SAFETY DATA SHEET
N,N-DIMETHYLCYCLOHEXYLAMINE

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

1.1 Product identifier
   Chemical name: N,N-Dimethylcyclohexylamine
   Registration no.: 01-2119533030-60-0001
   Index number: –
   ES (EINECS) number: 202-715-5
   CAS number: 98-94-2
   Other names of the substance: N,N-Dimethylaminocyclohexane

1.2 Relevant identified uses of the substance or mixture and uses advised against
   Uses of the substance: Used especially as catalyst for polyurethane systems, for production of surface materials, fillers of binding agents, sealing agents, softeners (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.
   Place of business or headquarters: Chemická 1/2039, 709 03 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 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
   CHEMTREC, international call: 001-703-527-3887
   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
   According to Regulation (EC) no. 1272/2008:
   Flam. Liq. 3; H226 Flammable liquid and vapour.
   Acute Tox. 3; H301 Toxic if swallowed.
   Acute Tox. 3; H311 Toxic in contact with skin.
   Acute Tox. 3; H331 Toxic if inhaled.
   Skin Corr. 1; H314 Causes severe skin burns and eye damage.
   Eye Irrit. 1; H318 Causes serious eye damage.
   Aquatic Chronic 2; H411 Toxic to aquatic life with long lasting effects.
R10 Flammable.
Xn; R20/21/22 Harmful by inhalation, in contact with skin and if swallowed.
C; R34 Causes burns.

The most important human health adverse effects during use of the substance or preparation:
Corrosive. Burns skin and mucous membranes. Vapours severely irritate eyes and airways.

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

2.2 Label elements
According to Regulation (EC) no. 1272/2008:
Symbols:

- GHS05
- GHS06
- GHS02
- GHS09

Signal word: DANGER
H phrases:
H226 Flammable liquid and vapour.
H301+H311+H331 Toxic if swallowed, in contact with skin or if inhaled.
H314 Causes severe skin burns and eye damage.
H411 Toxic to aquatic life with long lasting effects.

P phrases:
P210 Keep away from heat/sparks/open flames/hot surfaces. – No smoking.
P233 Keep container tightly closed.
P273 Avoid release to the environment.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing.
Rinse skin with water/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.

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 | N,N-Dimethylcyclohexylamine |
SAFETY DATA SHEET
N,N-DIMETHYLCYCLOHEXYLAMINE

| Index number | – |
| EC No.       | 202-715-5 |
| CAS No.      | 98-94-2 |
| Substance content (% w.) | min. 99,0 |
| Synonyms     | N,N-Dimethylaminocyclohexane |

Impurities: < 1 % w., CMR impurities < 0.1 % 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 1 0 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!

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, unaffected 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 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. Airways are irritated and there is a risk of oedema of larynges and lungs that may develop belatedly only after 2 days. Therefore, medical attention is always necessary in case of inhalation! 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. The substance absorbs by skin. It has allergenic effects. Sometimes, it may cause disorders of kidneys.
Contact with the substance manifests itself by severe burning in the nose, rhinopharynx, eyes and skin, severe irritating cough, nausea, breathlessness or even by loss of consciousness.

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! In case of irritation of airways, let inhale each 10 minutes 5 doses from an aerosol dispenser with dexymethasone (Auxison dos. Aerosol) until problems disappear. Beware of lungs oedema that may be latent up to 2 days. Prophylactic treatment even without symptoms, each 10 minutes 5 doses of the aerosol, 3 in total, in case of minor symptoms, each 10 minutes 5 doses until symptoms disappear, at least one pack. Administer Hydrocortison or Prednisolon intravenously, 250 mg immediately, up to 1000 mg the first day, decrease the dose slowly the second and the third day. Strict rest in bed. Infection prophylaxis. Oxygen as needed, human albumin 20%. Codeine in case of irritating cough. Ingestion causes burns, therefore perform gastric lavage in case of ingestion. No emetics. It is more important to dilute contents of the 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. WARNING! Savers and helping persons must wear complete protective clothing when giving first aid.

SECTION 5: Firefighting measures

5.1 Extinguishing media
Suitable extinguishing media: big 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: Flammable liquid. In warm days and when heated up, the liquid may form caustic and explosive mixtures with air. The mixtures are heavier than air, they keep at ground and in case of ignition, fire may blaze to big distances. Possibility of release of carbon monoxide and nitrogen oxides.

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: Protection of air ways, protection of non-protected body parts, protection of eyes. Measure concentration of N,N-Dimethylcyclohexylamine (hereinafter only DMCHA) in the environment, provide sufficient ventilation.

6.2 Environmental precautions: Prevent contamination of soil and water, check concentration of DMCHA in the environment in the 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. For methods of disposal see Section 13.

6.4 Reference to other sections: Refer to section 10 and 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling: Delivered in rail or truck tanks or in steel barrels or in IBC containers. Ventilation provided during emptying. The recommended maximum temperature during transport is 50 °C.
7.2 Conditions for safe storage, including any incompatibilities:
Store in easily ventilated rooms in original packages or in steel tanks. The highest allowable storing temperature is 30 °C.
Do not store together with foodstuffs, strong oxidising agents and concentrated inorganic acids.

7.3 Specific end use(s): Use only under strictly controlled conditions or while observing conditions stated in the exposure scenario – see Annex 1.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

<table>
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<th>Czech Republic: PEL (ind.)/NPC-W (lim.)</th>
<th>= 5/10 mg.m(^{-3})</th>
</tr>
</thead>
</table>

8.1.1 DNEL (Derived No Effect Level) for exposure of workers
Acute exposure (systemic effects) – inhalation: 35 mg/m\(^3\)
Other DNEL not established yet.

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

Engineering controls: Ensure ventilation. Check measurement of DMCHA concentration in the working environment.
Respiratory protection: protective mask or half mask with filter (EN 140) against organic vapours – type A/P2
Hand protection: protective gloves (EN 374)
Eye protection: protective goggles or face shield (e.g. EN 166)
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

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<td>Odour:</td>
<td>like amines (fish)</td>
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<td>Odour threshold:</td>
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<tr>
<td>pH:</td>
<td>not established</td>
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<tr>
<td>Melting point/freezing point (°C) at 1013 hPa:</td>
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<td>Initial boiling point (at 1013 hPa in °C):</td>
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<td>Flash point (at 1013 hPa in °C):</td>
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<th>Value</th>
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<td>Flammability (solid, gas):</td>
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<td>Upper/lower flammability or explosive limits</td>
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<tr>
<td>(% vol.):</td>
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<td>Vapour pressure (hPa at 21.5 °C):</td>
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<tr>
<td>Vapour density:</td>
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<td>Relative density (at 20 °C):</td>
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<tr>
<td>Solubility (in g/l at 20 °C):</td>
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<td>Partition coefficient: n-octanol/water</td>
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<tr>
<td>(log p&lt;sub&gt;ow&lt;/sub&gt; at 25 °C and pH 7.5):</td>
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<td>Auto-ignition temperature (at 1013 hPa in °C):</td>
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<td>Decomposition temperature:</td>
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<tr>
<td>Explosive properties:</td>
<td>no</td>
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<tr>
<td>Oxidising properties:</td>
<td>no</td>
</tr>
<tr>
<td>Kinematic viscosity (mm&lt;sup&gt;2&lt;/sup&gt;.s&lt;sup&gt;-1&lt;/sup&gt; at 20 °C):</td>
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</tr>
</tbody>
</table>

SECTION 10: Stability and reactivity

10.1 Reactivity: **Possibility of reaction at temperatures higher than 30 °C.**
10.2 Chemical stability: **Stable under normal conditions.**
10.3 Possibility of hazardous reactions: **Reacts vigorously with strong oxidising agents and inorganic acids.**
10.4 Conditions to avoid: In case of heating up formation of irritating and explosive mixtures. Thermal decomposition with formation of nitrogen oxides and carbon monoxide occurs at higher temperatures. Ignition in contact with hot surfaces, sparks or open fire.
10.5 Incompatible materials: see point 10.3.
10.6 Hazardous decomposition products: **Combustion may produce toxic carbon monoxide and nitrogen oxides.**

SECTION 11: Toxicological information

CLP evaluation:

11.1 Acute toxicity: **category 3**
- LD50 (oral, rat) = 272 – 289 mg.kg<sup>-1</sup>
- LD50 (derm., rat) = 380 mg.kg<sup>-1</sup>
- LC50 (inhal., rat) = 1.7 – 5.8 mg.l<sup>-1</sup>/6 hours
- LC50 (inhal., rat) = 9 mg.l<sup>-1</sup>/1 hour

11.2 Irritation
Dermal irritation (rabbit): **category 1B**
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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: following a subacute test, no subsequent tests performed

11.6 Reproductive toxicity (rat): NOAEL > 1500 ppm ⇒ not toxic for reproduction

11.7 STOT – single exposure: not classified

11.8 STOT (blood, haematopoietic system) – repeated exposure: not classified

11.9 Aspiration hazard: data not available

SECTION 12: Ecological information

12.1 Toxicity

12.1.1 Aquatic toxicity
Acute for fish: Oncorhynchus mykiss: LC₅₀ (96 h) = 28 mg.l⁻¹
Prolonged for fish: data not available
Acute for the invertebrates: Daphnia magna: LC₅₀ (48 h) = 75 mg.l⁻¹
Prolonged for the invertebrates: data not available
Effective concentration for algae Scenedesmus subspicatus: EC₅₀ (72 h) = 2 mg.l⁻¹ (static test)
Algae: NOErC (72 h) = 0.078 mg.l⁻¹

Classification conclusion: Classified as hazardous to the aquatic environment – Chronic toxicity 2nd category.

12.1.2 Sediment toxicity: Data not available.

12.1.3 PNEC (Predicated No Effect Concentration)
PNEC water (surface): 0.002 mg.l⁻¹
PNEC water (sea): 0.0002 mg.l⁻¹
PNEC sediment: 0.0211 mg.kg⁻¹ of weight of dry sediment
PNEC sewage treatment plant: 20.6 mg.l⁻¹
PNEC soil: 0.00305 mg.kg⁻¹ of weight of dry soil
PNEC plants: data not available
PNEC birds: data not available
PNEC oral administration: data not available

12.2 Persistence and degradability
Evaluation: The product is not a high bioaccumulation potential substance.
Evaluation: Readily degradable in aqueous environment (in accordance with OECD criteria).
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12.3 Bio-accumulative potential: BCF < 50 (estimate based on log $P_{ow}$)

12.4 Mobility in soil: May enter the environment from waste water.
   Stability: Soluble in water
   Adsorption: possible in soil, adsorption coefficient value: log Koc = 1.84 at 20 °C

12.5 Results of PBT and vPvB assessment: not included

12.6 Other adverse effects: not specified

SECTION 13: Disposal considerations

13.1 Waste treatment methods: Incineration in a hazardous waste incineration plant in accordance with Act on Wastes under the catalogue numbers 160305, 160508 or 150202.
   Disposal of contaminated packaging: It is recommended to burn contaminated packaging under waste code 150110 in the waste incineration plant.

SECTION 14: Transport information

14.1 UN number: 2264
14.2 UN proper shipping name: N,N-Dimethylcyclohexylamine
14.3 Class, Classification code: 8, CF1
   Hazard identification number (Kemler code): 83
14.4 Packing group: II
14.5 Environmental hazards: yes
   Marine pollutant: yes
14.6 Special precautions for user: EMS: F-E, S-C
14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Irrelevant

Notes – ICAO/IATA: max. passenger limit 1,0 l (851), max. cargo limit 30 l (855)

SECTION 15: Regulatory information

15.1.1 EU regulations concerning safety, health and environment/specific legislation concerning substances or mixtures, as amended:
   • Council directive 67/548/EEC of 27th June 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances;
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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 402/2011 Coll. (Ministry of Industry and Trade), on the evaluation of hazardous properties of chemical substances and mixtures and on packaging and labeling of hazardous chemical compounds;
- Decree of Ministry of Environment no. 381/2001 Coll. laying down Waste Catalogue, List of Dangerous Waste and lists of wastes and states for the purpose of export, import and transit of wastes and procedure of granting approval for export, import and transit of wastes (Waste Catalogue);
- Governmental decree no. 361/2007 Coll., laying down occupational health and safety conditions.

15.2 Chemical safety assessment
- Chemical safety assessment is part of the report on chemical safety of N,N-Dimethylcyclohexylamine – 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 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
- EC50: Median effective concentration EC50 – used in toxicity tests. Median effective concentration EC50 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
- LC50: Lethal concentration, 50 % (lethal concentration) is used for toxicity tests
- LD50: 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
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OECD: Organisation for Economic Cooperation and Development
PBT: Persistent, bio-accumulative 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 bio-accumulative

16.3 A list of mentioned R-phrases:

R-phrases:
R10 Flammable.
R20/21/22 Harmful by inhalation, in contact with skin and if swallowed.
R34 Causes burns.

H phrases:
H226 Flammable liquid and vapour.
H301+H311+H331 Toxic if swallowed, in contact with skin or if inhaled.
H314 Causes severe skin burns and eye damage.
H318 Causes serious eye damage.
H411 Toxic to aquatic life with long lasting effects.

P phrases:
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P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/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.

16.4 Sources used

Registration dossier for N,N-Dimethylcyclohexylamine.
Material safety data sheet – N,N-Dimethylcyclohexylamine, BC MCHZ, issued in 04/2012.
16.5 History of revisions

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<thead>
<tr>
<th>Issue</th>
<th>Date</th>
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<tr>
<td>2.0</td>
<td>10 October 2011</td>
<td>Additional information from the registration dossier</td>
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<tr>
<td>3.0</td>
<td>30 April 2012</td>
<td>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</td>
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<td>4.0</td>
<td>1 November 2012</td>
<td>Complementation of the overview of exposure scenarios, update of classification (use of a combination of H-phrases), 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</td>
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Prepared by: Quality, ecology and safety department – Ing. Zuzana Svobodová
Approved by: Head of Quality, ecology and safety department – Ing. Zdeněk Polách

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 1/2039
709 03 Ostrava – Mariánské Hory
Telefon: +420 596 641 111
Fax: +420 596 626 258

Version: English
Date: 31.10.2012
Safety Data Sheet
N,N-Dimethylcyclohexylamine
## OVERVIEW OF EXPOSURE SCENARIOS

<table>
<thead>
<tr>
<th>Number of exposure scenario</th>
<th>Volume (t/r)</th>
<th>Production</th>
<th>Identified use</th>
<th>Stage of life cycle</th>
<th>Areas of application (SU)</th>
<th>Chemical products (PC)</th>
<th>Processes (PROC)</th>
<th>Release to the environment (ERC)</th>
<th>Items (AC)</th>
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<td>Formulation and (re)packing of substances and mixtures</td>
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<td>Flexible foam</td>
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<td>X</td>
<td></td>
<td></td>
<td>SU3, 21, 22</td>
<td>PC32</td>
<td>PROC1, 2, 3, 4, 5, 7, 8a, 8b, 9, 10, 11, 13, 14, 15</td>
<td>ERC3, 8c, 8f</td>
<td>Tari code 3909509090</td>
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<tr>
<td>Adhesive/sealant</td>
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<td>ES7</td>
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<td>SU3, 21, 22</td>
<td>PC32</td>
<td>PROC1, 2, 3, 4, 5, 7, 8a, 8b, 9, 10, 13, 14, 15</td>
<td>ERC8c, 8d, 8f, 10a, 11a</td>
<td>Tari code 3909509090</td>
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<tr>
<td>Elastomers</td>
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</tr>
</tbody>
</table>

N/A – not available (confidential information)
NR – not relevant
# SUMMARY OF RISK MANAGEMENT MEASURES

<table>
<thead>
<tr>
<th>Title</th>
<th>Manufacture or use of N,N-Dimethylcyclohexylamine (DMCHA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sector of Use</td>
<td>SU2a, SU3, SU9, SU10, SU12, SU17, SU18, SU19, SU21, SU22</td>
</tr>
<tr>
<td>Process Category</td>
<td>PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC14, PROC15, PROC21</td>
</tr>
<tr>
<td>Product Category</td>
<td>PC1, PC9a, PC9b, PC32</td>
</tr>
<tr>
<td>Article Category</td>
<td>n/a</td>
</tr>
<tr>
<td>Environmental release Category</td>
<td>ERC1, ERC2, ERC3, ERC5, ERC8c, ERC8d, ERC8f, ERC10a, ERC11a</td>
</tr>
<tr>
<td>Specific environmental release category</td>
<td>n/a</td>
</tr>
</tbody>
</table>

## Processes, tasks, activities covered
Covers the manufacture and use of DMCHA in closed/open processes where exposure to DMCHA is contained, or where exposure (inhalation or dermal) to DMCHA may occur during sampling, maintenance or equipment breakage. Covers further processing (use) of DMCHA to form a number of different products such as polymer preparations and compounds during which DMCHA predominately contained but there may be some exposure during sampling, maintenance and equipment breakage. Covers the same processing (use) of DMCHA in batch or other processes where, due to the nature of the process design opportunity for exposure to DMCHA may occur but with exposure to DMCHA controlled by operational conditions or risk management measures. Covers the transfer of DMCHA by charging/discharging from/to small or large containers at dedicated or non-dedicated facilities, with exposure to DMCHA controlled by operational conditions or risk management measures. Covers use of DMCHA as laboratory reagent at small scale laboratories with quantities of 1 L or 1 kg DMCHA or less present in the workplace with exposure to DMCHA controlled by operational conditions or risk management measures.

## Operational conditions and risk management measures

### Control of worker exposure
Covers daily exposures up to 8 hours (unless stated) [OC1]

### Other Operational Conditions affecting worker exposure
The procedures in the manufacture or use of DMCHA are not designed to contain emissions, workers exposure to DMCHA must be prevented by use of local exhaust ventilation and good work practices. These may include:
- keeping equipment under slightly increased pressure,
- control of staff entry to work area,
- ensuring all equipment is well maintained,
- permits to work for maintenance work,
- regular cleaning of equipment and work area,
- systems in place to ensure correct use of RMMs and that OCs are being followed, training for staff on good practice,
- procedures and training for emergency decontamination and disposal,
- good standards of personal hygiene,
- recording of any 'near miss' situations.

### Process Categories

<table>
<thead>
<tr>
<th>Process Categories</th>
<th>Risk Management Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – Use in closed process, no likelihood of exposure</td>
<td>Handle substance within a closed system [E47]. Ensure material transfers are under containment or extract ventilation [E66]. Use suitable eye protection and gloves [PPE14]. Wear suitable coveralls to prevent exposure to the skin [PPE27].</td>
</tr>
</tbody>
</table>
**SAFETY DATA SHEET**  
**N,N-DIMETHYLCYCLOHEXYLAMINE**

<table>
<thead>
<tr>
<th>2 – Use in closed, continuous process with occasional controlled exposure (e.g. sampling)</th>
<th>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]. Use suitable eye protection and gloves [PPE14]. Wear suitable coveralls to prevent exposure to the skin [PPE27].</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 – Use in closed, batch process (synthesis or formulation)</td>
<td>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]. Use suitable eye protection and gloves [PPE14]. Wear a full face respirator conforming to EN140 with Type A/P2 filter or better [PPE32]. Wear suitable coveralls to prevent exposure to the skin [PPE27].</td>
</tr>
<tr>
<td>4 – Use in batch and other process (synthesis) where opportunity for exposure arises</td>
<td>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]. Use suitable eye protection and gloves [PPE14]. Wear a full face respirator conforming to EN140 with Type A/P2 filter or better [PPE32]. Wear suitable coveralls to prevent exposure to the skin [PPE27].</td>
</tr>
<tr>
<td>5 – Mixing or blending in batch processes for formulation of preparations.</td>
<td>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]. 97% efficiency is required by means of the use of LEV described above. Use suitable eye protection and gloves [PPE14]. Wear a full face respirator conforming to EN140 with Type A/P2 filter or better [PPE32]. Wear suitable coveralls to prevent exposure to the skin [PPE27].</td>
</tr>
<tr>
<td>7 – Industrial spraying.</td>
<td>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]. 97% efficiency is required by means of the use of LEV described above. Use suitable eye protection and gloves [PPE14]. Wear suitable coveralls to prevent exposure to the skin [PPE27].</td>
</tr>
<tr>
<td>8a – Transfer of chemicals from/to vessels/ large containers at non-dedicated facilities.</td>
<td>Fill containers/cans at dedicated fill points supplied with local extract ventilation [E51]. Provide extract ventilation to material transfer points and other openings [E82]. 97% efficiency is required by means of the use of LEV described above. Use suitable eye protection and gloves [PPE14]. Wear a respirator protection. Wear suitable coveralls to prevent exposure to the skin [PPE27].</td>
</tr>
<tr>
<td>8b – Transfer of chemicals from/to vessels/ large containers at dedicated facilities.</td>
<td>Fill containers/cans at dedicated fill points supplied with local extract ventilation [E51]. Provide extract ventilation to material transfer points and other openings [E82]. 97% efficiency is required by means of the use of LEV described above. Use suitable eye protection and gloves [PPE14]. Wear a respirator protection. Wear suitable coveralls to prevent exposure to the skin [PPE27].</td>
</tr>
</tbody>
</table>
**SAFETY DATA SHEET**  
**N,N-DIMETHYLCYCLOHEXYLAMINE**

<table>
<thead>
<tr>
<th>9 – Transfer of substance into small containers (dedicated filling line, including weighing)</th>
<th>Fill containers/cans at dedicated fill points supplied with local extract ventilation [E51]. Provide extract ventilation to material transfer points and other openings [E82]. Use suitable eye protection and gloves [PPE14]. Wear a respirator protection. Wear suitable coveralls to prevent exposure to the skin [PPE27].</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 – Roller application or brushing</td>
<td>Provide extract ventilation to points where emissions occur [E54]. 97% efficiency is required by means of the use of LEV described above. Use suitable eye protection and gloves [PPE14]. Wear a respirator protection. Wear suitable coveralls to prevent exposure to the skin [PPE27].</td>
</tr>
<tr>
<td>11 – Non industrial spraying</td>
<td>Provide extract ventilation to points where emissions occur [E54]. 97% efficiency is required by means of the use of LEV described above. Use suitable eye protection and gloves [PPE14]. Wear a respirator protection. Wear suitable coveralls to prevent exposure to the skin [PPE27].</td>
</tr>
<tr>
<td>13 – Treatment of articles by dipping and pouring</td>
<td>Provide extract ventilation to points where emissions occur [E54]. 97% efficiency is required by means of the use of LEV described above. Use suitable eye protection and gloves [PPE14]. Wear a respirator protection. Wear suitable coveralls to prevent exposure to the skin [PPE27].</td>
</tr>
<tr>
<td>14 – Production of preparation or articles by tabletting, compression, extrusion, pelletisation</td>
<td>Provide extract ventilation to points where emissions occur [E54]. 97% efficiency is required by means of the use of LEV described above. Use suitable eye protection and gloves [PPE14]. Wear a respirator protection. Wear suitable coveralls to prevent exposure to the skin [PPE27].</td>
</tr>
<tr>
<td>15 – Use as laboratory reagent</td>
<td>Provide extract ventilation to points where emissions occur [E54]. 97% efficiency is required by means of the use of LEV described above. Use suitable eye protection and gloves [PPE14]. Wear suitable coveralls to prevent exposure to the skin [PPE27].</td>
</tr>
<tr>
<td>21 – Low energy manipulation of substances bound in materials and/or articles</td>
<td>Provide extract ventilation to points where emissions occur [E54]. 97% efficiency is required by means of the use of LEV described above. Use suitable eye protection and gloves [PPE14]. Wear suitable coveralls to prevent exposure to the skin [PPE27].</td>
</tr>
</tbody>
</table>