



MATERIAL SAFETY DATA SHEET

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1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

24-Hour Emergency Phone Number: 989-636-4400

Product Name: **ENER10 CLEANER**

GMID: 159262 Collective ID: 241

The Dow Chemical Company, Midland, MI 48674

Customer Service: 800-366-4740

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL	CAS#	CONCENTRATION
Ethyl 3-Ethoxypropionate (EEP)	763-69-9	60-100%
N-Methylpyrrolidinone (NMP)	872-50-4	15-40%

3. HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS (See Section 11 for toxicological data.)

EYE: May cause moderate to severe irritation.

SKIN: Brief contact is not irritating. Prolonged or repeated exposure may cause more severe irritation, with discomfort or pain. Local redness and swelling and possible tissue destruction.

INGESTION: Will cause adverse health effects. May cause nausea, vomiting, stomachache, and diarrhea. Signs of nervous system depression (e.g. Drowsiness, dizziness, loss of coordination, and fatigue).

INHALATION: Vapor may produce irritation of the respiratory tract as discomfort cough and difficulty with breathing, headache, nausea, vomiting, dizziness, fatigue, loss of coordination, drowsiness, and possible unconsciousness.

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS Based on available data, NMP has reported effects to the blood-forming organs (bone marrow and spleen) and liver in animals. NMP has caused toxic effects to the fetus in laboratory animals at high dose levels with either mild or undetectable maternal toxicity.

4. FIRST-AID MEASURES

EYE: Flush eyes with plenty of water.

SKIN: Wash off in flowing water or shower.

INGESTION: If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

INHALATION: Remove to fresh air if effects occur. Consult a Physician.

NOTE TO PHYSICIAN: No specific antidote. Supportive care. Treatment based

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on judgment of the physician in response to reactions of the patient.

5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Water fog or fine spray. Carbon dioxide, dry chemical, foams. Alcohol resistant foams (ATC type) are preferred if available. General purpose synthetic foams (including AFFF) or protein foams may function, but much less effective.

HAZARDOUS COMBUSTION PRODUCTS: Incomplete combustion may lead to the build-up of toxic pyrolysis products. Complete combustion will result in: Carbon oxides, Nitrogen oxides, and Water.

PROTECTION OF FIREFIGHTERS: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, pants, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

SPECIFIC FIRE OR EXPLOSION HAZARDS: Will support combustion.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS: Isolate area. May be a slipping hazard. Wear adequate personal protective equipment, see Section 8, EXPOSURE CONTROLS/PERSONAL PROTECTION.

ENVIRONMENTAL PRECAUTIONS: Contain material to prevent contamination of ground and surface water. Spills should be collected to prevent contamination of waterways. Recover if possible, or dispose of according to applicable regulations, see Section 13, DISPOSAL CONSIDERATIONS.

METHODS OF CLEANING UP: Spills should be contained by, and covered with large quantities of sand, earth or any other readily available absorbent material which is then brushed in vigorously to assist absorption. The mixture can then be collected into drums and removed for disposal. Wash area from residues with soap and water and rinse down. Contaminated water should be retained, not being allowed to flow into ground or surface water.

7. HANDLING AND STORAGE

HANDLING: Wear proper PPE when handling this material. Maintain good personal hygiene. Wash thoroughly after handling.

Since polyols are handled together with diisocyanates, proper distinction between these two kinds of products is essential in order to avoid undesired mixing resulting in uncontrolled polymerization.

STORAGE: Keep container tightly closed when not in use. Store in a cool, dry, well ventilated area away from heat and ignition sources.

- Store empty containers away from heat, sparks, and open flame. Vapors may accumulate and travel to distant ignition sources and flashback.

- Storage Temperature: 60-90F (15.6-32.2C)

8. EXPOSURE CONTROL/PERSONAL PROTECTION

ENGINEERING CONTROLS: Use only with adequate ventilation. Local exhaust

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ventilation may be necessary for some operations.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection: For most conditions, no respiratory protection is needed; however, if handling at elevated temperature without sufficient ventilation or in presence of aerosols, use an approved air-purifying respirator. Atmospheric levels should be maintained below the exposure guideline.

Skin Protection: Use gloves impervious to this material. Wear clean, long-sleeved, body covering clothing. After work and before eating, drinking or smoking wash and clean yourself carefully with soap and water. Contaminated clothing should be washed and/or dry cleaned before re-use.

Eye/Face Protection: Use chemical goggles. If vapor exposure causes eye discomfort, use a full-face respirator. Eye wash fountain should be located in immediate work area.

EXPOSURE GUIDELINES(S):

N-Methylpyrrolidinone (NMP): AIHA WEEL is 10 ppm, skin. Interim IHG is 500 ppm.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Liquid
Specific gravity : 0.95
Water solubility : Partially
Flash point : >149 deg.F (65 deg.C)

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable under recommended storage conditions.

CONDITIONS TO AVOID: Do not distill to dryness. Avoid excessive temperature or prolonged reflux such as in batch distillations, as required by good chemical praxes keep away from intense heat, open flames, and sources of ignition.

INCOMPATIBILITY WITH OTHER MATERIALS: High temperatures in the presence of strong bases, acids, and strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS: None under normal conditions of storage and use.

HAZARDOUS POLYMERIZATION: Will not occur by itself.

11. TOXICOLOGICAL INFORMATION

INGESTION: The oral LD50 for rats is >2000 mg/kg for these components.

SKIN CONTACT: The LD50 for skin absorption in rabbits is >2000 mg/kg for these components.

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12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE for NMP

MOVEMENT & PARTITIONING for NMP: Bioconcentration potential is low (BCF less than 100 or Log Pow less than 3). Measured log octanol/water partition coefficient (log Pow) is -0.38. Potential for mobility in soil is very high (Koc between 0 and 50). Soil organic carbon/water partition coefficient (Koc) is estimated to be 21. Henry's Law Constant (H) is estimated to be 4.46E-8 atm-m³/mole.

DEGRADATION & PERSISTENCE for NMP

Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Theoretical Oxygen Demand (ThOD) is calculated to be 2.58 p/p. In the atmospheric environment, material is estimated to have a tropospheric half-life of 5.439 hrs. Biodegradation reached in Modified MITI Test (I) (OECD Test No. 301 C) after 28 days: 73%.

ECOTOXICOLOGY for NMP

Material is practically non-toxic to aquatic organisms on an acute basis (LC50 or EC50 >100 mg/L in the most sensitive species tested). Acute LC50 in bluegill (*Lepomis macrochirus*) is 832 mg/L. Acute LC50 in golden orfe (*Leuciscus idus*) is 4000 mg/L. Acute LC50 in fathead minnow (*Pimephales promelas*) is 1072 mg/L. Acute LC50 in guppy (*Poecilia reticulata*) is 1900 mg/L. Acute LC50 in rainbow trout (*Oncorhynchus mykiss*) is 3048 mg/L. Acute immobilization EC50 in water flea *Daphnia magna* is 4897 mg/L. Acute LC50 in scud *Gammarus sp.* is 4655 mg/L.

13. DISPOSAL CONSIDERATIONS

DISPOSAL: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal methods must be in compliance with all Federal, State/Provincial and local laws and regulations.

Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. THE DOW CHEMICAL COMPANY HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION 2 (Composition/Information On Ingredients).

FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: recycler, reclaimer, incinerator or other thermal destruction device.

As a service to its customers, Dow can provide names of information resources to help identify waste management companies and other facilities which recycle, reprocess or manage chemicals or plastics, and that manage used drums. Telephone Dow's Customer Information Center at 800-258-2436 or 517-832-1556 for further details.

14. TRANSPORT INFORMATION

DEPARTMENT OF TRANSPORTATION (D.O.T.): This product is not regulated by D.O.T. when shipped domestically by land.

CANADIAN TDG INFORMATION: This product is not regulated by TDG when shipped domestically by land.

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15. REGULATORY INFORMATION

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, expressed or implied is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations. See other sections for health and safety information.

U.S. REGULATIONS

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SARA 313 INFORMATION: This product contains the following subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

CHEMICAL NAME	CAS NUMBER
N-Methylpyrrolidinone (NMP)	872-50-4

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories for the following chemicals:

N-Methylpyrrolidinone (NMP)
Immediate
Chronic

TOXIC SUBSTANCES CONTROL ACT (TSCA):

All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

STATE RIGHT-TO-KNOW: The following product components are cited on certain state lists as mentioned. Non-listed components may be shown in the composition section of the MSDS.

CHEMICAL NAME	CAS NUMBER	LIST
N-Methylpyrrolidinone (NMP)	872-50-4	CA, MA, NJ2, PA

CA=California prop 65

MA=Massachusetts

PA=Pennsylvania

NJ2- New Jersey Environmental Hazardous Substance List

OSHA HAZARD COMMUNICATION STANDARD: This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT (CERCLA, or SUPERFUND): To the best of our knowledge, this product contains no chemical subject to reporting under CERCLA.

CANADIAN REGULATIONS

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CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA):

All substances in this product are listed on the Canadian Domestic Substances

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15. REGULATORY INFORMATION

List (DSL) or are not required to be listed.

WHMIS Classification: B3. D2b

16. OTHER INFORMATION

No other information.