MATERIAL SAFETY DATA SHEET
TRIAZINECAT

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

1.1 Product identifier

Chemical name:	**1,3,5-tris[3-(dimethylamino)propyl]hexahydro-1,3,5-triazine**
Registration number:	**01-2119983514-30-0005**
Index number:	**-**
EC number. (EINECS):	**240-004-1**
CAS number:	**15875-13-5**
Other names:	**N,N,N',N',N'',N''-hexamethyl-1,3,5-triazine-1,3,5(2H,4H,6H)-tripropanamine;** **3,3‘,3‘‘-(1,3,5-triazinane-1,3,5-triyl)tris(N,N-dimethylpropan-1-amine);**

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

Uses: **It is used mainly as a catalyst for polyurethane systems (the overview of exposure scenarios is set out in Annex 1).**

Uses advised against: **Not specified.**

1.3 Details of the supplier of the safety data sheet

Name: **BorsodChem MCHZ, s.r.o.**
Name or business name: **BorsodChem MCHZ, s.r.o.**
Location or registered office: **Chemická 2039/1, 709 00 Ostrava - Mariánské Hory, Czech Republic**
Identification number: **26019388**
Telephone: **+420 596 641 111**
Fax: **+420 596 642 040**
E-mail address of a competent person responsible for this MSDS: **zsvobodova@bc-mchz.cz**

1.4 Emergency telephone number

Company telephone number: **+420 596 643 221 or 596 620 794 non-stop**
24-hours emergency contact CHEMTREC: 001-703-527-3887, company code CCN 206 072

The National Poisons Information Service (NPIS), City Hospital, Birmingham, B18 7QH, UK
Tel: +44 121 507 4123, fax: +44 121 507 5580, e-mail: allistervale@npis.org, www.npis.org

National Capital Poison Center, 3201 New Mexico Ave, Suite 310 Washington, DC 20016
Emergency Line: 1-800-222-1222, fax: 202-362-8377, e-mail: pc@poison.org, www.poison.org

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

In compliance with Regulation (EC) No. 1272/2008:
Acute Tox. 4; H312 Harmful in contact with skin.
Skin Irrit. 2; H315 Causes skin irritation.
Eye Dam. 1; H318 Causes serious eye damage.

The most serious adverse effects on human health when using the substance/preparation:
Irritant. Risk of serious damage to eyes. Harmful in contact with skin.

The most serious adverse effects on the environment when using the substance/preparation:
Not identified.

2.2 Label elements

In compliance with Regulation (EC) No. 1272/2008:

Hazard pictograms:

Signal word: DANGER

H-phrases:

H312 Harmful in contact with skin.

H315 Causes skin irritation.

H318 Causes serious eye damage.

P-phrases:

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

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

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P312 Call a POISON CENTER/doctor if you feel unwell.

P332+P313 If skin irritation occurs: Get medical advice/attention.

P362 Take off contaminated clothing.

P501 Dispose of contents/container to in accordance with national regulation.

2.3 Other hazards

The substance is not listed as persistent, bioaccumulative and toxic (PBT) or very persistent, very bioaccumulative (vPvB) in compliance with annex XIII of Regulation 1907/2006/EC.

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical name:	**1,3,5-tris[3-(dimethylamino)propyl]hexahydro-1,3,5-triazine**
Index number:	**–**
EC number:	**240-004-1**
CAS number:	**15875-13-5**
Content of substance (in % wt.)	**min. 80.0**
Synonyms	**N,N,N',N',N'',N''-hexamethyl-1,3,5-triazine-1,3,5(2H,4H,6H)-tripropanamine**

Impurities: **< 1 % wt., CMR impurities < 0.1 % wt.**

3.2 Mixtures

It is a chemical substance.

SECTION 4: First aid measures

4.1 Description of first aid measures

Inhalation: **Remove the affected person to fresh air, release clothing or change clothes if contaminated. If necessary flush oral or nasal cavity with water. Protect the affected person against cold and seek medical attention!**

Skin: **Immediately take off contaminated clothing (take off watches and rings if they are in the area of contact with skin), do not pull contaminated clothing over your face! Wash contaminated skin with a stream of warm water (ca. 30 – 35 °C), if possible, for 10 to 30 minutes and make sure that the water that flows away does not come into contact with the parts of body that have not been contaminated. Do not use a brush or soap, do not neutralize! Cover the affected area with a sterile bandage, do not use any ointments or medications. Protect the affected person against cold. Seek medical attention immediately!**

Eyes: **Flush eyes with running water for 10 to 30 minutes as quickly and as thoroughly as possible from the inner corner to the outer corner of the eye (so that the water is not running into the other unaffected eye, mouth or nose). Never use any neutralizing solutions! If the affected person's eyelid is spasmodically closed, sensible amount of force is in place to open it. If the affected person is wearing contact lenses, remove them immediately. Always send the affected person to an ophthalmologist!**

Ingestion: **DO NOT INDUCE VOMITING - danger of further damage to the alimentary canal!!! Danger of perforation of the oesophagus or stomach! IMMEDIATELY FLUSH ORAL CAVITY WITH WATER AND LET DRINK 2-5 dl of cold water.**

Due to almost immediate effect on the mucous membranes, it is more suitable to quickly let the affected person drink tap water than waste time by obtaining cold liquids - with every minute of delay, the condition of mucous membranes deteriorates irreversibly! Soda waters or mineral waters which may release carbon dioxide are not suitable. It is not suitable to use larger amount of liquid, as it may induce vomiting and possibly inhalation of caustic substances into the lungs.

Do not force the affected person to drink, especially when he or she already feel pain in the mouth or throat. In this case only let the affected person rinse their oral cavity with water. DO NOT ADMINISTER ACTIVATED CHARCOAL! *(Blackening makes examination of the condition of the alimentary canal mucosa more difficult and does not have a positive effect with acids and bases.)* Do not administer any food. Do not administer anything orally if the affected person is unconscious or having convulsions. Seek medical attention immediately!

4.2 Most important symptoms and effects, both acute and delayed

At low temperatures, due to low pressure of vapours, irritation of eyes and mucous membranes is only small. At higher temperatures, however, the level of irritation grows considerably. Causes irritation of the respiratory tract with a danger of laryngeal and pulmonary oedema which can develop with a two-days delay. Medical examination after inhalation is always necessary! Damage to the conrea may occur with subsequent cataract, especially when the product entered the eye. Contact with the liquid causes severe skin burns. The substance is absorbed by skin. It has allergenic properties. It may even cause renal impairment.

4.3 Indication of any immediate medical attention and special treatment needed

Symptomatic treatment. Immediately upon contamination of eyes, rinse the conjunctival sac thoroughly.
Quickly seek ophthalmologic treatment!

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media: **large fire – foam for polar liquids**
small fire – dry powder, powder or snow fire extinguisher

Unsuitable extinguishing media: **not specified**

5.2 Special hazards arising from the substance or mixture: **Avoid contact with the liquid or vapours.**

5.3 Advice for firefighters **Self-contained breathing apparatus, full fire-fighting turnout gear! (Hazchem-Code: 3W)**

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures: **Protection of exposed parts of the body, eye protection. Ensured ventilation.**

6.2 Environmental precautions: **Prevent contamination of soil and water, inspect concentration of the substance in the environment in the surroundings of the place of accident.**

6.3 Methods and material for containment and cleaning up: **Pour absorbent material (Vapex, Vermiculite) onto the substance and sweep it into a waste container. For further disposal considerations see Section 13.**

6.4 Reference to other sections: **Sections 10 and 13.**

SECTION 7: Handling and storage

7.1 Precautions for safe handling: **It is supplied in rail tank cars or tank trucks or in steel barrels, or in IBC containers. Recommended maximum temperature during transport is 35 ℃. Ventilation must be ensured during discharging.**

7.2 Conditions for safe storage, including any incompatibilities
Store in ventilated rooms in the original packaging or in steel tanks. The highest permissible temperature for storage is 35 °C.

Do not store together with foodstuffs.

7.3 Specific end use(s): **When using, adhere to the conditions specified in exposure scenario.**

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Czech Republic: not specified

Member States (2000/39/EC): not specified

8.1.1 DNEL (Derived No Effect Level) for worker exposure:

Risk Assessment was performed qualitative method.

8.2 Exposure controls

When using the substance in a closed circuit or with adequate vapour exhaust, standard personal protection equipment must be used. When using the substance in an open facility and with inadequate vapour exhaust, it is necessary to use also respiratory protection.

Technical measures: **Ventilation. Check measurement of concentration of the substance in the work environment.**

Respiratory protection: **is not required. If necessary, we recommend**: **Protective mask or half mask with a filter (EN 141) against organic vapours - type A/P2**

Hand protection: **protective gloves (EN 374)**

Eye protection: **protective goggles or shield (e.g. EN 166)**

Skin protection: **protective clothing**

Other information: **Do not eat, drink or smoke at work. After work, wash your hands with warm water and soap, treat skin with suitable repair cream.**

Environmental exposure controls
Use in closed circuit, off-gases burned in gas flare or cleaned by adsorption (activated charcoal), waste water is treated by biological treatment.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance:	**colourless to pale yellow liquid**
Odour:	**ammonia**
Odour threshold value:	**not specified**
pH:	**ca. 12**
Melting point/freezing point (°C):	**-90**
Initial boiling point (at 1,013 hPa in °C):	**not specified**
Flash point (at 1,013 hPa in °C):	**100.5**
Evaporation rate:	**not specified**
Flammability (solid, gas):	**it is a liquid**
Upper/lower flammability or explosive limits (% vol.):	**1.7/0.4**
Vapour pressure (hPa at 20 °C):	**5.33**
Vapour density:	**not specified**
Relative density (at 23 °C):	**0.912**
Solubility (in g/l at 25 °C):	**500–590**
Partition coefficient: n-octanol/water; (log P_{ow} at 25 °C and pH 12.2):	**0.18–0.26**
Auto-ignition temperature (at 992 hPa in °C):	**215**
Decomposition temperature:	**> 177 ℃**
Explosive properties:	**none**
Oxidising properties:	**none**

9.2 Other information:

Refraction index:	**1.478 (Huntsman, Chemical Book)**

SECTION 10: Stability and reactivity

10.1 Reactivity: **Possible at temperatures exceeding 50 °C.**

10.2 Chemical stability: **Stable under normal conditions.**

10.3 Possibility of hazardous reactions: **Reacts violently with strong oxidizing agents and inorganic acids.**

10.4 Conditions to avoid: **Avoid contact with moist air.**

10.5 Incompatible materials: **See 10.3.**

10.6 Hazardous decomposition products: **Burning may release toxic carbon oxide and nitrogen oxides.**

SECTION 11: Toxicological information

Information on toxicological effects

CLP classification:

11.1 Acute toxicity: **category 4**

- LD_{50} (oral, rat) = **2,900** $mg.kg^{-1}$
- LD_{50} (dermal, rabbit) = **1,840** $mg.kg^{-1}$

11.2 Irritation

Skin irritation (rabbit): **category 2**
Eye irritation (rabbit): **category 1**

11.3 Sensitisation

Skin sensitisation (mouse): **not sensitising**

11.4 Mutagenicity (in vitro and in vivo studies): **not mutagenic**

11.5 Carcinogenicity: **based on the results of the tests carried out, no other testing was done**

11.6 Reproduction toxicity (rat): **NOAEL > 720 mg/kg/day ⇨ not toxic for reproduction**

11.7 Specific target organ toxicity – single exposure: **not classified**

11.8 Specific target organ toxicity (blood, hematopoietic system) – repeated exposure: **not classified**

11.9 Aspiration hazard: **no data available**

SECTION 12: Ecological information

12.1 Toxicity

12.1.1 Water organisms

Acute for fish:
Poecilia reticulata: **LC_{50}** (96 h) > 100 mg/l

Longterm for fish: NOEC **> 100 mg/l**

Acute for invertebrates:
Daphnia magna: E**C_{50}** (48 h) = 62.6 mg/l

Longterm for invertebrates: **no data available**

Effective concentration for algae:
EC_{50} (72 h) > 77.7 mg/l
Algae: **ErC_{10} (72 h) = 0.4 mg/l**

Summary for classification: **Not classified.**

12.1.2 Toxicity on sediments
Microorganisms: **EC_{50} (30 min) > 1,000 mg/l**

12.1.3 PNEC (Predicated No Effect Concentration)

PNEC water (surface):	**0.063 mg/l**
PNEC water (sea):	**0.0063 mg/l**
PNEC sediment:	**0.958 mg/kg of weight of dry sediment**
PNEC sewage treatment plant:	**20.0 mg/l**
PNEC soil:	**0.154 mg/kg of weight of dry soil**
PNEC plants:	**no data available**
PNEC birds:	**no data available**
PNEC oral:	**no data available**

12.2 Persistence and degradability
Classification: **It is not a substance with high bioaccumulative potential.**
Classification: **Easily degradable in water environment (in compliance with OECD criteria).**

12.3 Bioaccumulative potential **BCF < 50 (prediction based on log P_{ow})**

12.4 Mobility in soil **Can penetrate into the environment through waste water.**
Stability: **soluble in water**
Adsorption: **possible adsorption into soil, adsorption coefficient:**
Koc **(**at 25 °C; pH 5.7-8) **= 117**

12.5 Results of PBT and vPvB assessment **not listed**

12.6 Other adverse effects **not specified**

SECTION 13: Disposal considerations

13.1 Waste treatment methods **Disposal at a hazardous waste incineration plant in compliance with the Waste Act under catalogue number 160305, 160508 or 150202.**

Contaminated waste disposal methods: **It is recommended to incinerate contaminated packaging listed under catalogue number 150110 according to the Waste Act in hazardous waste incineration plant.**

SECTION 14: Transport information

Land transport (ADR/RID)
Sea transport (IMDG)

14.1. UN number:	**2735**
14.2. UN proper shipping name:	**AMINES, LIQUID, CORROSIVE, N.O.S. (1,3,5-tris[3-(dimethylamino)propyl]hexa-hydro-1,3,5-triazine)**
14.3 Transport hazard class(es):	**8, C7**
Hazard identification number (Kemler code)	**80**
14.4. Packing group	**III**
14.5. Environmental hazards	**no**
Substance polluting the sea:	**no**
14.6. Special precautions for user	**included in "Segregation Groups – 18 Alkalis"**
EMS:	**F-A, S-B**
14.7 Transport in bulk according to Annex II MARPOL and IBC Code	**irrelevant**

SECTION 15: Regulatory information

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

15.1.1 EU regulations concerning safety, health and environmental specific for the substance or mixture, as amended:

- Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006;
- Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC;
- Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives;
- Council Directive 96/82/EC on the control of major-accident hazards involving dangerous substances.

15.1.2 Regulations valid in the Czech Republic concerning safety, health and environmental specific for the substance or mixture, as amended:

- Act No. 350/2011 Coll., on chemical substances and chemical mixtures and on changes to some Acts;
- Decree of Ministry of Environment no. 93/2016 Coll., laying down Waste Catalogue;
- Government Regulation No. 361/2007 Coll. laying down conditions for the protection of employees' health at work, as amended.

15.2 Chemical safety assessment: **Chemical safety assessment is part of the report on chemical safety of TRIAZINECAT -- the overview of risk management measures is provided in Annex 1.**

Detailed information on exposure scenarios will be contained in Annex 2 available at the customer's request.

SECTION 16: OTHER INFORMATION

16.1 This material safety data sheet supersedes all previous issues.

16.2 List of abbreviations

Carc.:	Carcinogenicity
CAS:	Chemical Abstracts Service
CLP:	Classification, labelling, packaging
CSR:	Chemical safety report
DNEL:	Derived no-effect level
ES:	Exposure scenario
EC:	European Commission
EC_{50}:	Half maximal effective concentration EC_{50} - is used in toxicity testing. Half maximal effective concentration EC_{50} represents a concentration of the tested substance resulting in 50 % decrease or 50 % reduction of growth or growth speed in relation to a control sample.
EINECS:	European Inventory of Existing Commercial chemical Substances
ELINCS:	European list of notified chemical substances
Irrit.:	irritant
LC_{50}:	lethal concentration, 50 % (of lethal concentration) is used in testing toxicity
LD_{50}:	absolute lethal dose - resulting in the decrease of 50 % of subjects
LOAEC:	lowest observable adverse effect concentration
NOAEC:	no observed adverse effect concentration
NOEC:	no observed effect concentration
OECD:	Organisation for Economic Co-operation and Development
PBT:	persistent, bioaccumulative and toxic
PNEC:	predicted no-effect concentration
REACH:	Registration, evaluation, authorisation and restriction of chemicals
Sens.:	sensitivity
STP:	sewage treatment plant
Tox.:	Toxicity
vPvB:	very persistent and very bioaccumulative substances

16.3 List of used phrases:

H-phrases:

H312 Harmful in contact with skin.

H315 Causes skin irritation.

H318 Causes serious eye damage.

P-phrases:

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

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

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P312 Call a POISON CENTER/doctor if you feel unwell.

P332+P313 If skin irritation occurs: Get medical advice/attention.

P362 Take off contaminated clothing.

P501 Dispose of contents/container to in accordance with national regulation.

16.4 Sources

Registration dossier for 1,3,5-tris[3-(dimethylamino)propyl]hexahydro-1,3,5-triazine
Material safety data sheet – Triazinecat, BC MCHZ, version 2.0 issued in 06/2015.
Chemical Safety Report for TRIAZINECAT from 11/2017.

16.5 Revision history

Issue	Date	Changes
1.0	01/03/2015	Preparation of the MSDS according to European Parliament and Council Regulation (EC) No. 1907/2006
2.0	29/06/2015	Modification of Section 2 (deletion of classification under DSD) and other sections according to regulations 2015/830/EU
3.0	22/01/2018	Revision according to Commission Regulation (EU) no. 918/2016 and registration

Prepared by: Head of Ecology and safety department – Eng. Zuzana Svobodová

Approved by: Head of IT & Quality, ecology and safety department – Eng. Stanislav Pekara, MBA

Version: English translation
Date: 22/01/2018
Material safety data sheet
TRIAZINECAT

www.borsodchem-cz.com

The data provided by this MSDS represent the current state of knowledge and experience and are in accordance with the laws of the Czech Republic. Compliance with the national legislation in force at the point of use is the responsibility of the purchaser.

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Annex No. 1

SUMMARY OF EXPOSURE SCENARIOS

Exposure scenario no.	Volume (t/y)	Identified uses			Life cycle stage		Sectors of Use (SU)	Chemical Product Category (PC) or	Process category (PROC)	Environmental Release Category (ERC)
		Formulation	End use	Consumers	Service life (for articles)	Waste stage				
ES2 Formulation of mixtures - in industry	N/A	X					SU3, 12		PROC3, 4, 5, 8a, 8b, 9, 15	ERC2
ES3 Formulation in solid matrices - in industry	N/A	X					SU3, 12		PROC1, 3, 4, 5, 8a, 8b, 9, 15	ERC3
ES4 Formulation of mixtures - professional	N/A	X					SU22, 12		PROC3, 4, 5, 8a, 8b, 9, 15	ERC3
ES5 Production of flexible foams - in industry	N/A		X				SU3, 12, 17	PC32	PROC1, 2, 3, 4, 5, 8a, 8b, 14, 21, 24, 15	ERC5
ES6 Production of hard foams - in industry	N/A		X				SU3, 12, 17, 19	PC32	PROC1, 2, 3, 4, 5, 8a, 8b, 14, 21, 24, 15	ERC5
ES7 Use in paints, glues, sealing materials, softeners - in industry	N/A		X				SU3, 12, 17, 19.	PC9a, 9b	PROC1, 2, 3, 4, 5, 6, 7, 8a, 8b, 14, 15	ERC5
ES8 Production of hard foams - professional	N/A		X				SU22, 17, 19	PC32	PROC1, 3, 4, 5, 8a, 10, 11	ERC8c,8f
ES9 Use in paints, glues, sealing materials, softeners - professional	N/A		X				SU22, 12, 17, 18, 19	PC9a, 9b	PROC1, 3, 4, 8a, 10, 11, 13, 19	ERC8c,8f

N/A – not available (confidential information)

SUMMARY OF RISK MANAGEMENT MEASURES

Name	**Production and use of TRIAZINECAT (TAC)**
Sectors of use	SU3, SU12, SU17, SU18, SU19, SU22
Process categories	PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC14, PROC15, PROC19, PROC21, PROC21, PROC24
Chemical product category	PC9a, PC32
Article category	n/a
Environmental release categories	ERC1, ERC2, ERC3, ERC5, ERC8c, ERC8f
Specific environmental release categories	Not specified.
Included processes, tasks, activities	This overview includes production and use of TAC in closed facilities where workers come into contact with TAC and/or where such contact may occur (by means of skin contact) during sampling, maintenance and/or failures of equipment. It also covers other processing (use) of TAC in the manufacture of various products, such as polymeric preparations and compounds and paints, glues, sealing materials, where contact may occur during sampling, maintenance and/or failures of equipment. It covers the same processing (use) of TAC in batch process or other operations where due to the structure of such process there is a possibility of contact with TAC, and that are controlled by operational conditions or risk management measures. It includes the transfer of TAC by charging/discharging from/to small or large containers at dedicated facilities, which are subject to inspection within operating conditions and/or risk management measures. It also includes the use of TAC as a laboratory reagent in small laboratories, in the quantity up to 1 l and/or 1 kg or smaller quantities available at the workplace, which are subject to inspection within operating conditions and/or risk management measures. It also covers industrial spraying and calendering operations, non-industrial roller application or brushing, spraying, dipping and pouring and other manual activities. It includes industrial activities connected to the use of TAC as an additive for plastics/lubricants, use in closed processes, but also in processes with the possibility of exposure, such as calendering, spraying, use of foaming agents during the production of foams, transfer of TAC from/to small non-large containers on specialized or non-specialized equipment, handling of materials containing TAC with low or high (mechanical) energy.
	Operating conditions and risk management measures
	Control of worker exposure
Product characteristics	
Physical form	Liquid
Vapour pressure	533.2 Pa at 21 ℃
Concentration of the substance in the product	It covers substance concentration of up to 100 %.
Volume of use	n/a

Operating conditions	
Frequency and duration of use	It includes the exposure to effects of the substance for up to 8 hours.
Risk factors for humans not influenced by risk management.	Not specified.
Other operating conditions with the effect on worker exposure to the substance	TAC is classified as a corrosive substance with acute effects on the skin and eyes, therefore in the production and use of TAC where the process is not carried out in a closed circuit, workers' health must be protected by using a local exhaust system, skin and eye protection and introducing suitable working procedures. They include: • checking the entry of workers to the workplace, • assurance of proper maintenance of all the equipment, • permissions to perform maintenance of the equipment, • regular tidying and cleaning of the equipment and the workplace, • a workplace system which ensures adherence to risk management measures and conditions for the working environment, training of employees focused on the correct set procedures, • procedures and training for emergency situations, including decontamination and removal procedures, • stipulated level of personal hygiene, • near miss record, • surveying employees' health condition with regard to sensitivity and regular verification of health fitness.

Risk management measures		
Scenarios	**Process categories**	**Risk management measures**
Exposure (ES3, ES5, ES6, ES7, ES8, ES9)	1 – Use in closed process, no likelihood of exposure.	Ensure that the material is under protection during transfer and/or the necessary exhaust is ensured. Use suitable eye protection aids and gloves (EN374). Use suitable working clothes for the protection against skin contact. Should TAC aerosol or vapours occur, we recommend using respiratory protection (AFP10).
Exposure (ES5, ES6, ES7)	2 – Use in closed, continuous process with occasional controlled exposure (e.g. sampling).	
Exposure (ES2, ES3, ES4, ES5, ES6, ES7, ES8, ES9)	3 – Use in closed batch process (synthesis or formulation).	
Exposure (ES2, ES3, ES4, ES5, ES6, ES7, ES8, ES9)	4 – Use in batch and other process (synthesis) where opportunity for exposure arises.	
Mixing or blending (ES2, ES3, ES4, ES5, ES6, ES7, ES8)	5 – Mixing or blending in batch processes for formulation of preparations* and articles (multistage and/or significant contact).	
Calendering operations (ES7)	6 – Calendering operations	
Industrial spraying (ES7)	7 – Spraying	

Scenarios	Process categories	Risk management measures
Transfer (ES2, ES3, ES4, ES5, ES6, ES7, ES8, ES9)	8a – Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.	Ensure that the material is under protection during transfer and/or the necessary exhaust is ensured. Use suitable eye protection aids and gloves (EN374). Use suitable working clothes for the protection against skin contact. Should TAC aerosol or vapours occur, we recommend using respiratory protection (AFP10).
Transfer (ES2, ES3, ES4, ES5, ES6, ES7)	8b – Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	
Transfer (ES2, ES3, ES4)	9 – Transfer of substance or preparation into small containers (dedicated filling line, including weighing).	
Surface treatment (ES8, ES9)	10 – Roller application or brushing	
Non industrial spraying. (ES8, ES9)	11 – Non industrial spraying.	
Dipping, pouring (ES9)	13 – Treatment of articles by dipping and pouring	
Compression, extrusion, pelletisation (ES5, ES6, ES7)	14 – Production of preparations or articles by tabletting, compression, extrusion, pelletisation	
Laboratory activities (ES2, ES3, ES4, ES5, ES6, ES7)	15 – Use as laboratory reagent	
Manual mixing (ES9)	19 – Hand-mixing with intimate contact and only PPE available.	
Low energy processing in materials or articles. (ES5, ES6)	21 – Low energy manipulation of substances bound in materials and/or articles.	
High (mechanical) energy work-up of substances bound in and/or articles (ES5, ES6)	24 – High (mechanical) energy work-up of substances bound in materials and/or articles.	

* standard statements and labelling come from the Worker Chemical Safety Assessment (CSA) Template for GES at the Cefic website - http://www.cefic.be/templates/shwPublications.asp?HID=750

List of abbreviations:

ERC1	Manufacture of the substance
ERC2	Formulation into mixture
ERC3	Formulation into solid matrix
ERC5	Use at industrial site leading to inclusion into/onto article
ERC8c	Widespread use leading to inclusion into/onto article (indoor)
ERC8f	Widespread use leading to inclusion into/onto article (outdoor)
LEV	Local exhaust ventilation
PC9a	Coatings and paints, thinners, paint removers
PC9b	Fillers, putties, plasters, modelling clay
PC32	Polymer preparations and compounds
PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure (e.g. sampling)
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 con-tact)
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
PROC11	Non industrial spraying
PROC13	Treatment of articles by dipping and pouring
PROC14	Production of preparations or articles by tabletting, compression, extrusion, pelletisation
PROC15	Use as laboratory reagent
PROC19	Hand-mixing with intimate contact and only PPE available
PROC21	Low energy manipulation of substances bound in materials and/or articles.
PROC24	High (mechanical) energy work-up of substances bound in materials and/or articles.
SU3	Industrial uses: Uses of substances as such or in preparations, at industrial sites
SU12	Manufacture of plastics products
SU17	General manufacturing
SU18	Manufacture of furniture
SU19	Building and construction work
SU22	Professional uses