Safety data sheet
according to 1907/2006/EC, Article 31

Printing date 19.03.2012 Version: 3 Revision: 19.03.2012

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

· **1.1 Product identifier**
4,4'-isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane
· **Trade name:** NPEL-128E
· **Synonyms:**
Reaction product: bisphenol -A-(epychlorhydrin)epoxy resin (number average molecular weight ≤700)
· **CAS Number:**
25068-38-6
· **NLP Number:**
500-033-5
· **Index number:**
603-074-00-8
· **Registration number** 01-2119456619-26-0020

ZEUS QUIMICA, S.A.
Santaló, 152 - 154
08021 BARCELONA
Tel. + 34 93 240 22 22
Fax + 34 93 240 22 23
zeus@zeusquimica.com
www.zeusquimica.com

· **1.2 Relevant identified uses of the substance or mixture and uses advised against**
Any uses where the epoxy resin product and/or formulation, that is classified on the packaging as a skin sensitizer/irritant, are to be used without skin protection (without recommended Personal Protective Equipment (PPE)).
Any uses in articles in which residual of BPA is greater than 1000 ppm
Refer to Exposure Scenarios for additional covered SU, PROC, PC, AC and ERC.
· **Sector of Use**
SU3 Industrial uses: Uses of substances as such or in preparations at industrial sites
SU8 Manufacture of bulk, large scale chemicals (including petroleum products)
· **Product category** PC19 Intermediate
· **Process category**
PROC2 Use in closed, continuous process with occasional controlled exposure
PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC15 Use as laboratory reagent
· **Environmental release category** ERC1 Manufacture of substances
· **Application of the substance / the preparation**
Additive for polymers
Raw material for plastics
Preparation of coatings
Adhesives
Intermediate

EMERGENCIAS
704.10.00.87
24h · 365 días

· **1.3 Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Nan Ya Plastics Corporation
201, Tung-Hwa North Road,
105 Taipei
Taiwan ROC
· **Only Representative**
Instituto Suizo para el Fomento de la Seguridad - Swissi España S.L.U
Calle Lope de Vega 30 Entlo.
E-08005 Barcelona
reach@swissiesp.com
· **1.4 Emergency telephone number:** NPC: Tel. +886-56818771

2 Hazards identification

· **2.1 Classification of the substance or mixture**
· **Classification according to Regulation (EC) No 1272/2008**

GHS09 environment

Aquatic Chronic 2 H411 Toxic to aquatic life with long lasting effects.

(Contd. on page 2)

Safety data sheet
according to 1907/2006/EC, Article 31

Printing date 19.03.2012 Version: 3 Revision: 19.03.2012

(Contd. of page 1)


GHS07

Skin Irrit. 2	H315 Causes skin irritation.
Eye Irrit. 2	H319 Causes serious eye irritation.
Skin Sens. 1	H317 May cause an allergic skin reaction.

· **Classification according to Directive 67/548/EEC or Directive 1999/45/EC**


Xi; Irritant

R36/38: Irritating to eyes and skin.


Xi; Sensitising

R43: May cause sensitisation by skin contact.


N; Dangerous for the environment

R51/53: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

· **2.2 Label elements**
· **Labelling according to Regulation (EC) No 1272/2008**
The substance is classified and labelled according to the CLP regulation.
· **Hazard pictograms**


GHS07 GHS09

· **Signal word** Warning
· **Hazard statements**
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H317 May cause an allergic skin reaction.
H411 Toxic to aquatic life with long lasting effects.
Contains epoxy constituents. May produce an allergic reaction.
· **Precautionary statements**

P280	Wear protective gloves/protective clothing/eye protection/face protection.
P262	Do not get in eyes, on skin, or on clothing.
P302+P352	IF ON SKIN: Wash with plenty of soap and water.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P333+P313	If skin irritation or rash occurs: Get medical advice/attention.
P362	Take off contaminated clothing and wash before reuse.
P501	Dispose of contents/container in accordance with local/regional/national/international regulations.

· **2.3 Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** None
· **vPvB:** None

3 Composition/information on ingredients

· **3.1 Chemical characterization: Substances**
· **CAS No.**
25068-38-6
· **CAS Description:** Reaction product: bisphenol-A-(epichlorhydrin)epoxy resins
· **Identification number(s)**
· **NLP Number:** 500-033-5

(Contd. on page 3)

Safety data sheet
according to 1907/2006/EC, Article 31

Printing date 19.03.2012 Version: 3 Revision: 19.03.2012

(Contd. of page 2)

· **Index number:** 603-074-00-8

4 First aid measures

· **4.1 Description of first aid measures**
· **General information:** Immediately remove any clothing soiled by the product.
· **After inhalation:**
Supply fresh air and to be sure call for a doctor.
In case of unconsciousness place patient stably in side position for transportation.
· **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
· **After eye contact:**
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· **After swallowing:** Do not induce vomiting; call for medical help immediately.
· **4.2 Most important symptoms and effects, both acute and delayed**
No further relevant information available.
· **4.3 Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Firefighting measures

· **5.1 Extinguishing media**
· **Suitable extinguishing agents:**
CO2, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
· **For safety reasons unsuitable extinguishing agents:** Water with full jet
· **5.2 Special hazards arising from the substance or mixture** No further relevant information available.
· **5.3 Advice for firefighters**
· **Protective equipment:**
Wear protective clothing and glasses
Wear self-contained respiratory protective device

6 Accidental release measures

· **6.1 Personal precautions, protective equipment and emergency procedures**
Wear protective equipment. Keep unprotected persons away.
Keep away from ignition sources.
· **6.2 Environmental precautions:**
Inform respective authorities in case of seepage into water course or sewage system.
Do not allow to enter sewers/ surface or ground water
· **6.3 Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
· **6.4 Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

· **7.1 Precautions for safe handling** Ensure good ventilation/exhaustion at the workplace.
· **Information about fire - and explosion protection:**
Protect from heat.
Keep ignition sources away - Do not smoke.

· **7.2 Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** No special requirements
· **Information about storage in common storage facility:** Store away from foodstuffs.
· **Further information about storage conditions:** Keep container tightly sealed.

(Contd. on page 4)

Safety data sheet
according to 1907/2006/EC, Article 31

Printing date 19.03.2012 Version: 3 Revision: 19.03.2012

(Contd. of page 3)

· **7.3 Specific end use(s)** No further relevant information available.

*
8 Exposure controls/personal protection

· **Additional information about design of technical facilities:** Mechanical exhaust required

· **8.1 Control parameters** None
· **Ingredients with limit values that require monitoring at the workplace:** Not required.

· **DNELs**		
25068-38-6 reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight ≤ 700)		
Oral	DNEL population	0.75 mg/kg bw/day (Human) (acute and long-term, systemic effect)
Dermal	DNEL population	3.571 mg/kg bw/day (Human) (acute and long-term, systemic effect)
	DNEL workers	8.33 mg/cm2 (Workers) (long-term and acute, systemic effect)
Inhalative	DNEL workers	12.25 mg/m3 (Workers) (long-term and acute, systemic effect)

· **PNECs**	
25068-38-6 reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight ≤ 700)	
PNEC STP	10 mg/l (general)
PNEC freshw sed	0.996 mg/kg sed dw (general)
PNEC freshwater	0.006 mg/l (general)
PNEC oral	11000 mg/jkg food (general)
PNEC saltw sed	0.0996 mg/kg sed dw (general)
PNEC saltwater	0.0006 mg/l (general)
PNEC soil	0.196 mg/kg soil dw (general)
PNEC water	0.0018 mg/l (general) (Intermittent release)

· **Additional information:** The lists valid during the making were used as basis.

· **8.2 Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.
· **Respiratory protection:**
Not necessary if room is well-ventilated.
Use suitable respiratory protective device only when aerosol or mist is formed.
· **Protection of hands:**

Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
· **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
Wear suitable gloves tested to EN374.
· **Penetration time of glove material**
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

(Contd. on page 5)

Safety data sheet
according to 1907/2006/EC, Article 31

Printing date 19.03.2012 Version: 3 Revision: 19.03.2012

(Contd. of page 4)

· **Eye protection:**

Tightly sealed goggles

9 Physical and chemical properties

· **9.1 Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Liquid
Colour:	Light yellow
· **Odour:**	Characteristic
· **pH-value:**	Not determined.
· **Change in condition**	
Melting point/Melting range:	-16°C
Boiling point/Boiling range:	Not determined
· **Flash point:**	266°C
· **Danger of explosion:**	Product does not present an explosion hazard
· **Explosion limits:**	
Lower:	Not determined.
Upper:	Not determined.
· **Vapour pressure at 25°C:**	4.6E-7 hPa
· **Density at 20°C:**	1.16 g/cm³
· **Solubility in / Miscibility with:**	
water at 20°C:	0.0069 g/l
· **Segregation coefficient (n-octanol/water) at 25°C:**	3.242 log POW
· **Viscosity:**	
Dynamic at 20°C:	11000 mPas
Kinematic:	Not determined.
· **9.2 Other information**	No further relevant information available.

10 Stability and reactivity

· **10.1 Reactivity**
· **10.2 Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications
· **10.3 Possibility of hazardous reactions** No dangerous reactions known
· **10.4 Conditions to avoid** Static electricity discharge
· **10.5 Incompatible materials:**
Amines
Acids, bases
Strong oxidizing agents.
· **10.6 Hazardous decomposition products:** In fire toxic fumes may be generated

(Contd. on page 6)

Safety data sheet
according to 1907/2006/EC, Article 31

Printing date 19.03.2012 Version: 3 Revision: 19.03.2012

(Contd. of page 5)

11 Toxicological information

· **11.1 Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values relevant for classification:**		
25068-38-6 reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight ≤ 700)		
Oral	LD50	> 15000 mg/kg (rat) (Mortality observed at 15000 mg/kg)
	NOAEL	180 mg/kg bw/d (general) (Prenatal Develop Tox study (rat))
		750 mg/kg bw/day (general) (Studies on fertility (rat))
		50 mg/kg bw/d (rat) (OECD Guideline 408)
		15 mg/kg bw/day (rat) (OECD Guideline 453)
Dermal	LD50	23032 mg/kg (rabbit) (Draize test)
	NOAEL	100 mg/kg bw/day (mouse) (OECD Guideline 411)
		1 mg/kg bw/day (rat) (OECD Guideline 453)
		300 mg/kg bw/day (rabbit) (The EPA: TSCA test guidelines)
Inhalative	LC0/5h	0 ppm (rat) (Union Carbide (1983a))
Irritation of skin	Skin irritation	Slightly irrit. (tbt) (OECD Guideline 404)
Irritation of eyes	Occular irritation	Not irritating (rabbit) (OECD Guideline 405/ EU Method B.5)

· **Primary irritant effect:**
· **on the skin:** Irritant to skin and mucous membranes.
· **on the eye:** Irritating effect.
· **Sensitisation** May cause sensitisation by skin contact.
· **Carcinogenicity:** No data available

12 Ecological information

· **12.1 Toxicity**

· **Aquatic toxicity:**	
25068-38-6 reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight ≤ 700)	
EC10/72h	4.2 mg/l (Algae)
EC10/LC10	0.3 mg/L (daphnia) (OECD Guideline 211 (21 days))
EC50/48h	1.8 mg/l (daphnia) (Mean of five valid exposure studies)
EC50/72h (static)	11 mg/l (Scenedesmus subspicatus) (Similar to EPA-660/3-75-009)
LC50/96 h	2 mg/l (Oncorhynchus mykiss) (Mean of five valid exposure studies)

· **12.2 Persistence and degradability** Not easily biodegradable
· **12.3 Bioaccumulative potential** Does not accumulate in organisms
· **12.4 Mobility in soil** Not expected
· **Ecotoxical effects:**
· **Remark:** Toxic for fish
· **Additional ecological information:**
· **General notes:**
Water hazard class 2 (German Regulation) (Self-assessment): hazardous for water
Do not allow product to reach ground water, water course or sewage system.
Danger to drinking water if even small quantities leak into the ground.
Also poisonous for fish and plankton in water bodies.
Toxic for aquatic organisms
· **12.5 Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

(Contd. on page 7)

Safety data sheet
according to 1907/2006/EC, Article 31

Printing date 19.03.2012 Version: 3 Revision: 19.03.2012

(Contd. of page 6)

· **12.6 Other adverse effects** No further relevant information available.

13 Disposal considerations

· **13.1 Waste treatment methods**
· **Recommendation**
Must not be disposed together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packaging:**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· **14.1 UN-Number**	
· **ADR, IMDG, IATA**	3082
· **14.2 UN proper shipping name**	
· **IMDG, IATA**	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight ≤ 700))
· **14.3 Transport hazard class(es)**	
· **ADR**	
· **Class**	9 Miscellaneous dangerous substances and articles.
· **Label**	9
· **IMDG, IATA**	
· **Class**	9 Miscellaneous dangerous substances and articles.
· **14.4 Packing group**	
· **ADR, IMDG, IATA**	III
· **14.6 Special precautions for user**	Warning: Miscellaneous dangerous substances and articles.
· **Danger code (Kemler):**	90
· **14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **ADR**	
· **Excepted quantities (EQ):**	E1
· **Tunnel restriction code**	E

15 Regulatory information

· **15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Inventory - United States - Toxic Substances Control Act (TSCA)** Substance is listed.
· **US - FIFRA - Pesticide Product Other Ingredients** Substance is not listed.
· **OECD - List of High Production Volume Chemicals** Substance is not listed.
· **U.S. - EPA - HPV (High Production Volume) Challenge Program Chemical List** Substance is not listed.
· **NIOSH - Health Standards - Pesticides** Substance is not listed.
· **Inventory - Canada - Domestic Substances List (DSL)** Substance is listed.
· **Philippines Inventory of Chemicals and Chemical Substances** Substance is listed.
· **Inventory-China** Substance is listed.
· **Australian Inventory of Chemical Substances** Substance is listed.

(Contd. on page 8)

Safety data sheet
according to 1907/2006/EC, Article 31

Printing date 19.03.2012 Version: 3 Revision: 19.03.2012

(Contd. of page 7)

· **Japan Existing and New Chemical Substances (ENCS)**	
25068-38-6	reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight ≤ 700)

· **Inventory - Korea - Existing and Evaluated Chemical Substances**		
25068-38-6	reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight ≤ 700)	KE-24000

· **Standard for the Uniform Scheduling of Drugs and Poisons** Substance is not listed.
· **15.2 Chemical safety assessment:** A Chemical Safety Assessment has been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Exposure scenarios**
This SDS has one annex which includes the Exposure Scenarios developed in the Chemical Safety Assessment
Exposure Scenarios in local languages will be published as soon as they are available.
· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
ICAO: International Civil Aviation Organization
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
DNEL: Derived No-Effect Level (REACH)
PNEC: Predicted No-Effect Concentration (REACH)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
· *** Data compared to the previous version altered.**
Change of Only Representative.
Inclusion of Exposure Scenarios
Version 1: 15 / 02 / 2011
Version 2: 21 / 12 / 2011

(Contd. on page 9)

Safety data sheet
according to 1907/2006/EC, Article 31

(Contd. of page 8)

*
Annex: Exposure scenario 1

· **Short title of the exposure scenario** Manufacture of substance
· **Sector of Use**
SU3 Industrial uses: Uses of substances as such or in preparations at industrial sites
SU8 Manufacture of bulk, large scale chemicals (including petroleum products)
· **Product category** PC19 Intermediate
· **Process category**
PROC2 Use in closed, continuous process with occasional controlled exposure
PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC15 Use as laboratory reagent
· **Environmental release category** ERC1 Manufacture of substances
· **Description of the activities / processes covered in the Exposure Scenario**
Manufacture
Associated laboratory activities
Distribution
Maintenance
Packaging
· **Conditions of use**
· **Worker** Covers daily exposures up to 8 hours [G2]
· **Environment**
Total: 197000 tonnes/year
Fraction of EU tonnage used in region: 0.35
Fraction of main source to local environment: 0.6
Fraction of substance in end-use products: 1
Continuous use.
Emission days: 300days/year
· **Physical parameters**
· **Physical state**
Fluid
Low volatility
· **Concentration of the substance in the mixture** up to 100%
· **Used amount per time or activity** No limit
· **Other operational conditions**
· **Other operational conditions affecting environmental exposure**
Local freshwater dilution factor: 10
Local marine water dilution factor: 100
· **Other operational conditions affecting worker exposure** Assumes use at not >70°C above ambient [OC6]
· **Risk management measures**
· **Worker protection**
· **Organisational protective measures**
Contributing Scenario (ES1-W1) (PROC2)
Avoid carrying out the operation for more than 4 hours [OC12]
· **Technical protective measures**
Contibuting scenario (ES1-W1) (PROC2)
Manufacturing and sampling
RMM: Handle substance within a closed system [E47].
Contributing Scenario (ES1-W2) (PROC8b)
Transfer from/pouring from containers [CS22]. Dedicated facility [CS81].
RMM: Provide extract ventilation to points where emissions occur [E54]. (effectiveness LEV: 97%).
Contributing Scenario (ES1-W3) (PROC15)
Laboratory activities [CS36]. Small scale [CS61].
RMM: No specific measures identified [EI18].
· **Personal protective measures**
Wear chemically resistant gloves (tested to EN374) in combination with „basic“ employee training [PPE16].
· **Environmental protection measures**
· **Air** Exhaust air is introduced into the gas scrubber.
· **Water**
Do not allow to reach ground water, water bodies or sewage system, not even in small quantities.

(Contd. on page 10)

Safety data sheet
according to 1907/2006/EC, Article 31

(Contd. of page 9)

Prevent discharge of undissolved substance to waste water or recover from wastewater.
Wastewater treatment is considered to be done.

· **Soil**
Prevent contamination of soil.
Land spreading of sludge of wastewater treatment is prohibited.
Sludge from wastewater treatment is incinerated.

· **Notes**
Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases.
A leak prevention plan is needed to prevent low leve continual releases.

· **Exposure estimation**
When the recommended risk management measures (RMM) and operational conditions (OC) are observed, exposures are not expected to exceed the predicted DNELs or PNECs and the resulting risk characterisation ratios are expected to be less than 1.
Confirm that RMMs and OCs are as described or of equivalent efficiency.

· **Worker (oral)** No significant oral exposure

· **Worker (dermal)**
The exposure estimation was carried out in accordance with ECETOC TRA.
PROC2: 0.14 mg/kg bw day
PROC8b: 0.69 mg/kg bw day
PROC15: 0.03 mg/kg bw day

· **Worker (inhalation)**
The exposure estimation was carried out in accordance with ECETOC TRA.
PROC2: 8.51 mg/m3
PROC8b: 2.13 mg/m3
PROC15: 1.418 mg/m3

· **Environment**
The highest environmental exposure to be expected for surface waters is 0.00263 mg / L.
The highest environmental exposure to be expected for soil is 0.0103 mg/kg w wt
The highest environmental exposure to be expected in purification plants is 0.0196 mg / L.
The highest environmental exposure to be expected to air is 4.22E-12 mg/m3.
The highest environmental exposure to be expected for aquatic sediment is 0.0275 mg / kg wet weight.
The highest environmental exposure to be expected to marine water is 0.000249 mg/L.

· **Consumer** Not relevant for this Exposure Scenario.

(Contd. on page 11)

Safety data sheet
according to 1907/2006/EC, Article 31

(Contd. of page 10)

*
Annex: Exposure scenario 2

· **Short title of the exposure scenario** Formulation & (re)packing of substance and mixtures (Industrial)
· **Sector of Use**
SU3 Industrial uses: Uses of substances as such or in preparations at industrial sites
SU8 Manufacture of bulk, large scale chemicals (including petroleum products)
SU10 Formulation [mixing] of preparations and/or re-packaging (excluding alloys)
· **Product category**
PC19 Intermediate
PC32 Polymer preparations and compounds
· **Process category**
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)
PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
· **Environmental release category**
ERC2 Formulation of preparations
ERC6a Industrial use resulting in manufacture of another substance (use of intermediates)
· **Notes** Specific Environmental release: CEPE 3
· **Description of the activities / processes covered in the Exposure Scenario**
Formulation, packing and repacking of the substance and its mixtures in batch or continous operations, including storage, materials transfers, mixing, large and small scale packing, maintenance and associated laboratory activities.
Manufacturing of formulated polymers including material transfers, moulding, curing and forming activities, material re-works, storage and associated maintenance.
· **Conditions of use**
· **Worker**
Covers daily exposures up to 8 hours [G2]
PROC 8b: Contributing Scenarios 2-W1
(Un)loading: Receipt and storage of raw materials
PROC 3: Contributing Scenarios 2-W2
Formulation: Blending/dissolving/dispersion: mixing, milling, dispersing, completion.
PROC 5: Contributing Scenarios 2-W3
Quality Control: laboratory use
PROC 3: Contributing Scenarios 2-W4
End use: reaction of monomers to polymer
PROC 9: Contributing Scenarios 2-W5
Post-processing: filtering and filling: filtering or sieving and filling, packaging of formulation into drums/IBCs
PROC 8b: Contributing Scenarios 2-W6
Waste Collection: transfer of process wastes to storage containers.
PROC 8b: Contributing Scenarios 2-W7
Maintenance: manufacturing equipment maintenance.
PROC 4: Contributing Scenarios 2-W8
Use in batch processes
· **Environment**
Formulation: powder coatings
Contributing Scenario (ES2-E1); ERC: 2, 6a
Total: 40287 tons/year (EU region)
Formulation: can and coil coatings
Contributing Scenario (ES2-E2); ERC: 2, 6a
Total: 10500 tons/year (EU region)
Formulation: Marine & Protective Coatings
Contributing Scenario (ES2-ES3); ERC: 2, 6a
Total: 23345 tons/year (EU region)

(Contd. on page 12)

Safety data sheet
according to 1907/2006/EC, Article 31

(Contd. of page 11)

Formulation: photocured
Contributing Scenario (ES2-E4); ERC: 2, 6a
Total: 2167 tons/year (EU region)
Fraction of EU tonnage used in region: 0.35
Fraction of main source to local environment: 0.01
Fraction of substance in end-use products: 0.5
Continuous release
Emission days: 225days/year

· **Physical parameters**
· **Physical state**
Fluid
Low volatility
· **Concentration of the substance in the mixture** up to 100%
· **Used amount per time or activity** No limit
· **Other operational conditions**
· **Other operational conditions affecting environmental exposure**
Local freshwater dilution factor: 10
Local marine water dilution factor: 100
· **Risk management measures**
· **Worker protection**
· **Technical protective measures** Containment (efficiency 99 %)
· **Personal protective measures**
Wear chemically resistant gloves (tested to EN374) in combination with „basic“ employee training [PPE16].
· **Environmental protection measures**
· **Air** Exhaust air is introduced into the gas scrubber.
· **Water**
Do not allow to reach ground water, water bodies or sewage system, not even in small quantities.
Prevent discharge of undissolved substance to waste water or recover from wastewater.
Wastewater treatment is considered to be done.
· **Soil**
Prevent contamination of soil.
Land spreading of sludge of wastewater treatment is prohibited.
Sludge from wastewater treatment is incinerated.
· **Notes**
Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases.
A leak prevention plan is needed to prevent low leve continual releases.
· **Exposure estimation**
When the recommended risk management measures (RMM) and operational conditions (OC) are observed, exposures are not expected to exceed the predicted DNELs or PNECs and the resulting risk characterisation ratios are expected to be less than 1.
Confirm that RMMs and OCs are as described or of equivalent efficiency.
· **Worker (oral)** No significant oral exposure
· **Worker (dermal)**
The exposure estimation was carried out in accordance with ECETOC TRA.
PROC3: 0.034 mg/kg bw day
PROC4: 0.686 mg/kg bw day
PROC 5: 1.371 mg/kg bw day
PROC8b: 0.686 mg/kg bw day
PROC9: 0.686 mg/kg bw day
· **Worker (inhalation)**
The exposure estimation was carried out in accordance with ECETOC TRA.
PROC3, 2-W2: 2.364 mg/m3
PROC3, 2-W4: 1.418 mg/m3
PROC4: 1.418 mg/m3
PROC5: 1.418 mg/m3
PROC8b, 2-W6: 2.364 mg/m3
PROC8b, 2-W7: 1.418 mg/m3
PROC8b, 2-W1: 2.364 mg/m3
PROC9: 1.418 mg/m3

(Contd. on page 13)

Safety data sheet
according to 1907/2006/EC, Article 31

(Contd. of page 12)

· **Environment**
The highest environmental exposure to be expected for surface waters is 0.00215 mg / L.
The highest environmental exposure to be expected for soil is 0.0148 mg/kg w wt
The highest environmental exposure to be expected in purification plants is 0.0148 mg / L.
The highest environmental exposure to be expected to air is 1.04E-05 mg/m3.
The highest environmental exposure to be expected for aquatic sediment is 0.0225 mg / kg wet weight.
The highest environmental exposure to be expected to marine water is 0.000144 mg/L.
· **Consumer** Not relevant for this Exposure Scenario.

(Contd. on page 14)

Safety data sheet
according to 1907/2006/EC, Article 31

(Contd. of page 13)

*
Annex: Exposure scenario 3

· **Short title of the exposure scenario** Formulation/Blending/Reaction (Professional)
· **Sector of Use**
SU10 Formulation [mixing] of preparations and/or re-packaging (excluding alloys)
SU19 Building and construction work
· **Product category**
PC19 Intermediate
PC32 Polymer preparations and compounds
· **Process category**
PROC3 Use in closed batch process (synthesis or formulation)
PROC5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)
PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
· **Environmental release category**
ERC2 Formulation of preparations
ERC6a Industrial use resulting in manufacture of another substance (use of intermediates)
· **Notes** Specific Environmental Release: EFCC 8
· **Description of the activities / processes covered in the Exposure Scenario**
Formulation, packing and repacking of the substance and its mixtures in batch or continous operations, including storage, materials transfers, mixing, large and small scale packing, maintenance and associated laboratory activities.
Manufacturing of formulated polymers including material transfers, additives handling (e.g. pigments, stabilisers, fillers, plasticisers, etc.), moulding, curing and forming activities, material re-works, storage and associated maintenance.
· **Conditions of use**
· **Worker**
Covers daily exposures up to 8 hours [G2]
PROC 8a: Contributing Scenarios 3-W1
(Un)loading: fill drum contents into mixing vessel
PROC 8a: Contributing Scenarios 3-W2
Formulation: mixing in closed system
PROC 8a: Contributing Scenarios 3-W3
Formulation: mixing in open system.
PROC 3: Contributing Scenarios 3-W4
Post-processing: packaging of formulation
PROC 8b: Contributing Scenarios 3-W5
Maintenance: cleaning of formulation equipment.
PROC 3: Contributing Scenarios 3-W6
Formulation: use in closed batch processes
PROC 5: Contributing Scenarios 3-W7
Formulation: mixing in closed batch process
· **Environment**
Total: 19503 tonnes/year
Fraction of EU tonnage used in region: 0.35
Fraction of main source to local environment: 0.000004
Fraction of substance in end-use products: 1
Continuous use.
Emission days: 365days/year
· **Physical parameters**
· **Physical state**
Fluid
Low volatility
· **Concentration of the substance in the mixture** up to 100%
· **Used amount per time or activity** No limit

(Contd. on page 15)

Safety data sheet
according to 1907/2006/EC, Article 31

(Contd. of page 14)

· **Other operational conditions**
· **Other operational conditions affecting environmental exposure**
Local freshwater dilution factor: 10
Local marine water dilution factor: 100
· **Other operational conditions affecting worker exposure** No special measures required.
· **Risk management measures**
· **Worker protection**
· **Organisational protective measures** No special measures required.
· **Technical protective measures** No special measures required.
· **Personal protective measures**
Wear chemically resistant gloves (tested to EN374) in combination with „basic“ employee training [PPE16].
· **Environmental protection measures**
· **Water**
Do not allow to reach ground water, water bodies or sewage system, not even in small quantities.
Prevent discharge of undissolved substance to waste water or recover from wastewater.
Wastewater treatment is considered to be done.
· **Soil**
Prevent contamination of soil.
Land spreading of sludge of wastewater treatment is prohibited.
Sludge from wastewater treatment is incinerated.
· **Notes**
Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases.
A leak prevention plan is needed to prevent low leve continual releases.
· **Exposure estimation**
When the recommended risk management measures (RMM) and operational conditions (OC) are observed, exposures are not expected to exceed the predicted DNELs or PNECs and the resulting risk characterisation ratios are expected to be less than 1.
Confirm that RMMs and OCs are as described or of equivalent efficiency.
· **Worker (oral)** No significant oral exposure
· **Worker (dermal)**
The exposure estimation was carried out in accordance with ECETOC TRA.
PROC8a: 1.371 mg/kg bw day
PROC8b: 0.686 mg/kg bw day
PROC5: 1.371 mg/kg bw day
PROC 3: 0.686 (W4) mg/kg bw day
PROC 3: 0.034 (W6) mg/kg bw day
· **Worker (inhalation)**
The exposure estimation was carried out in accordance with ECETOC TRA.
PROC8a, 3-W1: 1.418 mg/m3
PROC8a, 3-W2: 2.364 mg/m3
PROC8a, 3-W3: 2.364 mg/m3
PROC3, 3-W4: 1.418 mg/m3
PROC8b, 3-W5: 2.364 mg/m3
PROC3, 3-W6: 1.418 mg/m3
PROC5, 3-W7: 1.418 mg/m3
· **Environment**
The highest environmental exposure to be expected for surface waters is 0.000678 mg / L.
The highest environmental exposure to be expected for soil is 0.0104 mg/kg w wt
The highest environmental exposure to be expected in purification plants is 0.000101 mg / L.
The highest environmental exposure to be expected to air is 2.65E-14 mg/m3.
The highest environmental exposure to be expected for aquatic sediment is 0.00709 mg / kg wet weight.
The highest environmental exposure to be expected to marine water is 0.000054 mg/L.
· **Consumer** Not relevant for this Exposure Scenario.

(Contd. on page 16)

Safety data sheet
according to 1907/2006/EC, Article 31

(Contd. of page 15)

*
Annex: Exposure scenario 4

· **Short title of the exposure scenario** Use in Coatings (Industrial)
· **Sector of Use**
SU3 Industrial uses: Uses of substances as such or in preparations at industrial sites
SU10 Formulation [mixing] of preparations and/or re-packaging (excluding alloys)
SU17 General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment
SU19 Building and construction work
· **Product category**
PC9a Coatings and paints, thinners, paint removers
PC9b Fillers, putties, plasters, modelling clay
PC32 Polymer preparations and compounds
· **Process category**
PROC1 Use in closed process, no likelihood of exposure
PROC2 Use in closed, continuous process with occasional controlled exposure
PROC3 Use in closed batch process (synthesis or formulation)
PROC5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)
PROC6 Calendering 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
PROC13 Treatment of articles by dipping and pouring
· **Environmental release category**
ERC4 Industrial use of processing aids in processes and products, not becoming part of articles
ERC5 Industrial use resulting in inclusion into or onto a matrix
ERC8c Wide dispersive indoor use resulting in inclusion into or onto a matrix
· **Notes** Specific environmental release: CEPE18 (modified); EMPAC 1 (modified), ACEA 1 (modified)
· **Description of the activities / processes covered in the Exposure Scenario**
Covers the end use of the product, including storage, pre-processing of the material, loading of equipment, on-line application, equipment cleaning, waste collection, laboratory activities, and spraying, roller/brush application, and infusion of product.
· **Conditions of use**
· **Worker** Covers daily exposures up to 4 hours (except if other is indicated)
· **Environment**
Industrial use: Powder Coatings
Contributing Scenario (ES4-E1); ERC: 4, 5, 8c
Total: 40287 tons/year (EU region)
Specific Scenario: CEPE 18 modified
Fraction of substance in end-use product: 0.5
Emission days: 220 days/year
Industrial use: Can&Coil Coatings
Contributing Scenario (ES4-E2); ERC: 4, 5, 8c
Total: 10500 tons/year (EU region)
Specific Scenario: EMPAC 1 modified
Fraction of substance in end-use product: 0.1
Emission days: 220days/year
Site tonnage: 3550 tons/day
Industrial use: Automotive
Contributing Scenario (ES4-E3); ERC: 4, 5, 8c
Total: 4492 tons/year (EU region)
Specific Scenario ACEA 1 modified
Fraction of substance in end-use products: 1
Emission days/year: 365
.

(Contd. on page 17)

Safety data sheet
according to 1907/2006/EC, Article 31

(Contd. of page 16)

Fraction of EU tonnage used in region: 0.35
Fraction of main source to local environment: 0.005
Continuous use.
· **Physical parameters**
· **Physical state**
Fluid
Low volatility
· **Concentration of the substance in the mixture** Up to 40%
· **Used amount per time or activity** No limit
· **Other operational conditions**
· **Other operational conditions affecting environmental exposure**
Local freshwater dilution factor: 10
Local marine water dilution factor: 100
· **Other operational conditions affecting worker exposure** No special measures required.
· **Risk management measures**
· **Worker protection**
· **Organisational protective measures**
Avoid carrying out the operation for more than 4 hours [OC12]
Contributing Scenario (ES4-W1) (PROC8b)
Storage: Product delivery/storage - bulk product delivery-outdoor
Contributing Scenario (ES4-W2) (PROC 3)
Storage: Product delivery/storage - packaged product delivery - outdoor
Contributing Scenario (ES4-W4) (PROC 3)
Storage: Product delivery/storage - product storage - outdoor
Contributing Scenario (ES4-W8) (PROC 5)
Pre-processing: preparation of material for application - batch, outdoor
Contributing Scenario (ES4-W13) (PROC 8a)
Pre-processing: Loading of application equipment - batch outdoor (liquid products)
Contributing Scenario (ES4-W18) (PROC 3)
Maintenance: equipment cleaning - open in situ and offline - outdoor
Ensure operation is undertaken outdoors [E69].
· **Technical protective measures**
Contributing Scenario (ES4-W22) (PROC 7)
Spraying
Minimise exposure by enclosing the operation or equipment and provide extract ventilation at openings.
Contributing Scenario (ES4-W23) (PROC 10)
Roller application or brushing
Provide extract ventilation to points where emissions occur [E54].
· **Personal protective measures**
Wear chemically resistant gloves (tested to EN374) in combination with „basic“ employee training [PPE16].
Contributing Scenario (ES4-W2) (PROC 7)
Spraying
Wear a half-face respirator conforming to EN140 with Type A filter or better [PPE24].
· **Environmental protection measures**
· **Air**
ES 4-E1
Exhaust air is cleaned in dedusting process.
Efficiency: 95 %
ES 4-E3
Exhaust air is introduced into the wet scrubber.
Efficiency: 95 %
· **Water**
Do not allow to reach ground water, water bodies or sewage system, not even in small quantities.
Prevent discharge of undissolved substance to waste water or recover from wastewater.
Wastewater treatment is considered to be done.
· **Soil**
Prevent contamination of soil.
Land spreading of sludge of wastewater treatment is prohibited.
Sludge from wastewater treatment is incinerated.

(Contd. on page 18)

Safety data sheet
according to 1907/2006/EC, Article 31

(Contd. of page 17)

· **Notes**
Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases.
A leak prevention plan is needed to prevent low leve continual releases.
· **Exposure estimation**
When the recommended risk management measures (RMM) and operational conditions (OC) are observed, exposures are not expected to exceed the predicted DNELs or PNECs and the resulting risk characterisation ratios are expected to be less than 1.
Confirm that RMMs and OCs are as described or of equivalent efficiency.
· **Worker (oral)** No significant oral exposure
· **Worker (dermal)**
The exposure estimation was carried out in accordance with ECETOC TRA.
The highest dermal exposure to be expected is 1.096 mg / kg / day.
· **Worker (inhalation)**
The exposure estimation was carried out in accordance with ECETOC TRA.
The highest calculated inhalation exposure (long term) is 2.8836 mg/m3
· **Environment**
The highest environmental exposure to be expected for surface waters is 0.000668 mg / L.
The highest environmental exposure to be expected for soil is 0.0206 mg/kg w wt
The highest environmental exposure to be expected in purification plants is 0 mg / L.
The highest environmental exposure to be expected to air is 2.38E-05 mg/m3.
The highest environmental exposure to be expected for aquatic sediment is 0.00698 mg / kg wet weight.
The highest environmental exposure to be expected to marine water is 0.0000529 mg/L.
· **Consumer** Not relevant for this Exposure Scenario.

(Contd. on page 19)

Safety data sheet
according to 1907/2006/EC, Article 31

(Contd. of page 18)

*
Annex: Exposure scenario 5

· **Short title of the exposure scenario** Use in coatings (Professional)
· **Sector of Use**
SU17 General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment
SU19 Building and construction work
· **Product category**
PC9a Coatings and paints, thinners, paint removers
PC9b Fillers, putties, plasters, modelling clay
· **Process category**
PROC2 Use in closed, continuous process with occasional controlled exposure
PROC3 Use in closed batch process (synthesis or formulation)
PROC5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)
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
PROC10 Roller application or brushing
PROC11 Non industrial spraying
PROC13 Treatment of articles by dipping and pouring
PROC19 Hand-mixing with intimate contact and only PPE available
PROC24 High (mechanical) energy work-up of substances bound in materials and/or articles
· **Environmental release category**
ERC5 Industrial use resulting in inclusion into or onto a matrix
ERC6a Industrial use resulting in manufacture of another substance (use of intermediates)
ERC8c Wide dispersive indoor use resulting in inclusion into or onto a matrix
· **Notes** Specific Environmental Release: CEPE 12, 14
· **Description of the activities / processes covered in the Exposure Scenario**
Covers the end use of the product, including storage, pre-processing of the material, loading of equipment, on-line application, equipment cleaning, waste collection, laboratory activities, and spraying, roller/brush application, and infusion of product.
· **Conditions of use**
· **Worker** Covers daily exposures up to 8 hours [G2]
· **Environment**
Formulation: Marine & Protective Coatings
Contributing Scenario (ES5-E1); ERC: 5, 6a, 8c
Total: 21670 tons/year (EU region)
Specific Scenario: CEPE 14
Photocure
Contributing Scenario (ES5-E2); ERC: 5, 6a, 8c
Total: 4492 tons/year (EU region)
Specific Scenario: CEPE 12
.
Fraction of EU tonnage used in region: 0.35
Fraction of main source to local environment: 0.0005
Fraction of substance in end-use product: 1
Continuous use.
Emission days/year: 365
· **Physical parameters**
· **Physical state**
Fluid
Low volatility
· **Concentration of the substance in the mixture** Up to 40%
· **Used amount per time or activity** No limit
· **Other operational conditions**
· **Other operational conditions affecting environmental exposure**
Local freshwater dilution factor: 10
Local marine water dilution factor: 100

(Contd. on page 20)

Safety data sheet
according to 1907/2006/EC, Article 31

(Contd. of page 19)

· **Other operational conditions affecting worker exposure** No special measures required.
· **Risk management measures**
· **Worker protection**
· **Organisational protective measures**
Contributing Scenario (ES5-W1) (PROC8a)
Storage: Product delivery/storage - bulk product delivery-outdoor
Contributing Scenario (ES5-W2) (PROC 3)
Storage: Product delivery/storage - packaged product delivery - outdoor
Contributing Scenario (ES5-W6) (PROC 5)
Pre-processing: preparation of material for application - batch, outdoor
Contributing Scenario (ES5-W8) (PROC 8a)
Pre-processing: Preparation of material for application - transfer of material from one container to another - outdoor
Contributing Scenario (ES5-W11) (PROC 5)
Pre-processing: Loading of application equipment - batch outdoor (liquid products)
Contributing Scenario (ES5-W13) (PROC 8a)
Pre-processing: Loading of application equipment-transfer of material from one container to another -outdoor
Contributing Scenario (ES5-W16) (PROC 10)
Processing: Manual brush, roller, spreader application of coatings-outdoor
Contributing Scenario (ES5-W24) (PROC 5)
Maintenance: equipment cleaning - open in situ and offline - outdoor
Ensure operation is undertaken outdoors [E69].
· **Technical protective measures**
Contributing Scenario (ES5-W15) (PROC 7)
Contributing Scenario (ES5-W19) (PROC 11)
Spraying
Provide extract ventilation to points where emissions occur [E54].
· **Personal protective measures**
Wear chemically resistant gloves (tested to EN374) in combination with „basic“ employee training [PPE16].
Contributing Scenario (ES5-W14) (PROC 11)
Contributing Scenario (ES5-W15) (PROC 7)
Contributing Scenario (ES5-W19) (PROC 11)
Spraying
Contributing Scenario (ES5-W16) (PROC 10)
Processing: Manual brush, roller, spreader application of coatings - outdoor
Wear a full face respirator conforming to EN 140 wiht type A filter or better
· **Environmental protection measures**
· **Water**
Do not allow to reach ground water, water bodies or sewage system, not even in small quantities.
Prevent discharge of undissolved substance to waste water or recover from wastewater.
Wastewater treatment is considered to be done.
· **Soil**
Prevent contamination of soil.
Land spreading of sludge of wastewater treatment is prohibited.
Sludge from wastewater treatment is incinerated.
· **Notes**
Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases.
A leak prevention plan is needed to prevent low leve continual releases.
· **Exposure estimation**
When the recommended risk management measures (RMM) and operational conditions (OC) are observed, exposures are not expected to exceed the predicted DNELs or PNECs and the resulting risk characterisation ratios are expected to be less than 1.
Confirm that RMMs and OCs are as described or of equivalent efficiency.
· **Worker (oral)** No significant oral exposure
· **Worker (dermal)**
The exposure estimation was carried out in accordance with ECETOC TRA.
The highest dermal exposure to be expected is 4.286 mg / kg / day.
· **Worker (inhalation)**
The exposure estimation was carried out in accordance with ECETOC TRA.

(Contd. on page 21)

Safety data sheet
according to 1907/2006/EC, Article 31

(Contd. of page 20)

The highest calculated inhalation exposure (long term) is 1.292 mg/m3

· **Environment**

The highest environmental exposure to be expected for surface waters is 0.00207 mg / L.
The highest environmental exposure to be expected for soil is 0.032 mg/kg w wt
The highest environmental exposure to be expected in purification plants is 0.0141 mg / L.
The highest environmental exposure to be expected to air is 3.68E-12 mg/m3.
The highest environmental exposure to be expected for aquatic sediment is 0.0217 mg / kg wet weight.
The highest environmental exposure to be expected to marine water is 0.000193 mg/L.

· **Consumer** Not relevant for this Exposure Scenario.

(Contd. on page 22)

Safety data sheet
according to 1907/2006/EC, Article 31

(Contd. of page 21)

*
Annex: Exposure scenario 6

· **Short title of the exposure scenario** Tooling and casting (Industrial)
· **Sector of Use**
SU12 Manufacture of plastics products, including compounding and conversion
SU16 Manufacture of computer, electronic and optical products, electrical equipment
SU17 General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment
· **Product category**
PC19 Intermediate
PC32 Polymer preparations and compounds
· **Process category**
PROC2 Use in closed, continuous process with occasional controlled exposure
PROC3 Use in closed batch process (synthesis or formulation)
PROC5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)
PROC6 Calendering operations
PROC7 Industrial spraying
PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC10 Roller application or brushing
PROC13 Treatment of articles by dipping and pouring
PROC14 Production of preparations or articles by tabletting, compression, extrusion, pelletisation
PROC24 High (mechanical) energy work-up of substances bound in materials and/or articles
· **Environmental release category**
ERC5 Industrial use resulting in inclusion into or onto a matrix
ERC6a Industrial use resulting in manufacture of another substance (use of intermediates)
· **Notes** Specific Environmental Release: ESVOC 23
· **Description of the activities / processes covered in the Exposure Scenario**
Covers the end use including synthesis, formulation, spraying application, roller/brush application, dipping and pouring of articles, and other processing.
· **Conditions of use**
· **Worker** Covers daily exposures up to 8 hours [G2]
· **Environment**
Composites
Contributing Scenario (ES6-E1); ERC: 5, 6a
Total: 13790 tons/year (EU region)
Electrical castings
Contributing Scenario (ES6-E2); ERC: 5, 6a
Total: 1852 tons/year (EU region)
Fraction of EU tonnage used in region: 0.35
Fraction of main source to local environment: 0.5
Fraction of substance in end-use products: 0.007
Site tonnage: 50000 tons/day
Continuos use
Emission days: 300 days/year
· **Physical parameters**
· **Physical state**
Fluid
Low volatility
· **Concentration of the substance in the mixture** Up to 30%
· **Used amount per time or activity** No limit
· **Other operational conditions**
· **Other operational conditions affecting environmental exposure**
Local freshwater dilution factor: 10
Local marine water dilution factor: 100

(Contd. on page 23)

Safety data sheet
according to 1907/2006/EC, Article 31

(Contd. of page 22)

· **Risk management measures**
· **Worker protection**
· **Technical protective measures**
Contributing Scenario (ES6-W7) (PROC 10)
Roller application or brushing
Contributing Scenario (ES6-W13) (PROC 7)
Spraying
Provide extract ventilation to points where emissions occur [E54].
· **Personal protective measures**
Wear chemically resistant gloves (tested to EN374) in combination with „basic“ employee training [PPE16].
Spraying
Wear a half-face respirator conforming to EN140 with Type A filter or better [PPE24].
· **Environmental protection measures**
· **Water**
Do not allow to reach ground water, water bodies or sewage system, not even in small quantities.
Prevent discharge of undissolved substance to waste water or recover from wastewater.
Wastewater treatment is considered to be done.
· **Soil**
Prevent contamination of soil.
Land spreading of sludge of wastewater treatment is prohibited.
Sludge from wastewater treatment is incinerated.
· **Notes**
Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases.
A leak prevention plan is needed to prevent low leve continual releases.
· **Exposure estimation**
When the recommended risk management measures (RMM) and operational conditions (OC) are observed, exposures are not expected to exceed the predicted DNELs or PNECs and the resulting risk characterisation ratios are expected to be less than 1.
Confirm that RMMs and OCs are as described or of equivalent efficiency.
· **Worker (oral)** No significant oral exposure
· **Worker (dermal)**
The exposure estimation was carried out in accordance with ECETOC TRA.
The highest dermal exposure to be expected is 0.823 mg / kg / day.
· **Worker (inhalation)**
The exposure estimation was carried out in accordance with ECETOC TRA.
The highest calculated inhalation exposure (long term) is 2.127 mg/m3
· **Environment**
The highest environmental exposure to be expected for surface waters is 00.000827 mg / L.
The highest environmental exposure to be expected for soil is 0.0334 mg/kg w wt
The highest environmental exposure to be expected in purification plants is 0.0016 mg / L.
The highest environmental exposure to be expected to air is 5.15E-05 mg/m3.
The highest environmental exposure to be expected for aquatic sediment is 0.00865 mg / kg wet weight.
The highest environmental exposure to be expected to marine water is 0.0000689 mg/L.
· **Consumer** Not relevant for this Exposure Scenario.

(Contd. on page 24)

Safety data sheet
according to 1907/2006/EC, Article 31

(Contd. of page 23)

*
Annex: Exposure scenario 7

· **Short title of the exposure scenario** Tooling and Casting (Profesional)
· **Sector of Use**
SU12 Manufacture of plastics products, including compounding and conversion
SU16 Manufacture of computer, electronic and optical products, electrical equipment
· **Product category**
PC1 Adhesives, sealants
PC9a Coatings and paints, thinners, paint removers
PC9b Fillers, putties, plasters, modelling clay
PC33 Semiconductors
PC32 Polymer preparations and compounds
· **Process category**
PROC5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)
PROC6 Calendering operations
PROC10 Roller application or brushing
PROC11 Non industrial spraying
PROC13 Treatment of articles by dipping and pouring
PROC14 Production of preparations or articles by tabletting, compression, extrusion, pelletisation
PROC19 Hand-mixing with intimate contact and only PPE available
PROC24 High (mechanical) energy work-up of substances bound in materials and/or articles
· **Environmental release category**
ERC5 Industrial use resulting in inclusion into or onto a matrix
ERC6a Industrial use resulting in manufacture of another substance (use of intermediates)
ERC8c Wide dispersive indoor use resulting in inclusion into or onto a matrix
ERC8f Wide dispersive outdoor use resulting in inclusion into or onto a matrix
· **Notes** Specific Environmental Release: ESVOC 43
· **Description of the activities / processes covered in the Exposure Scenario**
Covers the end use including synthesis, formulation, spraying application, roller/brush application, dipping and pouring of articles, and other processing.
· **Conditions of use**
· **Worker** Covers daily exposures up to 8 hours [G2]
· **Environment**
Electrical laminates
2344 tonnes/year
Fraction of EU tonnage used in region: 0.35
Fraction of main source to local environment: 0.5
Fraction of substance in end-use products: 0.3
Continuos use
Emission days: 300 days/year
· **Physical parameters**
· **Physical state**
Fluid
Low volatility
· **Concentration of the substance in the mixture** Up to 30%
· **Used amount per time or activity** No limit
· **Other operational conditions**
· **Other operational conditions affecting environmental exposure**
Local freshwater dilution factor: 10
Local marine water dilution factor: 100
· **Risk management measures**
· **Worker protection**
· **Technical protective measures**
Contributing Scenario (ES7-W1) (PROC 10)
Roller application or brushing
Contributing Scenario (ES7-W2) (PROC 11)
Spraying
Provide extract ventilation to points where emissions occur [E54].

(Contd. on page 25)

Safety data sheet
according to 1907/2006/EC, Article 31

(Contd. of page 24)

· **Personal protective measures**
Wear chemically resistant gloves (tested to EN374) in combination with „basic“ employee training [PPE16].
Spraying
Handmixing with intimate contact - only PPE available
Wear a half-face respirator conforming to EN140 with Type A filter or better [PPE24].
· **Environmental protection measures**
· **Water**
Do not allow to reach ground water, water bodies or sewage system, not even in small quantities.
Prevent discharge of undissolved substance to waste water or recover from wastewater.
Wastewater treatment is considered to be done.
· **Soil**
Prevent contamination of soil.
Land spreading of sludge of wastewater treatment is prohibited.
Sludge from wastewater treatment is incinerated.
· **Notes**
Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases.
A leak prevention plan is needed to prevent low leve continual releases.
· **Exposure estimation**
When the recommended risk management measures (RMM) and operational conditions (OC) are observed, exposures are not expected to exceed the predicted DNELs or PNECs and the resulting risk characterisation ratios are expected to be less than 1.
Confirm that RMMs and OCs are as described or of equivalent efficiency.
· **Worker (oral)** No significant oral exposure
· **Worker (dermal)**
The exposure estimation was carried out in accordance with ECETOC TRA.
PROC10: 0.041 mg/kg bw day
PROC11: 0.064 mg/kg bw day
PROC13: 0.411 mg/kg bw day
PROC 14: 0.103 mg/kg bw day
PROC 19: 2.121 mg/kg bw day
PROC 24a: 0.085 mg/kg bw day
PROC 5: 0.411 mg/kg bw day
PROC 6: 0.823 mg/kg bw day
· **Worker (inhalation)**
The exposure estimation was carried out in accordance with ECETOC TRA.
PROC10: 0.085 mg/m3
PROC11: 4.255 mg/m3
PROC13: 0.425 mg/m3
PROC14: 0.425 mg/m3
PROC19: 4.255 mg/m3
PROC24a: 0.300 mg/m3
PROC5: 0.425 mg/m3
PROC6: 0.425 mg/m3
· **Environment**
The highest environmental exposure to be expected for surface waters is 0.000695 mg / L.
The highest environmental exposure to be expected for soil is 0.0141 mg/kg w wt
The highest environmental exposure to be expected in purification plants is 0.000272 mg / L.
The highest environmental exposure to be expected to air is 8.75E-06 mg/m3.
The highest environmental exposure to be expected for aquatic sediment is 0.00726 mg / kg wet weight.
The highest environmental exposure to be expected to marine water is 0.0000552 mg/L.
· **Consumer** Not relevant for this Exposure Scenario.

(Contd. on page 26)

Safety data sheet
according to 1907/2006/EC, Article 31

(Contd. of page 25)

*
Annex: Exposure scenario 8

· **Short title of the exposure scenario** Consumer use of Two-Component Epoxy Paints and Adhesives.
· **Product category**
PC1 Adhesives, sealants
PC9a Coatings and paints, thinners, paint removers
· **Environmental release category**
ERC8c Wide dispersive indoor use resulting in inclusion into or onto a matrix
ERC8f Wide dispersive outdoor use resulting in inclusion into or onto a matrix
· **Notes** Specific Environmental Release: FEICA 11
· **Description of the activities / processes covered in the Exposure Scenario**
ES 1: Aplication of a two-component epoxy paint being applied with a brush or roller.
ES 2: Uso of "Do-it-yourself" epoxy adhesives: manual mixing with a stir stick or applicator.
· **Conditions of use**
· **Environment**
1773 tonnes/year
Fraction of EU tonnage used in region: 0.35
Fraction of main source to local environment: 0.0005
Fraction of substance in end-use products: 1
Continuos use
Emission days: 365 days/year
· **Consumer**
ES 1: Surface application area to reflect a garage floor.
ES 2: Duration of application: ≤10 mins
· **Physical parameters**
· **Physical state**
Fluid
Low volatility
· **Concentration of the substance in the mixture**
ES 1: up to 35 %
ES 2: up to 45 %
· **Used amount per time or activity** No limit
· **Other operational conditions**
· **Other operational conditions affecting environmental exposure**
Local freshwater dilution factor: 10
Local marine water dilution factor: 100
· **Other operational conditions affecting consumer exposure during the use of the product**
The consumer has to be advised of warnings regarding overdosage in the instructions for use.
· **Risk management measures**
· **Environmental protection measures**
· **Water** Do not allow to reach sewage system.
· **Soil** Avoid contact with soil and / or ground water during the application.
· **Disposal measures**
· **Disposal procedures**
Dispose of waste according to local regulations
Must not be disposed together with household garbage. Do not allow product to reach sewage system.
· **Waste type** Partially emptied and uncleaned packaging
· **Exposure estimation**
· **Environment**
The highest environmental exposure to be expected for surface waters is 0.000771 mg / L.
The highest environmental exposure to be expected for soil is 0.0119 mg/kg w wt
The highest environmental exposure to be expected in purification plants is 0.00104 mg / L.
The highest environmental exposure to be expected to air is 2.71E-13 mg/m3.
The highest environmental exposure to be expected for aquatic sediment is 0.00806 mg / kg wet weight.
The highest environmental exposure to be expected to marine water is 0.0000633 mg/L.
· **Consumer**
The exposure estimation was carried out in accordance with ConsExpo 4.1.
ES 1: Dermal (systemic): 0.269 mg/kg bw day
ES 1: Inhalation : 9.28E-9 mg/kg bw day
ES 2: Dermal (systemic): 0.346 mg/kg bw day

(Contd. on page 27)

Safety data sheet
according to 1907/2006/EC, Article 31

(Contd. of page 26)

ES 2: Inhalation : 8.09E-12 mg/kg bw day
No significant oral exposure