

SAFETY DATA SHEET

1. SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Product Name	METHACRYLIC ACID
Product Description	This product contains Methacrylic acid and low levels of stabiliser.
Alternative names	Stabilised methacrylic acid; 2-Methyl 2-propenoic acid; alpha Methacrylic acid; alpha Methylacrylic acid; MAA.
REACH Registration No.	01-2119463884-26-0002 01-2119463884-26-XXXX
CAS No.	000079-41-4
EC No.	201-204-4

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

Identified use(s)	Industrial : Intermediate for production of methacrylate esters, acrylic polymers and mixtures. Professional : End use of mixtures containing Methacrylic acid. Consumer : Use of mixtures with low levels of Methacrylic acid monomer.
Uses advised against	None.

Refer to Exposure Scenarios Annex for further details (i-xiii)

1.3 Details of the supplier of the safety data sheet

Lucite International, Cassel, PO Box 8, Billingham, TS23 1LE, United Kingdom
Tel: +44 (0)1642 735042
msdsinfo@lucite.com

1.4 Emergency telephone number

+44 (0) 1642 452461

2. SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification in accordance with Regulation (EC) No 1272/2008 [CLP]

Acute toxicity (Dermal) Category 3.	H311
Acute toxicity (Oral) Category 4.	H302
Skin corrosion / irritation Category 1A.	H314
Serious eye damage / eye irritation Category 1.	H318
Acute toxicity (Inhalation) Category 4.	H332
STOT-single exposure Category 3	H335

Classification in accordance with 67/548/EEC or 1999/45/EC

Xn,C; R21/22 R35

For full text of H/P phrases see section 16.

For full text of R phrases see section 16.

2.2 Label elements



Signal word



Danger

Hazard statement(s)	Toxic in contact with skin. Harmful if swallowed. Causes severe skin burns and eye damage. Harmful if inhaled. May cause respiratory irritation.
Precautionary statement(s)	Wear protective gloves/protective clothing/eye protection/face protection. IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Store locked up. Dispose of contents/container to hazardous waste in accordance with local, state or national legislation. Incinerate under approved controlled conditions, using incinerator suitable for disposal of flammable organics.

2.3 Other hazards

Not classified as PBT or vPvB.

3. SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Substances in the product which may present a health or environmental hazard, or which have been assigned occupational exposure limits, are detailed below.

(EC) No 1272/2008 Classification

Hazardous ingredient(s)	%W/W	EC No.	REACH No.	Hazard Class and Category Code(s)	Hazard statement Code(s)
Methacrylic acid	>99	201-204-4	01-2119463884-26-XXXX 01-2119463884-26-0002	Acute Tox. 3 Acute Tox. 4 Skin Corr. 1A Eye Dam. 1 Acute Tox. 4 STOT SE 3	H311 H302 H314 H318 H332 H335

4. SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Inhalation IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing. Administer oxygen if necessary.

Skin Contact IF ON SKIN (or hair): Take off immediately all contaminated clothing. Wash with plenty of soap and water. Wash contaminated clothing before reuse.

Eye Contact IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Ingestion IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

4.2 Most important symptoms and effects, both acute and delayed

Toxic in contact with skin. Causes severe skin burns and eye damage. Harmful if swallowed. Harmful if inhaled. May cause respiratory irritation.

4.3 Indication of the immediate medical attention and special treatment needed

Following severe exposure the patient should be kept under medical review for at least 48 hours as delayed pulmonary oedema may develop.

5. SECTION 5: FIRE-FIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media In case of fire, use water spray, foam, dry powder or CO₂ for extinction. Keep containers cool by spraying with water if exposed to fire.

Unsuitable Extinguishing Media None.

5.2 Special hazards arising from the substance or mixture

May polymerise on heating. Sealed containers may rupture explosively if hot.

5.3 Advice for fire-fighters

A self contained breathing apparatus and suitable protective clothing should be worn in fire conditions.

6. SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Ensure suitable personal protection (including respiratory protection) during removal of spillages. Do not breathe vapour. Wear protective gloves and eye/face protection. See Section: 8

6.2 Environmental precautions

Avoid release to the environment. Spillages or uncontrolled discharges into watercourses must be alerted to the appropriate regulatory body.

6.3 Methods and material for containment and cleaning up

Contain spillages with sand, earth or any suitable adsorbent material. Spillages should be neutralised by the use of lime or lime slurry followed by water washing. Do not allow to enter drains, sewers or watercourses. Transfer to a container for disposal or recovery.

6.4 Reference to other sections

See Section: 8, 13

7. SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

Do not eat, drink or smoke at the work place. Wash thoroughly after handling. Do not breathe vapour. Use only outdoors or in a well-ventilated area. Do not eat, drink or smoke when using this product.

In the event of an uncontrolled polymerisation, indicated by temperature rise or visible formation of polymer: Evacuate the area.

If safe to do so:

Cool vessel by applying cooling water to cooling coils or the exterior of the vessel.

Ensure adequate venting by opening up hatches.

Add additional inhibitor (PTZ) in a concentrated solution or slurry.

Dilute the methacrylic acid with water.

CAUTION: BEWARE OF UNRELEASED PRESSURE

IT IS STRONGLY RECOMMENDED THAT YOU REFER TO THE METHACRYLIC ACID SAFE HANDLING MANUAL FOR FURTHER INFORMATION.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed. Store in a well-ventilated place. Keep cool. Store locked up. Keep away from heat, sparks, open flame, hot surfaces - No smoking. Keep away from direct sunlight. Never let bulk quantities freeze. Bulk quantities must be stored under air.

Monitor stored material for loss of inhibitor. Monomer vapours are uninhibited and may form polymers in vent or flame arresters, resulting in blockage of vents. If drums containing the product freeze, allow to thaw slowly in a warm room at temperatures up to 40°C.

Roll the drums every 6 - 8 hours to mix the contents.

Storage Temperature Ideal storage temperature is 18 - 25°C.

Never store above 40°C.

Storage Life

Provided proper storage and handling procedures are followed (see safety data sheet and Methacrylic Acid - Safe Handling Manual) the product may be stored for up to 6 months from the date of receipt.

Incompatible materials:

Polymerisation catalysts such as peroxy or azo compounds, strong acids, alkalis, oxidising agents and metal salts. Attacks Copper and mild steel.

7.3 Specific end use(s)

- IU1: Manufacture and use as intermediate.
- IU2: Use in production of formulations.
- IU3: Industrial end use as monomer, intermediate or formulation.
- IU4: Professional end use in formulations.
- IU5: Consumer end use in formulations.
- IU6: Service life in articles.

8. SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Substance	CAS No.	LTEL ppm (8Hr TWA)	LTEL mg/m ³ (8Hr TWA)	STEL ppm	STEL mg/m ³	Notes
Methacrylic acid	000079-41-4	20	72	40	143	WEL

DNEL	Oral	Inhalation	Dermal
Worker - long term - local effects	¹	88 mg/m ³	
Worker - long term - systemic effects	¹	29.6 mg/m ³	4.25 mg/Kg bw/day
Worker - short term - local effects	¹	²	1% w/w mixture
Worker - short term - systemic effects	¹	²	²
Consumer - long term - local effects	¹	6.55 mg/m ³	
Consumer - long term - systemic effects	¹	6.3 mg/m ³	2.55 mg/Kg bw/day
Consumer - short term - local effects	¹	²	1% w/w mixture
Consumer - short term - systemic effects	¹	²	

	PNEC
Aquatic Compartment	0.82 mg/l (Fresh water) 0.82 mg/l (Sea water) 1.2 mg/Kg dw (Sediment)
Terrestrial Compartment	
Atmospheric Compartment	

¹ Not required.

² DNEL long term is protective of effects resulting from short term exposure

8.2 Exposure controls

Appropriate engineering controls

Do not eat, drink or smoke at the work place. Use in closed systems or provide adequate LEV if natural ventilation is insufficient, to ensure that the DNEL/OEL is not exceeded. The maximum duration for safe use is dependant upon concentration, operating conditions and Risk Management Measures. Refer to section 4.3 of each GES. Consideration should be given to the work procedures involved and the potential extent of exposure as they may determine whether a higher level of protection is required.

Individual protection measures, such as personal protective equipment (PPE)

Worker : Wear protective equipment to comply with good occupational hygiene practice and as specified in section 6.1.1 of each GES.
Consumer : No PPE or Risk Management Measures are required when working within the boundaries as specified in section 4.3 of the Generic Exposure Scenarios (GES).

Eye/face protection



Wear eye/face protection.
Safety spectacles/goggles/full face shield.

Skin protection



Wear suitable gloves.
For splash protection: Butyl; EN 374.
For immersion protection: Butyl; 0.7 mm or greater; EN 374. Suitability of gloves should be confirmed with glove manufacturer. Change gloves, if contamination occurs or duration of activity exceeds break through time.
Breakthrough time of the glove material: refer to the information provided by the gloves' producer.

Respiratory protection



Wear suitable respiratory protective equipment if exposure to levels above the occupational exposure limit is likely. A suitable mask with filter type A (EN141 or EN405) may be appropriate. In the event of formation of particularly high levels of vapour a self contained breathing apparatus may be appropriate. Refer to Exposure Scenario Annex for further details.

Environmental Exposure Controls

Ensure proper process control to ensure releases to air are within local permits. Monitor and regularly maintain ventilation equipment to ensure performance. Do not empty into drains. Contain and collect spillages for incineration. Fully polymerise before landfill. Only dispose of polymerised material with household waste.

9. SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Form	Liquid.
Colour	Colourless.
Odour	Pungent.
Odour Threshold (ppm)	Not available.
pH (Value)	Not available.
Melting Range (°C)	14 - 16
Freezing Point (°C)	15
Boiling Point (°C)	160 with slight polymerisation.
Flash Point (°C)	67 [Closed cup]
Relative Evaporation Rate (Ether = 1)	Not available.
Flammability (solid, gas)	Not applicable.
Flammable Limits (Lower) (%v/v)	1.6
Flammable Limits (Upper) (%v/v)	8.7
Vapour Pressure (Pascal)	133 @ 25°C
Vapour Density (Air=1)	3
Specific Gravity	1.018 @ 20°C
Solubility (Water)	Miscible above 17°C Partially soluble below 17°C
Solubility (Other)	Soluble in most organic solvents.
Partition Coefficient (n-Octanol/water)	0.93
Auto Ignition Temperature (°C)	400
Decomposition Temperature (°C)	Not available.
Viscosity (mPa.s)	Not available.
Explosive Properties	Not applicable.
Oxidising Properties	Not applicable.

9.2 Other information

None

10. SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

Will exothermically polymerise in the presence of initiators.

10.2 Chemical stability

Stable under normal conditions in the presence of air between 18-25°C. Stable in the presence of inhibitor.

10.3 Possibility of hazardous reactions

Susceptible to polymerisation initiated by prolonged heating or the presence of catalyst.

10.4 Conditions to avoid

Heat and direct sunlight.

10.5 Incompatible materials

Polymerisation catalysts such as peroxy or azo compounds, strong acids, alkalis, oxidising agents and metal salts. Attacks Copper and mild steel.

10.6 Hazardous Decomposition Product(s)

Stable to at least boiling point. Some polymerisation may occur at these temperatures.

11. SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

Ingestion	Harmful if swallowed.
Ingestion toxicity data	LD50 (rat) 1320 - 2260 mg/Kg
Ingestion STOT-single exposure	Not applicable.
Inhalation	May cause respiratory irritation. May cause drowsiness and dizziness.
Inhalation toxicity data	No information available.
Inhalation STOT-single exposure	Exposure to high concentrations may produce adverse effects on the nasal epithelium.
Skin Contact	Causes severe burns. Toxic in contact with skin. Can be absorbed through skin causing systemic harmful effects.
Skin contact toxicity data	LD50 (rabbit) >500 - <1000 mg/Kg
Skin contact STOT-single exposure	Not applicable.
Eye Contact	Causes serious eye damage.
Eye contact toxicity data	Severe/very severe irritant to rabbit eyes.
Eye STOT-single exposure	Not applicable.

Aspiration hazard data Not an aspiration hazard.

Sensitisation

Skin sensitization data	It is not a skin sensitizer.
Respiratory sensitization data	Not a respiratory sensitizer.

CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction).

Carcinogenicity data	It is unlikely to present a carcinogenic hazard to man.
Germ cell mutagenicity data	Salmonella typhimurium [TA1535, 1537, 98, 100] negative
Reproductive toxicity data	No information available but no adverse reproductive effects are anticipated.

Repeated exposure toxicity

Chronic exposure	Repeated exposure of animals by inhalation to levels well above the occupational exposure limit produces adverse effects on the nasal epithelium (levels of 100ppm and 300ppm).
STOT - repeated exposure data	For systemic effects: NOAEC (inhalation) (rat) (90 days) 300 ppm NOAEC (inhalation) (mouse) (90 days) 100 ppm
Other information	None.

12. SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity

Harmful to aquatic life.

LC50 (rainbow trout) (96 hour) (flow through) 85 mg/l

LC50 (zebra fish) (96 hour) (semi-static) >100-180 mg/l

EC50 (Daphnia magna) (48 hour) (Flow through) >130 mg/l

EC50 (Selenastrum capricornutum) (96 hour) 45 mg/l

The product is substantially removed in biological treatment processes.

Will inhibit biological treatment processes due to low pH.

12.2 Persistence and degradability

Readily biodegradable.

86% (28 days)

60% (10 days)

12.3 Bioaccumulative potential

The product has low potential for bioaccumulation.

12.4 Mobility in soil

The product is predicted to have high mobility in soil.

12.5 Results of PBT and vPvB assessment

Not classified as PBT or vPvB.

12.6 Other adverse effects

Not subject to international restrictions.

13. SECTION 13: DISPOSAL CONSIDERATIONS

Avoid release to the environment. Decontaminate empty drums before recycling.

13.1 Waste treatment methods

Dispose of contents/container to hazardous waste in accordance with local, state or national legislation. Incinerate under approved controlled conditions, using incinerators suitable for the disposal of noxious chemical waste.

14. SECTION 14: TRANSPORT INFORMATION

14.1 UN number

2531

14.2 UN proper shipping name

METHACRYLIC ACID, STABILIZED

14.3 Transport hazard class(es)

Class	8
ADR Classification Code	C3
ADR HIN	89
ADR Transport Category	2
Tunnel Restriction Code	E
UK CDG Road: Emergency	3W
Action Code	

14.4 Packing Group

II

14.5 Environmental hazards

Marine Pollutant Not classified as a Marine Pollutant.

14.6 Special precautions for user

None.

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

Not applicable.

15. SECTION 15: REGULATORY INFORMATION

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

Safety, health and environmental regulations Regulation (EC) No 1272/2008 (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).

15.2 Chemical Safety Assessment

A Chemical Safety Assessment has been carried out for this substance/mixture.

16. SECTION 16: OTHER INFORMATION

This Safety Data Sheet was prepared in accordance with EC Regulation (EC) No. 453/2010.

Date of preparation: 1 -December- 2010
The following sections contain revisions or new statements: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16

Import to the EU is regulated under REACH. Confirmation from Lucite International UK Ltd acting as Only Representative and registrant is required to confirm that the volume of material imported has been confirmed as within the Only Representative supply chain.

Label elements in accordance with 1999/45/EC



Indication(s) of danger

Risk Phrases

Safety Phrases

R21/22: Harmful in contact with skin and if swallowed.

R35: Causes severe burns.

S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S36/37/39: Wear suitable protective clothing, gloves and eye/face protection.

S45: In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

Inventory Status

European Union (EINECS/ELINCS)	Listed in EINECS
United States (TSCA)	Listed in TSCA
Canada (DSL/NDSL)	Listed in DSL
Japan (ENCS)	Listed in ENCS
Philippines (PICCS)	Listed in PICCS
Australia (AICS)	Listed in AICS
South Korea (KECI)	Listed in KECI
China (IECSC)	Listed in IECSC

LEGEND

Note: Not all of the following are necessarily contained in this Safety Data Sheet:

IOELV: Indicative Occupational Exposure Limit Value

WEL: Workplace Exposure Limit (UK HSE EH40)

Bmgv: Biological Monitoring Guidance Value

Sen: Capable of causing respiratory sensitisation

Sk: Can be absorbed through skin

Carc: Capable of causing cancer and/or heritable genetic damage

CHAN: Chemical Hazard Alert Notice

COM: The company aims to control exposure in its workplace to this limit

LTEL: Long Term Exposure Limit

STEL: Short Term Exposure Limit

TWA: Time Weighted Average

STOT SE: Specific Target Organ Toxicity - Single Exposure

Repr.: Reproductive toxicity

Aquatic acute/chronic: Hazardous to the aquatic environment

References

REACH Registration Chemical Safety Report 11 August 2010
Methacrylic Acid Safe Handling Manual

Full text of R/H/P phrases

H302: Harmful if swallowed.
H311: Toxic in contact with skin.
H314: Causes severe skin burns and eye damage.
H318: Causes serious eye damage.
H332: Harmful if inhaled.
H335: May cause respiratory irritation.
P260: Do not breathe dust/fume/gas/mist/vapours/spray.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray.
P264: Wash thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
P271: Use only outdoors or in a well-ventilated area.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P301 + P312: IF SWALLOWED: Call a POISON CENTRE or doctor/physician if you feel unwell.
P301 + P330 + P331: IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P302 + P352: IF ON SKIN: Wash with plenty of soap and water.
P303 + P361 + P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310: Immediately call a POISON CENTRE or doctor/physician.
P312: Call a POISON CENTRE or doctor if you feel unwell.
P321: Specific treatment (see on this label).
P322: Specific measures (see on this label).
P330: Rinse mouth.
P361: Remove/Take off immediately all contaminated clothing.
P363: Wash contaminated clothing before reuse.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
P405: Store locked up.
P501: Dispose of contents/container to hazardous waste in accordance with local, state or national legislation. Incinerate under approved controlled conditions, using incinerators suitable for the disposal of noxious chemical waste.

IT IS STRONGLY RECOMMENDED THAT YOU REFER TO THE METHACRYLIC ACID SAFE HANDLING MANUAL BEFORE HANDLING, STORING OR USING METHACRYLIC ACID.

Methacrylate monomers are used safely in a wide variety of applications including some areas of personal hygiene. We are aware of some reports suggesting that use of methacrylate monomers in fingernail extension applications may result in loosening or shedding of the nails of the user as well as respiratory or other effects in those exposed to high levels of the vapors. Lucite International has performed no technical or clinical testing and has no data to support the use of methacrylate monomers in this application. Under no circumstances should methacrylate monomers be used in this or similar applications.

MEDICAL USE: CAUTION: DO NOT USE IN MEDICAL APPLICATIONS INVOLVING IMPLANTATION IN THE HUMAN BODY.

Lucite International has performed no clinical testing on the use of this product in any medical application. Lucite International has no data to support the use of this product in any medical application. This product was not designed or manufactured for use in implantation in the human body or in contact with internal body fluids or tissues. Lucite International has neither sought, nor received, approval from any regulatory agency for the use of this product in implantation in the human body or in contact with internal body fluids or tissues.

For further information on the properties and uses, or storage and handling, of Methacrylic acid refer to Product data sheet; Methacrylic acid (TS/C/2204/11).

It is the responsibility of the end-product manufacturer to identify all market and use-specific regulations and to ensure compliance with these regulations.

Information contained in this publication or as otherwise supplied to Users is believed to be accurate and is given in good faith, but it is for the Users to satisfy themselves of the suitability of the product for their own particular purpose. Lucite International gives no warranty as to the fitness of the product for any particular purpose and any implied warranty or condition (statutory or otherwise) is excluded except to the extent that exclusion is prevented by law. Lucite International accepts no liability for loss or damage (other than that arising from death or personal injury caused by defective product, if proved), resulting from reliance on this information. Freedom under Patents, Copyright and Designs cannot be assumed.

Annex: Exposure Scenarios

GES1	Use in closed systems with low risk of exposure
GES2	No identified scenarios
GES3	No identified scenarios
GES4	Industrial and Professional use in systems with engineered ventilation and low risk of exposure
GES5	Industrial or professional use with engineered ventilation where opportunity for exposure requires use of gloves
GES6	Industrial or professional use with engineered ventilation where opportunity for exposure requires use of gloves and respiratory protection
GES7	Industrial and Professional use outdoors with low risk of exposure
GES8	Industrial or professional use outdoors where opportunity for exposure requires use of gloves
GES9	Industrial or professional use outdoors where opportunity for exposure requires use of gloves and respiratory protection
GES10	Industrial and Professional use indoors with low risk of exposure
GES11	Industrial or professional use indoors where opportunity for exposure requires use of gloves
GES12	Industrial or professional use indoors where opportunity for exposure requires use of gloves and respiratory protection
GES13	Consumer

Abbreviations

IU1: Manufacture and use as intermediate; **IU2:** Use in production of formulations; **IU3:** Industrial end use as monomer, intermediate or formulation; **IU4:** Professional end use in formulations; **IU5:** Consumer end use in formulations; **IU6:** Service life in articles

SU3: Industrial Manufacturing (all); **SU2a:** Mining, (without offshore industries); **SU2b:** Offshore industries; **SU6a:** Manufacture of wood and wood products; **SU6b:** Manufacture of pulp, paper and paper products; **SU8:** Manufacture of bulk, large scale chemicals (including petroleum products); **SU9:** Manufacture of fine chemicals; **SU10:** Chemical formulation and packaging; **SU12:** Manufacture of plastic products, including compounding and conversion; **SU13:** Manufacture of other non-metallic mineral products; **SU14:** Manufacture of basic metals; **SU15:** Manufacture of fabricated metal products, except machinery and equipment; **SU16:** Manufacture of computer, electronic and optical products, electrical equipment; **SU17:** General manufacturing; **SU19:** Building and construction work; **SU20:** Health services; **SU23:** Recycling.

PROC1: Use in closed process, no likelihood of exposure; **PROC2:** Use in closed, continuous process with occasional controlled exposure; **PROC3:** Use in closed batch process (synthesis or formulation); **PROC4:** Use in batch and other process (synthesis) where opportunity for exposure arises; **PROC5:** Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact); **PROC6:** Calendaring operations; **PROC7:** Industrial spraying; **PROC8a:** Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities; **PROC8b:** Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities; **PROC9:** Transfer of substance or preparation into small containers (dedicated filling line, including weighing). **PROC10:** Roller application or brushing; **PROC11:** Non industrial spraying; **PROC12:** Use of blow agents in manufacture of foam; **PROC13:** Treatment of articles by dipping and pouring; **PROC14:** Production of preparations or articles by tableting, compression, extrusion, pelletisation; **PROC15:** Use as laboratory reagent; **PROC17:** Lubrication at high energy conditions and in partly open process; **PROC18:** Greasing at high energy conditions; **PROC19:** Hand-mixing with intimate contact and only PPE available; **PROC21:** Low energy manipulation of substances bound in form of massive metal or bound in other materials and/or articles; **PROC22:** Potentially closed processing operations with minerals/metals at elevated temperature. Industrial setting; **PROC23:** Open processing and transfer operations with minerals/metals at elevated temperature; **PROC24:** High (mechanical) energy workup of massive metal or substances bound in materials and/or articles

PC1: Adhesives, sealants; **PC2:** Adsorbents; **PC3:** Air care products; **PC7:** Base metals and alloys; **PC8:** Biocidal Products (e.g. Disinfectants, pest control); **PC9a:** Coatings and paints, thinners, paint removers; **PC9b:** Fillers and putty; **PC9c:** Finger paints; **PC14:** Metal surface treatment products, including galvanic and electroplating products; **PC15:** Non-metal-surface treatment products; **PC18:** Ink and Toners; **PC19:** Intermediate; **PC20:** Products such as ph-regulators, flocculants, precipitants, neutralisation agents, other unspecific uses; **PC21:** Laboratory Chemicals; **PC23:** Leather tanning, dye, finishing, impregnation and care products; **PC24:** Lubricants, Greases and Release products; **PC26:** Paper and Board dye, finishing and impregnation products: including bleaches and other processing aids; **PC31:** Polishes and Wax Blends; **PC32:** Polymer Preparations and Compounds; **PC33:** Semiconductor; **PC34:** Textile dyes, finishing and impregnating products: including bleaches and other processing aids; **PC35:** Washing and Cleaning Products (including solvent based products); **PC37:** Water treatment chemicals; **PC39:** Cosmetics, personal care

AC1-1: Passenger cars and motor cycles; **AC1-2:** Other vehicles: Railway, aircraft, vessels, boats, trucks, and associated transport equipment; **AC2:** Machinery, mechanical appliances, electrical/electronic articles; **AC3:** Electrical batteries and accumulators; **AC4:** Stone, plaster, cement, glass and ceramic articles; **AC5-1:** Fabrics, textiles and apparel: bedding and clothing; **AC5-2:** Fabrics, textiles and apparel: curtains, upholstery, carpeting/flooring, rugs; **AC6:** Leather products: apparel and upholstery; **AC7:** Metal articles; **AC8-1:** Paper products: tissue, towels, disposable dinnerware, nappies, feminine hygiene products, adult incontinence products, writing paper; **AC10-2:** Rubber products: flooring; **AC10-5:** Other general rubber products; **AC11:** Wood articles; **AC13-1:** Commercial and consumer plastic products like disposable dinner ware, food storage, food packaging, baby bottles; **AC13-2:** Plastic products: Flooring; **AC13-3:** Plastic products: Toys; **AC13*:** Plastic, small articles.

ERC1: Manufacture of substances; **ERC2:** Formulation of preparations; **ERC3:** Formulation in materials; **ERC4:** Industrial use of processing aids in processes and products, not becoming part of articles; **ERC5:** Industrial use resulting in inclusion into or onto a matrix; **ERC6a:** Industrial use resulting in manufacture of another substance (use of intermediates); **ERC6b:** Industrial use of reactive processing aids; **ERC6c:** Industrial use of monomers for polymerisation; **ERC6d:** Industrial use of auxiliaries for polymerisation processes in production of resins, rubbers, polymers; **ERC7:** Industrial use of substances in closed systems; **ERC8d:** Wide dispersive outdoor use of processing aids in open systems; **ERC8e:** Wide dispersive outdoor use of reactive substances in open systems; **ERC8f:** Wide dispersive outdoor use resulting in inclusion into or onto a matrix; **ERC10a:** Wide dispersive outdoor use of long-life articles and materials with low release

GES1	
1	Short title Use in closed systems with low risk of exposure
2	Description of activities/process(es) covered in the Exposure Scenario Industrial or professional activities involving the handling of preparations containing monomers. IU1, IU2, IU3, IU4, SU3, SU1, SU2a, SU2b, SU5, SU6a, SU6b, SU7, SU8, SU9, SU10, SU11, SU12, SU13, SU14, SU15, SU16, SU17, SU18, SU19, SU23, SU20, SU22 PROC1, PROC2, PROC3 ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7: ERC8a, ERC8b, ERC8c, ERC8d, ERC8e, ERC8f, ERC9a
3	Operational conditions
3.1	Duration and frequency of use
	Duration Worker: dependent upon concentration and activity, see section 4.3. Consumer: N/A.
	Frequency of exposure at workplace Worker: daily; Consumer: N/A
	Emission days per site 300 d/yr
4	Other operational conditions related to physical properties and boundary conditions
4.1	Physical form of product in which substance is contained Liquid
4.2	Concentration of substance in preparation or article ≤ 100%
4.3	Maximum used amount of substance (as such or in preparation) per worker/workplace per day Worker: N/A, closed systems; Consumer: N/A. Amount used per time or per activity for which RMMs ensure control of risk OC: Industrial PROC: 1, 2, 3; Professional PROC: 3; Concentration/Duration: 0-100% / 0-24hrs OC: Professional PROC: 2; Concentration/Duration: 0-25% / 0-8hrs, 25-100% / 0-4hrs.
	Operational conditions related to environment High tonnage material produced in contained systems.
	Annual amount used per site ≤ 50 kte/yr
5	Other operational conditions determining exposure
	Room size N/A
	Ventilation rate N/A
	Waste water treatment Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.
6	Risk Management Measures:
6.1	Human health measures
6.1.1	Occupational related measures
	Oral Do not eat, drink or smoke at the work place.
	Dermal Gloves not required. If opportunity for skin contact with liquid monomer occurs wear gloves (e.g. butyl; EN 374) for splash protection when handling liquids and comply with good occupational hygiene practice. Change gloves, if contamination occurs.
	Inhalation N/A – Contained system
	Eyes Eye protection not required. If opportunity for contact with liquid monomer occurs wear suitable eye protection, goggles.
6.1.2	Consumer related measures Not Applicable
6.2	Environment related measures
	Air Ensure proper process control to ensure releases to air are within local permits.
	Water Contain and collect spillages for incineration.
	Soil Fully polymerise before landfill
7	Waste related measures Avoid release to the environment. Contain and collect any spillages. Recycle where possible or incinerate under approved controlled conditions using a facility suitable for the disposal of flammable organics. Obtain the consent of pollution control authorities before discharging to waste water treatment plants. Only dispose of polymerised material to landfill.
8	Prediction of exposure resulting from the conditions described above
8.1	Human exposure estimation
8.1.1	Worker. Predicted exposure and Risk Characterisation Ratio based on DNEL and exposure calculated by ECETOC-TRA.
	Dermal Concentration ≤ 1.37 mg/kg bw/day RCR ≤ 0.32
	Inhalative Concentration ≤ 3 ppm RCR ≤ 0.36
	Combined RCR ≤ 0.68
8.1.2	Consumer Not applicable
8.2	Environmental exposure estimation
8.2.1	Environmental. Risk Characterisation Ratio based on PNEC and PEC calculated by EUSUS local compartments.
	Air Concentration ≤ 1.1e-02 mg/m ³ RCR ≤ 1.8e-03
	Aquatic Concentration ≤ 2.5e-02 mg/ml RCR ≤ 3.6e-02
	Aquatic Sediment Concentration ≤ 2.8e-02 mg/kg ww RCR ≤ 3.6e-02
	Soil Concentration ≤ 3.6e-03 mg/kg ww RCR ≤ 1.7e-02
9	Other information Risk adequately controlled. Gloves required for splash protection when handling liquids. Change gloves, if duration of activity exceeds break through time. Measured data could be used to confirm exposure levels are within the boundaries of the exposure scenario. Use the exposure assessment tools ECETOC-TRA and EUSUS for confirmation that you work inside to boundaries set by the GES (RCR<1 and PEC/PNEC<1).

GES4	
1	Short title Industrial and Professional use in systems with engineered ventilation and low risk of exposure
2	Description of activities/process(es) covered in the Exposure Scenario Industrial or professional activities involving the handling of preparations containing monomers. IU1, IU2, IU3, IU4, SU3, SU1, SU2a, SU2b, SU5, SU6a, SU6b, SU7, SU8, SU9, SU10, SU11, SU12, SU13, SU14, SU15, SU16, SU17, SU18, SU19, SU23, SU20, SU22 PROC12, PROC15 ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ERC8a, ERC8b, ERC8c, ERC8d, ERC8e, ERC8f, ERC9a
3	Operational conditions
3.1	Duration and frequency of use
	Duration Worker: dependent upon concentration and activity, see section 4.3. Consumer: N/A.
	Frequency of exposure at workplace Daily
	Emission days per site 300 d/yr
4	Other operational conditions related to physical properties and boundary conditions
4.1	Physical form of product in which substance is contained Liquid
4.2	Concentration of substance in preparation or article ≤ 100%
4.3	Maximum used amount of substance (as such or in preparation) per worker/workplace per day Industrial/Professional: <1000 kg/d; Consumer: N/A See below for detail individual PROCs. Amount used per time or per activity for which RMMs ensure control of risk Industrial PROC: 12, 15; Professional PROC: 12, 15; Concentration/Duration: 0-100% / 0-8hrs.
	Operational conditions related to environment Processing and handling with engineering control, indoor and outdoor.
	Annual amount used per site ≤ 50 kte/yr
5	Other operational conditions determining exposure
	Room size N/A.
	Ventilation rate ≥ 90% ECETOC default for industrial worker; ≥ 80% ECETOC default for professional worker (for details see ECETOC default table).
	Waste water treatment Discharges should be checked to ensure they comply with the requirements of local environmental protection legislation.
6	Risk Management Measures:
6.1	Human health measures
6.1.1	Occupational related measures
	Oral Do not eat, drink or smoke at the work place.
	Dermal Gloves not required. If opportunity for skin contact occurs wear gloves (e.g. butyl; EN 374) for splash protection when handling liquids and comply with good occupational hygiene practice. Change gloves, if contamination occurs.
	Inhalation Use local exhaust ventilation (LEV) or engineering equipment implying comparable efficiency.
	Eyes Eye protection not required. If opportunity for contact with liquid monomer occurs wear suitable eye protection, goggles.
6.1.2	Consumer related measures Not applicable
6.2	Environment related measures
	Air Ensure proper process control to ensure releases to air are within local permits. Monitor and regularly maintain ventilation equipment to ensure performance.
	Water Contain and collect spillages for incineration.
	Soil Fully polymerise before landfill
7	Waste related measures Avoid release to the environment. Contain and collect any spillages. Recycle where possible or incinerate under approved controlled conditions using a facility suitable for the disposal of flammable organics. Obtain the consent of pollution control authorities before discharging to waste water treatment plants. Only dispose of polymerised material to landfill.
8	Prediction of exposure resulting from the conditions described above
8.1	Human exposure estimation
8.1.1	Worker. Predicted exposure and Risk Characterisation Ratio based on DNEL and exposure calculated by ECETOC-TRA
	Dermal Concentration ≤ 0.34 mg/kg bw/day RCR ≤ 0.08
	Inhalative Concentration ≤ 2 ppm RCR ≤ 0.24
	Combined RCR ≤ 0.32
8.1.2	Consumer Not Applicable
8.2	Environmental exposure estimation
8.2.1	Environmental. Risk Characterisation Ratio based on PNEC and PEC calculated by EUSUS local compartments
	Air Concentration ≤ 1.1e-02 mg/m ³ RCR ≤ 1.8e-03
	Aquatic Concentration ≤ 2.5e-02 mg/ml RCR ≤ 3.6e-02
	Aquatic Sediment Concentration ≤ 2.8e-02 mg/kg ww RCR ≤ 3.6e-02
	Soil Concentration ≤ 3.6e-03 mg/kg ww RCR ≤ 1.7e-02
9	Other information Risk adequately controlled. Gloves required for splash protection when handling liquids. If potential for contact with liquid is present refer to GES5. Measured data could be used to confirm exposure levels are within the boundaries of the exposure scenario. Use the exposure assessment tools ECETOC-TRA and EUSUS for confirmation that you work inside to boundaries set by the GES (RCR<1 and PEC/PNEC<1)

GES5	
1	Short title Industrial or professional use with engineered ventilation where opportunity for exposure requires use of gloves
2	Description of activities/process(es) covered in the Exposure Scenario Industrial or professional activities involving the handling of preparations containing monomers: IU1, IU2, IU3, IU4, SU3, SU1, SU2a, SU2b, SU5, SU6a, SU6b, SU7, SU8, SU9, SU10, SU11, SU12, SU13, SU14, SU15, SU16, SU17, SU18, SU19, SU23, SU20, SU22. PROC4, PROC5, PROC6, PROC7, PROC8a, PROC8b, PROC10, PROC11, PROC13, PROC14, PROC17, PROC18, PROC19. ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ERC8a, ERC8b, ERC8c, ERC8d, ERC8e, ERC8f, ERC9a.
3	Operational conditions
3.1	Duration and frequency of use
	Duration Worker: dependent upon concentration and activity, see section 4.3. Consumer: N/A.
	Frequency of exposure at workplace Daily
	Emission days per site 300 d/yr
4	Other operational conditions related to physical properties and boundary conditions
4.1	Physical form of product in which substance is contained Liquid
4.2	Concentration of substance in preparation or article ≤ 100%
4.3	Maximum used amount of substance (as such or in preparation) per worker/workplace per day Worker: <1000 kg/d; Consumer: N/A. See below for detail individual PROCs. Amount used per time or per activity for which RMMs ensure control of risk Industrial PROC: 4, 5, 6, 8a, 8b, 9, 10, 13, 14, 17, 18, 19; Professional PROC: 4, 5, 6, 8b, 9, 13, 14; Concentration/Duration: 0-100% / 0-8hrs. Industrial PROC: 7; Professional PROC: 8a, 10, 17, 18, 19; Concentration/Duration: 0-25% / 0-8hrs, 25-100% / 0-4hrs. Professional PROC: 11; Concentration/Duration: 0-5% / 0-8hrs, 5-100% / 0-1hr. Operational conditions related to environment Processing and handling with engineering control, indoor and outdoor. Annual amount used per site ≤ 50 kte/yr
5	Other operational conditions determining exposure
	Room size N/A.
	Ventilation rate ≥ 90% ECETOC default for industrial worker; ≥ 80% ECETOC default for professional worker (for details see ECETOC default table).
	Waste water treatment Discharges should be checked to ensure they comply with the requirements of local environmental protection legislation.
6	Risk Management Measures:
6.1	Human health measures
6.1.1	Occupational related measures
	Oral Do not eat, drink or smoke at the work place.
	Dermal Wear gloves (e.g. butyl; 0.7 mm; EN 374) for immersion protection when handling liquids and comply with good occupational hygiene practice. Change gloves, if contamination occurs or duration of activity exceeds break through time.
	Inhalation Use local exhaust ventilation (LEV) or engineering equipment implying comparable efficiency.
	Eyes Wear suitable eye protection, goggles, to protect against liquid splash.
6.1.2	Consumer related measures N/A
6.2	Environment related measures
	Air Ensure proper process control to ensure releases to air are within local permits. Monitor and regularly maintain ventilation equipment to ensure performance.
	Water Contain and collect spillages for incineration.
	Soil Fully polymerise before landfill
7	Waste related measures Avoid release to the environment. Contain and collect any spillages. Recycle where possible or incinerate under approved controlled conditions using a facility suitable for the disposal of flammable organics. Obtain the consent of pollution control authorities before discharging to waste water treatment plants. Only dispose of polymerised material to landfill.
8	Prediction of exposure resulting from the conditions described above
8.1	Human exposure estimation
8.1.1	Worker. Predicted exposure and Risk Characterisation Ratio based on DNEL and exposure calculated by ECETOC-TRA.
	Dermal Concentration ≤ 14.1 mg/kg bw/day RCR ≤ 3.29 (see section 9)
	Inhalative Concentration ≤ 4 ppm RCR ≤ 0.48
	Combined RCR ≤ 3.65 (see section 9)
8.1.2	Consumer Not applicable
8.2	Environmental exposure estimation
8.2.1	Environmental. Risk Characterisation Ratio based on PNEC and PEC calculated by EUSUS local compartments
	Air Concentration ≤ 1.1e-02 mg/m ³ RCR ≤ 1.8e-03
	Aquatic Concentration ≤ 2.5e-02 mg/ml RCR ≤ 3.6e-02
	Aquatic Sediment Concentration ≤ 2.8e-02 mg/kg ww RCR ≤ 3.6e-02
	Soil Concentration ≤ 3.6e-03 mg/kg ww RCR ≤ 1.7e-02
9	Other information Risk adequately controlled. Gloves required for immersion protection when handling liquids. Change gloves, if duration of activity exceeds break through time. Then safe handling of high exposure dermal applications (PROC11, 19) is ensured and RCR(dermal) is assumed to be below 0.5. All other PROCs indicate a dermal RCR below 0.5 within the assessed boundaries. Measured data could be used to confirm exposure levels are within the boundaries of the exposure scenario. Use the exposure assessment tools ECETOC-TRA and EUSUS for confirmation that you work inside to boundaries set by the GES (RCR<1 and PEC/PNEC<1)

GES6	
1	Short title Industrial or professional use with engineered ventilation where opportunity for exposure requires use of gloves and respiratory protection
2	Description of activities/process(es) covered in the Exposure Scenario Industrial or professional activities involving the handling of preparations containing monomers. IU3, IU4. SU3, SU1, SU2a, SU2b, SU5, SU6a, SU6b, SU7, SU11, SU12, SU13, SU14, SU15, SU16, SU17, SU18, SU19, SU23, SU20, SU22 PROC7, PROC8a, PROC10, PROC11, PROC17, PROC18, PROC19 ERC5, ERC8a, ERC8b, ERC8c, ERC8d, ERC8f, ERC9a
3	Operational conditions
3.1	Duration and frequency of use
	Duration Worker: dependent upon concentration and activity, see section 4.3. Consumer: N/A.
	Frequency of exposure at workplace Daily
	Emission days per site 300 d/yr
4	Other operational conditions related to physical properties and boundary conditions
4.1	Physical form of product in which substance is contained Liquid
4.2	Concentration of substance in preparation or article ≤ 100%
4.3	Maximum used amount of substance (as such or in preparation) per worker/workplace per day Worker: <100 kg/d; Consumer: N/A. See below for detail individual PROCs. Amount used per time or per activity for which RMMs ensure control of risk RMM: RPE protection factor 10 (see section 9). Industrial PROC: 7; Professional PROC: 8a, 10, 11, 17, 18, 19; Concentration/Duration: 0-100% / 0-8hrs.
	Operational conditions related to environment Processing and handling with engineering control, indoor and outdoor.
	Annual amount used per site (relevance for regional scenario) ≤ 50 kte/yr
5	Other operational conditions determining exposure
	Room size N/A.
	Ventilation rate ≥ 90% ECETOC default for industrial worker; ≥ 80% ECETOC default for professional worker (for details see ECETOC default table).
	Waste water treatment Discharges should be checked to ensure they comply with the requirements of local environmental protection legislation.
6	Risk Management Measures:
6.1	Human health measures
6.1.1	Occupational related measures
	Oral Do not eat, drink or smoke at the work place.
	Dermal Wear gloves (e.g. butyl; 0.7 mm; EN 374) for immersion protection when handling liquids and comply with good occupational hygiene practice. Change gloves, if contamination occurs or duration of activity exceeds break through time.
	Inhalation Use local exhaust ventilation (LEV) or engineering equipment implying comparable efficiency. RPE protection factor 10.
	Eyes Wear suitable eye protection, face shield or goggles, to protect against liquid splash.
6.1.2	Consumer related measures Not applicable
6.2	Environment related measures
	Air Ensure proper process control to ensure releases to air are within local permits. Monitor and regularly maintain ventilation equipment to ensure performance.
	Water Contain and collect spillages for incineration.
	Soil Fully polymerise before landfill
7	Waste related measures Avoid release to the environment. Contain and collect any spillages. Recycle where possible or incinerate under approved controlled conditions using a facility suitable for the disposal of flammable organics. Obtain the consent of pollution control authorities before discharging to waste water treatment plants. Only dispose of polymerised material to landfill.
8	Prediction of exposure resulting from the conditions described above
8.1	Human exposure estimation
8.1.1	Worker. Predicted exposure and Risk Characterisation Ratio based on DNEL and exposure calculated by ECETOC-TRA.
	Dermal Concentration ≤ 14.1 mg/kg bw/day RCR ≤ 3.29 (see section 9)
	Inhalative Concentration ≤ 2 ppm RCR ≤ 0.24
	Combined RCR ≤ 3.36 (see section 9)
8.1.2	Consumer Not applicable
8.2	Environmental exposure estimation
8.2.1	Environmental. Risk Characterisation Ratio based on PNEC and PEC calculated by EUSUS local compartments
	Air Concentration ≤ 1.1e-02 mg/m ³ RCR ≤ 1.8e-03
	Aquatic Concentration ≤ 2.5e-02 mg/ml RCR ≤ 3.6e-02
	Aquatic Sediment Concentration ≤ 2.8e-02 mg/kg ww RCR ≤ 3.6e-02
	Soil Concentration ≤ 3.6e-03 mg/kg ww RCR ≤ 1.7e-02
9	Other information Risk adequately controlled. Gloves required for immersion protection when handling liquids. Change gloves, if duration of activity exceeds break through time. Then safe handling of high exposure dermal applications (PROC7, 10, 11, 17, 19) is ensured and RCR(dermal) is assumed to be below 0.5. Ensure duration of wearing respiratory protection comply with the requirements of legislation. Measured data could be used to confirm exposure levels are within the boundaries of the exposure scenario. Use the exposure assessment tools ECETOC-TRA and EUSUS for confirmation that you work inside to boundaries set by the GES (RCR<1 and PEC/PNEC<1)

GES7	
1	Short title Industrial and Professional use outdoors with low risk of exposure
2	Description of activities/process(es) covered in the Exposure Scenario Industrial or professional activities involving the handling of preparations containing monomers. IU2, IU3, IU4., IU5, IU6 SU3, SU1, SU2a, SU2b, SU5, SU6a, SU6b, SU7, SU8, SU9, SU10, SU12, SU13, SU14, SU15, SU16, SU17, SU19, SU18, SU20, SU23, SU22. PROC12, PROC21, PROC22, PROC23, PROC24, PROC25, PROC26 PC1, PC2, PC3, PC4, PC7, PC8, PC9a, PC9b, PC9c, PC12, PC14, PC15, PC18, PC19, PC21, PC20, PC23, PC24, PC26, PC28, PC29, PC30, PC31, PC32, PC33, PC34, PC35, PC37, PC39. AC1, AC2, AC3, AC4, AC5, AC6, AC7, AC8, AC10, AC11, AC13, AC31 ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ERC8d, ERC8e, ERC8f, ERC10a
3	Operational conditions
3.1	Duration and frequency of use
	Duration Worker: dependent upon concentration and activity, see section 4.3. Consumer: Not applicable.
	Frequency of exposure at workplace Daily
	Emission days per site 300 d/yr
4	Other operational conditions related to physical properties and boundary conditions
4.1	Physical form of product in which substance is contained Liquid Monomer/Polymer preparations with limited monomer volumes (see 4.3)
4.2	Concentration of substance in preparation or article ≤ 100% contained liquid ≤ 5% residual monomer in polymer component
4.3	Maximum used amount of substance (as such or in preparation) per worker/workplace per day Industrial/Professional: <1000kg/d See below for detail individual PROCs, PCs. Amount used per time or per activity for which RMMs ensure control of risk Industrial PROC: 12; Concentration/Duration: 0-100% / 0-8hrs Professional PROC: 12; Concentration/Duration: 0-25% / 0-8hrs, 25-100% / 0-4hrs. Industrial PROC: 21, 22, 23, 24, 25, 26; Professional PROC: 21, 23, 24, 25, 26; Concentration/Duration: 0-5% / 0-8hrs, 5-100% / Not covered. See section 9. Operational conditions related to environment Outdoor processing and handling. Annual amount used per site ≤ 50 kte/yr
5	Other operational conditions determining exposure
	Room size N/A – Outdoor scenario.
	Ventilation rate 70% ECETOC default for outdoor worker.
	Waste water treatment Discharges should be checked to ensure they comply with the requirements of local environmental protection legislation.
6	Risk Management Measures:
6.1	Human health measures
6.1.1	Occupational related measures
	Oral Do not eat, drink or smoke at the work place.
	Dermal Gloves not required. If opportunity for skin contact with liquid monomer occurs wear gloves (e.g. butyl; EN 374) for splash protection when handling liquids and comply with good occupational hygiene practice. Change gloves, if contamination occurs.
	Inhalation Use outdoor.
	Eyes Eye protection not required. If opportunity for contact with liquid monomer occurs wear suitable eye protection, goggles.
6.1.2	Consumer related measures Not applicable
6.2	Environment related measures
	Air Not required
	Water Contain and collect spillages for incineration.
	Soil Fully polymerise before landfill
7	Waste related measures Avoid release to the environment. Contain and collect any spillages. Recycle where possible or incinerate under approved controlled conditions using a facility suitable for the disposal of flammable organics. Obtain the consent of pollution control authorities before discharging to waste water treatment plants. Only dispose of polymerised material to landfill.
8	Prediction of exposure resulting from the conditions described above
8.1	Human exposure estimation
8.1.1	Worker. Predicted exposure and Risk Characterisation Ratio based on DNEL and exposure calculated by ECETOC-TRA
	Dermal Concentration ≤ 0.34 mg/kg bw/day RCR ≤ 0.08
	Inhalative Concentration ≤ 4.2 ppm RCR ≤ 0.50
	Combined RCR ≤ 0.58
8.1.2	Consumer Not applicable
8.2	Environmental exposure estimation
8.2.1	Environmental. Risk Characterisation Ratio based on PNEC and PEC calculated by EUSUS local compartments
	Air Concentration ≤ 1.1e-02 mg/m ³ RCR ≤ 1.8e-03
	Aquatic Concentration ≤ 2.5e-02 mg/ml RCR ≤ 3.6e-02
	Aquatic Sediment Concentration ≤ 2.8e-02 mg/kg ww RCR ≤ 3.6e-02
	Soil Concentration ≤ 3.6e-03 mg/kg ww RCR ≤ 1.7e-02
9	Other information Risk adequately controlled. Gloves required for splash protection when handling liquids. If potential for contact with liquid is present refer to GES8. Measured data could be used to confirm exposure levels are within the boundaries of the exposure scenario. PCs and PROCs (polymer applications) evaluated as safe for up to 5% residual MAA related to used amount of MAA. Use the exposure assessment tools ECETOC-TRA and EUSUS for confirmation that you work inside to boundaries set by the GES (RCR<1 and PEC/PNEC<1).

GES8	
1	Short title Industrial or professional use outdoors where opportunity for exposure requires use of gloves
2	Description of activities/process(es) covered in the Exposure Scenario Industrial or professional activities involving the handling of preparations containing monomers. IU1, IU2, IU3, IU4, SU3, SU1, SU2a, SU2b, SU5, SU6a, SU6b, SU7, SU8, SU9, SU10, SU11, SU12, SU13, SU14, SU15, SU16, SU17, SU18, SU19, SU20, SU22, SU23. PROC4, PROC5, PROC6, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC14, PROC17, PROC18, PROC19. ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ERC8d, ERC8e, ERC8f.
3	Operational conditions
3.1	Duration and frequency of use
	Duration Worker: dependent upon concentration and activity, see section 4.3. Consumer: N/A.
	Frequency of exposure at workplace Daily
	Emission days per site 300 d/yr
4	Other operational conditions related to physical properties and boundary conditions
4.1	Physical form of product in which substance is contained Liquid
4.2	Concentration of substance in preparation or article ≤ 100%
4.3	Maximum used amount of substance (as such or in preparation) per worker/workplace per day Worker: <1000kg/d Consumer: N/A. See below for detail individual PROCs.
	Amount used per time or per activity for which RMMs ensure control of risk
	Industrial PROC: 4, 5, 6, 8b, 9, 14; Concentration/Duration: 0-100% / 0-8hrs.
	Industrial PROC: 8a, 10, 13, 19; Professional PROC: 4, 5, 6, 8b, 9, 13, 14; Concentration/Duration: 0-25% / 0-8hrs, 25-100% / 0-4hrs.
	Industrial PROC: 7; Concentration/Duration: 0-5% / 0-1hr, 5-25% / 0-15min, 25-100% / Not covered.
	Industrial PROC: 17, 18; Professional PROC: 8a, 10, 19; Concentration/Duration: 0-5% / 0-8hrs, 5-100% / 0-1hr.
	Professional PROC: 11; Concentration/Duration: 0-1% / 0-4hrs, 1-25% / 0-1hr, 25-100% / Not covered.
	Professional PROC: 17, 18; Concentration/Duration: 0-1% / 0-8hrs, 1-5% / 0-4hrs, 5-25% / 0-1hr, 25-100% / 0-15min.
	Operational conditions related to environment Outdoor processing and handling.
	Annual amount used per site ≤ 50 kte/yr
5	Other operational conditions determining exposure
	Room size N/A – Outdoor scenario.
	Ventilation rate 70% ECETOC default for outdoor worker.
	Waste water treatment Discharges should be checked to ensure they comply with the requirements of local environmental protection legislation.
6	Risk Management Measures:
6.1	Human health measures
6.1.1	Occupational related measures
	Oral Do not eat, drink or smoke at the work place.
	Dermal Wear gloves (e.g. butyl; 0.7 mm; EN 374) for immersion protection when handling liquids and comply with good occupational hygiene practice. Change gloves, if contamination occurs or duration of activity exceeds break through time.
	Inhalation Use outdoor.
	Eyes Wear suitable eye protection, goggles, to protect against liquid splash.
6.1.2	Consumer related measures N/A – Industrial / Professional Scenario.
6.2	Environment related measures
	Air Not required
	Water Contain and collect spillages for incineration.
	Soil Fully polymerise before landfill
7	Waste related measures Avoid release to the environment. Contain and collect any spillages. Recycle where possible or incinerate under approved controlled conditions using a facility suitable for the disposal of flammable organics. Obtain the consent of pollution control authorities before discharging to waste water treatment plants. Only dispose of polymerised material to landfill.
8	Prediction of exposure resulting from the conditions described above
8.1	Human exposure estimation
8.1.1	Worker. Predicted exposure and Risk Characterisation Ratio based on DNEL and exposure calculated by ECETOC-TRA.
	Dermal Concentration ≤ 14.1 mg/kg bw/day RCR ≤ 3.29 (see section 9)
	Inhalative Concentration ≤ 4.2 ppm RCR ≤ 0.50
	Combined RCR ≤ 3.79 (see section 9)
8.1.2	Consumer N/A
8.2	Environmental exposure estimation
8.2.1	Environmental. Risk Characterisation Ratio based on PNEC and PEC calculated by EUSUS local compartments
	Air Concentration ≤ 1.1e-02 mg/m ³ RCR ≤ 1.8e-03
	Aquatic Concentration ≤ 2.5e-02 mg/ml RCR ≤ 3.6e-02
	Aquatic Sediment Concentration ≤ 2.8e-02 mg/kg ww RCR ≤ 3.6e-02
	Soil Concentration ≤ 3.6e-03 mg/kg ww RCR ≤ 1.7e-02
9	Other information Risk adequately controlled. Gloves required for immersion protection when handling liquids. Change gloves, if duration of activity exceeds break through time. Then safe handling of high exposure dermal applications (PROC6, 7, 10, 11, 17, 19) is ensured and RCR(dermal) is assumed to be below 0.5. All other PROCs indicate a dermal RCR below 0.5 within the assessed boundaries. Measured data could be used to confirm exposure levels are within the boundaries of the exposure scenario. Use the exposure assessment tools ECETOC-TRA and EUSUS for confirmation that you work inside to boundaries set by the GES (RCR<1 and PEC/PNEC<1)

GES9	
1	Short title Industrial or professional use outdoors where opportunity for exposure requires use of gloves and respiratory protection
2	Description of activities/process(es) covered in the Exposure Scenario Industrial or professional activities involving the handling of preparations containing monomers. IU2, IU3, IU4, SU3, SU1, SU2a, SU2b, SU5, SU6a, SU6b, SU7, SU10, SU11, SU12, SU13, SU14, SU15, SU16, SU17, SU18, SU19, SU20, SU22, SU23. PROC4, PROC5, PROC6, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC12, PROC13, PROC14, PROC17, PROC18, PROC19. ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ERC8d, ERC8e, ERC8f
3	Operational conditions
3.1	Duration and frequency of use
	Duration Worker: dependent upon concentration and activity, see section 4.3. Consumer: N/A.
	Frequency of exposure at workplace Daily
	Emission days per site 300 d/yr
4	Other operational conditions related to physical properties and boundary conditions
4.1	Physical form of product in which substance is contained Liquid
4.2	Concentration of substance in preparation or article ≤ 100%
4.3	Maximum used amount of substance (as such or in preparation) per worker/workplace per day Worker: <1000kg/d Consumer: N/A. See below for detail individual PROCs.
	Amount used per time or per activity for which RMMs ensure control of risk RMM: Butyl gloves (0.7 mm; EN 374) for immersion protection. RPE protection factor 10 (see section 9). Industrial PROC: 8a, 10, 13, 17, 18, 19; Professional PROC: 4, 5, 6, 8a, 8b, 9, 10, 12, 13, 14, 17, 18, 19; Concentration/Duration: 0-100% / 0-8hrs.
	RMM: Butyl gloves (0.7 mm; EN 374) for immersion protection. RPE protection factor 10 (see section 9). PROC: 7; Professional PROC: 11; Concentration/Duration: 0-100% / 0-4hrs.
	RMM: Butyl gloves (0.7 mm; EN 374) for immersion protection. RPE protection factor 20 (see section 9). Above scenarios plus: Industrial PROC: 7; Professional PROC: 11; Concentration/Duration: 0-100% / 0-8hrs.
	Operational conditions related to environment Outdoor processing and handling.
	Annual amount used per site ≤ 50 kte/yr
5	Other operational conditions determining exposure
	Room size N/A – Outdoor scenario.
	Ventilation rate 70% ECETOC default for outdoor worker.
	Waste water treatment Discharges should be checked to ensure they comply with the requirements of local environmental protection legislation.
6	Risk Management Measures:
6.1	Human health measures
6.1.1	Occupational related measures
	Oral Do not eat, drink or smoke at the work place.
	Dermal Wear gloves (e.g. butyl; 0.7 mm; EN 374) for immersion protection when handling liquids and comply with good occupational hygiene practice. Change gloves, if contamination occurs or duration of activity exceeds break through time.
	Inhalation Use outdoor. RPE protection factor 20 or 10 dependent upon PROC and duration.
	Eyes Wear suitable eye protection, face shield or goggles, to protect against liquid splash.
6.1.2	Consumer related measures N/A
6.2	Environment related measures
	Air Not required
	Water Contain and collect spillages for incineration.
	Soil Fully polymerise before landfill
7	Waste related measures Avoid release to the environment. Contain and collect any spillages. Recycle where possible or incinerate under approved controlled conditions using a facility suitable for the disposal of flammable organics. Obtain the consent of pollution control authorities before discharging to waste water treatment plants. Only dispose of polymerised material to landfill.
8	Prediction of exposure resulting from the conditions described above
8.1	Human exposure estimation
8.1.1	Worker. Predicted exposure and Risk Characterisation Ratio based on DNEL and exposure calculated by ECETOC-TRA.
	Dermal Concentration ≤ 14.1 mg/kg bw/day RCR ≤ 3.29 (see section 9)
	Inhalative Concentration ≤ 4.2 ppm RCR ≤ 0.50
	Combined RCR ≤ 3.50 (see section 9)
8.1.2	Consumer N/A – Industrial / Professional Scenario.
8.2	Environmental exposure estimation
8.2.1	Environmental. Risk Characterisation Ratio based on PNEC and PEC calculated by EUSUS local compartments
	Air Concentration ≤ 1.1e-02 mg/m ³ RCR ≤ 1.8e-03
	Aquatic Concentration ≤ 2.5e-02 mg/ml RCR ≤ 3.6e-02
	Aquatic Sediment Concentration ≤ 2.8e-02 mg/kg ww RCR ≤ 3.6e-02
	Soil Concentration ≤ 3.6e-03 mg/kg ww RCR ≤ 1.7e-02
9	Other information Risk adequately controlled. Gloves required for immersion protection when handling liquids. Change gloves, if duration of activity exceeds break through time. Then safe handling of high exposure dermal applications (PROC6, 7, 10, 11, 17, 19) is ensured and RCR(dermal) is assumed to be below 0.5. All other PROCs indicate a dermal RCR below 0.5 within the assessed boundaries. Ensure duration of wearing respiratory protection comply with the requirements of legislation. Measured data could be used to confirm exposure levels are within the boundaries of the exposure scenario. Use the exposure assessment tools ECETOC-TRA and EUSUS for confirmation that you work inside to boundaries set by the GES (RCR<1 and PEC/PNEC<1)

GES10	
1	Short title Industrial and Professional use indoors with low risk of exposure
2	Description of activities/process(es) covered in the Exposure Scenario Industrial or professional activities involving the handling of preparations containing monomers. IU1, IU2, IU3, IU4 SU3, SU1, SU2a, SU2b, SU5, SU6a, SU6b, SU7, SU8, SU9, SU10, SU12, SU13, SU14, SU15, SU16, SU17, SU18, SU19, SU20, SU22, SU23 PROC12, PROC15, PROC21, PROC22, PROC23, PROC24, PROC25, PROC26. PC1, PC2, PC3, PC4, PC7, PC8, PC9a, PC9b, PC9c, PC14, PC15, PC18, PC19, PC21, PC20, PC23, PC24, PC26, PC28, PC29, PC30, PC31, PC32, PC33, PC34, PC35, PC37, PC39 AC1, AC2, AC3, AC4, AC5, AC6, AC7, AC8, AC10, AC11, AC13, AC31 ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ERC8a, ERC8b, ERC8c, ERC9a, ERC11a
3	Operational conditions
3.1	Duration and frequency of use
	Duration Worker: dependent upon concentration and activity, see section 4.3. Consumer: Not applicable.
	Frequency of exposure at workplace Daily
	Emission days per site 300 d/yr
4	Other operational conditions related to physical properties and boundary conditions
4.1	Physical form of product in which substance is contained Liquid Monomer/Polymer preparations with limited monomer volumes (see 4.3)
4.2	Concentration of substance in preparation or article ≤ 100% contained liquid ≤ 5% residual monomer in polymer component
4.3	Maximum used amount of substance (as such or in preparation) per worker/workplace per day Industrial/Professional: <1000kg/d See below for detail individual PROCs, PCs. Amount used per time or per activity for which RMMs ensure control of risk Industrial PROC: 12; Concentration/Duration: 0-100% / 0-8hrs. Industrial PROC: 15; Professional PROC: 15; Concentration/Duration: 0-25% / 0-8hrs, 25-100% / 0-4hrs. Professional PROC: 12; Concentration/Duration: 0-5% / 0-8hrs, 5-25% / 0-4hrs, 25-100% / 0-1hr. No ECETOC model for volatiles available; solids application only; polymer demonstrated as safe use. Industrial PROC: 21, 22, 23, 24, 25, 26; Professional PROC: 21, 23, 24, 25, 26; Concentration/Duration: 0-5% / 0-8hrs, 5-100% / Not covered. See section 9.
	Operational conditions related to environment Indoor processing and handling.
	Annual amount used per site ≤ 260 kte/yr
5	Other operational conditions determining exposure
	Room size > 20 m ³ (ECETOC default).
	Ventilation rate General ventilation of workplaces. 5 - 15 air changes per hour recommended for general application.
	Waste water treatment Discharges should be checked to ensure they comply with the requirements of local environmental protection legislation.
6	Risk Management Measures:
6.1	Human health measures
6.1.1	Occupational related measures
	Oral Do not eat, drink or smoke at the work place.
	Dermal Gloves not required. If opportunity for skin contact with liquid monomer occurs wear gloves (e.g. butyl; EN 374) for splash protection when handling liquids and comply with good occupational hygiene practice. Change gloves, if contamination occurs.
	Inhalation Use indoor.
	Eyes Eye protection not required. If opportunity for contact with liquid monomer occurs wear suitable eye protection, goggles.
6.1.2	Consumer related measures Not applicable.
6.2	Environment related measures
	Air Not required
	Water Contain and collect spillages for incineration.
	Soil Fully polymerise before landfill
7	Waste related measures Avoid release to the environment. Contain and collect any spillages. Recycle where possible or incinerate under approved controlled conditions using a facility suitable for the disposal of flammable organics. Obtain the consent of pollution control authorities before discharging to waste water treatment plants. Only dispose of polymerised material to landfill.
8	Prediction of exposure resulting from the conditions described above
8.1	Human exposure estimation
8.1.1	Worker. Predicted exposure and Risk Characterisation Ratio based on DNEL and exposure calculated by ECETOC-TRA
	Dermal Concentration ≤ 0.34 mg/kg bw/day RCR ≤ 0.08
	Inhalative Concentration ≤ 3.6 ppm RCR ≤ 0.43
	Combined RCR ≤ 0.51
8.1.2	Consumer Not applicable
8.2	Environmental exposure estimation
8.2.1	Environmental. Risk Characterisation Ratio based on PNEC and PEC calculated by EUSUS local compartments
	Air Concentration ≤ 1.1e-02 mg/m ³ RCR ≤ 1.8e-03
	Aquatic Concentration ≤ 2.5e-02 mg/ml RCR ≤ 3.6e-02
	Aquatic Sediment Concentration ≤ 2.8e-02 mg/kg ww RCR ≤ 3.6e-02
	Soil Concentration ≤ 3.6e-03 mg/kg ww RCR ≤ 1.7e-02
9	Other information Risk adequately controlled. Gloves required for splash protection when handling liquids. If potential for contact with liquid is present refer to GES11. Measured data could be used to confirm exposure levels are within the boundaries of the exposure scenario. PCs and PROCs (polymer applications) evaluated as safe for up to 5% residual MAA related to used amount of MAA. Use the exposure assessment tools ECETOC-TRA and EUSUS for confirmation that you work inside to boundaries set by the GES (RCR<1 and PEC/PNEC<1).

GES11	
1	Short title Industrial or professional use indoors where opportunity for exposure requires use of gloves
2	Description of activities/process(es) covered in the Exposure Scenario Industrial or professional activities involving the handling of preparations containing monomers. IU1, IU2, IU3, IU4 SU3, SU1, SU2a, SU2b, SU5, SU6a, SU6b, SU7, SU8, SU9, SU10, SU11, SU12, SU13, SU14, SU15, SU16, SU17, SU18, SU19, SU20, SU22, SU23. PROC4, PROC5, PROC6, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC14, PROC17, PROC18, PROC19 ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ERC8a, ERC8b, ERC8c, ERC9a
3	Operational conditions
3.1	Duration and frequency of use
	Duration Worker: dependent upon concentration and activity, see section 4.3. Consumer: N/A.
	Frequency of exposure at workplace Daily
	Emission days per site 300 d/yr
4	Other operational conditions related to physical properties and boundary conditions
4.1	Physical form of product in which substance is contained Liquid
4.2	Concentration of substance in preparation or article ≤ 100%
4.3	Maximum used amount of substance (as such or in preparation) per worker/workplace per day Worker: <1000kg/d Consumer: N/A. See below for detail individual PROCs.
	Amount used per time or per activity for which RMMs ensure control of risk Industrial PROC: 4, 5, 6, 8b, 9, 14; Concentration/Duration: 0-25% / 0-8hrs, 25-100% / 0-4hrs. Industrial PROC: 8a, 10, 13, 19; Professional PROC: 4, 5, 6, 8b, 9, 13, 14; Concentration/Duration: 0-5% / 0-8hrs, 5-25% / 0-4hrs, 25-100% / 0-1hr. Industrial PROC: 17, 18; Concentration/Duration: 0-5% / 0-8hrs, 5-100% / 0-1hr. Industrial PROC: 7; Professional PROC: 11; Concentration/Duration: 0-5% / 0-1hr, 5-100% / Not covered. Professional PROC: 8a, 10, 19; Concentration/Duration: 0-1% / 0-8hrs, 1-5% / 0-4hrs, 5-25% / 0-1hr, 25-100% / 0-15min. Professional PROC: 17, 18; Concentration/Duration: 0-1% / 0-4hrs, 1-5% / 0-1hr, 5-25% / 0-15min, 25-100% / Not covered. Operational conditions related to environment Indoor processing and handling. Annual amount used per site ≤ 50 kte/yr
5	Other operational conditions determining exposure
	Room size > 20 m ³ (ECETOC default).
	Ventilation rate General ventilation of workplaces. 5 - 15 air changes per hour recommended for general application.
	Waste water treatment Discharges should be checked to ensure they comply with the requirements of local environmental protection legislation.
6	Risk Management Measures:
6.1	Human health measures
6.1.1	Occupational related measures
	Oral Do not eat, drink or smoke at the work place.
	Dermal Wear gloves (e.g. butyl; 0.7 mm; EN 374) for immersion protection when handling liquids and comply with good occupational hygiene practice. Change gloves, if contamination occurs or duration of activity exceeds break through time.
	Inhalation Use indoor.
	Eyes Wear suitable eye protection, goggles, to protect against liquid splash.
6.1.2	Consumer related measures N/A – Industrial / Professional Scenario.
6.2	Environment related measures
	Air Not required
	Water Contain and collect spillages for incineration.
	Soil Fully polymerise before landfill
7	Waste related measures Avoid release to the environment. Contain and collect any spillages. Recycle where possible or incinerate under approved controlled conditions using a facility suitable for the disposal of flammable organics. Obtain the consent of pollution control authorities before discharging to waste water treatment plants. Only dispose of polymerised material to landfill.
8	Prediction of exposure resulting from the conditions described above
8.1	Human exposure estimation
8.1.1	Worker. Predicted exposure and Risk Characterisation Ratio based on DNEL and exposure calculated by ECETOC-TRA.
	Dermal Concentration ≤ 14.1 mg/kg bw/day RCR ≤ 3.29 (see section 9)
	Inhalative Concentration ≤ 4 ppm RCR ≤ 0.48
	Combined RCR ≤ 3.65 (see section 9)
8.1.2	Consumer N/A
8.2	Environmental exposure estimation
8.2.1	Environmental. Risk Characterisation Ratio based on PNEC and PEC calculated by EUSUS local compartments
	Air Concentration ≤ 1.1e-02 mg/m ³ RCR ≤ 1.8e-03
	Aquatic Concentration ≤ 2.5e-02 mg/ml RCR ≤ 3.6e-02
	Aquatic Sediment Concentration ≤ 2.8e-02 mg/kg ww RCR ≤ 3.6e-02
	Soil Concentration ≤ 3.6e-03 mg/kg ww RCR ≤ 1.7e-02
9	Other information Risk adequately controlled. Gloves required for immersion protection when handling liquids. Change gloves, if duration of activity exceeds break through time. Then safe handling of high exposure dermal applications (PROC6, 7, 10, 11, 17, 19) is ensured and RCR(dermal) is assumed to be below 0.5. Measured data could be used to confirm exposure levels are within the boundaries of the exposure scenario. All other PROCs indicate a dermal RCR below 0.5 within the assessed boundaries. Use the exposure assessment tools ECETOC-TRA and EUSUS for confirmation that you work inside to boundaries set by the GES (RCR<1 and PEC/PNEC<1)

GES12	
1	Short title Industrial or professional use indoors where opportunity for exposure requires use of gloves and respiratory protection
2	Description of activities/process(es) covered in the Exposure Scenario Industrial or professional activities involving the handling of preparations containing monomers. Includes: IU1, IU2, IU3, IU4, SU3, SU1, SU2a, SU2b, SU5, SU6a, SU6b, SU7, SU8, SU9, SU10, SU11, SU12, SU13, SU14, SU15, SU16, SU17, SU18, SU19, SU20, SU22, SU23 PROC4, PROC5, PROC6, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC12, PROC13, PROC14, PROC17, PROC18, PROC19. ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ERC8a, ERC8b, ERC8c, ERC9a
3	Operational conditions
3.1	Duration and frequency of use
	Duration Worker: dependent upon concentration and activity, see section 4.3. Consumer: N/A.
	Frequency of exposure at workplace Daily
	Emission days per site 300 d/yr
4	Other operational conditions related to physical properties and boundary conditions
4.1	Physical form of product in which substance is contained Liquid
4.2	Concentration of substance in preparation or article ≤ 100%
4.3	Maximum used amount of substance (as such or in preparation) per worker/workplace per day Worker: <1000kg/d Consumer: N/A. See below for detail individual PROCs.
	Amount used per time or per activity for which RMMs ensure control of risk
	RMM: Butyl gloves (0.7 mm; EN 374) for immersion protection. RPE protection factor 10 (see section 9). Industrial PROC: 4, 5, 6, 8a, 8b, 9, 10, 13, 14, 17, 18, 19; Professional PROC: 4, 5, 6, 8a, 8b, 9, 10, 12, 13, 14, 19; Concentration/Duration: 0-100% / 0-8hrs.
	RMM: Butyl gloves (0.7 mm; EN 374) for immersion protection. RPE protection factor 10 (see section 9). Industrial PROC: 7; Professional PROC: 11; Concentration/Duration: 0-5% / 0-8hrs, 5-25% / 0-4hrs, 25-100% / 0-1hr.
	RMM: Butyl gloves (0.7 mm; EN 374) for immersion protection. RPE protection factor 10 (see section 9). Professional PROC: 17, 18; Concentration/Duration: 0-25% / 0-8hrs, 25-100% / 0-4hrs.
	RMM: Butyl gloves (0.7 mm; EN 374) for immersion protection. RPE protection factor 20 (see section 9). Above scenarios plus: Professional PROC: 17, 18; Concentration/Duration: 0-100% / 0-8hrs.
	RMM: Butyl gloves (0.7 mm; EN 374) for immersion protection. RPE protection factor 20 (see section 9). Above scenarios plus: Industrial PROC: 7; Professional PROC: 11; Concentration/Duration: 0-25% / 0-8hrs, 25-100% / 0-4hrs.
	Operational conditions related to environment Indoor processing and handling.
	Annual amount used per site ≤ 50 kte/yr
5	Other operational conditions determining exposure
	Room size > 20 m ³ (ECETOC default).
	Ventilation rate General ventilation of workplaces. 5 - 15 air changes per hour recommended for general application.
	Waste water treatment Discharges should be checked to ensure they comply with the requirements of local environmental protection legislation.
6	Risk Management Measures:
6.1	Human health measures
6.1.1	Occupational related measures
	Oral Do not eat, drink or smoke at the work place.
	Dermal Wear gloves (e.g. butyl; 0.7 mm; EN 374) for immersion protection when handling liquids and comply with good occupational hygiene practice. Change gloves, if contamination occurs or duration of activity exceeds break through time.
	Inhalation Use indoor. RPE protection factor 20 or 10 dependent upon PROC and duration.
	Eyes Wear suitable eye protection, face shield or goggles, to protect against liquid splash.
6.1.2	Consumer related measures N/A
6.2	Environment related measures
	Air Not required
	Water Contain and collect spillages for incineration.
	Soil Fully polymerise before landfill
7	Waste related measures Avoid release to the environment. Contain and collect any spillages. Recycle where possible or incinerate under approved controlled conditions using a facility suitable for the disposal of flammable organics. Obtain the consent of pollution control authorities before discharging to waste water treatment plants. Only dispose of polymerised material to landfill.
8	Prediction of exposure resulting from the conditions described above
8.1	Human exposure estimation
8.1.1	Worker. Predicted exposure and Risk Characterisation Ratio based on DNEL and exposure calculated by ECETOC-TRA.
	Dermal Concentration ≤ 14.1 mg/kg bw/day RCR ≤ 3.29 (see section 9)
	Inhalative Concentration ≤ 3.6 ppm RCR ≤ 0.43
	Combined RCR ≤ 3.59 (see section 9)
8.1.2	Consumer N/A
8.2	Environmental exposure estimation
8.2.1	Environmental. Risk Characterisation Ratio based on PNEC and PEC calculated by EUSUS local compartments
	Air Concentration ≤ 1.1e-02 mg/m ³ RCR ≤ 1.8e-03
	Aquatic Concentration ≤ 2.5e-02 mg/ml RCR ≤ 3.6e-02
	Aquatic Sediment Concentration ≤ 2.8e-02 mg/kg ww RCR ≤ 3.6e-02
	Soil Concentration ≤ 3.6e-03 mg/kg ww RCR ≤ 1.7e-02

9	Other information Risk adequately controlled. Gloves required for immersion protection when handling liquids. Change gloves, if duration of activity exceeds break through time. Then safe handling of high exposure dermal applications (PROC6, 7, 10, 11, 17, 19) is ensured and RCR(dermal) is assumed to be below 0.5. All other PROCs indicate a dermal RCR below 0.5 within the assessed boundaries. Ensure duration of wearing respiratory protection comply with the requirements of legislation. Measured data could be used to confirm exposure levels are within the boundaries of the exposure scenario. Use the exposure assessment tools ECETOC-TRA and EUSUS for confirmation that you work inside to boundaries set by the GES (RCR<1 and PEC/PNEC<1)
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GES 13	
1	Short title Consumer use
2	Description of activities/process(es) covered in the Exposure Scenario IU5, IU6 SU19, SU20, SU21, SU22, SU23 PROCs not applicable PC1, PC2, PC3, PC4, PC7, PC8, PC9a, PC9b, PC9c, PC12, PC14, PC15, PC18, PC19, PC21, PC20, PC23, PC24, PC26, PC28, PC29, PC30, PC31, PC32, PC33, PC34, PC35, PC37, PC39 AC1, AC2, AC3, AC4, AC5, AC6, AC7, AC8, AC10, AC11, AC13, AC31 ERC8a, ERC8b, ERC8c, ERC8d, ERC8e, ERC8f, ERC9a, ERC10a, ERC11a
3	Operational conditions
3.1	Duration and frequency of use Duration Dependent upon concentration and activity, see section 4.3. Frequency of exposure at workplace Daily Emission days per site 365 d/yr
4	Other operational conditions related to physical properties and boundary conditions
4.1	Physical form of product in which substance is contained Monomer/Polymer preparations with limited monomer volumes (see 4.3)
4.2	Concentration of substance in preparation or article ≤ 5% residual monomer in polymer component
4.3	Maximum used amount of substance (as such or in preparation) per worker/workplace per day Consumer: 9g, duration up to 4 hrs (PC1); product ingredient up to 0.05 g/g product (PC1); defaults ECETOC. See below for detail individual PCs. Amount used per time or per activity for which RMMs ensure control of risk RMM: No RMMs identified. Consumer PC: 1; Concentration/Duration/Amount used: 0-22% / 0-8hrs / 39g; maximum for specific parameter using default values for other boundaries. See section 9. RMM: No RMMs identified. Consumer PC: 1, 2, 3, 4, 7, 8, 9a, 9b, 9c, 12, 14, 15, 18, 19, 20, 21, 23, 24, 26, 28, 29, 30, 31, 32, 33, 34, 35, 37, 39; Consumer AC: 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 13, 31; Concentration/Duration: 0-5% / 0-8hrs, 5-100% / Not covered. See section 9. Operational conditions related to environment General processing and handling. Annual amount used ≤ 2.5 te/yr
5	Other operational conditions determining exposure Room size > 20 m ³ (ECETOC default). Ventilation rate General ventilation of workplaces. 5 - 15 air changes per hour recommended for general application. Waste water treatment Not applicable.
6	Risk Management Measures:
6.1	Human health measures
6.1.1	Occupational related measures None required.
6.1.2	Consumer related measures Oral Do not eat, drink or smoke at the work place. Dermal None required. If potential for contact with liquid occurs or duration and concentration exceeds safe use refer to industrial / professional use scenarios. Size and design of application container is to be adapted to avoid significant dermal exposure during duration of use. Inhalation None required. Size of application container is to be adapted to avoid significant exposure by inhalation during duration of use. Eyes None required
6.2	Environment related measures Air None required. Water Do not empty into drains. Soil Only dispose of polymerised material with household waste.
7	Waste related measures Only dispose of polymerised material with household waste.
8	Prediction of exposure resulting from the conditions described above
8.1	Human exposure estimation
8.1.1	Worker. Not applicable
8.1.2	Consumer. Predicted exposure and Risk Characterisation Ratio based on DNEL and exposure calculated by ECETOC-TRA. Dermal Concentration ≤ 0.30 mg/kg bw/day RCR ≤ 0.115 Inhalative Concentration ≤ 0.02 mg/m ³ RCR ≤ 0.004 Combined RCR ≤ 0.12
8.2	Environmental exposure estimation
8.2.1	Environmental. Risk Characterisation Ratio based on PNEC and PEC calculated by EUSUS local compartments Air Concentration ≤ 1.1e-02 mg/m ³ RCR ≤ 1.8e-03 Aquatic Concentration ≤ 2.5e-02 mg/ml RCR ≤ 3.6e-02 Aquatic Sediment Concentration ≤ 2.8e-02 mg/kg ww RCR ≤ 3.6e-02 Soil Concentration ≤ 3.6e-03 mg/kg ww RCR ≤ 1.7e-02
9	Other information Risk adequately controlled. Consumer scenario only. If concentration or duration exceeds amount covered by this scenario refer to appropriate industrial / professional scenario. Consumer scenarios predominantly polymer preparations. PC1 evaluated for higher residual monomer according to ECETOC standard defaults. For changing specific defaults of the model equation $[0.5 \geq RCR(\text{dermal/inhalation}) * (\text{amount used} / \text{default ECETOC}) * (\text{duration} / \text{default ECETOC}) * \text{product ingredient} / \text{default ECETOC}]$ has to be satisfied. Other PCs and ACs (polymer applications) evaluated as safe for up to 5% residual MAA related to used amount of MAA. Use the exposure assessment tools ECETOC-TRA and EUSUS for confirmation that you work inside to boundaries set by the GES (RCR<1 and PEC/PNEC<1).