



MATERIAL SAFETY DATA SHEET

JUN 06 2002

PRODUCT

TRI-ACT 2813 INHIBITOR

Emergency Telephone Number

Medical (800) 462-5378 (24 hours)

(800) I-M-ALERT

SECTION 01 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

TRADE NAME: TRI-ACT 2813 INHIBITOR

DESCRIPTION: An aqueous solution of cyclohexylamine, morpholine and diethylaminoethanol

NFPA 704M/HMIS RATING: 3/3 HEALTH 2/2 FLAMMABILITY 0/0 REACTIVITY 0 OTHER
0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

SECTION 02 COMPOSITION AND INFORMATION ON INGREDIENTS

Our hazard evaluation has identified the following chemical ingredient(s) as hazardous under OSHA's Hazard Communication Rule, 29 CFR 1910.1200. Consult Section 15 for the nature of the hazard(s).

INGREDIENT(S)	CAS #	APPROX. %
Cyclohexylamine	108-91-8	20-40
Diethylaminoethanol	100-37-8	5-10
Morpholine	110-91-8	5-10

SECTION 03 HAZARD IDENTIFICATION

EMERGENCY OVERVIEW:

DANGER: Corrosive to tissue. Do not get in eyes, on skin, or on clothing. Wear goggles, face shield and rubber gloves when handling. Avoid breathing of vapor. Use with adequate ventilation. Do not take internally. Combustible. Keep away from heat and open flame. Keep container closed when not in use.

Empty containers may contain residual product. Do not reuse container unless properly reconditioned.

PRIMARY ROUTE(S) OF EXPOSURE: Eye, Skin, Inhalation

EYE CONTACT: Corrosive to the eyes with possible permanent damage depending on the length of exposure and on the first aid action given.

SKIN CONTACT: Corrosive to the skin, possibly resulting in third degree burns depending on the length of exposure and on the first aid action given. Can cause contact dermatitis.

INGESTION: Can cause kidney damage. Can be harmful.

INHALATION: Can be corrosive to the mucous membranes and the lungs.

SYMPTOMS OF EXPOSURE: A review of available data does not identify any symptoms from exposure not previously mentioned.



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AGGRAVATION OF EXISTING CONDITIONS: A review of available data does not identify any worsening of existing conditions.

SECTION 04 FIRST AID INFORMATION

EYES: Immediately flush for at least 15 minutes while holding eyelids open. Call a physician at once.

SKIN: Immediately flush with water for at least 15 minutes. For a large splash, flood body under a shower. Call a physician at once.

INGESTION: Do not induce vomiting. Give water. Call a physician at once.

INHALATION: Remove to fresh air. Treat symptoms. Call a physician at once. If breathing has stopped, give cardiopulmonary resuscitation (CPR). Administer oxygen. Call a physician at once.

NOTE TO PHYSICIAN: Based on the individual reactions of the patient, the physician's judgment should be used to control symptoms and clinical condition.

CAUTION: If unconscious, having trouble breathing or in convulsions, do not induce vomiting or give water.

NOTE TO PHYSICIAN: Probable mucosal damage may contraindicate the use of gastric lavage. Measures against circulatory shock, respiratory depression and convulsions may be needed.

SECTION 05 FIRE FIGHTING MEASURES

FLASH POINT: 131 Degrees F (PMCC) ASTM D-93

EXTINGUISHING MEDIA: Based on the NFPA guide, use dry chemical, foam, carbon dioxide or other extinguishing agent suitable for Class B fires. Use water to cool containers exposed to fire. For large fires, use water spray or fog, thoroughly drenching the burning material.

UNUSUAL FIRE AND EXPLOSION HAZARD: May evolve NOx under fire conditions.

SECTION 06 ACCIDENTAL RELEASE MEASURES

IN CASE OF TRANSPORTATION ACCIDENTS, CALL THE FOLLOWING 24-HOUR TELEPHONE NUMBER (800) I-M-ALERT or (800) 462-5378.

SPILL CONTROL AND RECOVERY:

Small liquid spills: Contain with absorbent material, such as clay, soil or



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SOLUBILITY IN WATER:	Completely	
SPECIFIC GRAVITY:	0.98-0.99 @ 77 Degrees F	ASTM D-1298
pH (NEAT) =	12.0-13.0	ASTM E-70
VISCOSITY:	5 cps @ 77 Degrees F	ASTM D-2983
FREEZE POINT:	27 Degrees F	ASTM D-1177
FLASH POINT:	131 Degrees F (PMCC)	ASTM D-93
VAPOR PRESSURE:	6 mm Hg @ 68 Degrees F	ASTM D-2879
VOLATILE ORGANIC COMPOUND (VOC):	3.27 lbs/gal.	ASTM D-323

NOTES: . These physical properties are typical values for this product.

. This product does not sustain combustion; therefore, it does not meet the definition of hazard class 3 for transportation under 49CFR 173.120(A) (3).

SECTION 10 STABILITY AND REACTIVITY

INCOMPATIBILITY: N-nitrosamines, many are cancer causing agents to laboratory animals, may be formed when certain amines are mixed with nitrous acid, organic or inorganic nitrites or atmospheres with high nitrous oxide concentrations.

Avoid contact with strong oxidizers (eg. chlorine, peroxides, chromates, nitric acid, perchlorates, concentrated oxygen, permanganates) which can generate heat, fires, explosions and the release of toxic fumes.

Avoid contact of product vapors with SO₂ vapors which may react to form a visible cloud of amine salt particulate.

THERMAL DECOMPOSITION PRODUCTS: In the event of combustion CO, CO₂, NO_x may be formed. Do not breathe smoke or fumes. Wear suitable protective equipment.

SECTION 11 TOXICOLOGICAL INFORMATION

ACUTE TOXICITY STUDIES: Acute toxicity studies have not been conducted on this product, but acute studies have been conducted on a similar product along with the hazardous ingredient(s) in Section 2. The results are shown below.

ACUTE ORAL TOXICITY (ALBINO RATS):
Similar product LD₅₀ = 779 mg/kg

95% Confidence Limit = 497 mg/kg - 1,420 mg/kg

ACUTE DERMAL TOXICITY (ALBINO RABBITS):
Similar product LD₅₀ = 2,055 mg/kg



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95% Confidence Limit = 1,346 mg/kg - 3,136 mg/kg

ACUTE INHALATION TOXICITY (ALBINO RATS):

Similar product LC50 = Greater than 12,000 ppm (8-hour vapor exposure)

PRIMARY SKIN IRRITATION TEST (ALBINO RABBITS):

SKIN IRRITATION INDEX DRAIZE RATING: Similar product

8.0/8.0 Extremely irritating (Corrosive)

PRIMARY EYE IRRITATION TEST (ALBINO RABBITS):

EYE IRRITATION INDEX DRAIZE RATING: Similar product

110.0/110.0 Extremely irritating (Corrosive)

OTHER TOXICITY RESULTS: Mutagenicity tests on morpholine provided the following results: Ames was negative; sister chromatid exchange was equivocal; cell transformation was positive; mouse lymphoma was weakly positive and rat hepatocyte/DNA repair was negative. A similar battery was run on cyclohexylamine with inconclusive results. Diethylaminoethanol is nonmutagenic in the Ames test using Salmonella strains TA98, 100, 1535 and 1537 with and without metabolic activation.

CHRONIC TOXICITY RESULTS: A two year rat inhalation study with morpholine was negative for cancer.

HUMAN HAZARD CHARACTERIZATION: Based on our hazard characterization, the potential human hazard is: HIGH.

SECTION 12 ECOLOGICAL INFORMATION

BIOCHEMICAL OXYGEN DEMAND (5-day BOD):

Dissolved oxygen reduction of Less than 2.0 mg/L observed.

CHEMICAL OXYGEN DEMAND (COD): 563,000 ppm

AQUATIC STUDIES:

Results below are based on the product.

96 hour static acute LC50 to Rainbow Trout = 130 mg/L

96 hour no observed effect concentration 32 mg/L is based on no mortality or abnormal effects.

TOXICITY RATING: Slightly toxic

96 hour static acute LC50 to Fathead Minnow = 75 mg/L



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96 hour no observed effect concentration is 5.6 mg/L based on no mortality or abnormal effects.

TOXICITY RATING: Moderately toxic

48 hour static acute LC50 to Daphnia Magna = 190 mg/L

48 hour no observed effect concentration is 100 mg/L based on no mortality or abnormal effects.

TOXICITY RATING: Slightly toxic

96 hour static acute LC50 to Sheepshead Minnow = 454 mg/L

96 hour no observed effect concentration is 250 mg/L based on no mortality or abnormal effects.

TOXICITY RATING: Slightly toxic

96 hour static acute LC50 to Mysid shrimp = 131 mg/L

96 hour no observed effect concentration is 40 mg/L based on no mortality or abnormal effects.

TOXICITY RATING: Slightly toxic

If released into the environment, see CERCLA in Section 15.

ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION: Based on our Hazard Characterization, the potential environmental hazard is: MODERATE. Based on Nalco's recommended product application and the product's characteristics, the potential environmental exposure is: HIGH.

SECTION 13 DISPOSAL CONSIDERATIONS

DISPOSAL: If this product becomes a waste, it meets the criteria of a hazardous waste as defined under the Resources Conservation and Recovery Act (RCRA) 40 CFR 261. Hazardous Waste D001 and D002.

As a hazardous liquid waste, it must be solidified with stabilizing agents (such as sand, fly ash, or cement) so that no free liquid remains before disposal to a licensed industrial waste landfill (Hazardous Waste Treatment, Storage and Disposal facility). A hazardous liquid waste can also be incinerated in accordance with local, state, and federal regulations.

SECTION 14 TRANSPORTATION INFORMATION

PROPER SHIPPING NAME/HAZARD CLASS MAY VARY BY PACKAGING, PROPERTIES, AND MODE OF TRANSPORTATION. TYPICAL PROPER SHIPPING NAMES FOR THIS



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PRODUCT ARE:

ALL TRANSPORTATION MODES : AMINES, LIQUID, CORROSIVE, N.O.S.

UN/ID NO : UN 2735
HAZARD CLASS - PRIMARY : 8 - CORROSIVE
PACKING GROUP : II
IMDG PAGE NO : 8109-2
IATA PACKING INSTRUCTION : CARGO: 812
IATA CARGO AIRCRAFT LIMIT : 30 L (MAX NET QUANTITY PER PACKAGE)
FLASH POINT : 131 F 55.0 C
TECHNICAL NAME(S) : CYCLOHEXYLAMINE,
DIETHYLAMINOETHANOL,
MORPHOLINE
RQ LBS (PER PACKAGE) : NONE
RQ COMPONENT(S) : NONE

SECTION 15 REGULATORY INFORMATION

The following regulations apply to this product.

TRANSPORTATION REGULATIONS:

NOTE: This product does not sustain combustion; therefore, it does not meet the definition of hazard class 3 for transportation under 49CFR 173.120(A)(3).

FEDERAL REGULATIONS:

OSHA'S HAZARD COMMUNICATION RULE, 29 CFR 1910.1200:

Based on our hazard evaluation, the following ingredient(s) in this product are hazardous and the reason(s) are shown below.

Cyclohexylamine - Corrosive to eyes/skin, combustible
Morpholine - Corrosive to eyes/skin
Diethylaminoethanol - Corrosive to eyes, skin irritant

Cyclohexylamine = TWA 10 ppm, 41 mg/m³ ACGIH/TLV
Morpholine = TWA 20 ppm, 71 mg/m³ ACGIH/TLV
Diethylaminoethanol = TWA 2 ppm, 9.6 mg/m³ (skin) ACGIH/TLV

Cyclohexylamine = TWA 10 ppm, 40 mg/m³ OSHA/PEL
Morpholine = TWA 20 ppm, STEL 30 ppm (skin) OSHA/PEL
70 mg/m³, 105 mg/m³ OSHA/PEL
Diethylaminoethanol = TWA 10 ppm, 50 mg/m³ (skin) OSHA/PEL

CERCLA/SUPERFUND, 40 CFR 117, 302:



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Notification of spills of this product is not required.

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986
(TITLE III) - SECTIONS 302, 311, 312 AND 313:

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355):

This product contains cyclohexylamine, which is listed in Appendix A and B as an Extremely Hazardous Substance. The statutory threshold planning quantity for this substance is 10,000 pounds.

A release of 40,000 pounds of product will require a notification to your State Emergency Response Commission.

You may also be required to notify the NATIONAL RESPONSE CENTER
- See CERCLA/SUPERFUND, above.

SECTIONS 311 and 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370):
Our hazard evaluation has found this product to be hazardous. The product should be reported under the following EPA hazard categories:

XX Immediate (acute) health hazard
-- Delayed (chronic) health hazard
XX Fire hazard
-- Sudden release of pressure hazard
-- Reactive hazard

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372):

This product does not contain ingredients on the List of Toxic Chemicals.

TOXIC SUBSTANCES CONTROL ACT (TSCA):

The chemical ingredients in this product are on the 8(b) Inventory List (40 CFR 710).

FOOD AND DRUG ADMINISTRATION (FDA):

Federal Food, Drug and Cosmetic Act:

When use situations necessitate compliance with FDA regulations, this product is acceptable under 21 CFR 173.310 Boiler Water Additives. The following use limitations apply: Maximum dosage of product not to exceed 45 ppm in the steam. This product may not be used where the steam produced will contact milk or milk products.

U. S. DEPARTMENT OF AGRICULTURE (USDA):



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USDA Inspection and Grading Programs - Food Safety and Inspection Service:
This product is authorized by USDA for use in federally inspected meat and poultry plants. Authorized use is under category G6.
The following limitations apply: Maximum dosage of product not to exceed 45 ppm in the steam.

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA), 40 CFR 261 SUBPART C & D:
Consult Section 13 for RCRA classification.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 (formerly Sec. 307), 40 CFR 116 (formerly Sec. 311):
None of the ingredients are specifically listed.

CLEAN AIR ACT, Sec. 111 (40 CFR 60), Sec. 112 (40 CFR 61, 1990 Amendments), Sec. 611 (40 CFR 82, CLASS I and II Ozone depleting substances):
This product contains the following ingredients covered by the Clean Air Act:

Cyclohexylamine - Section 111
Morpholine - Section 111

STATE REGULATIONS:

CALIFORNIA PROPOSITION 65:
This product does not contain any chemicals which require warning under California Proposition 65.

MICHIGAN CRITICAL MATERIALS:
This product does not contain ingredients listed on the Michigan Critical Materials Register.

STATE RIGHT TO KNOW LAWS:
The following ingredient(s) are disclosed for compliance with State Right To Know Laws:

Cyclohexylamine	108-91-8
Diethylaminoethanol	100-37-8
Morpholine	110-91-8
Water	7732-18-5

INTERNATIONAL REGULATIONS:

All components in this product are either on the Domestic Substance List, have been notified under Section 26 of CEPA, or are exempt.

This is a WHMIS controlled product under The House of Commons of Canada Bill C-70 (Class E). The product contains the following substance(s), from the Ingredient Disclosure List or has been evaluated based on its toxicological



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properties, to contain the following hazardous ingredient(s):

Chemical Name	CAS #	% Concentration Range
Cyclohexylamine	108-91-8	20-40
Diethylaminoethanol	100-37-8	5-10
Morpholine	110-91-8	5-10

SECTION 16 OTHER INFORMATION

None

SECTION 17 RISK CHARACTERIZATION

Due to our commitment to Product Stewardship, we have evaluated the human and environmental hazards and exposures of this product. Based on our recommended use of this product, we have characterized the product's general risk. This information should provide assistance for your own risk management practices. We have evaluated our product's risk as follows:

- * The human risk is: LOW.
- * The environmental risk is: MODERATE.

Any use inconsistent with Nalco's recommendations may affect our risk characterization. Our sales representative will assist you to determine if your product application is consistent with our recommendations. Together we can implement an appropriate risk management process.

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to insure safe workplace operations. Please consult your local sales representative for any further information.

SECTION 18 REFERENCES

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, OH.

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (CD-ROM version), Micromedex, Inc., Englewood, CO.

