MATERIAL SAFETY DATA SHEET
N,N-DIMETHYLPROPYLAMINE

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

1.1. Product identifier

Chemical name: **N,N-dimethylpropane-1-amine**
Registration number: **01-2119977070-40-0002**
Index number: **–**
EC number (EINECS): **213-139-9**
CAS number: **926-63-6**
Other names: **Dimethyl(propyl)amine**

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

Uses: **It is used in the industry for production of other products and preparation of mixtures used in the foundry industry (the summary of exposure scenarios is given in Annex No. 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.**
Place of business 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:
Flam. Liquid 2; H225 Highly flammable liquid and vapour.
Acute Tox. 4; H302 Harmful if swallowed.
Acute Tox. 3; H331 Toxic if inhaled.
Skin Irrit. 2; H315 Causes skin irritation.
Eye Dam. 1; H318 Causes serious eye damage.
STOT SE 3; H335 May cause respiratory irritation.

The most serious adverse effects on human health when using the substance/mixture:

Toxic if inhaled, contact causes severe eye damage and skin irritation. May cause respiratory irritation.

The most serious adverse effects on the environment when using the substance/mixture:

Highly flammable liquid and vapour.

2.2. Label elements

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

Hazard pictograms:

Signal word: DANGER

Hazard statements:

H225 Highly flammable liquid and vapour.

H302 Harmful if swallowed.

H315 Causes skin irritation.

H318 Causes serious eye damage.

H331 Toxic if inhaled.

H335 May cause respiratory irritation.

Precautionary statements:

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P260 Do not breathe vapours.

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

P302+P352 IF ON SKIN: Wash with plenty of 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.

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

P362+P364 Take off contaminated clothing and wash before reuse.

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	**N,N-Dimethylpropylamine**
Index number	**–**
EC number	**213-139-9**

CAS number	**926-63-6**
Content of substance (in % wt.)	**min. 98.0**
Synonyms	**N,N-Dimethyl-1-propanamine, Dimethyl-N,N-propylamine**

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!**

If on 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 (about 30–35 ℃), if possible, for 10 to 30 minutes. 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!**

If in 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!**

If swallowed: **DO NOT INDUCE VOMITING – Danger of further damage to the alimentary canal! IMMEDIATELY FLUSH ORAL CAVITY WITH WATER AND LET DRINK 2–5 dl of cold water to reduce the heat effect of the irritating substance.**

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.

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

Extremely irritating by skin contact, also irritating to respiratory system – danger of pulmonary edema, which can be delayed up to two days after exposure! Seek medical attention!

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! Beware of pulmonary edema, which can have a latency of up to 2 days.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media: **water fog, foam for polar liquids, powder extinguishing medium, carbon dioxide**

Unsuitable extinguishing media: **not specified**

5.2. Special hazards arising from the substance or mixture **Highly flammable substance. Danger of ignition at normal temperature. The liquid evaporation is very fast and vapours are easily ignitable, they can form corrosive and ignitable mixtures with air. They are heavier than air, stay close to ground and when ignited, the fire can blaze to a long distance. Ignition is due to hot surfaces, sparks or open flame. During thermal decomposition nitrogen oxides and carbon oxides are produced. It reacts violently with acids and strong oxidizing agents. Cool with water while extinguishing a tank with the substance.**

5.3. Advice for firefighters: **Self-contained breathing apparatus, full fire-fighting turnout gear! (Hazchem-Code: 2PE)**

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures: **Respiratory protection, 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 N,N-Dimethylpropylamine in the environment in the surroundings of the place of accident.**

6.3. Methods and material for containment and cleaning up: **Pour a chemical absorbent or preparation for absorption of aggressive substances, 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 tank trucks or in steel barrels and small barrels (12 l or 60 l), or in IBC containers, type EX. Recommended maximum temperature during transport is 135 ℃. Ventilation must be ensured during discharg ing.**

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 135 °C.

Do not store together with foodstuffs, strong oxidizing agents and concentrated inorganic acids.

7.3 Specific end use(s): **Use only in the industry under controlled conditions or adhere to the conditions specified in the exposure scenario – see Annex No. 1.**

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:

Long-term exposure (systemic effects) – inhalation:	**5.6 mg/m³**
Long-term exposure (systemic effects) – dermal:	**1.0 mg/kg of weight/day**
Short-term exposure (systematic and local effects) – inhalation:	**12.2 mg/m³**

Long-term exposure (local effects) – inhalation: **6.1 mg/m³**

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 (DMPA concentration > inhalation DNEL), it is necessary to use also respiratory protection.

Technical measures: **Ventilation.**

Respiratory protection: **Protective mask or half mask with a filter (EN 140) against organic vapours – type A/P2 or with a combined filter – type AEBK**

Hand protection: **protective gloves (EN 374) with protection index 6 – e.g. nitrile (0.4 mm), chloroprene (0.5 mm) and polyvinyl chloride (0.7 mm)**

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:	**amine**
Odour threshold:	**0.068 ppm**
pH (100 g/l at 20 °C):	**10**
Melting point/freezing point (°C):	**< -20**
Initial boiling point (at 1,013 hPa in °C):	**65.7**
Flash point (at 1,013 hPa in °C):	**-11**
Evaporation rate:	**not specified**
Flammability (solid, gas):	**not specified**
Upper/lower explosive limits (% vol.):	**1.1 at -29.4 °C/9.0 at 6.8 °C**
Vapour pressure (hPa at 20 °C):	**180.3**
Vapour density:	**not specified**
Relative density (at 20 °C):	**0.701**
Solubility(ies) (in g/l at 20 °C):	**miscible with water**
Partition coefficient: n-octanol/water (log P_{ow} at 23 °C and pH 11):	**1.32**
Auto-ignition temperature (at 1,013 hPa in °C):	**165**
Decomposition temperature in °C:	**425**

Explosive properties:	**none**
Oxidising properties:	**none**

9.2. Other information:

Viscosity – dynamic in mPa.s at 20 °C:	**0.32**
Viscosity – kinematic in mm^2/s at 20 °C:	**0.45**
Dissociation constant at 25 °C:	**9.25**

SECTION 10: Stability and reactivity

10.1. Reactivity: **Hazardous reactions during storage or handling are not described.**

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

10.3. Possibility of hazardous reactions: **It reacts violently with strong oxidizing agents and acids.**

10.4. Conditions to avoid: **Danger of ignition at normal temperature. The liquid evaporation is very fast and vapours are easily ignitable, they can form corrosive and ignitable mixtures with air.**

10.5. Incompatible materials: **See 10.3.**

10.6. Hazardous decomposition products: **When heated strongly, it decomposes to toxic and corrosive nitrogen and carbon oxides.**

SECTION 11: Toxicological information

Information on toxicological effects

CLP classification:

11.1 Acute toxicity:

- LD_{50} (oral, rat) = **500** $mg.kg^{-1}$ - **category 4**
- LD_{50} (dermal, rat) = **> 2000** $mg.kg^{-1}$ (OECD 402) - **not classified**
- LC_{50} (inhal., rat/4h) = **4.499** $mg.l^{-1}$ (OECD 403) - **category 3**

11.2. Skin irritation: **category 2**
on eyes: **eye damage, category 1**

11.3 Sensitisation: **not sensitising**

11.4 Mutagenicity (in vitro and in vivo studies): **negative**

11.5 Carcinogenicity (rat, mouse): **not specified**

11.6 Reproductive toxicity (rat, oral, reproductive/developmental toxicity): **not classified**

11.7. Specific target organ toxicity – single exposure: **STOT SE category 3 (may cause respiratory irritation)**

11.8 Specific target organ toxicity – repeated exposure: **not specified**

11.9 Aspiration hazard: **not supposed**

SECTION 12: Ecological information

12.1. Toxicity

12.1.1. Water organisms

Fish: LC_{50} = **38.29** mg/l/96 h (read-across)

EC_{10}/LC_{10}/NOEC = **31.6** mg/l/96 h (read-across)

Daphnia magna: EC_{50}/ LC_{50} = **28.7** mg/l/48 h (OECD 202, static)

NOEC (21 days) = **11** mg/l (read-across)

Edaphic organisms:

Pseudomonas putida: EC_{50}/ LC_{50} = **100** mg/l/17 h

EC_{10}/ LC_{10}/NOEC = **73** mg/l/17 h

Plants and terrestrial animals:

Desmodesmus subspicatus: EC_{50}/ LC_{50} **= 6.89** mg/l/72 h (OECD 201, static)

EC_{10}/ LC_{10}/NOEC = **1.77** mg/l

Summary for classification: not classified as hazardous for the environment.

12.1.2. Toxicity on sediments: NOEC ≥ **29** mg/l (28 days, OECD 310)

12.1.3 PNEC (Predicated No Effect Concentration)

PNEC water (fresh):	**0.0578 mg/l**
PNEC water (sea):	**0.00578 mg/l**
PNEC sediment:	**16.1 mg/kg of weight of dry sediment**
PNEC sewage treatment plant:	**7.3 mg/l**
PNEC soil:	**3.13 mg/kg of weight of dry sediment**

12.2 Persistence and degradability:

Classification: ***easily biodegradable*** (OECD 310)

12.3. Bioaccumulative potential **not bioaccumulative (**log Pow = **0.54;** BCF = **3.45 l/kg)**

12.4. Mobility in soil:

Stability: **miscible with water**

Adsorption: log Koc at 25 ℃ and pH 7 = **3.11**

12.5. Results of PBT and vPvB assessment: **not PBT/vPvB**

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

SECTION 14: Transport information

Land transport (ADR/RID)
Sea transport (IMDG)
Air transport (ICAO/IATA)

14.1 UN number:	**2266**
14.2 UN proper shipping name:	**Dimethyl-N-propylamine**
14.3. Transport hazard class(es):	**3, FC**
Hazard identification number (Kemler code):	**338**
14.4. Packing group:	**II**
14.5. Environmental hazards:	**no**
Substance polluting the sea:	**no**
14.6. Special precautions for user:	**not classified under "Segregation Groups"**
EMS:	**F-E, S-C**
14.7 Bulk transport according to Annex II of the MARPOL and the 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;
- ME Decree No. 93/2016 Coll., establishing the Catalogue of Wastes;
- Government Regulation No. 361/2007 Coll., laying down conditions for the protection of employees' health at work, as amended.

15.2. Chemical safety assessment

The assessment of chemical safety is a part of the chemical safety report for N,N-dimethylpropylamine (DMPA). The summary of risk management measures is given in Annex No. 1.

Detailed information on exposure scenarios will be given in Annex No. 2 which will be provided upon 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% decease 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 decease 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
STOT:	specific target organ toxicity
STOT SE:	Specific target organ toxicity – single exposure
STOT RE:	Specific target organ toxicity – repeated exposure
STP:	Sewage treatment plant
SU:	sector of use
Tox.:	Toxicity
vPvB:	Very persistent and very bioaccumulative substances

16.3. List of the phrases used:

Hazard statements:

H225 Highly flammable liquid and vapour.

H302 Harmful if swallowed.

H315 Causes skin irritation.

H318 Causes serious eye damage.

H331 Toxic if inhaled.

H335 May cause respiratory irritation.

Precautionary statements:

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P260 Do not breathe vapours..

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

P302+P352 IF ON SKIN: Wash with plenty of 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.

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

P362+P364 Take off contaminated clothing and wash before reuse.

16.4. Sources

Published ECHA information for N,N-dimethylpropylamine.

Material safety data sheet – N,N-dimethylpropylamine, BC MCHZ, the 2nd issue of 06/2015

16.5. Revision history

Issue	Date	Changes
1.0	20/10/2014	Preparation of the MSDS according to European Parliament and Council Regulation (EC) No. 1907/2006
2.0	29/06/2015	Amendment of Section 2 (deletion of classification according to DSD) and of other sections in accordance with Regulation No. 2015/830/EU
3.0	01/02/2017	Registration number, data from registration and the summary of exposure scenarios added. Revision according to Commission Regulation (EU) 918/2016

Prepared by: Ing. Zuzana Svobodová – IT & QEHS

Approved by: Ing. Stanislav Pekara, MBA – IT & QEHS Manager

Version: English translation
Date: 01/02/2017
Material safety data sheet
N,N-dimethylpropylamine

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.

Produced by:

BorsodChem MCHZ, s.r.o.
Chemická 2039/1
709 00 Ostrava – Mariánské Hory
Telephone: +420 596 641 111
Fax: +420 596 626 258

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)	Process category (PROC)	Environmental Release Category (ERC)	Articles (AC)
		Formulation	End use	Consumers	Service life (for articles)	Waste stage					
ES2 Use as an intermediate for the production of other substances in industry	N/A		X				SU3,	PC19	PROC1, 2, 3	ERC6a	N/A
ES3 Charging/discharging of the substance and mixture in industry (ES3A) and professional use (ES3B)	N/A	X	X				SU3, 22	PC9b, 19, 21	PROC8a, 8b, 9	ERC4, 6a	N/A
ES4 Formulation of mixtures, industrial (ES4A professional use (ES4B)	N/A	X					SU3, 22	PC9b	PROC1, 2, 3, 4, 5.19	ERC2	N/A
ES5 Laboratory use in industry (ES5A) and professional use (ES5B)	N/A		X				SU3,	PC21	PROC15	ERC4	N/A
ES6 Use in foundry industry as a catalyst for polymerisation reactions industrial use	N/A		X				SU3,	PC9b	PROC1, 3, 22a	ERC6d	N/A

N/A – not available (confidential information)

SUMMARY OF RISK MANAGEMENT MEASURES

Name	**Production and use of dimethylpropylamine (DMPA)**
Sectors of Use	SU3, SU22
Process categories	PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC15, PROC19, PROC 22a
Chemical product category	PC9b, PC19, PC21
Environmental Release Categories	ERC2, ERC4, ERC6a, ERC6d

Included processes, tasks, activities	This overview includes production and use of DMPA prevailingly in closed facilities where workers come into contact with DMPA and/or where such contact may occur (whether by means of inhalation and/or skin contact) during sampling, maintenance and/or failures of equipment. It also includes other processing (use) of DMPA ín the production of foundry cores and special chemicals as an intermediate, which contain DMPA, but where contact may occur during sampling, maintenance and/or failures of equipment. It also includes processing (use) of DMPA in doses which are subject to inspection within operating conditions and/or risk management measures. It includes the transfer of DMPA 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 DMPA as a laboratory chemical in small laboratories, in the quantity up to 1 l and/or 1 kg or smaller, which are available at the workplace, which are subject to inspection within operating conditions and/or risk management measures. All processes are presumed to run at ambient temperatures.
	Operating conditions and risk management measures
	Control of workers' contact with the substance
Frequency and duration of use	It includes the exposure to effects of the substance for up to 4 hours (unless otherwise stated)
Other operating conditions with the effect on workers' contact with the substance	DMPA is included among hazardous substances, therefore in the production and use of DMPA where the process is not carried out in a closed circuit, workers' health must be protected by using local exhaust system and introducing suitable working procedures. They include: • keeping the equipment under vacuum, • 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.
Process categories	**Risk management measures***
1, 2, 3, 4, 5, 8a, 8b, 9, 15, 19, 22a	**DMPA is listed among hazardous substances, therefore in cases of potential contact with dimethylpropylamine**: Use suitable eye protection aids and gloves.

	Use an all-face respirator according to EN140, with a Type A/P2 and/or better filter. Use suitable working clothes for the protection against skin contact.
1 – Use in closed process, no likelihood of exposure.	Handling of the substance in a closed circuit.
2 – Use in closed, continuous process with occasional controlled exposure (e.g. sampling).	Handling of the substance in a closed circuit. During sampling of the material use suitable gloves, meeting requirements of EN374. ES 2, ES 4 – Prevent exposure for more than 1 hour.
3 – Use in closed batch process (synthesis or formulation).	Handling of the substance within mostly closed process equipped with exhaust equipment. Ensure that the material is under protection during transfer and/or the necessary exhaust is ensured. Ensure sampling is carried out under protection and/or the necessary exhaust is ensured. ES 2, ES 4 – Prevent exposure for more than 1 hour. ES6 – Use respiratory track protection with 90% efficiency.
4 – Use in batch or other process (synthesis) where higher opportunity for exposure arises.	Ensure exhaust in places with substance emissions. Ensure that the material is under protection during transfer and/or the necessary exhaust is ensured. Ensure sampling is carried out under protection and/or the necessary exhaust is ensured. ES4 – Prevent exposure for more than 15 minutes.
5 – Mixing or blending in batch processes for formulation of preparations* and articles (multistage and/or significant contact).	Ensure exhaust in places with substance emissions. ES4 – Prevent exposure for more than 1 hour. Use respiratory track protection with 90% efficiency.
8a – Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.	Perform filling of containers/cans at dedicated filling places, equipped with the proper exhaust system. Ensure proper exhaust at places of potential contact with the substance. ES3 – Prevent exposure for more than 15 minutes.
8b – Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Perform filling of containers/cans at dedicated filling places, equipped with the proper exhaust system. Ensure proper exhaust at places of potential contact with the substance. ES3 – Prevent exposure for more than 15 minutes.
9 – Transfer of substance or preparation into small containers (dedicated filling line, including weighing).	Perform filling of containers/cans at dedicated filling places, equipped with the proper ventilation. Ensure proper exhaust at places of potential contact with the substance. ES3 – Prevent exposure for more than 15 minutes.

Process categories	**Risk management measures***
15 – Use as laboratory reagent	Use an exhaust hood. Ensure sampling is carried out under protection and/or the necessary exhaust is ensured. ES5 – Prevent exposure for more than 1 hour.
19 – Hand-mixing with intimate contact and only PPE available.	ES4 – Prevent exposure for more than 15 minutes. Use respiratory track protection with 95 % efficiency.
22a – Potentially closed processes with minerals/metals at elevated temperature – pt < mp – low volatility. Industrial setting	ES6 – Ensure exhaust in places with substance emissions. Prevent exposure for more than 8 hours.

* common statements come from the Assessment of workers' safety in chemical industry template of GES at the Cefic website - http://www.cefic.org

List of abbreviations:

ERC2	Formulation of preparations
ERC4	Industrial use of processing aids in processes and products, not becoming part of articles
ERC6a	Industrial use resulting in manufacture of another substance (use of intermediates)
ERC6d	Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers
LEV	Local exhaust ventilation
PC9b	Fillers, putties, plasters, modelling clay
PC19	Intermediate
PC21	Laboratory chemicals
SU3	Industrial uses: Uses of substances as such or in preparations, at industrial sites
SU22	Professional uses: Public domain (administration, education, entertainment, services, craftsmen)