

**METAL CLEANER --**

**Section 1. Supplier Information**

**CMI Chemical Corporation**  
12336 Emerson Drive  
Brighton, MI 48116  
(248) 587-5600  
**Emergency Telephone: 1-800-424-9300**

**Section 2. Hazardous Ingredients**

<u>Hazardous Component(s)</u>	<u>CAS #</u>	<u>PEL TWA</u>	<u>PEL Ceiling</u>	<u>TLV TWA</u>	<u>TLV STEL</u>	<u>MFG Limits</u>	<u>WGT %</u>
N-Methyl-2-pyrrolidone	872-50-4	N/E	N/E	N/E	N/E	N/E	35 - 50
Solvent naphtha, heavy arom.	64742-94-5	5 mg/m3	N/E	5 mg/m3*	10 mg/m	N/E	35 - 50
Monoethanolamine	141-43-5	3 ppm	N/E	3 ppm	6 ppm	N/E	< 20
Surfactant	Proprietary	N/E	N/E	N/E	N/E	N/E	1 - 10
Solvent naphtha, light arom.	64742-95-6	5 mg/m3	N/E	5 mg/m3*	10 mg/m	N/E	1 - 10

N/A = Not Applicable; N/E = Not Established; \* = Mists; # = Skin; ' = Respirable Dust; " = Total Dust; ^ = Vapor; \*\* = Fumes; C = Ceiling Limit

All components of this product are listed on the Toxic Substances Control Act (TSCA) Inventory and the Canadian Domestic Substances List (DSL), or are exempt from the listing.

**Section 3. Hazards Identification**

**Primary Routes of Entry**

Inhalation: YES  
Skin: YES  
Ingestion: YES

**Hazardous Materials Information System (HMIS) Ratings**

Health: \* 3  
Fire: 2  
Reactivity: 0  
0 = Minimal  
1 = Slight  
2 = Moderate  
3 = Serious  
4 = Severe  
\* = Chronic Hazard

**Signs of Symptoms of Exposure:**

**INHALATION:** Exposure to mists may cause coughing, sneezing, and other symptoms of respiratory tract irritation. Overexposure may result in lung tissue damage due to corrosive effects.

**SKIN:** Can be a severe skin irritant. May be corrosive and cause severe burns if not washed immediately.

**EYES:** This product is destructive to eye tissues on contact. Will cause severe burns that result in damage to the eyes and even blindness.

**INGESTION:** This product, if swallowed, can cause severe burns and complete tissue

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perforation of mucous membranes of the mouth, throat, esophagus, and stomach.

**Chemical Listed as Potential Carcinogens:**

NTP: NO

IARC: NO

OSHA: NO

Target Organs: Kidneys, liver, skin, and eyes.

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**Section 4. Emergency And First Aid Procedures**

**INHALATION:** If adverse effects such as dizziness, nausea, or irritation are noted, move person to fresh air. If not breathing, give artificial respiration. Get medical attention!

**SKIN:** Immediately wash skin with large amounts of soap and water. Remove contaminated clothing and shoes; wash before reuse. Get medical attention if irritation persists after washing.

**EYES:** THE OBJECT IS TO FLUSH MATERIAL OUT IMMEDIATELY, THEN SEEK MEDICAL ATTENTION! Immediately flush eyes with large amounts of water for at least 15 minutes, holding lids apart to ensure flushing of the entire surface. Washing eyes within several seconds is essential to achieve maximum effectiveness. SEEK MEDICAL ATTENTION IMMEDIATELY!

**INGESTION:** DO NOT INDUCE VOMITING! Contact a physician immediately!

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**Section 5. Fire Fighting Measures**

Flash Point: 145°F

Method Used: Tagliabue Closed Cup

Flammable Limits in Air % by Volume: LEL: 1.3 UEL: 9.5; for n-methyl-2-pyrrolidone

Extinguisher Media: Carbon dioxide, dry chemical, foam, or water fog.

Special Fire Fighting Procedures: Firefighters should wear a self-contained breathing apparatus with a full facepiece operated in pressure demand or other positive pressure mode, and protective clothing.

Unusual Fire And Explosion Hazards: Vapors are heavier than air and may travel along the ground or be moved by ventilation and ignited at locations distant from handling point.

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**Section 6. Accidental Release Measures**

If material is spilled, eliminate all ignition sources. Keep people away. Recover free product. Add sand, earth or other suitable absorbent to spill area; place in closed containers for disposal. Ventilate confined spaces. Keep product out of sewers and watercourses by diking or impounding. Advise authorities if product has entered or may enter sewers, watercourses, or extensive land areas. Continue to observe precautions for volatile, combustible vapors from absorbed material.

CERCLA (Superfund) Reportable Quantity (in lbs) The naphthalene in this material is covered by CERCLA's petroleum exclusion (40 CFR 300.5), therefore, releases are not reportable under EPA-CERCLA.

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**Section 7. Handling and Storage**

**Handling:** Avoid contact with skin and eyes; wash thoroughly after handling. Avoid breathing vapor; use with adequate ventilation.

**Storage:** Store in a dry location at room temperature. Keep container closed and maintain all original markings and labels. Keep this container and vapors from this container away from heat, sparks, flame, and other ignition sources.

**Other:** CAUTION! Do not use cutting or welding torches on containers, even when empty. Containers, even those that have been emptied, will retain product residue and vapors. Do not reuse container without recycling or reconditioning. Handle

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empty containers as if they were full.

**Section 8. Exposure Controls and Personal Protection**

- Respiratory Protection: Use NIOSH / MSHA approved respirator where high vapor or mist concentrations are present.
- Local Exhaust: Special ventilation is suggested at points where vapors can be expected to escape to the workplace air.
- Mechanical Exhaust: Mechanical ventilation should be sufficient to maintain exposure levels below exposure limits.
- Protective Gloves: Butyl rubber and FEP Teflon provide the best resistance.
- Eye Protection: Safety glasses with side shields. Do NOT wear contact lenses. Chemical goggles and/or faceshield should be worn where splashing is possible.
- Other Protection: Eye wash and safety shower should be readily available. Wear a chemical resistant apron and boots where splashing is possible.
- Hygienic Practices: Protective equipment and clothing should be selected, used and maintained according to applicable standards and regulations. For further information, contact the clothing or equipment manufacturer. Do not eat, drink, or smoke while using this product. Wash hands prior to eating, drinking, smoking, or using restrooms. Cleanse skin thoroughly after contact, before breaks and meals, and at the end of the work shift.

**Section 9. Physical and Chemical Properties**

- Boiling Point: 305 ° F (initial)
- Specific Gravity (H<sub>2</sub>O=1): 0.96-0.97
- Vapor Pressure (mm Hg): > 1 @ 68 °F
- Vapor Density (air=1) 3.4 - 4.8
- Solubility in Water: Appreciable.
- Reactivity in Water: None.
- Weight per Gallon (lb/gal): 7.9 - 8.1 lbs/gal
- % Volatile by Volume: 96-98%
- % Solid by Weight: 2-4%
- Appearance and Odor: Color varies (clear, amber, to purple) liquid with a mild amine odor.
- Theoretical VOC: 7.7 - 7.9 lbs/gal  
(>0.1 mm Hg @ 20 ° C)
- Analytical VOC : 7.7 - 7.9 lbs/gal  
(EPA method 24)
- pH: N/A, product is solvent based.

Degree of water solubility:  
Negligible = Less than 0.1%  
Slight = 0.1% - 1%  
Moderate = 1% - 10%  
Appreciable = More than 10%  
Complete = 100%

**Section 10. Stability and Reactivity**

- Stability: Stable. Hazard Polymerization: Will not occur.
- Conditions to Avoid: COMBUSTIBLE! Keep from heat, sparks, or open flame. Product absorbs moisture from the air (hygroscopic).
- Incompatibility (Materials to Avoid): Oxidizing agents and strong acids.
- Hazardous Decomposition Products: Nitrogen oxides, unidentified organic compounds and oxides of carbon.

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**Section 11. Toxicological Information**

N-methyl-2-pyrrolidone [CASRN 000872-50-4]

**ACUTE TOXICITY**

Oral LD50 (rat) = 4,990 mg/kg (moderately toxic) Eye Irritation (rabbit) - markedly irritating  
Oral LD50 (mouse) = 5,270 mg/kg (slightly toxic) Skin irritation (rabbit) - markedly irritating  
Inhalation LC50 (rat) > 5.1 mg/L, 4 hr (moderately toxic) Inhalation safety screen (rat), 8 hr - slightly irritating (No deaths)

Acute Overexposure Effects: Contact with the liquid can result in irritation. Skin contact should be avoided. Prolonged skin contact may result in redness and dermatitis. NMP is moderately toxic by all routes of exposure; however, due to its low vapor pressure, dermal exposure represents the primary hazard in most settings. Contact with the liquid results in moderate eye irritation and may cause temporary corneal clouding. Skin contact results in mild irritation; prolonged skin contact may cause redness and dermatitis. Inhalation of the vapors of NMP may result in respiratory irritation. Accidental ingestion of the liquid causes gastric disturbances and may result in nausea and vomiting.

Reproductive / Development Effects: In animal studies NMP was embryotoxic by the oral, dermal and intraperitoneal routes, but only after repeated high doses that approached the LD50 or were maternally toxic. Embryotoxicity without maternal toxicity was observed at a high concentration in one rat inhalation study, but not in others. Testicular effects in rats were noted after repeated, high-dose oral and inhalation exposures. NMP was not carcinogenic in rats receiving lifetime exposures via inhalation (100 ppm) or the diet. NMP was not fetotoxic or teratogenic in rats exposed to NMP vapors up to 0.36 mg/l during gestation (Fund. and Appl. Tox. 9:222-235, 1987). NMP has been reported to cause aneuploidy in saccharomyces, but is not mutagenic in the Ames test (Env. and Molec. Mut. 11(1) 31-40, 1988). [1-13,12,15-062001], [11,24-13,12,15-110200]

Solvent naphtha (petroleum), heavy aromatic [CASRN 064742-94-5]

**ACUTE TOXICITY**

Oral LD50 (rat) = 10 ml/kg Eye irritation (rabbit): slightly irritating.  
Dermal LD50 (rat) > 4.0 ml/kg Dermal irritation (rabbit, 4 hrs.): slightly irritating.  
Inhalation LC50 (rat) > 710 ppm, 4 hr

Other Testing: Repeated inhalation exposure of rats to a related material at irritating concentrations caused decreased white blood cell counts. [18,7-18,0,B,F,A-060500]

Monoethanolamine [CASRN 000141-43-5]

**ACUTE TOXICITY**

Oral LD50 (rat) = 1.00 - 2.00 g/kg Eye irritation (rabbit): Draize; 80.0 - 110 ; extreme irritation  
Dermal LD50 (rabbit) > 1.6 g/kg Skin irritation (rabbit): Draize; 6.5- 8.0 ; corrosive

Prolonged and repeated ingestion of monoethanolamine has caused kidney and liver damage in laboratory animals. [7,20-12,4,0-091200], [3-12-092600] & [20,2-12-061900]

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Surfactant

**ACUTE TOXICITY**

Oral LD50 (rat, ♀) = 2.83 ml/kg    Eye Irritation (rabbit) = 0.005 ml (severe corneal injury)  
Oral LD50 (rat, ♂) = 2.33 ml/kg    Eye Irritation (rabbit) = 0.5 ml; 15% dilution in water (severe corneal injury)  
Dermal LD50 (rabbit, 24 hr) = 2.83 ml/kg    Dermal Irritation (rabbit) - 24 hr. uncovered (minimal capillary injection)  
Inhalation (rat, 8 hr, rm. tmp.) - mortality 0/6    Inhalation (rat, 8 hr, 170 °C) - mortality 0/6 [20,2-19,13,15,J,18-102300]  
Solvent naphtha (petroleum), light aromatic [CASRN 064742-95-6]

**ACUTE TOXICITY**

Oral LD50 (rat) = 4.7 g/kg    Eye irritation (rabbit): Draize - 3.1/110  
Dermal LD50 (rat) = 4.0 ml/kg    Skin irritation (rabbit): Draize - slight to moderate.  
Inhalation LC50 (rat) > 3670 ppm, 8 hour

Repeat Dose Testing: While there is no evidence that industrially acceptable levels of light hydrocarbon vapors (e.g., the occupational exposure limit) have produced cardiac effects in humans, animal studies have shown that inhalation of high levels produced cardiac sensitization. Such sensitization may cause fatal changes in heart rhythms, which was shown to be enhanced by hypoxia or the injection of adrenaline-like substances.

Carcinogenicity: The National Toxicology Program [NTP] has reported a chronic inhalation study in rats of naphthalene, a minor component of this product. Naphthalene caused severe inflammation and an increase in tumors of the nasal epithelium in both sexes. NTP considered this to be clear evidence of carcinogenic activity of naphthalene in rats. The relevance to the inhalation toxicity of this product in humans is unknown.

Reproductive and Developmental Toxicity: Animal testing with light aromatic solvents demonstrated embryo/fetal effects but not malformations at concentrations producing maternal toxicity.

Neurotoxicity: Prolonged and repeated exposures to high concentrations of some volatile hydrocarbon solvents have resulted in hearing loss in rats. Solvent abusers and noise interaction with these solvents in the work environment may cause symptoms of hearing loss. Short term repeated inhalation exposure of humans to m-xylene (200 ppm or greater) was reported to produce slight impairment of vestibular and visual function and reaction time. In these studies, there was no evidence of cumulative effects but some evidence of tolerance or adaptation. Repeated inhalation studies with some similar solvents or components in animals have reported decreased activity typical of central nervous system depression, but no irreversible effects.

Other Information: Animal data suggest that slight anemia, adaptive liver changes, and kidney toxicity (male rat nephropathy) may be caused by repeated over exposure to some similar solvents. The significance of this to humans is unknown. [18,7-18,0,B,A,A-021901]

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**Section 12. Ecological Information**

N-methyl-2-pyrrolidone [CASRN 000872-50-4]

**ECOTOXICITY**

96 hr LC50 (golden orfe) = 4,000 mg/l, static    24 hr EC/LC50 (daphnia magna) > 1000 mg/l  
72 hr EC/LC50 (algal) > 500 mg/l    IC50 (bacteria) > 9000 mg/l

Fate: Abiotic Degradability: Photolysis Half-Life 5.2 hrs. Biotic Degradability: BOD 92% (14 day).

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Theo. BOD (Modified MITI Test) 73 % (28 day)  
Elimination (method not specified) > 90 %, Readily Biodegradable  
Chemical Oxygen Demand: 1600 mg/l, Readily Biodegradable  
Biological Oxygen Demand, 5 day: 1100 mg/l, Readily Biodegradable  
Octanol/Water partition coefficient (log POW): -0.46 [11,24-13,12,15-110200], [1-13,12,15-062001]

Monoethanolamine [CASRN 000141-43-5]

**ECOTOXICITY**

48 hr - LC50 (daphnia) = 33-93 mg/L      96 hr - LC50 (fathead minnow) = 125-206 mg/l  
IC50 (bacteria) > 700 mg/l  
IC50 Activated Sludge Respiration Inhibition Test (OECD Test No. 209) is >1000 mg/L.

**FATE**

BOD Day 5 - 52-60%      Theoretical Oxygen Demand (ThOD): 1.31 mg/mg, calc.  
BOD Day 10 - 73-75%      Octanol/Water Partition Coefficient : -1.31, measured  
BOD Day 20 - 90-100 %      Henry's law constant (H): 2.45E-7 atm m<sup>3</sup>/mole (estimated)  
Log Koc: 0.70 (estimated)  
CO<sub>2</sub> Evolution test (Modified Sturm test, OECD Test 301 B) after 28 days: 97%. Modified OECD  
Screening test (OECD Test 301 E) after 28 days: 94%.  
Manometric Respirometry test (OECD Test 301 F) after 28 days: > 70%  
[7,20-12,4,0-091200], [3-12-092600] & [20,2-12-061900]  
Surfactant

**ECOTOXICITY**

48 hr - LC50 (daphnia magna) = 21.4 mg/L      96 hr - LC50 (fathead minnow) = 4.8 - 7.7 mg/L  
96 hr - LC50 (fathead minnow) = 6.6 mg/L      IC50 (bacteria) > 5000 mg/L

**ENVIRONMENTAL FATE**

BOD 5	3-18 %	Closed Bottle BOD (% Oxygen cons.) = 16%
BOD 10	32-36 %	Chemical Oxygen Demand (COD) - 2.23 mg/mg, measured
BOD 20	42-51%	Chemical Oxygen Demand (COD) - 2.09 mg/mg, calc
DOC 7	61%	STURM (% Carbon dioxide evolved) = 52.4-59%
DOC 14	66%	Theoretical Oxygen Demand (ThOD) - 2.09 mg/mg, measured
DOC 21	70%	
DOC 28	72%	

Appropriate treatment of effluents will reduce levels of nonylphenol ethoxylate (NPE) residues to concentrations that should pose no harm to the environment, including protection for weak estrogen-mimetic activity observed for some degradation intermediates. [20,2-19,13,15,J,18-102300]

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**Section 13. Disposal Considerations**

Waste Disposal Methods (Federal, State, Local):

In accordance with all federal, state and local requirements.

RCRA Hazardous Waste Number: N/A

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**Section 14. Transport Information**

Hazardous Material Description:

(Proper shipping name, hazard class, hazard ID#, packing group)

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Domestic ground non-bulk: AMINES, LIQUID, CORROSIVE, N.O.S., 8, UN2735, PG II  
(MONOETHANOLAMINE)

Domestic ground bulk: AMINES, LIQUID, CORROSIVE, N.O.S., 8, UN2735, PG II  
(MONOETHANOLAMINE)

International: AMINES, LIQUID, CORROSIVE, N.O.S., 8, UN2735, PG II  
(MONOETHANOLAMINE)

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**Section 15. Regulatory Information**

SARA 313 Information This product contains the following chemical(s) above de minimis concentrations and may be subject to reporting under section 313:

- n-Methyl-2-pyrrolidone, CAS# 872-50-4, 35-50 %
- 1,2,4-Trimethylbenzene (in solvent naphtha), CAS# 95-63-6, < 5 %
- Naphthalene (in solvent naphtha), CAS# 91-20-3, <3.5 %

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**Section 16. Other Information**

This MSDS contains revisions in the following sections: New format

Prepared by: Andrew J. Thomas Chemist

Revised by: Andrew J. Thomas Chemist

The development of this Material Safety Data Sheet (MSDS) relies upon information provided to us by each of our raw material suppliers. This MSDS will be updated as changes occur to their MSDS(s). We believe the recommendations and technical information contained herein to be accurate. However, they are given without warranty or guarantee, expressed or implied, and we assume no responsibility for losses or damage, direct or indirect, as a result of their use.