

Crude MCHM

Version Revision Date: SDS Number: Date of last issue: -
3.1 09/15/2016 150000014291 Date of first issue: 09/15/2016
SDSUS / PRD / 0001

SECTION 1. IDENTIFICATION

Product name : Crude MCHM
Product code : EAN 972790. 18717-00, P1871700, P18717EA, P18717ET,
E1871701

Manufacturer or supplier's details

Company name of supplier : Eastman Chemical Company
Address : 200 South Wilcox Drive
 Kingsport TN 37660-5280
Telephone : (423) 229-2000
Emergency telephone : CHEMTREC: +1-800-424-9300, +1-703-527-3887 CCN7321

Recommended use of the chemical and restrictions on use

Recommended use : Industrial chemical
 Fuel Blending
 Mining
Restrictions on use : None known.

SECTION 2. HAZARDS IDENTIFICATION**GHS Classification**

Acute toxicity (Oral) : Category 4
Skin irritation : Category 2
Eye irritation : Category 2A
Skin sensitization : Category 1
Reproductive toxicity : Category 2

GHS label elements

Hazard pictograms : 

Signal Word : Danger
Hazard Statements : H302 Harmful if swallowed.
 H315 Causes skin irritation.

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H317 May cause an allergic skin reaction.
 H319 Causes serious eye irritation.
 H361d Suspected of damaging the unborn child.

Precautionary Statements

: **Prevention:**

P260 Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
 P264 Wash skin thoroughly after handling.
 P270 Do not eat, drink or smoke when using this product.
 P280 Wear protective gloves/ eye protection/ face protection.
 P272 Contaminated work clothing must not be allowed out of the workplace.

Response:

P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.
 P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
 P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
 P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P337 + P313 If eye irritation persists: Get medical advice/ attention.
 P307 + P311 IF exposed: Call a POISON CENTER or doctor/ physician.
 P362 Take off contaminated clothing and wash before reuse.

Storage:

P405 Store locked up.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS**Ingredients**

Chemical name	CAS-No.	Concentration (% w/w)
4-methylcyclohexanemethanol	34885-03-5	68 - 89
4-(methoxymethyl)cyclohexanemethanol	98955-27-2	4 - 22
Water	7732-18-5	4 - 10
methyl 4-methylcyclohexanecarboxylate	51181-40-9	5
dimethyl 1,4-cyclohexanedicarboxylate	94-60-0	1
methanol	67-56-1	1
1,4-cyclohexanedimethanol	105-08-8	1 - 2

SECTION 4. FIRST AID MEASURES

If inhaled

: Treat symptomatically.
 Remove to fresh air.
 Get medical attention if symptoms occur.

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In case of skin contact	:	Wash off immediately with plenty of water for at least 15 minutes. Take off contaminated clothing and shoes immediately. Get medical advice/ attention.
In case of eye contact	:	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical advice/ attention.
If swallowed	:	Seek medical advice.
Most important symptoms and effects, both acute and delayed	:	Harmful if swallowed. Causes skin irritation. Causes serious eye irritation. Suspected of damaging the unborn child.
Notes to physician	:	Treat symptomatically.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	:	Water spray Dry chemical Carbon dioxide (CO ₂) Foam
Unsuitable extinguishing media	:	None known.
Hazardous combustion products	:	No hazardous combustion products are known
Further information	:	None known.
Special protective equipment for fire-fighters	:	Wear an approved positive pressure self-contained breathing apparatus in addition to standard fire fighting gear.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Use personal protective equipment. Local authorities should be advised if significant spillages cannot be contained.
Environmental precautions	:	Avoid release to the environment.
Methods and materials for containment and cleaning up	:	Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / national regulations (see section 13).

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SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion : None known.

Advice on safe handling : Avoid contact with skin, eyes and clothing.
 Do not taste or swallow.
 Use only with adequate ventilation.
 Wash thoroughly after handling.

Conditions for safe storage : Keep container tightly closed.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Ingredients with workplace control parameters**

Ingredients	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
methanol	67-56-1	TWA	200 ppm	ACGIH
		STEL	250 ppm	ACGIH
		TWA	200 ppm 260 mg/m ³	NIOSH REL
		ST	250 ppm 325 mg/m ³	NIOSH REL
		TWA	200 ppm 260 mg/m ³	OSHA Z-1
		STEL	250 ppm 325 mg/m ³	OSHA P0
		TWA	200 ppm 260 mg/m ³	OSHA P0

Hazardous components without workplace control parameters

Ingredients	CAS-No.
4-methylcyclohexanemethanol	34885-03-5
4-(methoxymethyl)cyclohexanemethanol	98955-27-2
methyl 4-methylcyclohexanecarboxylate	51181-40-9
dimethyl 1,4-cyclohexanedicarboxylate	94-60-0
1,4-cyclohexanedimethanol	105-08-8

Engineering measures : Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

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Personal protective equipment

Respiratory protection : Wear respiratory protection.

Hand protection

 Remarks : Wear suitable gloves.

Eye protection : Safety glasses

Protective measures : Wear suitable protective equipment.

Hygiene measures : Handle in accordance with good industrial hygiene and safety practice.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : liquid

Color : colorless

Odor : alcohol, licorice

Odor Threshold : 0.15 ppb

Melting point/freezing point : 0 °C

Boiling point/boiling range : 180 °C

Flash point : 112.8 °C
 Method: Seta closed cup

Evaporation rate : not determined

Vapor pressure : 24 mbar (20 °C)

Relative density : < 1
 (estimated)

Solubility(ies)

 Water solubility : appreciable

Decomposition temperature : Thermal stability not tested. Low stability hazard expected at normal operating temperatures.

Viscosity

 Viscosity, kinematic : not determined

SECTION 10. STABILITY AND REACTIVITY

Reactivity : Stable

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Chemical stability : Stable under normal conditions.
Possibility of hazardous reactions : None known.
Conditions to avoid : Incompatible materials
Incompatible materials : Strong oxidizing agents
Hazardous decomposition products : Carbon dioxide (CO₂)
Carbon monoxide

SECTION 11. TOXICOLOGICAL INFORMATION**Acute toxicity**

Harmful if swallowed.

Product:

Acute oral toxicity : LD50 Oral (Rat): 825 mg/kg
Acute dermal toxicity : LD50 Dermal (Rat): > 2,000 mg/kg

Ingredients:**4-methylcyclohexanemethanol:**

Acute oral toxicity : LD50 Oral (Rat, male): 1,768 mg/kg
LD50 Oral (Rat, female): 884 mg/kg
Acute dermal toxicity : LD50 Dermal (Rat): 3.6 ml/kg

methanol:

Acute oral toxicity : LD50 Oral (Rat): 5,600 mg/kg
Acute inhalation toxicity : LC50 (Rat): 64000 ppm
Exposure time: 4 h
Acute dermal toxicity : LD50 Dermal (Rabbit): 17,100 mg/kg

dimethyl 1,4-cyclohexanedicarboxylate:

Acute oral toxicity : LD50 Oral (Rat): > 5,000 mg/kg
Acute inhalation toxicity : LC50 (Rat): > 2.91 mg/l
Exposure time: 6 h
Acute dermal toxicity : LD50 Dermal (Guinea pig): > 10 ml/kg

1,4-cyclohexanedimethanol:

Acute oral toxicity : LD50 Oral (Rat): > 2,000 mg/kg
Acute inhalation toxicity : LC50 (Rat): > 1.25 mg/l
Exposure time: 6 h

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Acute dermal toxicity : LD50 Dermal (Guinea pig): > 1,000 mg/kg

Skin corrosion/irritation

Causes skin irritation.

Product:

Species: Rabbit
Exposure time: 4 h
Result: Moderate

Ingredients:**4-methylcyclohexanemethanol:**

Species: Guinea pig
Exposure time: 24 h
Result: strong

methanol:

Species: Rabbit
Exposure time: 72 h
Result: none

dimethyl 1,4-cyclohexanedicarboxylate:

Species: Guinea pig
Exposure time: 24 h
Result: slight

1,4-cyclohexanedimethanol:

Species: Rabbit
Exposure time: 24 h
Result: none

Serious eye damage/eye irritation

Causes serious eye irritation.

Ingredients:**4-methylcyclohexanemethanol:**

Species: Rabbit
Result: Moderate

methanol:

Species: Rabbit
Result: slight to moderate

dimethyl 1,4-cyclohexanedicarboxylate:

Species: Rabbit
Result: slight
Remarks: Read-across from a similar material

1,4-cyclohexanedimethanol:

Species: Rabbit
Result: Corrosive

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Exposure time: 24 h

Respiratory or skin sensitization

Skin sensitization: May cause an allergic skin reaction.
Respiratory sensitization: Not classified based on available information.

Product:

Test Type: Skin sensitization
Species: Mouse
Result: positive
Remarks: National Toxicology Program Study

Test Type: Skin sensitization
Species: Guinea pig
Result: negative

Ingredients:

4-methylcyclohexanemethanol:

Test Type: Skin sensitization
Species: Mouse
Result: Not a skin sensitizer.
Remarks: National Toxicology Program Study

methanol:

Test Type: Skin Sensitization
Species: Guinea pig
Result: non-sensitizing

dimethyl 1,4-cyclohexanedicarboxylate:

Species: Guinea pig
Result: Not a skin sensitizer.
Remarks: Read-across from a similar material

1,4-cyclohexanedimethanol:

Test Type: OECD 406: Guinea pig sensitization
Species: Guinea pig
Result: Did not cause sensitization on laboratory animals.

Germ cell mutagenicity

Not classified based on available information.

Product:

Genotoxicity in vitro : Test Type: Ames test
 Metabolic activation: with and without metabolic activation
 Result: negative
 Remarks: National Toxicology Program Study

 : Test Type: Ames test
 Metabolic activation: with and without metabolic activation
 Result: negative

Genotoxicity in vivo : Test Type: Micronucleus test

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Species: Mouse
Result: negative
Remarks: National Toxicology Program Study

Ingredients:**4-methylcyclohexanemethanol:**

Genotoxicity in vitro : Test Type: Ames test
Result: negative
Remarks: National Toxicology Program Study

Genotoxicity in vivo : Test Type: Micronucleus test
Species: Mouse
Result: negative
Remarks: National Toxicology Program Study

4-(methoxymethyl)cyclohexanemethanol:

Genotoxicity in vitro : Test Type: Ames test
Result: negative
Remarks: National Toxicology Program Study

methyl 4-methylcyclohexanecarboxylate:

Genotoxicity in vitro : Test Type: Ames test
Result: negative
Remarks: National Toxicology Program Study

dimethyl 1,4-cyclohexanedicarboxylate:

Genotoxicity in vitro : Test Type: Mutagenicity - Mammalian
Metabolic activation: Metabolic activation
Result: positive

 : Test Type: Chromosome aberration test in vitro
Metabolic activation: Metabolic activation
Result: positive

 : Test Type: Ames test
Metabolic activation: with and without metabolic activation
Result: negative

 : Test Type: Ames test
Result: positive
Remarks: National Toxicology Program Study

1,4-cyclohexanedimethanol:

Genotoxicity in vitro : Test Type: Mutagenicity - Mammalian
Metabolic activation: +/- activation
Method: In vitro Mammalian Cell Gene Mutation Test
Result: negative

 : Test Type: Ames test
Result: negative
Remarks: National Toxicology Program Study

Genotoxicity in vivo : Species: Rat

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Application Route: oral: gavage
 Method: Mammalian Bone Marrow Chromosome Aberration Test
 Result: negative

Carcinogenicity

Not classified based on available information.

Product:

Remarks: This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP.

Carcinogenicity - Assessment : This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP.

IARC

No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA

No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

NTP

No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

Suspected of damaging the unborn child.

Ingredients:**4-methylcyclohexanemethanol:**

Effects on fetal development : Species: Rat
 Application Route: Oral
 100 mg/kg
 Remarks: value listed is NOAEL
 National Toxicology Program Study

dimethyl 1,4-cyclohexanedicarboxylate:

Effects on fertility :
 Test Type: OECD Test No. 421: Reproduction/Developmental Toxicity Screening Test
 Species: Rat
 Sex: female
 Application Route: Ingestion
 NOAEL: 1,124 mg/kg

1,4-cyclohexanedimethanol:

Effects on fertility :
 Test Type: OECD Test No. 421: Reproduction/Developmental Toxicity Screening Test
 Species: Rat
 Sex: Male and Female

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Application Route: Ingestion
NOAEL: 479 mg/kg

Effects on fetal development : Species: Rat
Application Route: Ingestion
1,000 mg/kg
Method: OECD Test No. 414: Prenatal Developmental Toxicity Study
Remarks: value listed is NOEL

STOT-single exposure

Not classified based on available information.

Product:

Assessment: Not classified
Remarks: Not classified

Ingredients:**dimethyl 1,4-cyclohexanedicarboxylate:**

Assessment: Not classified

1,4-cyclohexanedimethanol:

Assessment: Not classified

STOT-repeated exposure

Not classified based on available information.

Product:

Assessment: Not classified
Remarks: Not classified

Ingredients:**dimethyl 1,4-cyclohexanedicarboxylate:**

Assessment: Not classified

1,4-cyclohexanedimethanol:

Assessment: Not classified

Repeated dose toxicity**Product:**

Species: Rat
NOAEL: 2,000 mg/kg
Application Route: Dermal Study
Exposure time: 14 days

Ingredients:**4-methylcyclohexanemethanol:**

Species: Rat
NOEL: 100 mg/kg

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Application Route: Oral Study
Exposure time: 28 days

dimethyl 1,4-cyclohexanedicarboxylate:

Species: Rat, male
NOEL: >= 871 mg/kg
Application Route: Oral Study
Exposure time: 30 d
Remarks: Read-across from a similar material

Species: Rat, female
NOEL: >= 894 mg/kg
Application Route: Oral Study
Exposure time: 30 d
Remarks: Read-across from a similar material

1,4-cyclohexanedimethanol:

Species: Rat, male
NOEL: 479 mg/kg
Application Route: in drinking water
Exposure time: 90 d

Species: Rat, female
NOEL: 754 mg/kg
Application Route: in drinking water
Exposure time: 90 h

Aspiration toxicity

Not classified based on available information.

Information on likely routes of exposure**Product:**

Inhalation : Remarks: None known.

Skin contact : Remarks: Causes skin irritation.

Eye contact : Remarks: Causes serious eye irritation.

Ingestion : Remarks: Harmful if swallowed.

Further information**Product:**

Test Type: Human Birthweight Study
Remarks: No meaningful differences in birthweights.
West Virginia Department of Health & Human Resources, Bureau for Public Health in conjunction with CDC and ATSDR

SECTION 12. ECOLOGICAL INFORMATION**Ecotoxicity****Product:**

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Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 57.4 mg/l
 Exposure time: 96 h

Toxicity to daphnia and other : EC50 (daphnid): 98.1 mg/l
 aquatic invertebrates Exposure time: 48 h

Ingredients:**methanol:**

Toxicity to fish : LC50 (Lepomis macrochirus (Bluegill sunfish)): 15,400 mg/l
 Exposure time: 96 h

Toxicity to daphnia and other : EC50 (Daphnia magna (Water flea)): > 10,000 mg/l
 aquatic invertebrates Exposure time: 48 h

Toxicity to algae : EC50 (Pseudokirchneriella subcapitata (algae)): 22,000 mg/l
 Exposure time: 96 h

dimethyl 1,4-cyclohexanedicarboxylate:

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 23 mg/l
 Exposure time: 96 h
 Remarks: Read-across from a similar material

Toxicity to daphnia and other : LC50 (Daphnia magna (Water flea)): > 100 mg/l
 aquatic invertebrates Exposure time: 48 h
 Remarks: Read-across from a similar material

Toxicity to algae : EC50 (Chlorella pyrenoidosa): > 124.6 mg/l
 Exposure time: 72 h

 NOEC: (Chlorella pyrenoidosa): > 124.6 mg/l
 Exposure time: 72 h

1,4-cyclohexanedimethanol:

Toxicity to fish : LC50 (Fish): > 125.3 mg/l
 Exposure time: 96 h

Toxicity to daphnia and other : LC50 (Daphnia magna (Water flea)): > 100 mg/l
 aquatic invertebrates Exposure time: 48 h

Toxicity to algae : EC50 (Chlorella pyrenoidosa): > 122.9 mg/l
 Exposure time: 72 h

 NOEC: (Chlorella pyrenoidosa): >= 122.9 mg/l
 Exposure time: 72 h

Toxicity to fish (Chronic tox- : NOEC (Fish): >= 125.3 mg/l
 icity)

Persistence and degradability**Product:**

Biodegradability : Result: Inherently biodegradable.

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Biochemical Oxygen Demand (BOD) : BOD-5:
70 mg/g

: BOD-20:
1,300 mg/g

Chemical Oxygen Demand (COD) : 2,450 mg/g

BOD/COD :
BOD/COD: 2.8 %

Ingredients:**methanol:**

Biodegradability : Concentration: 10 mg/l
Biodegradation: 95 %
Exposure time: 20 d

Biochemical Oxygen Demand (BOD) : BOD-5:
770 mg/g
Incubation time: 5 d

BOD-20:
1,260 mg/g
Incubation time: 20 d

Chemical Oxygen Demand (COD) : 1,410 mg/g

BOD/COD : BOD/COD: 54.6 %

ThOD : 1,500 mg/g

BOD/ThOD : 51.3 %

dimethyl 1,4-cyclohexanedicarboxylate:

Biodegradability : Biodegradation: 55 %
Exposure time: 28 d
Remarks: Not readily biodegradable.

1,4-cyclohexanedimethanol:

Biodegradability : Result: Readily biodegradable.
Biodegradation: 99.2 %
Exposure time: 28 d
Method: Ready Biodegradability: DOC Die Away Test

Biochemical Oxygen Demand (BOD) : BOD-5:
25 mg/g

BOD-20:
1,400 mg/g

Chemical Oxygen Demand : 2,400 mg/g

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(COD)

Bioaccumulative potential**Ingredients:****methanol:**

Partition coefficient: n- : Pow: 0.17
octanol/water log Pow: -0.77

dimethyl 1,4-cyclohexanedicarboxylate:

Bioaccumulation : Remarks: Bioaccumulation is unlikely.

Partition coefficient: n- : log Pow: 2.29
octanol/water

1,4-cyclohexanedimethanol:

Bioaccumulation : Bioconcentration factor (BCF): 4.45
Method: estimated

Partition coefficient: n- : log Pow: 0.36 - 1.47 (25 °C)
octanol/water

Mobility in soil**Ingredients:****1,4-cyclohexanedimethanol:**

Distribution among environ- : log Koc: 0.499 - 1.6
mental compartments Method: QSAR model

Other adverse effects**Product:**

Ozone-Depletion Potential : Regulation: 40 CFR Protection of Environment; Part 82 Pro-
tection of Stratospheric Ozone - CAA Section 602 Class I
Substances
Remarks: This product neither contains, nor was
manufactured with a Class I or Class II ODS as defined by the
U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A +
B).

Ingredients:**1,4-cyclohexanedimethanol:**

Results of PBT and vPvB : Not fulfilling vPvB (very persistent, very bioaccumulative) crite-
assessment ria.

SECTION 13. DISPOSAL CONSIDERATIONS**Disposal methods**

Waste from residues : Dispose of in accordance with local regulations.

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SECTION 14. TRANSPORT INFORMATION**International Regulation****IATA-DGR**

Not regulated as a dangerous good

IMDG-Code

Not regulated as a dangerous good

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

Domestic regulation**49 CFR**

Not regulated as a dangerous good

SECTION 15. REGULATORY INFORMATION**EPCRA - Emergency Planning and Community Right-to-Know****SARA 311/312 Hazards** : Acute Health Hazard**SARA 302** : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.**SARA 313** : The following components are subject to reporting levels established by SARA Title III, Section 313:

methanol	67-56-1	1 %
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Clean Air Act

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

The following chemical(s) are listed as HAP under the U.S. Clean Air Act, Section 12 (40 CFR 61):

methanol	67-56-1	1 %
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This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

The following chemical(s) are listed under the U.S. Clean Air Act Section 111 SOCM I Intermediate or Final VOC's (40 CFR 60.489):

methanol	67-56-1	1 %
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Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.

This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.

This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307

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US State Regulations**Massachusetts Right To Know**

methanol	67-56-1
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Pennsylvania Right To Know

4-methylcyclohexanemethanol	34885-03-5
4-(methoxymethyl)cyclohexanemethanol	98955-27-2
Water	7732-18-5
methyl 4-methylcyclohexanecarboxylate	51181-40-9
methanol	67-56-1

New Jersey Right To Know

4-methylcyclohexanemethanol	34885-03-5
4-(methoxymethyl)cyclohexanemethanol	98955-27-2
Water	7732-18-5
methyl 4-methylcyclohexanecarboxylate	51181-40-9
methanol	67-56-1
dimethyl 1,4-cyclohexanedicarboxylate	94-60-0
1,4-cyclohexanedimethanol	105-08-8

The ingredients of this product are reported in the following inventories:

CH INV : On the inventory, or in compliance with the inventory

DSL : This product contains the following components listed on the Canadian NDSL. All other components are on the Canadian DSL.

TSCA : On TSCA Inventory

TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

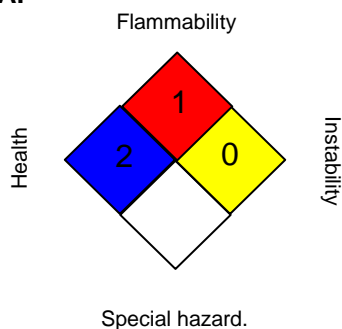
SECTION 16. OTHER INFORMATION**Full text of other abbreviations**

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous

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Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Further information**NFPA:****HMIS III:**

HEALTH	2
FLAMMABILITY	1
PHYSICAL HAZARD	0

0 = not significant, 1 = Slight,
 2 = Moderate, 3 = High
 4 = Extreme, * = Chronic

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The information provided in this Material Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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