

SECTION 1 - PRODUCT IDENTIFICATION

PRODUCT NAME:	FORMULA 48
PRODUCT USE:	CONDENSATE CORRSION INHIBITOR
RESTRICTIONS ON USE:	Refer to label, available technical information, and other appropriate sections of this SDS.
UN NUMBER:	UN 2735
PROPER SHIPPING NAME:	UN2735 AMINES, LIQUID, CORROSIVE, N.O.S. (CONTAINS CYCLOHEXYLAMINE AND DIETHYLAMINOETHANOL), 8, PGII
MANUFACTURER'S NAME:	Garratt-Callahan Company
ADDRESS:	50 Ingold Road, Burlingame, CA 94010-2206
EMERGENCY PHONE:	North America: CHEMTREC: 1-800-424-9300 Outside North America: +1-703-527-3887
BUSINESS PHONE:	Product Information: 650-697-5811
SDS NUMBER:	SD4048
DATE OF REVISION:	7/13/2017

SECTION 2 - HAZARDS IDENTIFICATION

SIGNAL WORD: DANGER

HAZARD STATEMENT:

H227: Combustible liquid. 4
H303: May be harmful if swallowed. 5
H312: Harmful in contact with skin. 4
H314: Causes severe skin burns and eye damage. 1A
H331: Toxic if inhaled. 3
H336: May cause drowsiness or dizziness. 3
H341: Suspected of causing genetic defects. 2
H351: Suspected of causing cancer. 2
H361: Suspected of damaging fertility or the unborn child. 2
H373: May cause damage to organs through prolonged or repeated exposure. 2



PRECAUTIONARY STATEMENTS: (PREVENTION)

P101: If medical advice is needed, have product container or label at hand.
P102: Keep out of reach of children.
P103: Read label before use.
P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P260: Do not breathe dust/fume/gas/mist/vapours/spray.
P264: Wash all exposed skin/hair thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
P271: Use only outdoors or in a well-ventilated area.
P280: Wear protective gloves/protective clothing/eye protection/face protection.

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM

HEALTH HAZARD (BLUE)	3	Hazard Scale 0=Minimal 1=Slight 2=Moderate 3=Serious 4=Severe *=Chronic hazard
FLAMMABILITY HAZARD (RED)	1	
PHYSICAL HAZARD (YELLOW)	1	
PERSONAL PROTECTION		



SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

<u>Hazardous Ingredients</u>	<u>CAS#</u>	<u>EC#</u>	<u>ICSC#</u>	<u>WT %</u>
DIETHYLAMINO-ETHANOL	100-37-8	202-845-2	0257	30 - 35
CYCLOHEXYLAMINE	108-91-8	203-629-0	0245	8 - 13

SECTION 4 - FIRST AID MEASURES

Exposed individuals must be taken for medical attention if any adverse effect occurs. Take a copy of this SDS to the health professional with the individual.

DANGER: Combustible liquid. May be harmful if swallowed. Harmful in contact with skin. Causes severe skin burns and eye damage. Toxic if inhaled. May cause drowsiness or dizziness. Suspected of causing genetic defects. Suspected of causing cancer. Suspected of damaging fertility or the unborn child. May cause damage to organs through prolonged or repeated exposure. Also refer to Section 11 for symptoms, effects, and likely routes of exposure for this product. P308+P313: IF exposed or concerned: Get medical advice/attention. P314: Get medical advice/attention if you feel unwell.

TARGET ORGANS:

ACUTE: irritation of skin, eyes, respiratory and gastrointestinal systems.
CHRONIC: irritation of skin, eyes, respiratory, kidneys and gastrointestinal systems.

SKIN EXPOSURE: P303+P361+P353: IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower. P302+P352: IF ON SKIN: Wash with plenty of water. Minimum flushing time is for 15 minutes. Remove exposed or contaminated clothing, taking care not to contaminate the eyes. P362+P364: Take off contaminated clothing and wash it before reuse. P310: Immediately call a POISON CENTER or doctor/physician.

EYE EXPOSURE: P305+P351+P338: IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing. Use sufficient force to open the eyelids. Have the exposed individual "roll" their eyes. Minimum flushing time is for 15 minutes. P310: Immediately call a POISON CENTER or doctor/physician.

INHALATION: P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. P310: Immediately call a POISON CENTER or doctor/physician.

INGESTION: P301+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Never induce vomiting or give diluents (milk or water) by mouth to someone who is unconscious, having convulsions, or unable to swallow. P310: Immediately call a POISON CENTER or doctor/physician.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Skin and respiratory disorders, as well as conditions involving the "Target Organs" may be aggravated by prolonged exposures to this product. Exposed individual must seek immediate medical attention if any adverse effect occurs.

NOTES TO PHYSICIAN: Treat symptoms as demonstrated by signs and distress in the patient.

SECTION 5 - FIRE FIGHTING MEASURES

SUITABLE (AND UNSUITABLE) EXTINGUISHING MATERIALS:

P370+P378: In case of fire: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

SPECIFIC HAZARDS ARISING FROM THE CHEMICAL:

None known.

SPECIAL PROTECTIVE EQUIPMENT AND PRECAUTIONS FOR FIREFIGHTERS:

Firefighters should wear fully protective clothing (chemical impermeable, fully encapsulated suit) and positive pressure self-contained breathing apparatus. Do not release run off from fire control methods to sewer or waterways.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT, ENVIRONMENTAL PRECAUTIONS AND EMERGENCY PROCEDURES.

WARNING: Any container expansion or rounding indicates pressure build-up. Use extreme caution. When opening, release pressure slowly through opening.

SPILL AND LEAK RESPONSE: Uncontrolled releases should be responded to by appropriately trained personnel using pre-planned procedures. Proper protective equipment should be used, refer to Section 8 - exposure controls.

Small Spill: Mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. P391: Collect spillage.

Large Spill: Restrict access to the area. Provide adequate protective equipment and ventilation. Stop leak if without risk. Remove chemicals which can react with the spilled material. Add dry inert material to contain and absorb spilled material. Prevent entry into surface waters, sewers, basements or confined areas, dike if needed. Ensure that exposure to product is not at a concentration exceeding regulatory limits. Decontaminate the area thoroughly. Decontaminate all response equipment with soapy water before returning to service. Place all spill residue in a suitable container and seal. P391: Collect spillage.

SECTION 7 - HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING: Keep out of reach of children. All employees who handle this material should be trained to handle it safely. Open containers slowly on a stable surface. As with all chemicals, avoid getting this product ON YOU or IN YOU. Avoid direct or prolonged contact with skin or eyes. Do not ingest. Wash thoroughly after handling this product. Do not eat, drink, smoke, or apply cosmetics while handling this product. Avoid breathing vapors, dusts or mists generated by this product. Use in a well-ventilated location. Remove contaminated clothing immediately. Use only as directed. Refer to Section 8 for exposure controls. P210: Keep away from heat, hot surfaces, sparks, openflames and other ignition sources. No smoking. P201: Obtain special instructions before use. P202: Do not handle until all safety precautions have been read and understood.

CONDITIONS FOR SAFE STORAGE: Containers of this product must be properly labeled. Storage areas of this product should be clearly identified, well-illuminated, clear of obstruction and accessible only to trained and authorized personnel. Store containers in a clean, cool, well ventilated, dry location, away from direct sunlight, away from incompatible materials at temperatures between 50°F (10°C) - 100°F (37°C). Keep container tightly closed when not in use. P405: Store locked up. Do not ingest. Do not breathe vapor mist. Wash hands after handling. Refer to Section 10 for incompatibilities.

SECTION 8 - EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation. Eyewash/safety shower station is recommended to be available near where this product is used/stored.

EXPOSURE LIMITS/GUIDELINES:

EXPOSURE LIMITS IN AIR

<u>CHEMICAL NAME</u>	<u>CAS#</u>	<u>ACGIH TLV</u>		<u>OSHA PEL</u>	<u>OTHER</u>
		<u>TWA</u>	<u>STEL</u>	<u>TWA</u>	
DIETHYLAMINO-ETHANOL	100-37-8	2 ppm (skin)	NE	10 ppm or 50 mg/m ³ (skin)	TWA NIOSH REL 10 ppm or 40 mg/m ³
CYCLOHEXYLAMINE	108-91-8	10 ppm	NE	NE	NIOSH 10 ppm

NE = Not Established

INGESTION: P264: Wash all exposed skin/hair thoroughly after handling. Do not eat, drink or smoke when using this product.

RESPIRATORY PROTECTION: P260: Do not breathe dust/fume/gas/mist/vapours/spray. P271: Use only outdoors or in a well-ventilated area. Maintain airborne contaminant concentrations below guidelines listed above, if applicable. Air-purifying respirators with dust/mist/fume/spray filters are recommended if operations may produce dusts, mists or sprays from this product with concentrations at or above levels posted above.

EYE PROTECTION: P264: Wash all exposed skin/hair thoroughly after handling. P280: Wear protective gloves/protective clothing/eye protection/face protection. Wear chemical safety goggles or safety glasses with side shields. A face shield may also be necessary for splash protection.

SKIN PROTECTION: P264: Wash all exposed skin/hair thoroughly after handling. P280: Wear protective gloves/protective clothing/eye protection/face protection. Use chemically-resistant gloves and skin protection, when handling this product. Use body protection appropriate for task (e.g., lab coat, overalls).

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE and COLOR:	Clear water white liquid	VAPOR PRESSURE, mm Hg @ 20°C:	Not Applicable
ODOR :	Ammonia	VAPOR DENSITY (Air=1):	Not Applicable
ODOR THRESHOLD:	Not established	RELATIVE DENSITY@20°C (water=1):	0.95 - 1.0
pH:	12.0 - 13.5	SOLUBILITY IN WATER:	Complete
MELTING/FREEZING POINT:	Not applicable	PARTITION COEFFICIENT(n-octanol/water):	Not established
BOILING POINT:	208°F	AUTOIGNITION TEMPERATURE:	Not Applicable
FLASHPOINT:	Non-flammable	DECOMPOSITION TEMPERATURE:	Not established
EVAPORATION RATE (n-BuAc=1):	Not Applicable	VISCOSITY:	Not established
FLAMMABILITY (SOLID/GAS):	Not Applicable	VOLATILE ORGANIC COMPOUNDS (%):	Not established
FLAMMABLE LIMITS (in air by volume, %):	Not Applicable		

SECTION 10 - STABILITY AND REACTIVITY

REACTIVITY: Product is not reactive under standard ambient temperature and pressure.

STABILITY: Stable under normal condition of use and storage.

POSSIBILITY OF HAZARDOUS

REACTIONS: None known.

CONDITIONS TO AVOID: See incompatible materials.

INCOMPATIBLE MATERIALS: Acids, oxidizing agents, halogenated compounds.

HAZARDOUS DECOMPOSITION

PRODUCTS: Ammonia, oxides of nitrogen.

SECTION 11 - TOXICOLOGICAL INFORMATION

TOXICOLOGICAL EFFECTS: Not established for this product.

LIKELY ROUTES OF EXPOSURE: Skin/eye contact and inhalation.

RELATED SYMPTOMS: Skin, eye, respiratory and gastrointestinal irritation. May be harmful if swallowed.

DELAYED/IMMEDIATE/CHRONIC

EFFECTS FROM SHORT AND

LONG TERM EXPOSURES: Skin, eye, respiratory and gastrointestinal irritation. May be harmful if swallowed.

NUMERICAL MEASURES OF

TOXICITY: Not established for this product.

CARCINOGENICITY: None of the components of this product are listed by the NTP, IARC, or regulated by OSHA as carcinogens.

SECTION 12 - ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

ECOTOXICITY:

Waterflea 48hr LC50 : 522.67 ppm

Fathead minnow 96hr LC50 : 824.69 ppm

PERSISTENCE AND DEGRADABILITY: No data available for this product.

BIOLOGICAL ACCUMULATION POTENTIAL: No data available for this product.

MOBILITY IN SOIL: No data available for this product.

OTHER ADVERSE EFFECTS (i.e., hazardous to the ozone layer): No data available for this product.

BIOLOGICAL EXPOSURE INDICES: Currently, Biological Exposure Indices (BEIs) have not been determined for the components of this product.

SECTION 13 - DISPOSAL CONSIDERATIONS

DISPOSAL: Rinse empty containers with water and use the rinse water to prepare the working solution. Refer to Section 8 for exposure controls - personal protection. P501: Dispose of contents/container in accordance with local/regional/national/international regulations.

SECTION 14 - TRANSPORTATION INFORMATION

PROPER SHIPPING NAME

DOT: UN2735, AMINES, LIQUID, CORROSIVE, N.O.S.
(CONTAINS CYCLOHEXYLAMINE AND DIETHYLAMINOETHANOL) 8, PGII
Emergency Response Guidebook, Guide No.: 153
Passenger Aircraft Qty: 1L
Cargo Aircraft Qty: 30L



IMDG/IMO: UN2735, AMINES, LIQUID, CORROSIVE, N.O.S.
(CONTAINS CYCLOHEXYLAMINE AND DIETHYLAMINOETHANOL) 8, PGII

IATA/ICAO: UN2735, AMINES, LIQUID, CORROSIVE, N.O.S.
(CONTAINS CYCLOHEXYLAMINE AND DIETHYLAMINOETHANOL) 8, PGII

ENVIRONMENTAL HAZARDS

(i.e., **MARINE POLLUTANT**): None known.

TRANSPORT IN BULK (according to annex II marpol 73/78 and the IBC code): Not applicable.

SPECIAL PRECAUTIONS FOR USER: None known.

PRODUCT REQUIRES CORROSIVE LABEL

SECTION 15 - REGULATORY INFORMATION

United States and International Regulations

United States Regulations: U.S. SARA REPORTING REQUIREMENTS: The components of this product are subject to the reporting as listed below, requirements of Sections 302, 304, and 313 of Title of the Superfund Amendments and Reauthorization Act:

CHEMICAL NAME

DIETHYLAMINO-ETHANOL	SARA 302 (40 CFR 355, Appendix A) - NO SARA 304 (40 CFR Table 302.4) - NO SARA 313 (40 CFR 372.65) - NO
CYCLOHEXYLAMINE	SARA 302 (40 CFR 355, Appendix A) - YES SARA 304 (40 CFR Table 302.4) - NO SARA 313 (40 CFR 372.65) - NO

U.S. Regulations

U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for the components of this product. The default Federal SDS submission and inventory requirement filing threshold of 10,000 lbs (4,540 kg) therefore applies, per 40 CFR 370.20.

U.S. CERCLA REPORTABLE QUANTITY (RQ): Cyclohexylamine (CAS# 108-91-8): 10,000 lbs (4540 kg).

U.S. TSCA INVENTORY STATUS: The components of this product are listed on the TSCA Inventory.

SARA Title 311/312, Hazard Category: Acute Health: YES; Chronic: YES; Fire: NO; Reactive: NO; Sudden Release of Pressure: NO

California Safe Drinking Water and Toxic Enforcement Act (proposition 65): No component of this product is on the Proposition 65 list.

International Regulations

CANADIAN REGULATIONS:

CANADIAN DSL/NDSL INVENTORY STATUS: The components of this product are on the DSL or NDSL Inventories or are exempt from listing.

CANADIAN WHMIS CLASSIFICATION:

Cyclohexylamine (CAS# 108-91-8) is classified by WHMIS as B2, D1B, D2B, E;

Diethylaminoethanol (CAS# 100-37-8) is classified by WHMIS as B3, D1B, E.

SECTION 16 - OTHER INFORMATION

PREPARED BY: GARRATT CALLAHAN

DATE OF REVISION: 7/13/2017 Supercedes: 8/18/2015

Formula 48 is registered with the NSF to the NSF International Registration Guidelines for Proprietary Substances and Nonfood Compounds for category codes G6, with NSF Reg. No. 045983.

FORMULA 48 has been certified by the Orthodox Union as Kosher Pareve under the UK ID number of OUV3-FB1BD08 when prepared in either the Addison, Illinois or Burlingame, California facilities.

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