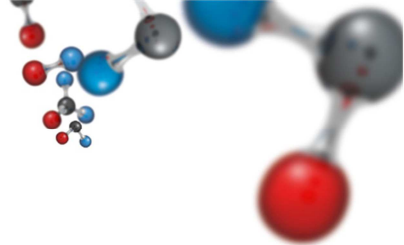


SAFETY DATA SHEET

N-METHYLDICYCLOHEXYLAMINE



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

1.1 Product identifier

Chemical name: **N-methyldicyclohexylamine**
Registration number: **01-2120764997-30-0000**
Index number: –
EC number (EINECS): **231-453-4**
CAS number: **7560-83-0**
Other names: **Dicyclohexyl-N-methylamine**

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

Uses: **N-methyldicyclohexylamine is used as a catalyst of soft and semi-rigid polyurethane foams.**

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 - 24 hrs/day**
24-hours emergency contact CHEMTREC: 001-703-527-3887, company code CCN 206 072
Toxicological information centre, Na Bojišti 1, 128 08 Prague 2
Non-stop telephone: +420 224 919 293 or 224 915 402, fax +420 224 914 570

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

Acute Tox. 3; H301 Toxic if swallowed.

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

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

Eye Dam. 1; H318 Causes serious eye damage.

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

The most serious adverse effects on human health when using the substance/mixture: **Corrosive. Vapours irritate eyes and airways. Toxic if swallowed and in contact with skin.**

The most serious adverse effects on the environment when using the substance/mixture: **Toxic to aquatic life with long-lasting effects**

SAFETY DATA SHEET

N-METHYLDICYCLOHEXYLAMINE

2.2. Label elements

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

Hazard pictograms:



Signal word: DANGER

Hazard statements:

H301+H311 Toxic if swallowed or in contact with skin.

H314 Causes severe skin burns and eye damage.

H411 Toxic to aquatic life with long lasting effects.

Precautionary statements:

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].

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

2.3 Other hazards

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

SECTION 3: Composition/information on ingredients

3.1. Substances

Chemical name	N-methyldicyclohexylamine
Index number	–
EC number	231-453-4
CAS number	7560-83-0
Content of substance (in % wt.)	99.00
Synonyms	Dicyclohexyl-N-methylamine

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

3.2. Mixtures

It is a chemical substance.

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N-METHYLDICYCLOHEXYLAMINE

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 (approx. 30–35 °C), if possible, for 10 to 30 minutes and make sure that the water that flows away does not come into contact with the parts of body that have not been contaminated. Do not use a brush or soap, do not neutralize! Cover the affected area with a sterile bandage, do not use any ointments or medications. Protect the affected person against cold. Seek medical attention immediately!**

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!!! Danger of perforation of the oesophagus or stomach! IMMEDIATELY FLUSH ORAL CAVITY WITH WATER AND LET DRINK 2–5 dl of cold water to reduce the heat effect of the corrosive 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. It is not suitable to use larger amount of liquid, as it may induce vomiting and possibly inhalation of caustic substances into the lungs.

Do not force the affected person to drink, especially when he or she already feels pain in 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

Vapours irritate eyes and airways, liquid causes chemical burns on skin and mucosa. Contact with the substance may result in burning of eyes, the nasal and palatal mucosa, skin, in cough, headache, nausea, shortness of breath or even loss of consciousness.

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

Symptomatic treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media: **water spray, dry powder, foam, CO₂**

Unsuitable extinguishing media: **not specified**

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N-METHYLDICYCLOHEXYLAMINE

5.2 Special hazards arising from the substance or mixture: **Flammable liquid, possibility of releasing carbon oxide and nitrogen oxides. Formation of toxic and explosive mixtures.**

5.3 Advice for firefighters: **Self-contained breathing apparatus, full fire-fighting turnout gear!**

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.**

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

6.4 Reference to other sections: **see Sections 8 and 13.**

SECTION 7: Handling and storage

7.1 Precautions for safe handling: **The product is supplied in tanker trucks, barrels or IBCs as necessary . Recommended maximum temperature during transport is 50 °C. Ventilation must be ensured.**

7.2 Conditions for safe storage, including any incompatibilities: **Store in ventilated rooms in closed original packaging or in steel tanks, out of the reach of heat and fire. Do not store together with food products and strong oxidizing agents.**

7.3 Specific end use(s): **Industrial use only.**

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:

Acute exposure (systemic effects) – inhalation: **not specified**

Acute exposure (systemic effects) – dermal: **not specified**

Acute exposure (local effects) – inhalation: **not specified**

Acute exposure (local effects) – dermal: **not specified**

Long-term exposure (systemic effects) – dermal: **0.1 mg/kg of weight/day**

Long-term exposure (systemic effects) – inhalation: **0.7 mg/m³**

Long-term exposure (local effects) – dermal: **not specified**

Long-term exposure (local effects) – inhalation: **not specified**

8.2. Exposure controls

Use in a closed circuit, provide vapour extraction, use personal protective equipment.

Technical measures: **Ventilation.**

Respiratory protection: **protective mask with a filter against organic vapours – type A if necessary**

Hand protection: **protective gloves**

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Eye protection: **protective goggles or shield**

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 liquid
Odour:	strong, fishy
Odour threshold:	not specified
pH:	not specified
Melting/freezing point (°C):	42
Initial boiling point (at 1,013 hPa in °C)	263
Flash point (at 1,013 hPa in °C):	110
Evaporation rate:	not specified
Flammability (solid, gas):	not specified
Upper/lower explosive limits (% vol.):	not specified
Vapour pressure (Pa at 25 °C):	7.52
Vapour density:	not specified
Relative density (at 20 °C):	0.91
Solubility: (g.l ⁻¹) - in water (at 25 °C):	0.74
- in fats (including oil specification):	not specified
Partition coefficient: n-octanol/water (log p _{ow} at 25 °C):	3.71
Auto-ignition temperature (at 1013 hPa and °C):	255
Decomposition temperature:	not specified
Viscosity (mPa.s at 20 °C):	not specified
Explosive properties:	none
Oxidising properties:	none

9.3 Other information:

Not available.

SECTION 10: Stability and reactivity

10.1. Reactivity: **0, the substance is non-reactive at normal temperature.**

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

10.3. Possibility of hazardous reactions: **The product can form corroding and harmful mixtures with water even when highly dissolved.**

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N-METHYLDICYCLOHEXYLAMINE

- 10.4. Conditions to avoid: **Irritating and explosive mixtures are produced during heating.**
- 10.5 Incompatible materials: **Reacts violently with strong oxidizing agents. It must not come into contact with foodstuffs.**
- 10.6 Hazardous decomposition products: **Burning releases toxic carbon oxide and nitrogen oxides.**

SECTION 11: Toxicological information

Information on toxicological effects

CLP classification

11.1 Acute toxicity: **category 3**

- LD₅₀ (oral, rat) ≥ **267 mg.kg⁻¹**
- LD₅₀ (derm., rabbit) = **295 mg. kg⁻¹**

11.2 Irritation **skin corrosion 1B**

Skin irritation (rabbit): **highly irritant effect is expected**

Eye irritation (rabbit): **highly irritant effect is expected**

Experience with people: **cause chemical burns on skin and mucosa, vapours irritate eyes and airways**

11.3 Sensitisation

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

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

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

11.6 Reproductive toxicity (rat): **READ ACROSS, not toxic**

11.7. Specific target organ toxicity – single exposure: **not specified**

11.8 Specific target organ toxicity – repeated exposure: **READ ACROSS, not toxic**

11.9 Aspiration hazard: **not specified**

SECTION 12: Ecological information

12.1. Toxicity

12.1.1 Water organisms - **READ ACROSS**

Acute for fish:

Oncorhynchus mykiss: **LC₅₀ (96 h) > 28 mg/l**

Longterm for fish: **no data available**

Acute for invertebrates:

Daphnia magna: **LC₅₀ (48 h) > 75 mg/l**

Longterm for invertebrates: **no data available**

Effective concentration for algae

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Scenedesmus subspicatus: EC₅₀ (72 h) = 2 mg/l (static test)

Algae: NOErC (72 h) = 0.078 mg/l

Summary for classification: Classified as harmful to environment – chronic toxicity Class 2.

12.1.2 Toxicity on sediments

No data available.

12.1.3 PNEC (Predicated No Effect Concentration)

PNEC water (surface):	0.002 mg/l
PNEC water (sea):	0.0002 mg/l
PNEC sediment:	0.0211 mg/kg of weight of dry sediment
PNEC sewage treatment plant:	20.6 mg/l
PNEC soil:	0.00305 mg/kg of weight of dry sediment
PNEC plants:	no data available
PNEC birds:	no data available
PNEC oral:	no data available

12.2 Persistence and degradability

Classification: It is not a substance with high bioaccumulative potential.

Assessment: Easily degradable in water environment (in compliance with OECD criteria).

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

12.4. Mobility in soil: Can penetrate into the environment through waste water.

Stability: **soluble in water**

Adsorption: **in soil possible, adsorption coefficient value: log Koc = 1.84 at 20 °C**

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

12.6. Other adverse effects: **not specified**

SECTION 13: Disposal considerations

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

Contaminated packaging disposal methods: **Rinse with water, dispose of the collected waste water and packaging in accordance with valid regulations.**

SECTION 14: Transport information

Land transport (ADR/RID)

Sea transport (IMDG)

Air transport (ICAO/IATA)

14.1 UN number:	2735
14.2 UN proper shipping name:	AMINES, LIQUID, CORROSIVE, N.O.S. (N-methyldicyclohexylamine)
14.3. Transport hazard class(es):	8/C7

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N-METHYLDICYCLOHEXYLAMINE

Hazard identification number (Kemler code):	80
14.4. Packing group:	III
14.5. Environmental hazards:	Yes
Substance polluting the sea:	Yes
14.6. Special precautions for user:	classified in "Segregation Groups – 18 Alkalis"
EMS:	F-A, S-B
14.7. Transport in bulk according to Annex II of Marpol and the IBC Code	

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., on the Catalogue of Wastes;
- Government Regulation No. 361/2007 Coll. laying down conditions for occupational health protection.

15.2 Chemical safety assessment

Chemical safety assessment is part of a chemical safety report for N-methyldicyclohexylamine – List of risk management measures is stated in Annex 1.

Specific exposure scenarios as required by customer will be stated in Annex 2.

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N-METHYLDICYCLOHEXYLAMINE

SECTION 16: Other information

16.1. This material safety data sheet supersedes all previous issues.

16.2. List of abbreviations

Carc.:	Carcinogenicity
CAS:	Chemical Abstracts Service
CLP:	Classification, labelling, packaging
CSR:	Chemical Safety Report
DNEL:	Derived no-effect level
ES:	Exposure scenario
EC:	European Commission
EC ₅₀ :	Half maximal effective concentration EC ₅₀ – is used in toxicity testing. Half maximal effective concentration EC ₅₀ represents a concentration of the tested substance resulting in 50% decrease or 50% reduction of growth or growth speed in relation to a control sample.
EINECS:	European Inventory of Existing Commercial Chemical Substances
ELINCS:	European list of notified chemical substances
Irrit.:	irritant
LC ₅₀ :	Lethal concentration, 50 % (of lethal concentration) is used in testing toxicity
LD ₅₀ :	Absolute lethal dose – resulting in the 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:

H301 Toxic if swallowed.

H311 Toxic in contact with skin.

H314 Causes severe skin burns and eye damage.

H318 Causes serious eye damage.

H411 Toxic to aquatic life with long lasting effects.

Precautionary statements:

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].

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

16.4. Sources

Material safety data sheet – N-methyldicyclohexylamine, BC MCHZ, Edition 5

Registration documentation as of 04/2018.

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N-METHYLDICYCLOHEXYLAMINE

16.5. Revision history

Issue	Date	Changes
1.0	30.11.2010	Preparation of the MSDS according to European Parliament and Council Regulation (EC) No. 1907/2006
2.0	15/08/2011	General revision of all sections of the MSDS according to European Parliament and Council Regulation (EC) No. 453/2010
3.0	01/12/2012	Update of the classification (use of a combination of H-statements), update of regulations valid in the Czech Republic, revision according to European Parliament and Council Regulation (EC) No. 286/2011
4.0	01.06.2015	Amendment of Section 2 (removal of classification according to DSD) and of other sections in accordance with Regulation No. 2015/830/EU.
5.0	18.07.2016	Revision according to Commission Regulation (EU) 918/2016
6.0	04.06.2018	Amendments according to registration documentation.

Prepared by: IT & QEHS – Ing. Zuzana Svobodová

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

Version: English
Date 04.06.2018
Material safety data sheet
N-methyldicyclohexylamine

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:

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MATERIAL SAFETY DATA SHEET

N-METHYLDICYCLOHEXYLAMINE

Annex No. 1

SUMMARY OF EXPOSURE SCENARIOS

Exposure scenario no.	Volume (t/y)	Production	Identified uses			Life cycle stage		Sectors of Use (SU)	Chemical Products (PC)	Process category (PROC)	Environmental release category (ERC)	Articles (AC)
			Formulation	End use	Consumers	Service life (for articles)	Waste stage					
ES2 Formulation (industry) Heat transfer agents Emulsions and emulsifying additives (as a substance or in a mixture)	N/A		X				X	SU9	N/A	PROC3, 4, 5, 8a, 8b, 9	ERC2	NR
ES3 (industry) Use in metal machining fluids Heat transfer agents (in mixture)	N/A			X			X	SU15, 17	PC25	PROC2, 7, 8a, 8b, 9, 10, 13, 17, 18	ERC4, 7	NR
ES4 (industry) Production of additives into plastics/emulsions (in mixture)	N/A		X	X			X	SU10	PC16, 17, 24, 25, 32	PROC1, 2, 3, 4, 6, 7, 8a, 8b, 9, 12, 14, 21, 24a, 24c	ERC4, 5	NR
ES5 (professional) Use in metal machining fluids Heat transfer agents (in mixture)	N/A			X			X	SU15, 17,	PC25	PROC17, 18	ERC8a, 8d	NR

N/A – not available (confidential information)

NR – not relevant

MATERIAL SAFETY DATA SHEET

N-METHYLDICYCLOHEXYLAMINE

SUMMARY OF RISK MANAGEMENT MEASURES

Name	Use of N-metyldicyclohexylamine (MDCHA)
Sectors of use	SU9, SU10, SU15, SU17
Process categories	PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC12, PROC13, PROC14, PROC17, PROC18, PROC21, PROC24a, PROC24c
Chemical product category	PC16, PC17, PC24, PC25, PC32
Article category	n/a
Environmental release categories	ERC2, ERC4, ERC5, ERC6a, ERC7, ERC8a, ERC8d
Specific environmental release categories	not specified
Included processes, tasks, activities	<p>This overview includes production and use of MDCHA in closed premises where workers come into contact with MDCHA and/or where such contact may occur (whether by means of inhalation and/or skin contact) during sampling, maintenance and/or failures of equipment.</p> <p>It also covers other processing (use) of MDCHA in the manufacture of various products, such as corrosion inhibitors, where contact may occur during sampling, maintenance and/or failures of equipment.</p> <p>It covers the same processing (use) of MDCHA in batch process or other processes where due to the structure of such process there is a possibility of contact with MDCHA, which, however, is subject to control as part of operating conditions or risk management measures.</p> <p>It includes the transfer of MDCHA 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.</p> <p>It also includes the use of MDCHA as a laboratory reagent 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.</p> <p>It includes industrial and professional uses of MDCHA as a component in metal machining fluids. In addition there are spraying methods, transport of MDCHA with loading from/to small or large containers by means of specialized or non-specialized equipment, roller or brush application, finish by dip coating and glazing, application of emulsions and lubricants under high-energy conditions.</p> <p>It includes industrial operations connected to the use of MDCHA as an additive for plastics/lubricants, use in closed processes, but also in processes with the possibility of exposure, such as calendaring, spraying, use of foaming agents during the production of foams, production of mixtures by tableting, compression, extrusion and pelletizing, transfer of MDCHA from/to small, not large, containers at specialized or non-specialized equipment, handling of materials containing MDCHA at low or high (mechanical) energy.</p>

	Operating conditions and risk management measures
	Control of worker exposure

MATERIAL SAFETY DATA SHEET

N-METHYLDICYCLOHEXYLAMINE

Product characteristics	
Physical form	Liquid
Vapour pressure	Low values
Concentration of the substance in the product	At ES2: It covers substance concentration of up to 100 % and up to 10 %. At ES3: It covers substance concentration of up to 25 %. At ES4: It covers substance concentration of up to 5 %. At ES5: It covers substance concentration of up to 10 %.
Volume of use	n/a
Operating conditions	
Frequency and duration of use	It includes the exposure to effects of the substance for up to 8 hours (unless otherwise stated)
Risk factors for humans not influenced by risk management.	Not specified.
Other operating conditions with the effect on worker exposure to the substance	<p>MDCHA is included among hazardous substances with acute effect, therefore, in the production and use of MDCHA where the process is not carried out in a closed circuit, workers' health must be protected by using a local exhaust system and introducing suitable working procedures. They include:</p> <ul style="list-style-type: none"> • keeping the equipment under negative pressure, • checking the entry of workers to the workplace, • assurance of proper maintenance of all the equipment, • permissions to perform maintenance of the equipment, • regular tidying and cleaning of the equipment and the workplace, • a workplace system which ensures adherence to risk management measures and conditions for the working environment, training of employees focused on the correct set procedures, • procedures and training for emergency situations, including decontamination and removal procedures, • stipulated level of personal hygiene, • near miss record, • surveying employees' health condition with regard to sensitivity and regular verification of health fitness.

Risk management measures		
Scenarios	Process categories	Risk management measures
Exposure (ES4)	1 – Use in closed process, no likelihood of exposure.	<p>Handling of the substance in a closed circuit.</p> <p>Ensure that the material is under protection during transfer and/or the necessary exhaust is ensured.</p> <p>Use suitable eye protection aids and gloves.</p> <p>Use suitable working clothes for the protection against skin contact.</p>
Exposure (ES3, ES4)	2 – Use in closed, continuous process with occasional controlled exposure (e.g. sampling).	<p>Handling of the substance within mostly closed process equipped with exhaust equipment.</p> <p>Ensure exhaust in places with substance emissions.</p> <p>Ensure that the material is under protection during transfer and/or the necessary exhaust is ensured.</p> <p>Ensure sampling is carried out under protection and/or</p>

MATERIAL SAFETY DATA SHEET

N-METHYLDICYCLOHEXYLAMINE

Risk management measures		
Scenarios	Process categories	Risk management measures
		<p>the necessary exhaust is ensured.</p> <p>Ensure proper exhaust at places of potential contact with the substance.</p> <p>Use appropriate gloves (according to EN374), working clothes and eye protection.</p>
Exposure (ES2)	3 – Use in closed batch process (synthesis or formulation).	<p>Handling of the substance within mostly closed process equipped with exhaust equipment.</p> <p>Ensure exhaust in places with substance emissions.</p> <p>Ensure that the material is under protection during transfer and/or the necessary exhaust is ensured.</p> <p>Ensure sampling is carried out under protection and/or the necessary exhaust is ensured.</p> <p>Ensure proper exhaust at places of potential contact with the substance.</p> <p>Avoid carrying out operation for more than 4 hours.</p> <p>Use appropriate gloves (according to EN374), working clothes and eye protection.</p> <p>Use an all-face respirator (according to EN140), with a filter type A (APF10) or better.</p>
Exposure (ES4)	3 – Use in closed batch process (synthesis or formulation).	<p>Handling of the substance within mostly closed process equipped with exhaust equipment.</p> <p>Ensure that the material is under protection during transfer and/or the necessary exhaust is ensured.</p> <p>Ensure sampling is carried out under protection and/or the necessary exhaust is ensured.</p> <p>Ensure proper exhaust at places of potential contact with the substance.</p> <p>Use suitable eye protection aids and gloves.</p> <p>Use suitable working clothes for the protection against skin contact.</p>
Exposure (ES2)	4 – Use in batch and other process (synthesis) where opportunity for exposure arises.	<p>Ensure exhaust in places with substance emissions.</p> <p>Ensure that the material is under protection during transfer and/or the necessary exhaust is ensured.</p> <p>Ensure sampling is carried out under protection and/or the necessary exhaust is ensured.</p> <p>Ensure proper exhaust at places of potential contact with the substance.</p> <p>Avoid carrying out operation for more than 4 hours.</p> <p>Use suitable eye protection aids and gloves.</p> <p>Use an all-face respirator (according to EN140), with a filter type A (APF10) or better.</p> <p>Use suitable working clothes for the protection against skin contact.</p>
Exposure (ES4)	4 – Use in batch and other process (synthesis) where opportunity for exposure arises.	<p>Ensure exhaust in places with substance emissions.</p> <p>Ensure that the material is under protection during transfer and/or the necessary exhaust is ensured.</p> <p>Ensure sampling is carried out under protection and/or</p>

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Risk management measures		
Scenarios	Process categories	Risk management measures
		<p>the necessary exhaust is ensured.</p> <p>Ensure proper exhaust at places of potential contact with the substance.</p> <p>Use appropriate gloves (according to EN374), working clothes and eye protection.</p>
Mixing or blending (ES2)	5 – Mixing or blending in batch processes for formulation of preparations* and articles (multistage and/or significant contact).	<p>Ensure exhaust in places with substance emissions.</p> <p>Ensure that the material is under protection during transfer and/or the necessary exhaust is ensured.</p> <p>Ensure sampling is carried out under protection and/or the necessary exhaust is ensured.</p> <p>Ensure proper exhaust at places of potential contact with the substance.</p> <p>Avoid carrying out operation for more than 4 hours.</p> <p>Use suitable eye protection aids and gloves.</p> <p>Use an all-face respirator (according to EN140), with a filter type A (APF10) or better.</p> <p>Use suitable working clothes for the protection against skin contact.</p>
Calendering operations (ES4)	6 – Calendering operations	<p>Ensure exhaust in places with substance emissions.</p> <p>Ensure that the material is under protection during transfer and/or the necessary exhaust is ensured.</p> <p>Ensure proper exhaust at places of potential contact with the substance.</p> <p>Avoid carrying out operation for more than 4 hours.</p> <p>Use appropriate gloves (according to EN374), working clothes and eye protection.</p>
Spraying (ES3)	7 – Spraying	<p>Minimize exposure by closing the equipment and operating local exhausting over openings.</p> <p>Apply in a pressurized chamber with air filtering and safety factor > 20.</p> <p>Avoid carrying out operation for more than 1 hour.</p> <p>Use chemically resistant gloves (tested to EN374) in combination with "basic" activity training.</p> <p>Use appropriate eye protection.</p> <p>Use suitable working clothes for the protection against skin contact.</p> <p>Use an all-face respirator (according to EN140), with a filter type A (APF20).</p>
Spraying (ES4)	7 – Spraying	<p>Minimize exposure by closing the equipment and operating local exhausting over openings.</p> <p>Apply in a pressurized chamber with air filtering and safety factor > 20.</p> <p>Avoid carrying out operation for more than 4 hours.</p> <p>Use appropriate gloves (according to EN374), working clothes and eye protection.</p> <p>Use chemically resistant gloves (tested to EN374) in</p>

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Risk management measures		
Scenarios	Process categories	Risk management measures
		<p>combination with "basic" activity training.</p> <p>Use an all-face respirator (according to EN140), with a filter type A (APF10) or better.</p>
Transfer (ES2, ES3, ES4)	8a – Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities.	<p>Ensure exhaust in places with substance emissions.</p> <p>Ensure that the material is under protection during transfer and/or the necessary exhaust is ensured.</p> <p>Ensure proper exhaust at places of potential contact with the substance.</p> <p>Avoid carrying out operation for more than 4 hours.</p> <p>Use suitable eye protection aids and gloves.</p> <p>Use an all-face respirator (according to EN140), with a filter type A (APF10) or better.</p> <p>Use suitable working clothes for the protection against skin contact.</p>
Transfer (ES2, ES3, ES4)	8b – Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	<p>Conduct filling of containers/cans at dedicated filling points equipped with proper ventilation.</p> <p>Ensure that the material is under protection during transfer and/or the necessary exhaust is ensured.</p> <p>Avoid carrying out operation for more than 4 hours.</p> <p>Use appropriate gloves (according to EN374), working clothes and eye protection.</p>
Transfer (ES2, ES3)	9 – Transfer of substance or preparation into small containers (dedicated filling line, including weighing).	<p>Conduct filling of containers/cans at dedicated filling points equipped with proper ventilation.</p> <p>Ensure that the material is under protection during transfer and/or the necessary exhaust is ensured.</p> <p>Ensure proper exhaust at places of potential contact with the substance.</p> <p>Avoid carrying out operation for more than 4 hours.</p> <p>Use chemically resistant gloves (tested to EN374) in combination with "basic" activity training.</p> <p>Use appropriate eye protection.</p> <p>Use suitable working clothes for the protection against skin contact.</p> <p>Use an all-face respirator (according to EN140), with a filter type A (APF10) or better.</p>
Transfer (ES4)	9 – Transfer of substance or preparation into small containers (dedicated filling line, including weighing).	<p>Conduct filling of containers/cans at dedicated filling points equipped with proper ventilation.</p> <p>Ensure that the material is under protection during transfer and/or the necessary exhaust is ensured.</p> <p>Ensure proper exhaust at places of potential contact with the substance.</p> <p>Avoid carrying out operation for more than 8 hours.</p> <p>Use suitable eye protection aids and gloves.</p> <p>Use chemically resistant gloves (tested to EN374) in combination with "basic" activity training.</p> <p>Use suitable working clothes for the protection against</p>

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Risk management measures		
Scenarios	Process categories	Risk management measures
		skin contact.
Surface cleaning (ES3)	10 – Roller application or brushing	<p>Ensure exhaust in places with substance emissions.</p> <p>Ensure that the material is under protection during transfer and/or the necessary exhaust is ensured.</p> <p>Ensure proper exhaust at places of potential contact with the substance.</p> <p>Avoid carrying out operation for more than 1 hour.</p> <p>Use chemically resistant gloves (tested to EN374) in combination with specific activity training.</p> <p>Use appropriate eye protection.</p> <p>Use suitable working clothes for the protection against skin contact.</p> <p>Use an all-face respirator (according to EN140), with a filter type A (APF10) or better.</p>
Manufacture of foams (ES4)	12 – Use of blowing agents in manufacture of foam	<p>Ensure exhaust in places with substance emissions.</p> <p>Ensure that the material is under protection during transfer and/or the necessary exhaust is ensured.</p> <p>Ensure proper exhaust at places of potential contact with the substance.</p> <p>Avoid carrying out operation for more than 4 hours.</p> <p>Use appropriate gloves (according to EN374), working clothes and eye protection.</p>
Dip coating, glazing (ES3)	13 – Treatment of articles by dipping and pouring	<p>Ensure exhaust in places with substance emissions.</p> <p>Ensure that the material is under protection during transfer and/or the necessary exhaust is ensured.</p> <p>Ensure proper exhaust at places of potential contact with the substance.</p> <p>Avoid carrying out operation for more than 4 hours.</p> <p>Use an all-face respirator (according to EN140), with a filter type A (APF10) or better.</p> <p>Use chemically resistant gloves (tested to EN374) in combination with specific activity training.</p> <p>Use appropriate eye protection.</p> <p>Use suitable working clothes for the protection against skin contact.</p>
Compression, extrusion, pelletisation (ES4)	14 – Production of preparations or articles by tableting, compression, extrusion, pelletisation	<p>Ensure exhaust in places with substance emissions.</p> <p>Ensure that the material is under protection during transfer and/or the necessary exhaust is ensured.</p> <p>Ensure proper exhaust at places of potential contact with the substance.</p> <p>Avoid carrying out operation for more than 4 hours.</p> <p>Use appropriate gloves (according to EN374), working clothes and eye protection.</p>

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Risk management measures		
Scenarios	Process categories	Risk management measures
Lubrication at high energy conditions and during a partially open process (ES3)	17 - Lubrication at high energy conditions and during a partially open process	<p>Minimize exposure by closing the equipment and operating local exhausting over openings.</p> <p>Apply in a pressurized chamber with air filtering and safety factor > 20.</p> <p>Avoid carrying out operation for more than 1 hour.</p> <p>Use an all-face respirator (according to EN140), with a filter type A (APF10) or better.</p> <p>Use chemically resistant gloves (tested to EN374) in combination with specific activity training.</p> <p>Use appropriate eye protection.</p> <p>Use suitable working clothes for the protection against skin contact.</p>
Lubrication at high energy conditions and during a partially open process (ES5)	17 - Lubrication at high energy conditions and during a partially open process	<p>Minimize exposure by closing the equipment and operating local exhausting over openings.</p> <p>Avoid carrying out operation for more than 4 hours.</p> <p>Use chemically resistant gloves (tested to EN374) in combination with "basic" activity training.</p> <p>Use appropriate eye protection.</p> <p>Use suitable working clothes for the protection against skin contact.</p> <p>Use an all-face respirator according to EN140, with a filter Type APF10) or better.</p>
Lubrication (ES3, ES5)	18 – Lubrication at high-energy conditions	<p>Minimize exposure by closing the equipment and operating local exhausting over openings.</p> <p>Avoid carrying out operation for more than 4 hours.</p> <p>Use chemically resistant gloves (tested to EN374) in combination with "basic" activity training.</p> <p>Use appropriate eye protection.</p> <p>Use suitable working clothes for the protection against skin contact.</p> <p>Use an all-face respirator (according to EN140), with a filter type A (APF10) or better.</p>
Low energy processing in materials or articles. (ES4)	21 – Low energy manipulation of substances bound in materials and/or articles.	<p>Ensure exhaust in places with substance emissions.</p> <p>Ensure that the material is under protection during transfer and/or the necessary exhaust is ensured.</p> <p>Ensure proper exhaust at places of potential contact with the substance.</p> <p>Use appropriate gloves (according to EN374), working clothes and eye protection.</p>
High (mechanical) energy work-up of substances bound in and/or articles (ES4)	24a- High (mechanical) energy work-up of substances bound in and/or articles - low fugitive emissions	<p>Ensure exhaust in places with substance emissions.</p> <p>Ensure that the material is under protection during transfer and/or the necessary exhaust is ensured.</p> <p>Ensure proper exhaust at places of potential contact with the substance.</p> <p>Use appropriate gloves (according to EN374), working clothes and eye protection.</p>

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Risk management measures		
Scenarios	Process categories	Risk management measures
High (mechanical) energy work-up of substances bound in and/or articles (ES4)	24c- High (mechanical) energy work-up of substances bound in and/or articles - high fugitive emissions	Ensure exhaust in places with substance emissions. Ensure that the material is under protection during transfer and/or the necessary exhaust is ensured. Ensure proper exhaust at places of potential contact with the substance. Use appropriate gloves (according to EN374), working clothes and eye protection.