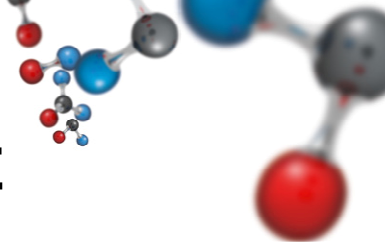


# MATERIAL SAFETY DATA SHEET

## PENTAMETHYLDIETHYLENTRIAMINE



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

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#### 1.1 Product identifier

Chemical name: **N,N-Bis(2-dimethylaminoethyl)methylamine**  
Registration no.: **01-2119979537-18-0000**  
Index number: **612-109-00-6**  
ES (EINECS) number: **221-201-1**  
CAS number: **3030-47-5**  
Other names of the substance: **2,5,8-trimethyl-2,5,8-triazononan**

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

Uses of the substance: **Pentamethyldiethylenetriamine is used as a catalyser of polyurethane foams and as special chemicals (the overview of exposure scenarios is set out in Annex 1).**

Uses advised against: **Not defined.**

#### 1.3 Details of the supplier of the material safety data sheet

Name: **BorsodChem MCHZ, s.r.o.**  
Name or business name: **BorsodChem MCHZ, s.r.o.**  
Place of business or headquarters: **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 of the technically competent person responsible for the material safety data sheet: **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, telephone number 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

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#### 2.1 Classification of the substance or mixture

According to Regulation (EC) no. 1272/2008:

**Acute Tox. 4; H302 Harmful if swallowed.**

**Acute Tox. 3; H311 Toxic in contact with skin.**

**Acute Tox. 3; H331 Toxic if inhaled.**

**Skin Corr. 1B; H314 Causes severe skin burns and eye damage.**

**Eye Dam. 1; H318 Causes serious eye damage.**

**Aquatic Chronic 3; H412 Harmful to aquatic life with long lasting effects.**

# MATERIAL SAFETY DATA SHEET

## PENTAMETHYLDIETHYLENTRIAMINE

The most important human health adverse effects during use of the substance or preparation:  
**Toxic in contact with skin or if inhaled. Causes severe skin burns and eye damage. Harmful if swallowed.**

The most important adverse effects to environment during use of the substance/preparation:  
**Harmful to aquatic life with long lasting effects.**

Possible misuse of the substance/preparation: **not specified**

### 2.2 Label elements

According to Regulation (EC) no. 1272/2008:

**Symbols:**



**Signal word: DANGER**

**H phrases:**

**H302 Harmful if swallowed.**

**H311+H331 Toxic in contact with skin or if inhaled.**

**H314 Causes severe skin burns and eye damage.**

**H412 Harmful to aquatic life with long lasting effects.**

**P phrases:**

**P260 Do not breathe vapours.**

**P273 Avoid release to the environment**

**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].**

**P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.**

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

**P310 Immediately call a POISON CENTER/doctor.**

### 2.3 Other hazards

**The substance is not identified as persistent, bio-accumulative and toxic (PBT) or very persistent, very bio-accumulative (vPvB) under Annex XIII of Regulation 1907/2006/ES.**

## SECTION 3: Composition/information on ingredients

### 3.1 Substances

Chemical name	<b>N,N-Bis(2-dimethylaminoethyl)methylamine</b>
Index number	<b>612-109-00-6</b>
EC No.	<b>221-201-1</b>

# MATERIAL SAFETY DATA SHEET

## PENTAMETHYLDIETHYLENTRIAMINE

CAS No.	3030-47-5
Substance content (% w.)	min. 98.0
Synonyms	2,5,8-trimethyl-2,5,8-triazononan

Impurities: < 1 % w/w, CMR impurities < 0.1 % w/w.

### 3.2 Mixtures

**This is a chemical substance.**

## SECTION 4: First aid measures

### 4.1 Description of first aid measures

**Inhalation: Remove the affected person to fresh air, unloose clothing or change him, if clothing is contaminated. If necessary, rinse oral cavity and nasal cavity with water. Protect the victim against chill and call medical help!**

**Skin: Remove immediately contaminated clothing (remove watches, rings, if they are in places of contact with skin), do not pull contaminated clothing over face! Rinse affected skin area under stream of warm water, if possible (30-35 °C), for 10 to 30 minutes and make sure that flowing water does not get into contact with those parts of body that were not contaminated. Do not use a brush, soap or neutralising agents! Cover the affected area with a sterile dressing, do not use any ointments or pharmaceutical products. Protect the victim against chill. Call a physician immediately!**

**Contact with eyes: Rinse eyes immediately and thoroughly under stream of water for 10 to 30 minutes in the direction from the inner to the outer ocular angle (to prevent running of water in the other, non-affected eye, mouth and nose). Never use any neutralising solutions! If the victim keeps his eyelid tightly closed, use reasonable degree of force to open it. If the victim wears contact lenses, remove them immediately. The victim must always consult an ophthalmologist!**

**Ingestion: DO NOT INDUCE VOMITING - higher risk of harm to digestive tract!!! Risk of perforation of oesophagus and stomach! RINSE MOUTH IMMEDIATELY WITH WATER AND GIVE TO DRINK 2-5 dl of cold water to alleviate thermal effect of the caustic.**

***Due to almost immediate effect to mucous membranes, it is suitable to offer immediately tap water than loose time by looking for chilled liquid – each minute of delay causes irreversible harm to mucous membranes! Soda water or mineral waters are not recommended, as they may release gaseous carbon dioxide. It is not recommended to consume a lot of liquid, as it could induce vomiting and possible aspiration of the caustic in lungs).***

**Do not force the victim to drink, especially if he/she feels pain in mouth or throat. In this case, make the victim rinse his/her mouth. DO NOT ADMINISTER ACTIVATED CARBON! (blackening will make examination of mucous membranes more difficult and activated carbon has no positive effect in case of acids and lye). Do not give anything to eat. Do not administer anything by mouth if the victim is unconscious or has convulsions. Call a physician immediately!**

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

**At low temperatures, due to low vapour pressure, irritation of eyes and mucous membranes is lighter. With higher temperatures, degree of irritation increases. Contact with eyes may cause disorders of cornea with subsequent fogging, especially in case of penetration of the substance into eye. Contact with the liquid causes severe skin burns.**

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

**Symptomatic treatment. In case of contact with eyes, immediately rinse the conjunctival sac. Quickly provide treatment by an ophthalmologist! Ingestion causes burns, therefore perform gastric lavage in case of ingestion. No emetics. It is more important to dilute contents of the**

# MATERIAL SAFETY DATA SHEET

## PENTAMETHYLDIETHYLENTRIAMINE

stomach that to try to neutralise. Check function of kidneys and liver for several days in case of severe cases. In case of ingestion, risk of shock.

### SECTION 5: Firefighting measures

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#### 5.1 Extinguishing media

Suitable extinguishing media: **sprinkled water, powder, foam, CO<sub>2</sub>**

Unsuitable extinguishing media: **not specified**

5.2 Special hazards arising from the substance or mixture: **Flammable liquid of hazard class III (VbF: AIII). Do not approach with open fire - risk of ignition. Possibility of release of carbon monoxide and nitrogen oxides. Formation of toxic and explosive mixtures.**

5.3 Advice for firefighters: **Self-contained breathing apparatus, special protective clothing! (Hazchem-Code: 3W)**

### SECTION 6: Accidental release measures

---

6.1 Personal precautions, protective equipment and emergency procedures: **Protective clothing, eye protection. Ensure ventilation.**

6.2 Environmental precautions: **Prevent contamination of soil and water in vicinity of accident.**

6.3 Methods and material for containment and cleaning up: **Cover with an absorbent material (Vapex, Vermikulit) and sweep up into a waste container marked with a hazardous waste identification list. For methods of disposal see Section 13.**

6.4 Reference to other sections: **Section 10, Section 13.**

### SECTION 7: Handling and storage

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7.1 Precautions for safe handling: **Delivered in rail or truck tanks or in steel barrels and IBC containers. The recommended maximum temperature during transport is 50 °C. Ventilation provided during emptying.**

7.2 Conditions for safe storage, including any incompatibilities: **Store in original packaging in rooms that may be ventilated. Do not store together with foodstuffs.**

7.3 Specific end use(s): **Not yet specified.**

### SECTION 8: Exposure controls/personal protection

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#### 8.1 Control parameters

**Czech Republic: not established**

**EC countries (2000/39/EC): not established**

##### 8.1.1 DNEL (Derived No Effect Level) for exposure of workers

Systemic Long-term Effect – inhalation:	<b>1.058 mg/m<sup>3</sup></b>
Systemic Long-term Effect – dermal:	<b>0.300 mg/kg of weight/day</b>
Acute exposure (local effects) – inhalation:	<b>not established</b>
Acute exposure (local effects) – dermal:	<b>not established</b>

# MATERIAL SAFETY DATA SHEET

## PENTAMETHYLDIETHYLENTRIAMINE

### 8.2 Exposure controls

When used in a closed circuit or with sufficient vapour exhaust, it is necessary to use standard personal protective equipment. When used in an open facility and insufficient vapour exhaust (Pentamethyldiethylentriamine concentration > DNEL inhalation), it is necessary to use respiratory protection.

Engineering controls: **Ensure ventilation.**

Respiratory protection: **if necessary, protective mask with a filter (EN 140) against organic vapours – type A/P2 (APF10)**

Eye protection: **protective glasses or face shield (EN 166)**

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

Skin protection: **protective clothing**

Other data: **Do not eat, drink and smoke during work. Wash your hands with hot water and soap after work, apply suitable reparative preparations.**

Environmental exposure controls:

**Use in a closed circuit, waste gases burnt in a fire crack or cleaned by adsorption (activated carbon), wastewater treated biologically.**

## SECTION 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

Appearance:	<b>Colourless to yellowish liquid</b>
Odour:	<b>ammonia</b>
Odour threshold:	<b>not established</b>
pH:	<b>11.9</b>
Melting point/freezing point (°C):	<b>-20</b>
Initial boiling point (at 1013 hPa in °C)	<b>201.84</b>
Flash point (at 1013 hPa in °C):	<b>76</b>
Evaporation rate:	<b>not established</b>
Flammability (solid, gas):	<b>the product is liquid</b>
Upper/lower flammability or explosive limits (% vol.):	<b>5.7/1.1</b>
Vapour pressure (Pa at 20 °C):	<b>27</b>
Vapour pressure (Pa at 50 °C):	<b>240</b>
Vapour density:	<b>not established</b>
Relative density (at 20 °C):	<b>0.829</b>
Solubility (in g/l at 20 °C) – in water:	<b>perfectly miscible, &gt; 1000.0</b>
- in fats (including oil specification):	<b>-</b>
Partition coefficient n-octanol/water (log $p_{ow}$ at 25 °C and pH 7,5):	<b>-2.1</b>
Auto-ignition temperature (at 1013 hPa in °C):	<b>162</b>
Decomposition temperature:	<b>not established</b>
Explosive properties:	<b>none</b>

# MATERIAL SAFETY DATA SHEET

## PENTAMETHYLDIETHYLENTRIAMINE

Oxidising properties:	none
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### 9.2 Other information

Dissociation constant (at 20 °C)	9.81
Viscosity (mPa.s at 20 °C):	1.52

## SECTION 10: Stability and reactivity

10.1 Reactivity: **Possibility of reaction at temperatures higher than 70 °C.**

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

10.3 Possibility of hazardous reactions:

10.4 Conditions to avoid: **Possibility of ignition in contact with hot surfaces, sparks or open fire.**

10.5 Incompatible materials: **It reacts explosively with strong oxidisers and acids. Avoid contact with food.**

10.6 Hazardous decomposition products: **Combustion produces toxic carbon monoxide and nitrogen oxides.**

## SECTION 11: Toxicological information

Information on toxicological effects:

CLP evaluation

11.1 Acute toxicity

- LD<sub>50</sub> (oral, rat) = **1 330 mg.kg<sup>-1</sup>, category 4**
- LD<sub>50</sub> (derm., rabbit) = **200 - 1000 mg.kg<sup>-1</sup>, category 3**
- LC<sub>50</sub> (inhal., rat) = **2055.5 mg.m<sup>-3</sup>/6h, category 3**

11.2 Irritation: **category 1B**

Dermal irritation (rabbit): **strongly irritant**

Eye irritation (rabbit): **strongly irritant**

11.3 Sensitisation

Skin sensitisation (guinea pig): **not sensitising**

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

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

11.6 Reproductive toxicity (rat, oral): NOAEL > 300 mg.kg<sup>-1</sup>, **not classified**

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

11.8 Specific target organs toxicity –repeated exposure: **OECD 408, NOAEL = 30 mg.kg<sup>-1</sup>, not classified**

11.9 Aspiration hazard: **not established**

# MATERIAL SAFETY DATA SHEET

## PENTAMETHYLDIETHYLENTRIAMINE

### SECTION 12: Ecological information

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#### 12.1 Toxicity

##### 12.1.1 Aquatic toxicity

*Oncorhynchus mykiss*: LC<sub>50</sub> = **157 mg/l/96 h**

*Daphnia magna*: EC<sub>50</sub>/ LC<sub>50</sub> = **54.9 mg/l/48 h**

*Desmodesmus subspicatus*: EC<sub>50</sub>/ LC<sub>50</sub> = **78.3 mg/l/72 h**

EC<sub>10</sub>/ LC<sub>10</sub>/NOEC = **40.2 mg/l**

Classification conclusion: **Harmful for aquatic environment**

##### 12.1.2 Sediment toxicity: **not established**

##### 12.1.3 PNEC (Predicated No Effect Concentration)

PNEC aqua (freshwater): **0.0549 mg/l**

PNEC aqua (marine water): **0.00549 mg/l**

PNEC sediment: **0.398 mg/kg of weight of dry sediment**

PNEC sewage treatment plant: **100 mg/l**

PNEC soil: **0.0472 mg/kg of weight of dry soil**

PNEC plants: **not established**

PNEC oral: **not established**

#### 12.2 Persistence and degradability

*Evaluation:*

**PMDTA can be regarded as hydrolytically stable substance. Half-life time at 25 °C and at pH 4, 7 and 9 was estimated higher than 1 year. The fact is based on the study „Hydrolysis as a function of pH“. No information about phototransformation in air, water and soil is available.**

**It can be regarded as not biodegradable under the test condition according to experimental results of ready and inherent biodegradability tests.**

#### 12.3 Bio-accumulative potential: **BCF of 3.16 L/kg wet wt indicates low bioconcentration potential.**

#### 12.4 Mobility in soil:

Stability: **miscible with water**

Adsorption: log K<sub>oc</sub> at 20 °C = **1.562**

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

#### 12.6 Other adverse effects: -

### SECTION 13: Disposal considerations

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#### 13.1 Waste treatment methods: **Incineration in a hazardous waste incineration plant in accordance with Act on Wastes under the catalogue numbers 16 0305 or 16 0508 or as contaminated absorbent under catalogue number 15 0202.**

Disposal of contaminated packaging: **Rinse with water, dispose the caught waste water and packaging in accordance with valid regulations.**

# MATERIAL SAFETY DATA SHEET

## PENTAMETHYLDIETHYLENTRIAMINE

### SECTION 14: Transport information

Land transport (ADR/RID)  
Marine transport (IMPG)  
Air transport (ICAO/IA TA)

14.1 UN number:	<b>2922</b>
14.2 UN proper shipping name:	<b>CORROSIVE LIQUID, TOXIC, N.O.S. [N,N-BIS(2-DIMETHYLAMINOETHYL)METHYLAMINE]</b>
14.3 Transport hazard class(es):	<b>8 (6.1)/ CT1</b>
Hazard identification number (Kemler code):	<b>86</b>
14.4 Packing group:	<b>II</b>
14.5 Environmental hazards:	<b>no</b>
Marine pollutant:	<b>no</b>
14.6 Special precautions for user:	<b>not included in „Segregation Groups“</b>
EMS:	<b>F-A, S-B</b>
14.7 Transport in bulk according to Annex II of MARPOL and the IBC Code:	<b>irrelevant</b>

### 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 environment/specific legislation concerning substances or mixtures, 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 CR and concerning safety, health and environment/specific legislation concerning substances or mixtures, as amended:

- Act 350/2011 Coll., on chemical substances and chemical mixtures and on amendments to some acts;
- [Decree of Ministry of Environment no. 93/2016 Coll. laying down Waste Catalogue;](#)
- Governmental decree no. 361/2007 Coll., laying down occupational health and safety conditions.



# MATERIAL SAFETY DATA SHEET

## PENTAMETHYLDIETHYLENTRIAMINE

### 15.2 Chemical safety assessment

**Chemical safety assessment is part of the chemical safety report for Pentamethyldiethylenetriamine – 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

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16.1 This material safety data sheet supersedes all previous versions.

#### 16.2 List of abbreviations

Carc.:	Carcinogenicity
CAS:	Chemical Abstracts Service
CLP:	Classification, labelling, packaging regulation
CSR:	Chemical safety report
DNEL:	Derived no-effect level
ES:	Exposure scenario
EC:	European Commission
EC <sub>50</sub> :	Median effective concentration EC <sub>50</sub> – used in toxicity tests. Median effective concentration EC <sub>50</sub> is the concentration of substance that causes 50 % mortality or 50 % decrease of growth or growth rate with reference to the control sample.
EINECS:	European Inventory of Existing Commercial Chemical Substances
ELINCS:	European List of Notified Chemical Substances
Irrit.:	Irritant
LC <sub>50</sub> :	Lethal concentration, 50 % (lethal concentration) is used for toxicity tests
LD <sub>50</sub> :	Absolute lethal dose that kills 50 % of members of population
LOAEC:	Lowest observed adverse effect concentration
NOAEC:	No observed adverse effect concentration
NOEC:	No observed effect concentration
OECD:	Organisation for Economic Cooperation 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 organs toxicity
STOT SE:	Specific target organs toxicity - single exposure
STOT RE:	Specific target organs toxicity - repeated exposure
STP:	Sewage treatment plant
SU:	Sector of use
Tox.:	Toxicity
vPvB:	Very persistent and very bioaccumulative

#### 16.3 List of mentioned phrases

H phrases:

**H302 Harmful if swallowed.**

**H311+H331 Toxic in contact with skin or if inhaled.**

**H314 Causes severe skin burns and eye damage.**

**H318 Causes serious eye damage.**

**H412 Harmful to aquatic life with long lasting effects.**

P phrases:

**P260 Do not breathe vapours.**

**P273 Avoid release to the environment**

# MATERIAL SAFETY DATA SHEET

## PENTAMETHYLDIETHYLENTRIAMINE

**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].

**P304+P340 IF INHALED:** Remove person to fresh air and keep comfortable for breathing.

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

**P310** Immediately call a POISON CENTER/doctor.

### 16.4 Sources used

Material safety data list of pentamethyldiethylenetriamine, BC MCHZ, **Version 6.0 issued in 06/2015.**

### 16.5 History of revisions

Issue	Date	Change
<b>1.0</b>	30 November 2010	Preparation of the safety data sheet according to Regulation (EC) No 1907/2006 of the European Parliament and of the Council
<b>2.0</b>	7 June 2011	Overall revision of all sections of the safety data sheet according to Regulation (EC) No 453/2010 of the European Parliament and of the Council
<b>3.0</b>	1 December 2012	Update of the regulations valid in the Czech Republic, and revisions according to Regulation (EC) No 286/2011 of the European Parliament and of the Council
<b>4.0</b>	18 June 2013	Overall revision of all section of SDS according to registration of Pentamethyldiethylenetriamine. Complementation of the overview of exposure scenarios
<b>4.1</b>	14 March 2014	Modification in Section 14.
<b>5.0</b>	1 September 2014	Addition of classification and overview of exposure scenarios
<b>6.0</b>	1 June 2015	Modification of Section 2 (deletion of classification under DSD) and other sections according to regulations 2015/830/EU
<b>7.0</b>	5 December 2016	Revision according to Commission Regulation (EU) no. 918/2016

# MATERIAL SAFETY DATA SHEET

## PENTAMETHYLDIETHYLENTRIAMINE

Prepared by: Ing. Zuzana Svobodová – IT & Quality, ecology and safety department

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

Version: English  
Date: 05.12.2016  
Material Safety Data Sheet  
N,N-Bis(2-dimethylaminoethyl)methylamine

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[www.borsodchem-cz.com](http://www.borsodchem-cz.com)

The mentioned data reflect the present state of knowledge and experience and they are in compliance with valid legislation of the Czech Republic. The client is responsible for observing valid national legislation in the place of use.

Manufactured by:

**BorsodChem MCHZ, s.r.o.**  
Chemická 2039/1  
709 00 Ostrava – Mariánské Hory  
Telephone: +420 596 641 111  
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# MATERIAL SAFETY DATA SHEET

## PENTAMETHYLDIETHYLENTRIAMINE

Annex No. 1

### OVERVIEW OF EXPOSURE SCENARIOS

Number of exposure scenario	Volume (t/r)	Production	Identified use			Stage of life cycle		Areas of application (SU)	Chemical products (PC)	Processes (PROC)	Release to the environment (ERC)	Items (AC)
			Formulation	End use	Consumers	Period of use (for items)	Stage of waste					
ES2A Formulation and re-packing	N/A		X					SU3, 10	PC1, 9a, 21, 32	PROC1, 2, 3, 4, 5, 8a, 8b, 9, 15	ERC2, 3	N/A
ES2B Formulation and re-packing - substance	N/A		X					SU3, 10	PC1, 9a, 21, 32	PROC1, 2, 3, 4, 5, 8a, 8b, 9, 15	ERC2	N/A
ES3 Intermediate	N/A			X				SU3	PC19	PROC1, 2, 3, 8b, 9	ERC6a	N/A
ES4 Flexible foam Industrial Use In mixture	N/A			X				SU3, 12, 17, 18	PC32	PROC1, 2, 3, 4, 5, 8a, 8b, 9, 12, 14, 15, 21	ERC5, 6c, 7	N/A
ES5 Rigid foam Industrial Use In mixture	N/A			X				SU2a, 12, 17, 19	PC32	PROC1, 2, 3, 4, 5, 7, 8a, 8b, 9, 12, 15, 21, 24	ERC5, 6c, 6d, 7	N/A
ES6 CASE Industrial Use In mixture	N/A			X				SU3	PC1, 9a,	PROC1, 2, 3, 4, 5, 6, 7, 8a, 8b, 9, 10, 14, 15, 21, 24	ERC5	N/A
ES7 Flexible foam Professional Use In mixture	N/A			X				SU22, 12, 17, 18	PC32	PROC3, 4, 5, 8a, 10, 11, 15, 21, 24	ERC8c, 8f	N/A
ES8 Rigid foam Professional Use In mixture	N/A			X				SU22, 2a, 12, 17, 19	PC32	PROC1, 2, 3, 4, 5, 8a, 10, 11, 15, 21, 24	ERC8c, 8f	N/A
ES9 CASE Professional Use In mixture	N/A			X				SU22	PC1, 9a	PROC4, 5, 6, 8a, 9, 10, 11, 21, 24	ERC8c, 8f	N/A

CASE – Coatings/Adhesives/Sealants/Elastomers

N/A – Not available (confidential)

# MATERIAL SAFETY DATA SHEET

## PENTAMETHYLDIETHYLENTRIAMINE

### SUMMARY OF RISK MANAGEMENT MEASURES

Title	<b>Manufacture and use of Pentamethyldiethylenetriamine (PMDTA)</b>
Sector of Use	SU2a, SU3, SU8, SU9, SU10, SU11, SU12, SU17, SU18, SU19, SU22
Process Category	PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC12, PROC14, PROC15, PROC21, PROC24
Product Category	PC1, PC9a, PC19, PC21, PC32
Environmental release Category	ERC1, ERC2, ERC3, ERC5, ERC6a, ERC6c, ERC6d, ERC7, ERC8c, ERC 8f
Processes, tasks, activities covered	<p>Covers the manufacture and use of PMDTA in closed processes where exposure to PMDTA is contained, or where exposure (inhalation or dermal) to PMDTA may occur during sampling, maintenance or equipment breakage.</p> <p>Covers further processing (use) of PMDTA to form a number of different products such as polymer products, special chemicals for coatings, sealants, adhesives and elastomers during which PMDTA is predominantly contained but there may be some exposure during sampling, maintenance and equipment breakage.</p> <p>Covers the same processing (use) of PMDTA in batch or other processes where, due to the nature of the process design opportunity for exposure to PMDTA may occur but with exposure to PMDTA controlled by operational conditions or risk management measures.</p> <p>Covers the transfer of PMDTA by charging/discharging from/to small or large containers at dedicated or non-dedicated facilities, with exposure to PMDTA controlled by operational conditions or risk management measures.</p> <p>Covers use of aniline as laboratory reagent at small scale laboratories with quantities of 1 L or 1 kg PMDTA or less present in the workplace with exposure to PMDTA controlled by operational conditions or risk management measures.</p> <p>It is assumed that all processes are performed at room temperature.</p>
	<b>Operational conditions and risk management measures</b>
	<b>Control of worker exposure</b>
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated) [OC1]
Other Operational Conditions affecting worker exposure	<p>PMDTA carries a hazard warning, therefore where procedures in the manufacture or use of PMDTA are not designed to contain emissions, workers exposure to PMDTA must be prevented by use of local exhaust ventilation and good work practices. These may include: keeping equipment under negative pressure,</p> <ul style="list-style-type: none"> <li>• control of staff entry to work area,</li> <li>• ensuring all equipment is well maintained,</li> <li>• permits to work for maintenance work,</li> </ul>

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	<ul style="list-style-type: none"> <li>regular cleaning of equipment and work area,</li> <li>systems in place to ensure correct use of RMMs and that OCs are being followed, training for staff on good practice,</li> <li>procedures and training for emergency decontamination and disposal,</li> <li>good standards of personal hygiene,</li> <li>recording of any 'near miss' situations.</li> <li>sensitisers – pre-employment screening and appropriate health screening.</li> </ul>
<b>Process Categories</b>	<b>Risk Management Measures *</b>
1, 2, 3, 4, 5, 6, 7, 8a, 8b, 9, 10, 11, 12, 14, 15, 21 and 24	<p><b>PMDTA carries a hazard warning classification, therefore where exceptional procedures may result in exposure to PMDTA:</b></p> <p>Use suitable eye protection and gloves [PPE14].</p> <p>Wear a full face respirator conforming to EN140 with Type A/P2 filter or better [PPE32]</p> <p>Wear suitable coveralls to prevent exposure to the skin [PPE27].</p>
1 – Use in closed process, no likelihood of exposure	Handle substance within a closed system [E47].
2 – Use in closed, continuous process with occasional controlled exposure (e.g. sampling)	Handle substance within a closed system [E47]. Wear suitable gloves tested to EN374 [PPE15] during material sampling.
3 – Use in closed, batch process (synthesis or formulation)	Handle substance within a predominantly closed system provided with extract ventilation [E49]. Ensure material transfers are under containment or extract ventilation [E66]. Ensure samples are obtained under containment or extract ventilation [E76].
4 – Use in batch and other process (synthesis) where opportunity for exposure arises	Provide extract ventilation to points where emissions occur [E54]. Ensure material transfers are under containment or extract ventilation [E66]. Ensure samples are obtained under containment or extract ventilation [E76]. Avoid carrying out operation for more than 4 hours [OC12].
5 – Mixing and blending in batch processes	Provide extract ventilation to points where emissions occur [E54]. Avoid carrying out operation for more than 4 hours [OC12].
6 – Calendering operations	Provide extract ventilation to points where emissions occur [E54]. Avoid carrying out operation for more than 4 hours [OC12].
7 – Industrial spraying	Provide extract ventilation to points where emissions occur [E54]. Avoid carrying out operation for more than 4 hours [OC12].
8a – Transfer of chemicals from/to	Fill containers/cans at dedicated fill points supplied with local

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vessels/ large containers at non-dedicated facilities.	<p>extract ventilation [E51].</p> <p>Provide extract ventilation to material transfer points and other openings [E82].</p> <p>Avoid carrying out operation for more than 4 hours [OC12].</p>
8b – Transfer of chemicals from/to vessels/ large containers at dedicated facilities.	<p>Fill containers/cans at dedicated fill points supplied with local extract ventilation [E51].</p> <p>Provide extract ventilation to material transfer points and other openings [E82].</p> <p>Avoid carrying out operation for more than 4 hours [OC12]</p>
9 – Transfer of substance into small containers (dedicated filling line, including weighing)	<p>Fill containers/cans at dedicated fill points supplied with local extract ventilation [E51].</p> <p>Provide extract ventilation to material transfer points and other openings [E82].</p> <p>Avoid carrying out operation for more than 4 hours [OC12]</p>
10 – Roller application or brushing	<p>Provide extract ventilation to points where emissions occur [E54].</p> <p>Avoid carrying out operation for more than 4 hours [OC12]</p>
11 – Non industrial spraying	<p>Provide extract ventilation to points where emissions occur [E54].</p> <p>Avoid carrying out operation for more than 1 hour [OC11]</p>
12 – Use of blowing agents in manufacture of foam	<p>Provide extract ventilation to points where emissions occur [E54].</p> <p>Ensure material transfers are under containment or extract ventilation [E66].</p> <p>Ensure samples are obtained under containment or extract ventilation [E76].</p> <p>Avoid carrying out operation for more than 4 hours [OC12].</p>
14 – Production of preparations* or articles by tableting, compression, extrusion, pelletisation	<p>Provide extract ventilation to points where emissions occur [E54].</p> <p>Avoid carrying out operation for more than 1 hour [OC11].</p>
15 – Use of laboratory reagents in small scale laboratories	<p>Carry out in a vented booth or extracted enclosure [E57].</p> <p>Ensure samples are obtained under containment or extract ventilation [E76].</p> <p>Avoid carrying out operation for more than 1 hour [OC11].</p>
21 – Low energy manipulation of substances bound in materials and/or articles	<p>Provide extract ventilation to points where emissions occur [E54].</p> <p>Avoid carrying out operation for more than 4 hours [OC12].</p>
24 – High (mechanical) energy work-up of substances bound in materials and/or articles	<p>Provide extract ventilation to points where emissions occur [E54].</p> <p>Avoid carrying out operation for more than 4 hours [OC12].</p>

\* standard phrases and codes are extracted from GES Worker Chemical Safety Assessment (CSA) Template on the Cefic web-site <http://www.cefic.org>