions affecting workers exposure		
Location	Inside	<i>Outside locations are covered by this worst case Indoor location.</i>
Domain	Industrial	
Frequency and duration of use/exposure		
Duration of exposure	> 4 hours/day	<i>Lower duration of exposure are covered by this worst case duration</i>
Frequency of exposure	Not specified (exposure every day is covered)	
Human factors not influenced by risk management		
Exposed skin surface	Palm of both hands (480 cm ²)	
Technical conditions and measures to control dispersion from source towards the worker		
Local exhaust ventilation	No	
Organisational measures to prevent /limit releases, dispersion and exposure		
Training of operators, supervision, risk management systems		
Conditions and measures related to personal protection, hygiene and health evaluation		
Gloves (90% effectiveness)	yes	
Exposure concentrations for workers		
Route of exposure	Concentration	
	level	units
Exposure, local, dermal	20	µg/cm ²
Exposure, local, inhalative	7.68	mg/m ³
Contributing Scenario (4) controlling industrial worker exposure for PROC 3		
Workers related free short title	Use in closed batch process (synthesis or formulation); Industrial setting.	
Use descriptor covered	PROC 3	
Processes, tasks, activities covered	Batch manufacture of a chemical or formulation where the predominant handling is in a contained manner, but where some opportunity for contact with chemicals occurs (e.g. through sampling).	
Assessment Method	ECETOC TRA 2.0	
Product characteristic		
Physical state	liquid	
Concentration of substance	100%	
Amounts used		
This information is not relevant for assessment of worker's exposure.		
Operational conditions affecting workers exposure		
Location	Inside	<i>Outdoor locations are covered by this worst case inside location.</i>
Domain	Industrial	
Frequency and duration of use/exposure		
Duration of exposure	> 4 hours/day	<i>Lower durations of exposure are covered by this worst case duration</i>
Frequency of exposure	Not specified (exposure every day is covered)	
Human factors not influenced by risk management		
Exposed skin surface	Palm of one hand (240 cm ²)	

Technical conditions and measures to control dispersion from source towards the worker				
Local exhaust ventilation	No			
Organisational measures to prevent /limit releases, dispersion and exposure				
Training of operators, supervision, risk management systems				
Conditions and measures related to personal protection, hygiene and health evaluation				
Gloves (90% effectiveness)	yes			
Exposure concentrations for workers				
Route of exposure	Concentration			
	level	units		
Exposure, local, dermal	10	µg/cm ²		
Exposure, local, inhalative	23.0	mg/m ³		
Contributing Scenario (5) controlling industrial worker exposure for PROC 8a				
Workers related free short title	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities			
Use descriptor covered	PROC 8a			
Processes, tasks, activities covered	Sampling, loading, filling, transfer, dumping, bagging in non dedicated facilities. Exposure related to dust, vapour, aerosols or spillage, and cleaning of equipment to be expected.			
Assessment Method	ECETOC TRA 2.0			
Product characteristic				
Physical state	liquid			
Concentration of substance	100%			
Amounts used				
This information is not relevant for assessment of worker's exposure.				
Human factors not influenced by risk management				
Exposed skin surface	Both sides of both hands (960 cm ²)			
Organisational measures to prevent /limit releases, dispersion and exposure				
Training of operators, supervision, risk management systems				
Operational conditions affecting workers exposure				
Domain	Industrial			
Scenarios	A	B	C	D
Location	Outdoor	Indoor	Indoor	Indoor
Frequency and duration of use/exposure				
Duration of exposure (hours/day)	< 4	> 4	> 4	< 1
Frequency of exposure	Not specified (exposure every day is covered)			
Technical conditions and measures to control dispersion from source towards the worker				
Local exhaust ventilation	n.a.	No	Yes	No
Conditions and measures related to personal protection, hygiene and health evaluation				
Suitable respiratory protection (90% effectiveness)	No	Yes	No	No
Gloves (90% effectiveness)	Yes			
Exposure concentrations for workers				
Scenario	A	B, C	D	units

Route of exposure					
Exposure, local, dermal	100	100	100	µg/cm ²	
Exposure, local, inhalative	32.2	7.68	15.4	mg/m ³	
Contributing Scenario (6) controlling industrial worker exposure for PROC 8b					
Workers related free short title	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.				
Use descriptor covered	PROC 8b				
Processes, tasks, activities covered	Sampling, loading, filling, transfer, dumping, bagging in non dedicated facilities. Exposure related to dust, vapour, aerosols or spillage, and cleaning of equipment to be expected.				
Assessment Method	ECETOC TRA 2.0				
Product characteristic					
Physical state	liquid				
Concentration of substance	100%				
Amounts used					
This information is not relevant for assessment of worker's exposure.					
Human factors not influenced by risk management					
Exposed skin surface	Palm of both hands (480 cm ²)				
Organisational measures to prevent /limit releases, dispersion and exposure					
Training of operators, supervision, risk management systems					
Operational conditions affecting workers exposure					
Domain	Industrial				
Scenarios	A	B	C	D	
Location	Outdoor	Indoor	Indoor	Indoor	
Frequency and duration of use/exposure					
Duration of exposure (hours/day)	> 4	> 4	> 4	< 4	
Frequency of exposure	Not specified (exposure every day is covered)				
Technical conditions and measures to control dispersion from source towards the worker					
Local exhaust ventilation	n.a.	No	Yes	No	
Conditions and measures related to personal protection, hygiene and health evaluation					
Suitable respiratory protection (90% effectiveness)	No	Yes	No	No	
Gloves (90% effectiveness)	Yes				
Exposure concentrations for workers					
Scenario	A	B	C	D	units
Route of exposure					
Exposure, local, dermal	100	100	100	100	µg/cm ²
Exposure, local, inhalative	26.9	3.84	1.15	23.0	mg/m ³
Contributing Scenario (7) controlling industrial worker exposure for PROC 9					
Workers related free short title	Transfer of substance or preparation into small containers (dedicated filling line, including weighing).				
Use descriptor covered	PROC 9				

Processes, tasks, activities covered	Transfer of substance or preparation into small containers (dedicated filling line, including weighing).				
Assessment Method	ECETOC TRA 2.0				
Product characteristic					
Physical state	liquid				
Concentration of substance	100%				
Amounts used					
This information is not relevant for assessment of worker's exposure.					
Human factors not influenced by risk management					
Exposed skin surface	Palm of two hands (480 cm ²)				
Organisational measures to prevent /limit releases, dispersion and exposure					
Training of operators, supervision, risk management systems					
Operational conditions affecting workers exposure					
Domain	Industrial				
Scenarios	A	B	C	D	
Location	Outdoor	Indoor	Indoor	Indoor	
Frequency and duration of use/exposure					
Duration of exposure (hours/day)	> 4	> 4	> 4	< 4	
Frequency of exposure	Not specified (exposure every day is covered)				
Technical conditions and measures to control dispersion from source towards the worker					
Local exhaust ventilation	n.a.	No	Yes	No	
Conditions and measures related to personal protection, hygiene and health evaluation					
Suitable respiratory protection (90% effectiveness)	No	Yes	No	No	
Gloves (90% effectiveness)	Yes				
Exposure concentrations for workers					
Scenario	A	B	C	D	units
Route of exposure					
Exposure, local, dermal	100	100	100	100	µg/cm ²
Exposure, local, inhalative	26.9	3.84	3.84	23.0	mg/m ³

Exposure Scenario 2 (ES2): Polymerization at production facilities

Free short title	Polymerization at production facilities.
Systematic title based on use descriptor	ERC 6C, 6D; PROC 1, 2, 3, 4, 5, 8a, 8b, 9
Name of contributing environmental scenario and corresponding ERC	ERC 6c: Industrial use of monomers in the production of plastics (thermoplastics), polymerisation processes. ERC 6d: Industrial use of chemicals in the production of thermosets and rubbers, polymer processing.
Name(s) of contributing worker scenarios and corresponding PROCs	PROC1: Use in closed process, no likelihood of exposure; Industrial setting. PROC2: Use in closed, continuous process with occasional controlled exposure (e.g. sampling); Industrial setting. PROC3: Use in closed batch process (synthesis or formulation); Industrial setting. PROC4: Batch process where significant opportunity for exposure arises PROC5: Mixing or blending in batch process for formulation of preparations 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).
Operational conditions and risk management measures	
Industrial dedicated processes 3 production sites in Europe	
Contributing Scenario (1) controlling environmental exposure for ERC 6C, 6D	
Free short title	Industrial use of process regulators/monomers for polymerisation
Use descriptor covered	ERC 6C, 6D
Description	ERC6c: Industrial use of monomers in the production of plastics (thermoplastics), polymerisation processes. ERC6d: Industrial use of chemicals in the production of thermosets and rubbers, polymer processing.
Assessment Method	EUSES v2.1.2
Product characteristics	
Physical state	liquid
Concentration of substance	100%
Amounts used	
Daily use at a site (tons/day use)	73
Annual use at a site (and total in Europe) (kilotons/year)	21.9 (66.3)
Fraction of the main local source	0.33
Frequency and duration of use	300 days (no. of emission days/year)
Pattern of release to the environment	Continuous
Environment factors not influenced by risk management	
Receiving surface water flow rate	≥ 18,000 m ³ /d (default)
Other given operational conditions affecting environmental exposure	

Industry category	11: Polymers industry	
Use category	33: Intermediates	
Main category industrial use	Polymerisation processes	
Extra details on use category	Wet : monomers	
Emission tables	A3.10, B3.9	
Release fraction to air from process (industrial use)	1E-03 (default)	
Release fraction to wastewater from process (industrial use)	1E-05 (default)	
Release fraction to soil from process (industrial use)	0 (default)	
Technical conditions and measures at process level (source) to prevent release		
Not relevant		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil		
Not relevant		
Organizational measures to prevent/limit release from site		
Not relevant		
Conditions and measures related to municipal sewage treatment plant		
Sewage Treatment Plant (STP)	Yes (freshwater and marine assessment)	
Discharge rate of the STP	≥ 2000 m ³ /d (default)	
STP sludge fate	Do not spread on agricultural soil.	
Concentration of chemical (total) in the STP effluent *	≤10 µg/L, based on measures	
Conditions and measures related to external treatment of waste for disposal		
Not relevant		
Conditions and measures related to external recovery of waste		
Not relevant		
Exposure for environment		
Compartment	PEC	Units
STP	1E-02	mg/L
Freshwater	1.43E-03	mg/L
Freshwater sediment	0.0145	mg/kg wwt
Soil (agricultural)	1.82E-03	mg/kg wwt
Marine water	1.32E-04	mg/l
Marine water sediment	1.33E-03	mg/kg wwt
Local total daily intake man via environment	7.38E-03	mg/kg bw/d
Air	0.0203	mg/m ³
* Analytical monitoring of the plant effluent and STP effluent at all 3 production sites of 2-EHA in Europe were performed, revealing no concentrations above the limit of quantification of 1 µg/l. Based on these results, an overestimate of 0.01 mg.L ⁻¹ (10 µg/l) was input into EUSES as concentration in STP effluent at all production sites. This assumption of 10 µg/l is considered conservative since measured values were all below 1 µg/l.		
Contributing Scenario (2) controlling industrial worker exposure for PROC 1		
Workers related free short title	Use in closed process, no likelihood of exposure.	
Use descriptor covered	PROC 1	
Processes, tasks, activities covered	Use of the substance in high integrity contained system where little potential exists for exposures, e.g. any sampling via closed loop systems.	

Assessment Method		ECETOC TRA 2.0
Product characteristic		
Physical state	liquid	
Concentration of substance	100%	
Amounts used		
This information is not relevant for assessment of worker's exposure.		
Operational conditions affecting workers exposure		
Location	Inside	<i>Outdoor location is covered by this worst case inside location.</i>
Domain	Industrial	
Frequency and duration of use/exposure		
Duration of exposure	> 4 hours/day	<i>Lower durations of exposure are covered by this worst case duration</i>
Frequency of exposure	Not specified (exposure every day is covered)	
Human factors not influenced by risk management		
Exposed skin surface	Palm of one hand (240 cm ²)	
Technical conditions and measures to control dispersion from source towards the worker		
Not applicable – closed system		
Organisational measures to prevent /limit releases, dispersion and exposure		
Training of operators, supervision, risk management systems		
Conditions and measures related to personal protection, hygiene and health evaluation		
Gloves (90% effectiveness)	yes	
Exposure concentrations for workers		
Route of exposure	Concentration	
	level	units
Exposure, local, dermal	10	µg/cm ²
Exposure, local, inhalative	0.0768	mg/m ³
Contributing Scenario (3) controlling industrial worker exposure for PROC 2		
Workers related free short title	Use in closed, continuous process with occasional controlled exposure (e.g. sampling).	
Use descriptor covered	PROC 2	
Processes, tasks, activities covered	Continuous process but where the design philosophy is not specifically aimed at minimizing emissions. It is not high integrity and occasional exposure will arise e.g. through maintenance, sampling and equipment breakings.	
Assessment Method	ECETOC TRA 2.0	
Product characteristic		
Physical state	liquid	
Concentration of substance	100%	
Amounts used		
This information is not relevant for assessment of worker's exposure.		
Operational conditions affecting workers exposure		
Location	Inside	<i>Outside locations are covered by</i>

		<i>this worst case Indoor location.</i>
Domain	Industrial	
Frequency and duration of use/exposure		
Duration of exposure	> 4 hours/day	<i>Lower duration of exposure are covered by this worst case duration</i>
Frequency of exposure	Not specified (exposure every day is covered)	
Human factors not influenced by risk management		
Exposed skin surface	Palm of both hands (480 cm ²)	
Technical conditions and measures to control dispersion from source towards the worker		
Local exhaust ventilation	No	
Organisational measures to prevent /limit releases, dispersion and exposure		
Training of operators, supervision, risk management systems		
Conditions and measures related to personal protection, hygiene and health evaluation		
Gloves (90% effectiveness)	yes	
Exposure concentrations for workers		
Route of exposure	Concentration	
	level	units
Exposure, local, dermal	20	µg/cm ²
Exposure, local, inhalative	7.68	mg/m ³
Contributing Scenario (4) controlling industrial worker exposure for PROC 3		
Workers related free short title	Use in closed batch process (synthesis or formulation); Industrial setting.	
Use descriptor covered	PROC 3	
Processes, tasks, activities covered	Batch manufacture of a chemical or formulation where the predominant handling is in a contained manner, but where some opportunity for contact with chemicals occurs (e.g. through sampling).	
Assessment Method	ECETOC TRA 2.0	
Product characteristic		
Physical state	liquid	
Concentration of substance	100%	
Amounts used		
This information is not relevant for assessment of worker's exposure.		
Operational conditions affecting workers exposure		
Location	Inside	<i>Outdoor locations are covered by this worst case inside location.</i>
Domain	Industrial	
Frequency and duration of use/exposure		
Duration of exposure	> 4 hours/day	<i>Lower durations of exposure are covered by this worst case duration</i>
Frequency of exposure	Not specified (exposure every day is covered)	
Human factors not influenced by risk management		
Exposed skin surface	Palm of one hand (240 cm ²)	
Technical conditions and measures to control dispersion from source towards the worker		
Local exhaust ventilation	No	

Organisational measures to prevent /limit releases, dispersion and exposure				
Training of operators, supervision, risk management systems				
Conditions and measures related to personal protection, hygiene and health evaluation				
Gloves (90% effectiveness)	yes			
Exposure concentrations for workers				
Route of exposure	Concentration			
	level	units		
Exposure, local, dermal	10	µg/cm ²		
Exposure, local, inhalative	23.0	mg/m ³		
Contributing Scenario (5) controlling industrial worker exposure for PROC 4				
Workers related free short title	Use in batch and other process where opportunity for exposure arises; Industrial setting.			
Use descriptor covered	PROC 4			
Processes, tasks, activities covered	Batch use of a chemical where significant opportunity for exposure arises, e.g. during charging, sampling or discharge of material, and when the nature of the design is likely to result in exposure			
Assessment Method	ECETOC TRA 2.0			
Product characteristic				
Physical state	liquid			
Concentration of substance	100%			
Amounts used				
This information is not relevant for assessment of worker's exposure.				
Human factors not influenced by risk management				
Exposed skin surface	Palm of both hands (480 cm ²)			
Organisational measures to prevent /limit releases, dispersion and exposure				
Training of operators, supervision, risk management systems				
Operational conditions affecting workers exposure				
Domain	Industrial			
Scenarios	A	B	C	D
Location	Outdoor	Indoor	Indoor	Indoor
Frequency and duration of use/exposure				
Duration of exposure (hours/day)	> 4	> 4	> 4	< 4
Frequency of exposure	Not specified (exposure every day is covered)			
Technical conditions and measures to control dispersion from source towards the worker				
Local exhaust ventilation	n.a.	No	Yes	No
Conditions and measures related to personal protection, hygiene and health evaluation				
Suitable respiratory protection (90% effectiveness)	No	Yes	No	No
Gloves (90% effectiveness)	Yes			
Exposure concentrations for workers				
Scenario	A	B, C	D	units
Route of exposure				

Exposure, local, dermal	100	100	100	µg/cm ²
Exposure, local, inhalative	26.9	3.84	23.0	mg/m ³
Contributing Scenario (6) controlling industrial worker exposure for PROC 5				
Workers related free short title	Mixing and blending in batch processes.			
Use descriptor covered	PROC 5			
Processes, tasks, activities covered	Manufacture or formulation of chemical products or articles using technologies related to mixing and blending of solid or liquid materials, and where the process is in stages and provides the opportunity for significant contact at any stage.			
Assessment Method	ECETOC TRA 2.0			
Product characteristic				
Physical state	liquid			
Concentration of substance	< 25%			
Amounts used				
This information is not relevant for assessment of worker's exposure.				
Human factors not influenced by risk management				
Exposed skin surface	Palm of both hands (480 cm ²)			
Organisational measures to prevent /limit releases, dispersion and exposure				
Training of operators, supervision, risk management systems				
Operational conditions affecting workers exposure				
Domain	Industrial			
Location	Indoor	<i>Outdoor locations are covered by this worst case inside location</i>		
Frequency and duration of use/exposure				
Duration of exposure (hours/day)	> 4			
Frequency of exposure	Not specified (exposure every day is covered)			
Technical conditions and measures to control dispersion from source towards the worker				
Local exhaust ventilation	no			
Conditions and measures related to personal protection, hygiene and health evaluation				
Gloves (90% effectiveness)	yes			
Exposure concentrations for workers				
Route of exposure	Concentration			
	level	units		
Exposure, local, dermal	120	µg/cm ²		
Exposure, local, inhalative	23.0	mg/m ³		
Contributing Scenario (7) controlling industrial worker exposure for PROC 8a				
Workers related free short title	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities			
Use descriptor covered	PROC 8a			
Processes, tasks, activities covered	Sampling, loading, filling, transfer, dumping, bagging in non dedicated facilities. Exposure related to dust, vapour, aerosols or spillage, and cleaning of equipment to be expected.			

Assessment Method		ECETOC TRA 2.0			
Product characteristic					
Physical state		liquid			
Concentration of substance		100%			
Amounts used					
This information is not relevant for assessment of worker's exposure.					
Human factors not influenced by risk management					
Exposed skin surface		Both sides of both hands (960 cm ²)			
Organisational measures to prevent /limit releases, dispersion and exposure					
Training of operators, supervision, risk management systems					
Operational conditions affecting workers exposure					
Domain		Industrial			
Scenarios		A	B	C	D
Location		Outdoor	Indoor	Indoor	Indoor
Frequency and duration of use/exposure					
Duration of exposure (hours/day)		< 4	> 4	> 4	< 1
Frequency of exposure		Not specified (exposure every day is covered)			
Technical conditions and measures to control dispersion from source towards the worker					
Local exhaust ventilation		n.a.	No	Yes	No
Conditions and measures related to personal protection, hygiene and health evaluation					
Suitable respiratory protection (90% effectiveness)		No	Yes	No	No
Gloves (90% effectiveness)		Yes			
Exposure concentrations for workers					
Scenario		A	B, C	D	units
Route of exposure					
Exposure, local, dermal		100	100	100	µg/cm ²
Exposure, local, inhalative		32.2	7.68	15.4	mg/m ³
Contributing Scenario (8) controlling industrial worker exposure for PROC 8b					
Workers related free short title		Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.			
Use descriptor covered		PROC 8b			
Processes, tasks, activities covered		Sampling, loading, filling, transfer, dumping, bagging in non dedicated facilities. Exposure related to dust, vapour, aerosols or spillage, and cleaning of equipment to be expected.			
Assessment Method		ECETOC TRA 2.0			
Product characteristic					
Physical state		liquid			
Concentration of substance		100%			
Amounts used					
This information is not relevant for assessment of worker's exposure.					
Human factors not influenced by risk management					

Exposed skin surface	Palm of both hands (480 cm ²)				
Organisational measures to prevent /limit releases, dispersion and exposure					
Training of operators, supervision, risk management systems					
Operational conditions affecting workers exposure					
Domain	Industrial				
Scenarios	A	B	C	D	
Location	Outdoor	Indoor	Indoor	Indoor	
Frequency and duration of use/exposure					
Duration of exposure (hours/day)	> 4	> 4	> 4	< 4	
Frequency of exposure	Not specified (exposure every day is covered)				
Technical conditions and measures to control dispersion from source towards the worker					
Local exhaust ventilation	n.a.	No	Yes	No	
Conditions and measures related to personal protection, hygiene and health evaluation					
Suitable respiratory protection (90% effectiveness)	No	Yes	No	No	
Gloves (90% effectiveness)	Yes				
Exposure concentrations for workers					
Scenario	A	B	C	D	units
Route of exposure					
Exposure, local, dermal	100	100	100	100	µg/cm ²
Exposure, local, inhalative	26.9	3.84	1.15	23.0	mg/m ³
Contributing Scenario (9) controlling industrial worker exposure for PROC 9					
Workers related free short title	Transfer of substance or preparation into small containers (dedicated filling line, including weighing).				
Use descriptor covered	PROC 9				
Processes, tasks, activities covered	Transfer of substance or preparation into small containers (dedicated filling line, including weighing).				
Assessment Method	ECETOC TRA 2.0				
Product characteristic					
Physical state	liquid				
Concentration of substance	100%				
Amounts used					
This information is not relevant for assessment of worker's exposure.					
Human factors not influenced by risk management					
Exposed skin surface	Palm of two hands (480 cm ²)				
Organisational measures to prevent /limit releases, dispersion and exposure					
Training of operators, supervision, risk management systems					
Operational conditions affecting workers exposure					
Domain	Industrial				
Scenarios	A	B	C	D	
Location	Outdoor	Indoor	Indoor	Indoor	
Frequency and duration of use/exposure					

Duration of exposure (hours/day)	> 4	> 4	> 4	< 4	
Frequency of exposure	Not specified (exposure every day is covered)				
Technical conditions and measures to control dispersion from source towards the worker					
Local exhaust ventilation	n.a.	No	Yes	No	
Conditions and measures related to personal protection, hygiene and health evaluation					
Suitable respiratory protection (90% effectiveness)	No	Yes	No	No	
Gloves (90% effectiveness)	Yes				
Exposure concentrations for workers					
Scenario	A	B	C	D	units
Route of exposure					
Exposure, local, dermal	100	100	100	100	µg/cm ²
Exposure, local, inhalative	26.9	3.84	3.84	23.0	mg/m ³

Exposure Scenario 3 (ES3): Polymerization at downstream user facilities

Free short title	Polymerization at downstream user facilities.
Systematic title based on use descriptor	ERC 6C, 6D; PROC 1, 2, 3, 4, 5, 8a, 8b, 9
Name of contributing environmental scenario and corresponding ERC	ERC 6c: Industrial use of monomers in the production of plastics (thermoplastics), polymerisation processes. ERC 6d: Industrial use of chemicals in the production of thermosets and rubbers, polymer processing.
Name(s) of contributing worker scenarios and corresponding PROCs	PROC1: Use in closed process, no likelihood of exposure; Industrial setting. PROC2: Use in closed, continuous process with occasional controlled exposure (e.g. sampling); Industrial setting. PROC3: Use in closed batch process (synthesis or formulation); Industrial setting. PROC4: Batch process where significant opportunity for exposure arises PROC5: Mixing or blending in batch process for formulation of preparations 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)
Operational conditions and risk management measures	
Industrial dedicated processes	
Contributing Scenario (1) controlling environmental exposure for ERC 6C, 6D	
Free short title	Industrial use of process regulators/monomers for polymerisation
Use descriptor covered	ERC 6C, 6D
Description	ERC6c: Industrial use of monomers in the production of plastics (thermoplastics), polymerisation processes. ERC6d: Industrial use of chemicals in the production of thermosets and rubbers, polymer processing.
Assessment Method	EUSES v2.1.2
Product characteristics	
Physical state	liquid
Concentration of substance	100%
Amounts used	
Daily use at a site (tons/day use)	24.6
Annual use at a site (and total in Europe) (kilotons/year)	7.37 (73.7)
Fraction of the main local source	0.1 (higher than TGD/EUSES defaults)
Frequency and duration of use	300 days (no. of emission days/year)
Pattern of release to the environment	Continuous
Environment factors not influenced by risk management	
Receiving surface water flow rate	≥ 18,000 m ³ /d (default)
Other given operational conditions affecting environmental exposure	
Industry category	11: Polymers industry

Use category	33: Intermediates	
Main category industrial use	Polymerisation processes	
Extra details on use category	Wet : monomers	
Emission tables	A3.10, B3.9	
Release fraction to air from process (industrial use)	1E-03 (default)	
Release fraction to wastewater from process (industrial use)	1E-05 (default)	
Release fraction to soil from process (industrial use)	0 (default)	
Technical conditions and measures at process level (source) to prevent release		
Not relevant		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil		
Not relevant		
Organizational measures to prevent/limit release from site		
Not relevant		
Conditions and measures related to municipal sewage treatment plant		
Sewage Treatment Plant (STP)	Yes (freshwater and marine assessment)	
Discharge rate of the STP	≥ 2000 m3/d (default)	
STP sludge fate	Not specified (recovery, incineration, landfilling all covered)	
Conditions and measures related to external treatment of waste for disposal		
Not relevant		
Conditions and measures related to external recovery of waste		
Not relevant		
Exposure for environment		
Compartment	PEC	Units
STP	1.26E-02	mg/L
Freshwater	1.69E-03	mg/L
Freshwater sediment	0.0170	mg/kg ww
Soil (agricultural)	0.0108*	mg/kg ww
Marine water	1.58E-04	mg/l
Marine water sediment	1.59E-03	mg/kg ww
Local total daily intake man via environment	3.14E-03	mg/kg bw/d
Air	6.83E-03	mg/m ⁻³
* averaged over 30 days (worst-case)		
Contributing Scenario (2) controlling industrial worker exposure for PROC 1		
Workers related free short title	Use in closed process, no likelihood of exposure.	
Use descriptor covered	PROC 1	
Processes, tasks, activities covered	Use of the substance in high integrity contained system where little potential exists for exposures, e.g. any sampling via closed loop systems.	
Assessment Method	ECETOC TRA 2.0	
Product characteristic		
Physical state	liquid	
Concentration of substance	100%	

Amounts used		
This information is not relevant for assessment of worker's exposure.		
Operational conditions affecting workers exposure		
Location	Inside	<i>Outdoor location is covered by this worst case inside location.</i>
Domain	Industrial	
Frequency and duration of use/exposure		
Duration of exposure	> 4 hours/day	<i>Lower durations of exposure are covered by this worst case duration</i>
Frequency of exposure	Not specified (exposure every day is covered)	
Human factors not influenced by risk management		
Exposed skin surface	Palm of one hand (240 cm ²)	
Technical conditions and measures to control dispersion from source towards the worker		
Not applicable – closed system		
Organisational measures to prevent /limit releases, dispersion and exposure		
Training of operators, supervision, risk management systems		
Conditions and measures related to personal protection, hygiene and health evaluation		
Gloves (90% effectiveness)	yes	
Exposure concentrations for workers		
Route of exposure	Concentration	
	level	units
Exposure, local, dermal	10	µg/cm ²
Exposure, local, inhalative	0.0768	mg/m ³
Contributing Scenario (3) controlling industrial worker exposure for PROC 2		
Workers related free short title	Use in closed, continuous process with occasional controlled exposure (e.g. sampling).	
Use descriptor covered	PROC 2	
Processes, tasks, activities covered	Continuous process but where the design philosophy is not specifically aimed at minimizing emissions. It is not high integrity and occasional exposure will arise e.g. through maintenance, sampling and equipment breakings.	
Assessment Method	ECETOC TRA 2.0	
Product characteristic		
Physical state	liquid	
Concentration of substance	100%	
Amounts used		
This information is not relevant for assessment of worker's exposure.		
Operational conditions affecting workers exposure		
Location	Inside	<i>Outside locations are covered by this worst case Indoor location.</i>
Domain	Industrial	
Frequency and duration of use/exposure		
Duration of exposure	> 4 hours/day	<i>Lower duration of exposure are</i>

		<i>covered by this worst case duration</i>
Frequency of exposure	Not specified (exposure every day is covered)	
Human factors not influenced by risk management		
Exposed skin surface	Palm of both hands (480 cm ²)	
Technical conditions and measures to control dispersion from source towards the worker		
Local exhaust ventilation	No	
Organisational measures to prevent /limit releases, dispersion and exposure		
Training of operators, supervision, risk management systems		
Conditions and measures related to personal protection, hygiene and health evaluation		
Gloves (90% effectiveness)	yes	
Exposure concentrations for workers		
Route of exposure	Concentration	
	level	units
Exposure, local, dermal	20	µg/cm ²
Exposure, local, inhalative	7.68	mg/m ³
Contributing Scenario (4) controlling industrial worker exposure for PROC 3		
Workers related free short title	Use in closed batch process (synthesis or formulation); Industrial setting.	
Use descriptor covered	PROC 3	
Processes, tasks, activities covered	Batch manufacture of a chemical or formulation where the predominant handling is in a contained manner, but where some opportunity for contact with chemicals occurs (e.g. through sampling).	
Assessment Method	ECETOC TRA 2.0	
Product characteristic		
Physical state	liquid	
Concentration of substance	100%	
Amounts used		
This information is not relevant for assessment of worker's exposure.		
Operational conditions affecting workers exposure		
Location	Inside	<i>Outdoor locations are covered by this worst case inside location.</i>
Domain	Industrial	
Frequency and duration of use/exposure		
Duration of exposure	> 4 hours/day	<i>Lower durations of exposure are covered by this worst case duration</i>
Frequency of exposure	Not specified (exposure every day is covered)	
Human factors not influenced by risk management		
Exposed skin surface	Palm of one hand (240 cm ²)	
Technical conditions and measures to control dispersion from source towards the worker		
Local exhaust ventilation	No	
Organisational measures to prevent /limit releases, dispersion and exposure		
Training of operators, supervision, risk management systems		
Conditions and measures related to personal protection, hygiene and health evaluation		

Gloves (90% effectiveness)	yes			
Exposure concentrations for workers				
Route of exposure	Concentration			
	level	units		
Exposure, local, dermal	10	µg/cm ²		
Exposure, local, inhalative	23.0	mg/m ³		
Contributing Scenario (5) controlling industrial worker exposure for PROC 4				
Workers related free short title	Use in batch and other process where opportunity for exposure arises; Industrial setting.			
Use descriptor covered	PROC 4			
Processes, tasks, activities covered	Batch use of a chemical where significant opportunity for exposure arises, e.g. during charging, sampling or discharge of material, and when the nature of the design is likely to result in exposure			
Assessment Method	ECETOC TRA 2.0			
Product characteristic				
Physical state	liquid			
Concentration of substance	100%			
Amounts used				
This information is not relevant for assessment of worker's exposure.				
Human factors not influenced by risk management				
Exposed skin surface	Palm of both hands (480 cm ²)			
Organisational measures to prevent /limit releases, dispersion and exposure				
Training of operators, supervision, risk management systems				
Operational conditions affecting workers exposure				
Domain	Industrial			
Scenarios	A	B	C	D
Location	Outdoor	Indoor	Indoor	Indoor
Frequency and duration of use/exposure				
Duration of exposure (hours/day)	> 4	> 4	> 4	< 4
Frequency of exposure	Not specified (exposure every day is covered)			
Technical conditions and measures to control dispersion from source towards the worker				
Local exhaust ventilation	n.a.	No	Yes	No
Conditions and measures related to personal protection, hygiene and health evaluation				
Suitable respiratory protection (90% effectiveness)	No	Yes	No	No
Gloves (90% effectiveness)	Yes			
Exposure concentrations for workers				
Scenario	A	B, C	D	units
Route of exposure				
Exposure, local, dermal	100	100	100	µg/cm ²
Exposure, local, inhalative	26.9	3.84	23.0	mg/m ³
Contributing Scenario (6) controlling industrial worker exposure for PROC 5				

Workers related free short title	Mixing and blending in batch processes.	
Use descriptor covered	PROC 5	
Processes, tasks, activities covered	Manufacture or formulation of chemical products or articles using technologies related to mixing and blending of solid or liquid materials, and where the process is in stages and provides the opportunity for significant contact at any stage.	
Assessment Method	ECETOC TRA 2.0	
Product characteristic		
Physical state	liquid	
Concentration of substance	25%	
Amounts used		
This information is not relevant for assessment of worker's exposure.		
Human factors not influenced by risk management		
Exposed skin surface	Palm of both hands (480 cm ²)	
Organisational measures to prevent /limit releases, dispersion and exposure		
Training of operators, supervision, risk management systems		
Operational conditions affecting workers exposure		
Domain	Industrial	
Location	Indoor	<i>Outdoor locations are covered by this worst case inside location</i>
Frequency and duration of use/exposure		
Duration of exposure (hours/day)	> 4	
Frequency of exposure	Not specified (exposure every day is covered)	
Technical conditions and measures to control dispersion from source towards the worker		
Local exhaust ventilation	no	
Conditions and measures related to personal protection, hygiene and health evaluation		
Gloves (90% effectiveness)	yes	
Exposure concentrations for workers		
Route of exposure	Concentration	
	level	units
Exposure, local, dermal	120	µg/cm ²
Exposure, local, inhalative	23.0	mg/m ³
Contributing Scenario (7) controlling industrial worker exposure for PROC 8a		
Workers related free short title	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	
Use descriptor covered	PROC 8a	
Processes, tasks, activities covered	Sampling, loading, filling, transfer, dumping, bagging in non dedicated facilities. Exposure related to dust, vapour, aerosols or spillage, and cleaning of equipment to be expected.	
Assessment Method	ECETOC TRA 2.0	
Product characteristic		
Physical state	liquid	
Concentration of substance	100%	

Amounts used					
This information is not relevant for assessment of worker's exposure.					
Human factors not influenced by risk management					
Exposed skin surface		Both sides of both hands (960 cm ²)			
Organisational measures to prevent /limit releases, dispersion and exposure					
Training of operators, supervision, risk management systems					
Operational conditions affecting workers exposure					
Domain		Industrial			
Scenarios		A	B	C	D
Location		Outdoor	Indoor	Indoor	Indoor
Frequency and duration of use/exposure					
Duration of exposure (hours/day)		< 4	> 4	> 4	< 1
Frequency of exposure		Not specified (exposure every day is covered)			
Technical conditions and measures to control dispersion from source towards the worker					
Local exhaust ventilation		n.a.	No	Yes	No
Conditions and measures related to personal protection, hygiene and health evaluation					
Suitable respiratory protection (90% effectiveness)		No	Yes	No	No
Gloves (90% effectiveness)		Yes			
Exposure concentrations for workers					
Scenario		A	B, C	D	units
Route of exposure					
Exposure, local, dermal		100	100	100	µg/cm ²
Exposure, local, inhalative		32.2	7.68	15.4	mg/m ³
Contributing Scenario (8) controlling industrial worker exposure for PROC 8b					
Workers related free short title		Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.			
Use descriptor covered		PROC 8b			
Processes, tasks, activities covered		Sampling, loading, filling, transfer, dumping, bagging in non dedicated facilities. Exposure related to dust, vapour, aerosols or spillage, and cleaning of equipment to be expected.			
Assessment Method		ECETOC TRA 2.0			
Product characteristic					
Physical state		liquid			
Concentration of substance		100%			
Amounts used					
This information is not relevant for assessment of worker's exposure.					
Human factors not influenced by risk management					
Exposed skin surface		Palm of both hands (480 cm ²)			
Organisational measures to prevent /limit releases, dispersion and exposure					
Training of operators, supervision, risk management systems					
Operational conditions affecting workers exposure					

Domain	Industrial				
Scenarios	A	B	C	D	
Location	Outdoor	Indoor	Indoor	Indoor	
Frequency and duration of use/exposure					
Duration of exposure (hours/day)	> 4	> 4	> 4	< 4	
Frequency of exposure	Not specified (exposure every day is covered)				
Technical conditions and measures to control dispersion from source towards the worker					
Local exhaust ventilation	n.a.	No	Yes	No	
Conditions and measures related to personal protection, hygiene and health evaluation					
Suitable respiratory protection (90% effectiveness)	No	Yes	No	No	
Gloves (90% effectiveness)	Yes				
Exposure concentrations for workers					
Scenario	A	B	C	D	units
Route of exposure					
Exposure, local, dermal	100	100	100	100	µg/cm ²
Exposure, local, inhalative	26.9	3.84	1.15	23.0	mg/m ³
Contributing Scenario (9) controlling industrial worker exposure for PROC 9					
Workers related free short title	Transfer of substance or preparation into small containers (dedicated filling line, including weighing).				
Use descriptor covered	PROC 9				
Processes, tasks, activities covered	Transfer of substance or preparation into small containers (dedicated filling line, including weighing).				
Assessment Method	ECETOC TRA 2.0				
Product characteristic					
Physical state	liquid				
Concentration of substance	100%				
Amounts used					
This information is not relevant for assessment of worker's exposure.					
Human factors not influenced by risk management					
Exposed skin surface	Palm of two hands (480 cm ²)				
Organisational measures to prevent /limit releases, dispersion and exposure					
Training of operators, supervision, risk management systems					
Operational conditions affecting workers exposure					
Domain	Industrial				
Scenarios	A	B	C	D	
Location	Outdoor	Indoor	Indoor	Indoor	
Frequency and duration of use/exposure					
Duration of exposure (hours/day)	> 4	> 4	> 4	< 4	
Frequency of exposure	Not specified (exposure every day is covered)				
Technical conditions and measures to control dispersion from source towards the worker					
Local exhaust ventilation	n.a.	No	Yes	No	

Conditions and measures related to personal protection, hygiene and health evaluation					
Suitable respiratory protection (90% effectiveness)	No	Yes	No	No	
Gloves (90% effectiveness)	Yes				
Exposure concentrations for workers					
Scenario	A	B	C	D	units
Route of exposure					
Exposure, local, dermal	100	100	100	100	µg/cm ²
Exposure, local, inhalative	26.9	3.84	3.84	23.0	mg/m ³

Exposure Scenario 4 (ES4a): Formulation of monomeric 2-EHA up to 21% in paints and adhesives

Free short title	Industrial production of preparations containing up to 21% 2-EHA
Systematic title based on use descriptor	ERC 2; PROC 1, 2, 3, 5, 8a, 8b, 9
Name of contributing environmental scenario and corresponding ERC	ERC 2: Formulation of preparations.
Name(s) of contributing worker scenarios and corresponding PROCs	<p>PROC1: Use in closed process, no likelihood of exposure; Industrial setting.</p> <p>PROC2: Use in closed, continuous process with occasional controlled exposure (e.g. sampling); Industrial setting.</p> <p>PROC3: Use in closed batch process (synthesis or formulation); Industrial setting.</p> <p>PROC5: Mixing or blending in batch process for formulation of preparations</p> <p>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities</p> <p>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing).</p>
Operational conditions and risk management measures	
Industrial dedicated processes	
Contributing Scenario (1) controlling environmental exposure for ERC 2	
Free short title	Industrial formulation
Use descriptor covered	ERC 2
Description	ERC2: Formulation of preparations
Assessment Method	EUSES v2.1.2
Product characteristics	
Physical state	liquid
Concentration of substance	21%
Amounts used	
Daily use at a site (tons 2EHA/day use)	13.3
Annual use at a site (and total in Europe) (tons 2EHA/year)	4.000 (5.000)
Fraction of the main local source	0.8 (TGD default)
Frequency and duration of use	300 days (no. of emission days/year)
Pattern of release to the environment	Continuous
Environment factors not influenced by risk management	
Receiving surface water flow rate	≥ 18,000 m ³ /d (default)
Other given operational conditions affecting environmental exposure	
Industry category	14: Paints, lacquers and varnishes industry
Use category	55/0: Other (coatings; the monomer reacts at final use)
Main category industrial use	Ib: Dedicated equipment, (very) little cleaning
Extra details on use category	Water- or solvent-based (both covered as releases are the same) Constructions, maintenance, etc.

Emission tables	A2.1, B2.3	
Release fraction to air from process (formulation)	1E-03 (default)	
Release fraction to wastewater from process (formulation)	3E-03 (default)	
Release fraction to soil from process (formulation)	1E-04 (default)	
Technical conditions and measures at process level (source) to prevent release		
Not relevant		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil		
Not relevant		
Organizational measures to prevent/limit release from site		
Not relevant		
Conditions and measures related to municipal sewage treatment plant		
Sewage Treatment Plant (STP)	Yes (freshwater and marine assessment)	
Discharge rate of the STP	≥ 2000 m ³ /d (default)	
STP sludge fate	Do not spread on agricultural soil.	
Concentration of chemical (total) in the STP effluent*	≤10 µg/L	
Conditions and measures related to external treatment of waste for disposal		
Not relevant		
Conditions and measures related to external recovery of waste		
Not relevant		
Exposure for environment		
Compartment	PEC	Units
STP	1E-02	mg/L
Freshwater	1.43E-03	mg/L
Freshwater sediment	0.0145	mg/kg wwt
Soil (agricultural)	4.11E-04	mg/kg wwt
Marine water	1.32E-04	mg/l
Marine water sediment	1.33E-03	mg/kg wwt
Local total daily intake man via environment	1.84E-03	mg/kg bw/d
Air	3.71E-03	mg/m ³
* Analytical monitoring of the plant effluent and STP effluent at all 3 production sites of 2-EHA in Europe were performed, revealing no concentrations above the limit of quantification of 1 µg/l. Based on these results, an overestimate of 0.01 mg.L ⁻¹ (10 µg/l) was input into EUSES, as a maximal concentration in industrial downstream user STP effluent, by extrapolation from the situation at production sites. This assumption of 10 µg/l is considered conservative since measured values were all below 1 µg/l.		
Contributing Scenario (2) controlling industrial worker exposure for PROC 1		
Workers related free short title	Use in closed process, no likelihood of exposure.	
Use descriptor covered	PROC 1	
Processes, tasks, activities covered	Use of the substance in high integrity contained system where little potential exists for exposures, e.g. any sampling via closed loop systems.	
Assessment Method	ECETOC TRA 2.0	
Product characteristic		
Physical state	liquid	
Concentration of substance	100%	

Amounts used		
This information is not relevant for assessment of worker's exposure.		
Operational conditions affecting workers exposure		
Location	Inside	<i>Outdoor location is covered by this worst case inside location.</i>
Domain	Industrial	
Frequency and duration of use/exposure		
Duration of exposure	> 4 hours/day	<i>Lower durations of exposure are covered by this worst case duration</i>
Frequency of exposure	Not specified (exposure every day is covered)	
Human factors not influenced by risk management		
Exposed skin surface	Palm of one hand (240 cm ²)	
Technical conditions and measures to control dispersion from source towards the worker		
Not applicable – closed system		
Organisational measures to prevent /limit releases, dispersion and exposure		
Training of operators, supervision, risk management systems		
Conditions and measures related to personal protection, hygiene and health evaluation		
Gloves (90% effectiveness)	yes	
Exposure concentrations for workers		
Route of exposure	Concentration	
	level	units
Exposure, local, dermal	10	µg/cm ²
Exposure, local, inhalative	0.0768	mg/m ³
Contributing Scenario (3) controlling industrial worker exposure for PROC 2		
Workers related free short title	Use in closed, continuous process with occasional controlled exposure (e.g. sampling).	
Use descriptor covered	PROC 2	
Processes, tasks, activities covered	Continuous process but where the design philosophy is not specifically aimed at minimizing emissions. It is not high integrity and occasional exposure will arise e.g. through maintenance, sampling and equipment breakings.	
Assessment Method	ECETOC TRA 2.0	
Product characteristic		
Physical state	liquid	
Concentration of substance	100%	
Amounts used		
This information is not relevant for assessment of worker's exposure.		
Operational conditions affecting workers exposure		
Location	Inside	<i>Outside locations are covered by this worst case Indoor location.</i>
Domain	Industrial	
Frequency and duration of use/exposure		
Duration of exposure	> 4 hours/day	<i>Lower duration of exposure are</i>

		<i>covered by this worst case duration</i>
Frequency of exposure	Not specified (exposure every day is covered)	
Human factors not influenced by risk management		
Exposed skin surface	Palm of both hands (480 cm ²)	
Technical conditions and measures to control dispersion from source towards the worker		
Local exhaust ventilation	No	
Organisational measures to prevent /limit releases, dispersion and exposure		
Training of operators, supervision, risk management systems		
Conditions and measures related to personal protection, hygiene and health evaluation		
Gloves (90% effectiveness)	yes	
Exposure concentrations for workers		
Route of exposure	Concentration	
	level	units
Exposure, local, dermal	20	µg/cm ²
Exposure, local, inhalative	7.68	mg/m ³
Contributing Scenario (4) controlling industrial worker exposure for PROC 3		
Workers related free short title	Use in closed batch process (synthesis or formulation); Industrial setting.	
Use descriptor covered	PROC 3	
Processes, tasks, activities covered	Batch manufacture of a chemical or formulation where the predominant handling is in a contained manner, but where some opportunity for contact with chemicals occurs (e.g. through sampling).	
Assessment Method	ECETOC TRA 2.0	
Product characteristic		
Physical state	liquid	
Concentration of substance	100%	
Amounts used		
This information is not relevant for assessment of worker's exposure.		
Operational conditions affecting workers exposure		
Location	Inside	<i>Outdoor locations are covered by this worst case inside location.</i>
Domain	Industrial	
Frequency and duration of use/exposure		
Duration of exposure	> 4 hours/day	<i>Lower durations of exposure are covered by this worst case duration</i>
Frequency of exposure	Not specified (exposure every day is covered)	
Human factors not influenced by risk management		
Exposed skin surface	Palm of one hand (240 cm ²)	
Technical conditions and measures to control dispersion from source towards the worker		
Local exhaust ventilation	No	
Organisational measures to prevent /limit releases, dispersion and exposure		
Training of operators, supervision, risk management systems		
Conditions and measures related to personal protection, hygiene and health evaluation		

Gloves (90% effectiveness)	yes			
Exposure concentrations for workers				
Route of exposure	Concentration			
	level	units		
Exposure, local, dermal	10	µg/cm ²		
Exposure, local, inhalative	23.0	mg/m ³		
Contributing Scenario (5) controlling industrial worker exposure for PROC 5				
Workers related free short title	Mixing or blending in batch process to produce a mixture at ≤21%.			
Use descriptor covered	PROC 5			
Processes, tasks, activities covered	Manufacture or formulation of chemical products or articles using technologies related to mixing and blending of solid or liquid materials, and where the process is in stages and provides opportunity for significant contact at any stage. Also covers the initial mixing stage (concentration of 100%).			
Assessment Method	ECETOC TRA 2.0			
Product characteristic				
Physical state	liquid			
Concentration of substance	100% (covers initial mixing stage)			
Amounts used				
This information is not relevant for assessment of worker's exposure.				
Human factors not influenced by risk management				
Exposed skin surface	Palm of both hands (480 cm ²)			
Organisational measures to prevent /limit releases, dispersion and exposure				
Training of operators, supervision, risk management systems				
Operational conditions affecting workers exposure				
Domain	Industrial			
Scenarios	A	B	C	D
Location	Outdoor	Indoor	Indoor	Indoor
Frequency and duration of use/exposure				
Duration of exposure (hours/day)	> 4	> 4	> 4	< 4
Frequency of exposure	Not specified (exposure every day is covered)			
Technical conditions and measures to control dispersion from source towards the worker				
Local exhaust ventilation	n.a.	No	Yes	No
Conditions and measures related to personal protection, hygiene and health evaluation				
Suitable respiratory protection (90% effectiveness)	No	Yes	No	No
Gloves (90% effectiveness)	yes			
Exposure concentrations for workers				
Scenario	A	B, C	D	units
Route of exposure				
Exposure, local, dermal	200	200	200	µg/cm ²
Exposure, local, inhalative	26.9	3.84	23.0	mg/m ³

Contributing Scenario (6) controlling industrial worker exposure for PROC 8a				
Workers related free short title	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities			
Use descriptor covered	PROC 8a			
Processes, tasks, activities covered	Sampling, loading, filling, transfer, dumping, bagging in non dedicated facilities. Exposure related to dust, vapour, aerosols or spillage, and cleaning of equipment to be expected.			
Assessment Method	ECETOC TRA 2.0			
Product characteristic				
Physical state	liquid			
Concentration of substance	100%			
Amounts used				
This information is not relevant for assessment of worker's exposure.				
Human factors not influenced by risk management				
Exposed skin surface	Both sides of both hands (960 cm ²)			
Organisational measures to prevent /limit releases, dispersion and exposure				
Training of operators, supervision, risk management systems				
Operational conditions affecting workers exposure				
Domain	Industrial			
Scenarios	A	B	C	D
Location	Outdoor	Indoor	Indoor	Indoor
Frequency and duration of use/exposure				
Duration of exposure (hours/day)	< 4	> 4	> 4	< 1
Frequency of exposure	Not specified (exposure every day is covered)			
Technical conditions and measures to control dispersion from source towards the worker				
Local exhaust ventilation	n.a.	No	Yes	No
Conditions and measures related to personal protection, hygiene and health evaluation				
Suitable respiratory protection (90% effectiveness)	No	Yes	No	No
Gloves (90% effectiveness)	Yes			
Exposure concentrations for workers				
Scenario	A	B, C	D	units
Route of exposure				
Exposure, local, dermal	100	100	100	µg/cm ²
Exposure, local, inhalative	32.2	7.68	15.4	mg/m ³
Contributing Scenario (7) controlling industrial worker exposure for PROC 8b				
Workers related free short title	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.			
Use descriptor covered	PROC 8b			
Processes, tasks, activities covered	Sampling, loading, filling, transfer, dumping, bagging in non dedicated facilities. Exposure related to dust, vapour, aerosols or spillage, and cleaning of equipment to be expected.			
Assessment Method	ECETOC TRA 2.0			

Product characteristic					
Physical state	liquid				
Concentration of substance	100%				
Amounts used					
This information is not relevant for assessment of worker's exposure.					
Human factors not influenced by risk management					
Exposed skin surface	Palm of both hands (480 cm ²)				
Organisational measures to prevent /limit releases, dispersion and exposure					
Training of operators, supervision, risk management systems					
Operational conditions affecting workers exposure					
Domain	Industrial				
Scenarios	A	B	C	D	
Location	Outdoor	Indoor	Indoor	Indoor	
Frequency and duration of use/exposure					
Duration of exposure (hours/day)	> 4	> 4	> 4	< 4	
Frequency of exposure	Not specified (exposure every day is covered)				
Technical conditions and measures to control dispersion from source towards the worker					
Local exhaust ventilation	n.a.	No	Yes	No	
Conditions and measures related to personal protection, hygiene and health evaluation					
Suitable respiratory protection (90% effectiveness)	No	Yes	No	No	
Gloves (90% effectiveness)	Yes				
Exposure concentrations for workers					
Scenario	A	B	C	D	units
Route of exposure					
Exposure, local, dermal	100	100	100	100	µg/cm ²
Exposure, local, inhalative	26.9	3.84	1.15	23.0	mg/m ³
Contributing Scenario (8) controlling industrial worker exposure for PROC 9					
Workers related free short title	Transfer of substance or preparation into small containers (dedicated filling line, including weighing).				
Use descriptor covered	PROC 9				
Processes, tasks, activities covered	Transfer of substance or preparation into small containers (dedicated filling line, including weighing).				
Assessment Method	ECETOC TRA 2.0				
Product characteristic					
Physical state	liquid				
Concentration of substance	<25%				
Amounts used					
This information is not relevant for assessment of worker's exposure.					
Human factors not influenced by risk management					
Exposed skin surface	Palm of both hands (480 cm ²)				
Organisational measures to prevent /limit releases, dispersion and exposure					

Training of operators, supervision, risk management systems		
Operational conditions affecting workers exposure		
Domain	Industrial	
Location	Indoor	<i>Outdoor locations are covered by this worst case inside location</i>
Frequency and duration of use/exposure		
Duration of exposure (hours/day)	>4	
Frequency of exposure	Not specified (exposure every day is covered)	
Technical conditions and measures to control dispersion from source towards the worker		
Local exhaust ventilation	no	
Conditions and measures related to personal protection, hygiene and health evaluation		
Gloves (90% effectiveness)	yes	
Exposure concentrations for workers		
Route of exposure	Concentration	
	level	units
Exposure, local, dermal	60	µg/cm ²
Exposure, local, inhalative	23.0	mg/m ³

Exposure Scenario 5 (ES4b): Use of formulated monomeric 2-EHA up to 21% in paints and adhesives

Free short title	Industrial and professional use of preparations containing up to 21% 2-EHA
Systematic title based on use descriptor	ERC 6C, 6D, 8C, 8F; PROC 5, 7, 9, 10, 11, 12
Name of contributing environmental scenario and corresponding ERC	ERC6c: Industrial use of monomers in the production of plastics (thermoplastics), polymerisation processes. ERC6d: Industrial use of chemicals in the production of thermosets and rubbers, polymer processing. ERC8c: Professional indoor use of substances which will be physically or chemically bound into or onto a matrix such as binding agent in paints and coatings or adhesives. ERC8f: Professional outdoor use of substances which will be physically or chemically bound into or onto a matrix such as binding agent in paints and coatings or adhesives.
Name(s) of contributing worker scenarios and corresponding PROCs	PROC5: Mixing or blending in batch process for formulation of preparations PROC7: Industrial spraying PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC10: Roller application or brushing PROC 11: Non industrial spraying PROC 19: Hand mixing with intimate contact and only PPE available
Operational conditions and risk management measures	
Industrial dedicated processes	
Contributing Scenario (1) controlling environmental exposure for ERC 6c, 6d (industrial use)	
Free short title	Industrial use of process regulators/monomers for polymerisation processes in paints and adhesives
Use descriptor covered	ERC6c, 6d
Description	ERC6c: Industrial use of monomers in the production of plastics (thermoplastics), polymerisation processes. ERC6d: Industrial use of chemicals in the production of thermosets and rubbers, polymer processing.
Assessment Method	EUSES v2.1.2
Product characteristics	
Physical state	liquid
Concentration of substance	21%
Amounts used	
Daily use at a site (kg 2EHA/day use)	1,667
Annual use at a site (and total in Europe) (tons 2EHA/year)	500 (2,500)
Fraction of the main local source	0.2 (increased from TGD and EUSES defaults)
Frequency and duration of use	300 days (no. of emission days/year)
Pattern of release to the environment	Continuous
Environment factors not influenced by risk management	
Receiving surface water flow rate	≥ 18,000 m ³ /d (default)

Other given operational conditions affecting environmental exposure		
Industry category	14: Paint, lacquers and varnishes industry	
Use category	55/0: Other (coatings; the monomer reacts at final use)	
Extra details on use category	Water- or solvent-based (both covered: highest releases considered) Constructions, maintenance, etc.	
Emission tables	A3.15, B3.13	
Release fraction to air from process (industrial use)	1E-03 (default for solvent-based)	
Release fraction to wastewater from process (industrial use)	5E-03 (default for water-based)	
Release fraction to soil from process (industrial use)	5E-03 (same default for both)	
Technical conditions and measures at process level (source) to prevent release		
Not relevant		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil		
Not relevant		
Organizational measures to prevent/limit release from site		
Not relevant		
Conditions and measures related to municipal sewage treatment plant		
Sewage Treatment Plant (STP)	Yes (freshwater and marine assessment)	
Discharge rate of the STP	≥ 2000 m ³ /d (default)	
STP sludge fate	Do not spread on agricultural soil.	
Concentration of chemical (total) in the STP effluent*	≤10 µg/L	
Conditions and measures related to external treatment of waste for disposal		
Not relevant		
Conditions and measures related to external recovery of waste		
Not relevant		
Exposure for environment		
Compartment	PEC	Units
STP	1E-02	mg/L
Freshwater	1.43E-03	mg/L
Freshwater sediment	0.0145	mg/kg wwt
Soil (agricultural)	5.84E-05	mg/kg wwt
Marine water	1.32E-04	mg/l
Marine water sediment	1.33E-03	mg/kg wwt
Local total daily intake man via environment	7.51E-04	mg/kg bw/d
Air	4.63E-04	mg/m ³
* Analytical monitoring of the plant effluent and STP effluent at all 3 production sites of 2-EHA in Europe were performed, revealing no concentrations above the limit of quantification of 1 µg/l. Based on these results, an overestimate of 0.01 mg.L-1 (10 µg/l) was input into EUSES, as a maximal concentration in industrial downstream user STP effluent, by extrapolation from the situation at production sites. This assumption of 10 µg/l is considered conservative since measured values were all below 1 µg/l.		
Contributing Scenario (2) controlling environmental exposure for ERC 8c, 8f (professional use)		
Free short title	Wide dispersive indoor and outdoor use resulting in inclusion into or onto a matrix	
Use descriptor covered	ERC8c, 8f	
Description	Professional indoor and outdoor use of substances which will be	

	physically or chemically bound into or onto a matrix such as binding agent in paints and coatings or adhesives.	
Assessment Method	EUSES v2.1.2 This professional use was modelled within the “industrial use” life-cycle step of EUSES, but existence of a large number of point emission sources (e.g., paints used on roads) was modelled thanks to Fraction of the main local source (below).	
Product characteristics		
Physical state	liquid	
Concentration of substance	21%	
Amounts used		
Daily use at a site (<i>kg</i> 2EHA/day use)	6.67	
Annual use at a site (and total in Europe) (<i>tons</i> 2EHA/year)	1 (2,500)	
Fraction of the main local source	0.0004 (large number of point sources; higher than EUSES/TGD defaults for private use)	
Frequency and duration of use	150 days (no. of emission days/year; default reduced to model application on roads during dry seasons only)	
Pattern of release to the environment	Continuous	
Environment factors not influenced by risk management		
Receiving surface water flow rate	≥ 18,000 m ³ /d (default)	
Other given operational conditions affecting environmental exposure		
Industry category	14: Paint, lacquers and varnishes industry	
Use category	55/0: Other (coatings; the monomer reacts at final use)	
Extra details on use category	Water- or solvent-based (both covered: highest releases considered) Constructions, maintenance, etc.	
Emission tables	A3.15, B3.13	
Release fraction to air from process (professional use)	1E-03 (default for solvent-based)	
Release fraction to wastewater from process (professional use)	5E-03 (default for water-based)	
Release fraction to soil from process (professional use)	5E-03 (same default for both)	
Technical conditions and measures at process level (source) to prevent release		
Not relevant		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil		
Not relevant		
Organizational measures to prevent/limit release from site		
Not relevant		
Conditions and measures related to municipal sewage treatment plant		
Sewage Treatment Plant (STP)	No (dispersive use: not all emissions are directed to an STP)	
Conditions and measures related to external treatment of waste for disposal		
Not relevant		
Conditions and measures related to external recovery of waste		
Not relevant		
Exposure for environment		
Compartment	PEC	Units
STP	1.67E-02	mg/L

Freshwater	2.10E-03	mg/L
Freshwater sediment	0.0212	mg/kg wwt
Soil (agricultural)	6.55E-07	mg/kg wwt
Marine water	1.99E-04	mg/l
Marine water sediment	2.01E-03	mg/kg wwt
Local total daily intake man via environment	5.31E-04	mg/kg bw/d
Air	1.85E-06	mg/m ³
Contributing Scenario (3) controlling industrial worker exposure for PROC 5 (industrial settings)		
Workers related free short title	Mixing and blending in batch processes.	
Use descriptor covered	PROC 5	
Processes, tasks, activities covered	Manufacture or formulation of chemical products or articles using technologies related to mixing and blending of solid or liquid materials, and where the process is in stages and provides the opportunity for significant contact at any stage.	
Assessment Method	ECETOC TRA 2.0	
Product characteristic		
Physical state	liquid	
Concentration of substance	25%	
Amounts used		
This information is not relevant for assessment of worker's exposure.		
Human factors not influenced by risk management		
Exposed skin surface	Palm of both hands (480 cm ²)	
Organisational measures to prevent /limit releases, dispersion and exposure		
Training of operators, supervision, risk management systems		
Operational conditions affecting workers exposure		
Domain	Industrial	
Location	Indoor	<i>Outdoor locations are covered by this worst case inside location</i>
Frequency and duration of use/exposure		
Duration of exposure (hours/day)	> 4	
Frequency of exposure	Not specified (exposure every day is covered)	
Technical conditions and measures to control dispersion from source towards the worker		
Local exhaust ventilation	no	
Conditions and measures related to personal protection, hygiene and health evaluation		
Gloves (90% effectiveness)	yes	
Exposure concentrations for industrial workers		
Route of exposure	Concentration	
	level	units
Exposure, local, dermal	120	µg/cm ²
Exposure, local, inhalative	23.0	mg/m ³
Contributing Scenario (4) controlling professional worker exposure for PROC 5 (professional settings)		

Workers related free short title	Mixing or blending in batch process of preparations containing up to 21% 2-EHA				
Use descriptor covered	PROC 5				
Processes, tasks, activities covered	Manufacture or formulation of chemical products or articles using technologies related to mixing and blending of solid or liquid materials, and where the process is in stages and provides opportunity for significant contact at any stage				
Assessment Method	ECETOC TRA 2.0				
Product characteristic					
Physical state	liquid				
Concentration of substance	< 25%				
Amounts used					
This information is not relevant for assessment of worker's exposure.					
Human factors not influenced by risk management					
Exposed skin surface	Palm of both hands (480 cm ²)				
Organisational measures to prevent /limit releases, dispersion and exposure					
Training of operators, supervision, risk management systems					
Operational conditions affecting workers exposure					
Domain	Professional				
Scenarios	A	B	C	D	
Location	Outdoor	Indoor	Indoor	Indoor	
Frequency and duration of use/exposure					
Duration of exposure (hours/day)	> 4	> 4	> 4	< 4	
Frequency of exposure	Not specified (exposure every day is covered)				
Technical conditions and measures to control dispersion from source towards the worker					
Local exhaust ventilation	n.a.	No	Yes	No	
Conditions and measures related to personal protection, hygiene and health evaluation					
Suitable respiratory protection (90% effectiveness)	No	Yes	No	No	
Gloves (90% effectiveness)	Yes				
Exposure concentrations for professional workers					
Scenario	A	B	C	D	units
Route of exposure					
Exposure, local, dermal	120	120	120	120	µg/cm ²
Exposure, local, inhalative	32.2	4.61	9.21	27.6	mg/m ³
Contributing Scenario (5) controlling worker exposure for PROC 7					
Workers related free short title	Industrial spraying				
Use descriptor covered	PROC7				
Processes, tasks, activities covered	Air dispersive techniques, spraying for surface coatings, adhesives, polishes/cleaners.				
Assessment Method	ECETOC TRA 2.0				
Product characteristic					
Physical state	liquid				

Concentration of substance	< 25%			
Amounts used				
This information is not relevant for assessment of worker's exposure.				
Human factors not influenced by risk management				
Exposed skin surface	Two hands and forearms (1500 cm ²)			
Organisational measures to prevent /limit releases, dispersion and exposure				
Training of operators, supervision, risk management systems				
Operational conditions affecting workers exposure				
Domain	Industrial			
Scenarios	A	B	C	
Location	Indoor	Outdoor	Outdoor	
Frequency and duration of use/exposure				
Duration of exposure (hours/day)	> 4	> 4	< 15 min/day	
Frequency of exposure	Not specified (exposure every day is covered)			
Technical conditions and measures to control dispersion from source towards the worker				
Local exhaust ventilation	Yes	n.a.	n.a.	
Conditions and measures related to personal protection, hygiene and health evaluation				
Suitable respiratory protection (90% effectiveness)	No	Yes	No	
Gloves (90% effectiveness)	Yes			
Exposure concentrations for workers				
Scenario	A	B	C	units
Route of exposure				
Exposure, local, dermal	120	120	120	µg/cm ²
Exposure, local, inhalative	23.0	32.2	32.2	mg/m ³
Contributing Scenario (6) controlling industrial worker exposure for PROC 9 (industrial settings)				
Workers related free short title	Transfer of substance or preparation into small containers (dedicated filling line, including weighing).			
Use descriptor covered	PROC 9			
Processes, tasks, activities covered	Transfer of substance or preparation into small containers (dedicated filling line, including weighing).			
Assessment Method	ECETOC TRA 2.0			
Product characteristic				
Physical state	liquid			
Concentration of substance	<25%			
Amounts used				
This information is not relevant for assessment of worker's exposure.				
Human factors not influenced by risk management				
Exposed skin surface	Palm of both hands (480 cm ²)			
Organisational measures to prevent /limit releases, dispersion and exposure				
Training of operators, supervision, risk management systems				
Operational conditions affecting workers exposure				

Domain	Industrial			
Location	Indoor	<i>Outdoor locations are covered by this worst case inside location</i>		
Frequency and duration of use/exposure				
Duration of exposure (hours/day)	>4			
Frequency of exposure	Not specified (exposure every day is covered)			
Technical conditions and measures to control dispersion from source towards the worker				
Local exhaust ventilation	no			
Conditions and measures related to personal protection, hygiene and health evaluation				
Gloves (90% effectiveness)	yes			
Exposure concentrations for industrial workers				
Route of exposure	Concentration			
	level	units		
Exposure, local, dermal	60	µg/cm ²		
Exposure, local, inhalative	23.0	mg/m ³		
Contributing Scenario (7) controlling professional worker exposure for PROC 9 (professional settings)				
Workers related free short title	Transfer of preparation into small containers (dedicated filling line, including weighing)			
Use descriptor covered	PROC 9			
Processes, tasks, activities covered	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)			
Assessment Method	ECETOC TRA 2.0			
Product characteristic				
Physical state	liquid			
Concentration of substance	< 25%			
Amounts used				
This information is not relevant for assessment of worker's exposure.				
Human factors not influenced by risk management				
Exposed skin surface	Palm of both hands (480 cm ²)			
Organisational measures to prevent /limit releases, dispersion and exposure				
Training of operators, supervision, risk management systems				
Operational conditions affecting workers exposure				
Domain	Professional			
Scenarios	A	B	C	D
Location	Outdoor	Indoor	Indoor	Indoor
Frequency and duration of use/exposure				
Duration of exposure (hours/day)	> 4	> 4	> 4	< 4
Frequency of exposure	Not specified (exposure every day is covered)			
Technical conditions and measures to control dispersion from source towards the worker				
Local exhaust ventilation	n.a.	No	Yes	No
Conditions and measures related to personal protection, hygiene and health evaluation				
Suitable respiratory protection (90% effectiveness)	No	Yes	No	No

Gloves (90% effectiveness)	Yes				
Exposure concentrations for professional workers					
Scenario	A	B	C	D	units
Route of exposure					
Exposure, local, dermal	60	60	60	60	µg/cm ²
Exposure, local, inhalative	32.2	4.61	9.21	27.6	mg/m ³
Contributing Scenario (8) controlling industrial worker exposure for PROC 10 (industrial settings)					
Workers related free short title	Roller application or brushing				
Use descriptor covered	PROC10				
Processes, tasks, activities covered	Roller application or brushing, low energy spreading of e.g. coatings. Substances can be inhaled as vapours, skin contact can occur through droplets, splashes, working with wipes and handling of treated surfaces				
Assessment Method	ECETOC TRA 2.0				
Product characteristic					
Physical state	liquid				
Concentration of substance	< 25%				
Amounts used					
This information is not relevant for assessment of worker's exposure.					
Human factors not influenced by risk management					
Exposed skin surface	Both sides of both hands (960 cm ²)				
Organisational measures to prevent /limit releases, dispersion and exposure					
Training of operators, supervision, risk management systems					
Operational conditions affecting workers exposure					
Domain	Industrial				
Scenarios	A	B	C	D	
Location	Outdoor	Indoor	Indoor	Indoor	
Frequency and duration of use/exposure					
Duration of exposure (hours/day)	> 4	> 4	> 4	< 4	
Frequency of exposure	Not specified (exposure every day is covered)				
Technical conditions and measures to control dispersion from source towards the worker					
Local exhaust ventilation	n.a.	No	Yes	No	
Conditions and measures related to personal protection, hygiene and health evaluation					
Suitable respiratory protection (90% effectiveness)	No	Yes	No	No	
Gloves (90% effectiveness)	Yes				
Exposure concentrations for industrial workers					
Scenario	A	B, C	D	units	
Route of exposure					
Exposure, local, dermal	120	120	120	µg/cm ²	
Exposure, local, inhalative	32.2	4.61	27.6	mg/m ³	
Contributing Scenario (9) controlling professional worker exposure for PROC 10 (professional settings)					

Workers related free short title	Roller application or brushing					
Use descriptor covered	PROC10					
Processes, tasks, activities covered	Roller application or brushing, low energy spreading of e.g. coatings. Substances can be inhaled as vapours, skin contact can occur through droplets, splashes, working with wipes and handling of treated surfaces					
Assessment Method	ECETOC TRA 2.0					
Product characteristic						
Physical state	liquid					
Concentration of substance	< 25%					
Amounts used						
This information is not relevant for assessment of worker's exposure.						
Human factors not influenced by risk management						
Exposed skin surface	Both sides of both hands (960 cm ²)					
Organisational measures to prevent /limit releases, dispersion and exposure						
Training of operators, supervision, risk management systems						
Operational conditions affecting workers exposure						
Domain	Professional					
Scenarios	A	B	C	D	E	
Location	Outdoor	Outdoor	Indoor	Indoor	Indoor	
Frequency and duration of use/exposure						
Duration of exposure (hours/day)	< 1	> 4	> 4	< 4	< 1	
Frequency of exposure	Not specified (exposure every day is covered)					
Technical conditions and measures to control dispersion from source towards the worker						
Local exhaust ventilation	n.a.	n.a.	No	Yes	No	
Conditions and measures related to personal protection, hygiene and health evaluation						
Suitable respiratory protection (90% effectiveness)	No	Yes	Yes	No	No	
Gloves (90% effectiveness)	Yes					
Exposure concentrations for professional workers						
Scenario	A	B	C	D	E	units
Route of exposure						
Exposure, local, dermal	120	120	120	120	120	µg/cm ²
Exposure, local, inhalative	16.1	8.06	11.5	13.8	23.0	mg/m ³
Contributing Scenario (10) controlling worker exposure for PROC 11						
Workers related free short title	Non industrial spraying					
Use descriptor covered	PROC11					
Processes, tasks, activities covered	Non industrial spraying for surface coating, adhesives					
Assessment Method	ECETOC TRA 2.0					
Product characteristic						
Physical state	liquid					
Concentration of substance	< 25%					
Amounts used						

This information is not relevant for assessment of worker's exposure.					
Human factors not influenced by risk management					
Exposed skin surface	Palm of both hands and forearms (1500 cm ²)				
Organisational measures to prevent /limit releases, dispersion and exposure					
Training of operators, supervision, risk management systems					
Operational conditions affecting workers exposure					
Domain	Professional				
Scenarios	A	B	C	D	
Location	Outdoor	Outdoor	Indoor	Indoor	
Frequency and duration of use/exposure					
Duration of exposure (hours/day)	> 4	< 15 min	> 4	< 1	
Frequency of exposure	Not specified (exposure every day is covered)				
Technical conditions and measures to control dispersion from source towards the worker					
Local exhaust ventilation	n.a.	n.a.	Yes	Yes	
Conditions and measures related to personal protection, hygiene and health evaluation					
Suitable respiratory protection (90% effectiveness)	Yes	No	Yes	No	
Gloves (90% effectiveness)	Yes				
Exposure concentrations for workers					
Scenario	A	B	C	D	units
Route of exposure					
Exposure, local, dermal	150	150	150	150	µg/cm ²
Exposure, local, inhalative	32.2	32.2	9.21	18.4	mg/m ³
Contributing Scenario (11) controlling worker exposure for PROC 19					
Workers related free short title	Professional hand mixing with intimate contact and only PPE available				
Use descriptor covered	PROC19				
Processes, tasks, activities covered	Hand mixing with intimate contact and only PPE available				
Assessment Method	ECETOC TRA 2.0				
Product characteristic					
Physical state	liquid				
Concentration of substance	< 25%				
Amounts used					
This information is not relevant for assessment of worker's exposure.					
Human factors not influenced by risk management					
Exposed skin surface	More than two hands and forearms (1980 cm ²)				
Organisational measures to prevent /limit releases, dispersion and exposure					
Training of operators, supervision, risk management systems					
Operational conditions affecting workers exposure					
Domain	Professional				
Scenarios	A	B	C	D	
Location	Outdoor	Outdoor	Indoor	Indoor	

Frequency and duration of use/exposure					
Duration of exposure (hours/day)	> 4	< 1	> 4	< 1	
Frequency of exposure	Not specified (exposure every day is covered)				
Technical conditions and measures to control dispersion from source towards the worker					
Local exhaust ventilation	n.a.				
Conditions and measures related to personal protection, hygiene and health evaluation					
Suitable respiratory protection (90% effectiveness)	Yes	No	Yes	No	
Gloves (90% effectiveness)	Yes				
Exposure concentrations for workers					
Scenario	A	B	C	D	units
Route of exposure					
Exposure, local, dermal	60	60	60	60	µg/cm ²
Exposure, local, inhalative	8.06	16.1	11.5	23.0	mg/m ³

Exposure Scenario 6 (ES5): Use as laboratory reagent

Free short title	Use as laboratory reagent			
Systematic title based on use descriptor	ERC 1; PROC 15			
Name of contributing environmental scenario and corresponding ERC	ERC 1 - Production of a chemical (This exposure scenario is only individualised for worker assessment; environment is covered by ES1 (manufacture))			
Name(s) of contributing worker scenarios and corresponding PROCs	PROC15: Use a laboratory reagent.			
Operational conditions and risk management measures				
Use as laboratory agent at the 3 production sites in Europe.				
Contributing Scenario (1) controlling environmental exposure for ERC 1				
Free short title	Production 2-EHA at production sites			
Use descriptor covered	ERC 1			
Description	Production of organic and inorganic substances in chemical, petrochemical, primary metals and minerals industry including intermediates, monomers using continuous processes or batch processes applying dedicated or multi-purpose equipment, either technically controlled or operated by manual interventions.			
Assessment Method	EUSES v2.1.2			
Product characteristics				
Physical state	liquid			
Concentration of substance	100%			
Amounts used				
	Site X	Site Y	Site Z	(Total in Europe)
Daily use at a site (tons/day production)	314	145	24.2	-
Annual use at a site (kilotons/year)	94.2	43.5	7.25	145 (total)
Fraction of the main local source	1	1	1	
Frequency and duration of use	300 days (no. of emission days/year)			
Pattern of release to the environment	Continuous			
Environment factors not influenced by risk management				
Receiving surface water flow rate	≥ 18000 m ³ /d (default)			
Other given operational conditions affecting environmental exposure				
Industry category	3: Chemical industry: chemicals used in synthesis			
Use category	33: Intermediates			
Main category industrial use	Ic: Intermediates stored off-site/dedicated equipment.			
Extra details on use category	Wet process Substance processed elsewhere (internal and external polymerisation being subject to separate ES below)			
Emission tables	Production: A1.2, B1.6			
Release fraction to air from process (production)				1E-04 (default)
Release fraction to wastewater from process (production)				3E-03 (default)
Release fraction to industrial soil from process (production)				1E-04 (default)
Technical conditions and measures at process level (source) to prevent release				

Not relevant				
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil				
Not relevant				
Organizational measures to prevent/limit release from site				
Not relevant				
Conditions and measures related to municipal sewage treatment plant				
Sewage Treatment Plant (STP)	Yes (freshwater and marine assessment)			
Discharge rate of the STP	≥ 2000 m ³ /d (default)			
STP sludge fate	Do not spread on agricultural soil.			
Concentration of chemical (total) in the STP effluent *	≤10 µg/L, based on measures			
Conditions and measures related to external treatment of waste for disposal				
Not relevant				
Conditions and measures related to external recovery of waste				
Not relevant				
Exposure for environment (This exposure scenario is only individualised for worker assessment; environment is covered by ES1 (manufacture))				
Site	X	Y	Z	Units
Compartment	PEC	PEC	PEC	
STP	1E-02	1E-02	1E-02	mg/L
Freshwater	1.43E-03	1.43E-03	1.43E-03	mg/L
Freshwater sediment	0.0145	0.0145	0.0145	mg/kg wwt
Soil (agricultural)	2.64E-03	1.22E-03	2.03E-04	mg/kg wwt
Marine water	1.32E-04	1.32E-04	1.32E-04	mg/l
Marine water sediment	1.33E-03	1.33E-03	1.33E-03	mg/kg wwt
Local total daily intake man via environment	7.57E-03	3.81E-03	1.13E-03	mg/kg bw/d
Air	0.0207	9.55E-03	1.59E-03	mg/m ³
* Analytical monitoring of the plant effluent and STP effluent at all 3 production sites of 2-EHA in Europe were performed, revealing no concentrations above the limit of quantification of 1 µg/l. Based on these results, an overestimate of 0.01 mg.L-1 (10 µg/l) was input into EUSES as the concentration in STP effluent at all production sites. This assumption of 10 µg/l is considered conservative since measured values were all below 1 µg/l.				
Contributing Scenario (2) controlling industrial worker exposure for PROC 15				
Workers related free short title	Use a laboratory reagent			
Use descriptor covered	PROC 15			
Processes, tasks, activities covered	Use of substances at small scale laboratory (< 1 L or 1 kg). Larger laboratories and R+D installations should be treated as industrial processes.			
Assessment Method	ECETOC TRA 2.0			
Product characteristic	Industrial			
Physical state	liquid			
Concentration of substance	100%			
Amounts used				
This information is not relevant for assessment of worker's exposure.				
Operational conditions affecting workers exposure				
Location	Inside			

Domain	Industrial	
Frequency and duration of use/exposure		
Duration of exposure	> 4 (hours/day)	
Frequency of exposure	Not specified (exposure every day is covered)	
Human factors not influenced by risk management		
Exposed skin surface	Palm of one hand (240 cm ²)	
Technical conditions and measures at process level (source) to prevent release		
Not relevant.		
Technical conditions and measures to control dispersion from source towards the worker		
Local exhaust ventilation	yes	
Organisational measures to prevent /limit releases, dispersion and exposure		
Not relevant.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Suitable respiratory protection	No	
Gloves (90% effectiveness)	yes	
Exposure concentrations for workers		
Route of exposure	Concentration	
	level	units
Exposure, local, dermal	100	µg/cm ²
Exposure, local, inhalative	3.84	mg/m ³

END OF SAFETY DATA SHEET