MATERIAL SAFETY DATA SHEET

SECTION I GENERAL INFORMATION

PRODUCT NAME OR NUMBER
DAC FLOC 4200

EMERGENCY PHONE NUMBER
PERS 1-800-633-8253

MANUFACTURER NAME/ADDRESS/PHONE
Dacar Industries, Inc.
1007 McCartney Street
Pittsburgh, PA 15220
412/921-3620

DOT HAZARDOUS MATERIAL PROPER NAME
Corrosive Liquid, NOS
(Aluminum Chloride Solution)
DOT HAZARD CLASS
Corrosive (UN 1760)

CHEMICAL FAMILY
Coagulant

CHEMICAL FORMULA
Proprietary Blend of AlCl X H_2O & DADMAC

SECTION II CHEMICAL COMPONENTS

	TLV	CAS NO.	PCT %
Aluminum Chloride	15% - 35%	7446-70-0 (as Anhydrous)	2 mg/m^3

SECTION III PHYSICAL DATA

Boiling point (760 mm Hg)	>212°F	Solubility in Water	Complete
Vapor Pressure (@ 20°C)	N/E	pH, 15%	2.5 - 3.0
Vapor density (Air = 1)	N/E	Specific Gravity	1.2
Volatiles by volume (%)	N/A	Evaporation Rate (_____ = 1)	N/E

APPEARANCE
Liquid

COLOR
Clear to Yellow

ODOR
Sharp, Pungent

MATERIAL IS A
Liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method)
N/A

FLAMMABLE LIMITS
LEL: N/A UEL: N/A

IGNITION TEMPERATURE
N/A

EXTINGUISHING MEDIA
Non-Flammable Liquid

SPECIAL FIRE FIGHTING PROCEDURES
A self-contained breathing apparatus should be worn by fire fighting personnel.

UNUSUAL FIRE AND EXPLOSION HAZARDS
Decomposition at high temperatures prevalent in a fire may result in generation of hydrogen gas.

Note: N/A = Not Available N/E = Not Established

SECTION V PHYSIOLOGICAL EFFECTS

TLV (UNITS): for Aluminum Chloride, Air/TLV-TWA, 2mg/m^3

EFFECTS OF EXPOSURE

Eyes: May cause irritation and burns.
Skin: May cause irritation and contact dermatitis in sensitive persons.
Inhalation: May cause lightheadedness, coughing, burning of nose and throat.
Swallowing: May cause irritation, nausea, vomiting or diarrhea. Oral (mouse): LD_{50} 770 mg/kg.

EMERGENCY AND FIRST AID PROCEDURES

Eyes: Flush with copious amounts of water; get medical attention.
Skin: Remove contaminated clothing. Wash thoroughly with soap and water.
Inhalation: Remove to fresh air. Administer oxygen if necessary; get medical attention.
Swallowing: Give large quantities of water and induce vomiting; get medical attention. Never give anything by mouth to an unconscious person.

SECTION VI REACTIVITY DATA

STABLE	UNSTABLE	CONDITIONS TO AVOID	MATERIALS TO AVOID
[x]	[ ]	High Temperature	Avoid Contact With Alkalis

HAZARDOUS DECOMPOSITION OR COMBUSTION PRODUCTS
At temperatures more than 500°F, hydrogen chloride gas will be liberated.

HAZARDOUS POLYERMIZATION
May occur [ ] Will not occur [x]

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Small Spill: Dike and absorb spill with inert material like sand, earth, vermiculite and transfer to a suitable container for disposal. Flush area with water.
Large Spill: Neutralize with soda ash or limestone and dilute with large amounts of water. Do not allow spills to enter waterways.

WASTE DISPOSAL METHOD

Dispose of in accordance with all local, state and federal regulations.

SECTION VIII PROTECTIVE EQUIPMENT

Respiratory: NIOSH approved cartridge respirator.
Ventilation: Local Exhaust - Normal
For Eyes: Safety Glasses or Face Shield
For Skin: Impervious Gloves, Clothing, Footwear and Head Gear
Other Protective Equipment: Eye Bath and Safety Shower

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

Protect from freezing.

OTHER PRECAUTIONS:

Keep out of reach from children. Keep container closed.

SECTION X REGULATORY INFORMATION

RCRA Waste Number D002

Reportable Quantity RQ 5000 lbs.

MATERIAL SAFETY DATA

Date: 12/17/2001
Supersedes: 06/19/1998

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: KR-C2570

SYNONYMS: None

CHEMICAL FAMILY: Cationic Polyacrylamide

MOLECULAR FORMULA: Polymer

MOLECULAR WGT: Polymer

Kroff Chemical Company, Inc., One North Shore Center, Ste. 450, 12 Federal St., Pittsburgh, PA 15212 USA
For Product Information call: 412-321-9800
EMERGENCY PHONE: For emergency involving spill, leak, fire, exposure or accident call CHEMTREC: 1-800/424-9300. Outside the USA and Canada call 1-703/527-3887.

2. COMPOSITION/INFORMATION ON INGREDIENTS

OSHA REGULATED COMPONENTS

COMPONENT	CAS. NO.	%	TWA/CEILING	REFERENCE
Adipic acid	000124-04-9	~4	5 mg/m3	ACGIH

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

APPEARANCE AND ODOR: Odorless off white crystalline powder.

STATEMENTS OF HAZARD:
IMPORTANT! SPILLS OF THIS PRODUCT ARE VERY SLIPPERY WHEN WET

POTENTIAL HEALTH EFFECTS

EFFECTS OF OVEREXPOSURE:
The estimated acute oral (rat) LD50, acute dermal (rabbit) LD50 and 4-hour inhalation (rat) LC50 values for this material are >5,000 mg/kg, >2,000 mg/kg and >20 mg/L, respectively.
Direct contact with this material may cause minimal eye and skin irritation.
Refer to Section 11 for toxicology information on the regulated components of this product.

4. FIRST AID MEASURES

If swallowed, call a physician immediately. ONLY induce vomiting at the instructions of a physician. Never give anything by mouth to an unconscious person.
In case of skin contact, wash affected areas of skin with soap and water.
In case of eye contact, immediately irrigate with plenty of water for 15 minutes.
If vapor or dust of this material is inhaled, remove from exposure. Administer oxygen if there is difficulty in breathing. Obtain medical attention immediately if necessary.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT: Not applicable

FLAMMABLE LIMITS
(% BY VOL): Not applicable

AUTOIGNITION TEMP: Not available

DECOMPOSITION TEMP: Not available

EXTINGUISHING MEDIA AND FIRE FIGHTING INSTRUCTIONS

As with many solids, any dust that is generated may be explosive if mixed with air in critical proportions and in the presence of a source of ignition. Use water, carbon dioxide or dry chemical to extinguish fires. Wear self-contained, positive pressure breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Spilled material becomes very slippery when wet. Sweep up spills and place in a waste disposal container. Flush the area thoroughly with water and scrub to remove residue. If slipperiness remains, apply more dry-sweeping compound. Do not flush large quantities of the material to sewer.

7. HANDLING AND STORAGE

Spills should be scooped up or wiped up immediately, and the spill area flushed with water.

To avoid product degradation and equipment corrosion, do not use iron, copper or aluminum containers or equipment.

Maintain good housekeeping to control dust accumulations. The material is hygroscopic and should not be exposed to moisture in order to maintain product integrity.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS AND PERSONAL PROTECTIVE EQUIPMENT (PPE)

Engineering controls are not usually necessary if good hygiene practices are followed. Before eating, drinking, or smoking, wash face and hands thoroughly with soap and water. Avoid unnecessary skin contact. Impervious gloves are recommended to prevent prolonged skin contact. For operations where eye or face contact can occur, eye protection is recommended. Where exposures are below the Permissible Exposure Limit (PEL), no respiratory protection is required. Where exposures exceed the PEL, use respirator approved by NIOSH for the material and level of exposure. See "GUIDE TO INDUSTRIAL RESPIRATORY PROTECTION"(NIOSH).

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR: Odorless off white crystalline powder.

BOILING POINT: Not applicable

MELTING POINT: Not available

VAPOR PRESSURE: Not applicable

SPECIFIC GRAVITY: 1.05-1.10 ; (Bulk density)

VAPOR DENSITY: Not applicable

% VOLATILE (BY WT): 7-8

pH: 5-7; as solution

SATURATION IN AIR (% BY VOL): Not applicable

EVAPORATION RATE: Not applicable

SOLUBILITY IN WATER: Limited by viscosity

VOLATILE ORGANIC CONTENT: Not applicable

10. STABILITY AND REACTIVITY

STABILITY: Stable

CONDITIONS TO AVOID: Avoid contact with alkaline materials which will degrade the polymer.

POLYMERIZATION: Will Not Occur
CONDITIONS TO AVOID: None known

INCOMPATIBLE MATERIALS: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS: carbon dioxide; carbon monoxide; ammonia; oxides of nitrogen; hydrogen chloride

11. TOXICOLOGICAL INFORMATION

Toxicological information for the product is found under Section 3. HAZARDS IDENTIFICATION. Toxicological information on the OSHA regulated components of this product is as follows:

Adipic acid has an acute oral LD50 (rat) value of greater than 11,000 mg/kg. Direct eye contact caused moderate irritation in rabbits. Contact with skin can cause drying, cracking, and mild irritation. Inhalation of vapor can irritate mucous membranes of the upper respiratory tract, causing coughing and sneezing. Rare instances of immediate hypersensitive asthmatic reactions have been reported.

California Proposition 65 Warning (applicable in California only) - This product contains (a) chemical(s) known to the State of California to cause cancer.

12. ECOLOGICAL INFORMATION

LC50 determinations without added suspended solids overestimate the true toxicity of cationic polymers. Suspended solids and other dissolved organic materials like humic acid are present in natural waters and reduce the effective concentration of the polymer and thereby its toxicity.

Based on the results of a 5-Day Biodegradability assay, the degradation potential of this product is negligible. Chemical Oxygen Demand (COD): 1.02 mg O2/mg.

This material is not readily biodegradable.

LC50

TROUT 96 HOUR: 1.73 mg/L

OCTANOL/H_2O PARTITION COEF.: Not applicable

13. DISPOSAL CONSIDERATIONS

The information on RCRA waste classification and disposal methodology provided below applies only to the Kroff product, as supplied. If the material has been altered or contaminated, or it has exceeded its recommended shelf life, the guidance may be inapplicable. Hazardous waste classification under federal regulations (40 CFR Part 261 et seq) is dependent upon whether a material is a RCRA "listed hazardous waste" or has any of the four RCRA "hazardous waste characteristics." Refer to 40 CFR Part 261.33 to determine if a given material to be disposed of is a RCRA "listed hazardous waste"; information contained in Section 15 of this MSDS is not intended to indicate if the product is a "listed hazardous waste." RCRA Hazardous Waste Characteristics: There are four characteristics defined in 40 CFR Section 261.21-61.24: Ignitability, Corrosivity, Reactivity, and Toxicity. To determine Ignitability, see Section 5 of this MSDS (flash point). For Corrosivity, see Sections 9 and 14 (pH and DOT corrosivity). For Reactivity, see Section 10 (incompatible materials). For Toxicity, see Section 2 (composition). Federal regulations are subject to change. State and local requirements, which may differ from or be more stringent than the federal regulations, may also apply to the classification of the material if it is to be disposed. Kroff encourages the recycle, recovery and reuse of materials, where permitted, as an alternate to disposal as a waste. Kroff recommends that organic materials classified as RCRA hazardous wastes be disposed of by thermal treatment or incineration at EPA approved facilities. Kroff has provided the foregoing for information only; the person generating the waste is responsible for determining the waste classification and disposal method.

14. TRANSPORT INFORMATION

This section provides basic shipping classification information. Refer to appropriate transportation regulations for specific requirements.

	D.O.T. SHIPPING INFORMATION	IMO SHIPPING INFORMATION
SHIPPING NAME:	NOT APPLICABLE/NOT REGULATED	NOT APPLICABLE/NOT REGULATED
HAZARD CLASS/ PACKING GROUP:	Not Applicable	Not Applicable
UN NUMBER:	Not Applicable	Not Applicable
IMDG PAGE:	Not Applicable	Not Applicable
D.O.T. HAZARDOUS SUBSTANCES:	(PRODUCT REPORTABLE QUANTITY) Not Applicable	Not Applicable
TRANSPORT LABEL REQUIRED:	None Required	None Required

	ICAO/IATA	TRANSPORT CANADA
SHIPPING NAME:	NOT APPLICABLE/NOT REGULATED	NOT APPLICABLE/NOT REGULATED
HAZARD CLASS:	Not Applicable	Not Applicable
SUBSIDIARY CLASS:	Not Applicable	Not Applicable
UN / ID NUMBER:	Not Applicable	Not Applicable
PACKING GROUP:	Not Applicable	Not Applicable
TRANSPORT LABEL REQUIRED:	None Required	None Required
PACKING INSTR:	PASSENGER Not Applicable CARGO Not Applicable	Not Applicable
MAX NET QTY:	PASSENGER Not Applicable CARGO Not Applicable	Not Applicable

ADDITIONAL TRANSPORT INFORMATION

TECHNICAL NAME (N.O.S.): Not Applicable

15. REGULATORY INFORMATION

INVENTORY INFORMATION

US TSCA: All components of this product are included on the TSCA Inventory in compliance with the Toxic Substances Control Act, 15 U. S. C. 2601 et. seq.

CANADA DSL: Components of this product have been reported to Environment Canada in accordance with subsection 25 of the Canadian Environmental Protection Act and are included on the Domestic Substances List.

EEC EINECS: All components of this product are included in the European Inventory of Existing Chemical Substances (EINECS) or are polymers of which the components are in EINECS, in compliance with Council Directive 67/548/EEC and its amendments.

OTHER ENVIRONMENTAL INFORMATION

The following components of this product may be subject to reporting requirements pursuant to Section 313 of CERCLA (40 CFR 372), Section 12(b) of TSCA, or may be subject to release reporting requirements (40 CFR 307, 40 CFR 311, etc.) See Section 13 for information on waste classification and waste disposal of this product.

COMPONENT	CAS. NO.	%	TPQ(lbs)	RQ(lbs)	S313	TSCA 12B
This product does not contain any components regulated under these sections of the EPA						

PRODUCT CLASSIFICATION UNDER SECTION 311 OF SARA
Not Applicable under SARA TITLE III

16. OTHER INFORMATION

NFPA HAZARD RATING (National Fire Protection Association)

Fire 1
Health 0 0 Reactivity
— Special

FIRE: Materials that must be preheated before ignition can occur.
HEALTH: Materials that under emergency conditions, would offer no hazard beyond that of ordinary combustible materials.
REACTIVITY: Materials that in themselves are normally stable, even under fire exposure conditions.

REASON FOR ISSUE:

Revised Sections 4 and 7

KROFF Chemical Company, Inc.

Suite 450
One North Shore Center
12 Federal Street
Pittsburgh, PA 15212

KR-F2311

MATERIAL SAFETY DATA SHEET

FOR EMERGENCY ASSISTANCE
CALL: 1-800-424-9300 CHEMTREC

FOR ADDITIONAL INFORMATION
CALL: 412-321-9800

SECTION 1: PRODUCT IDENTIFICATION

PRODUCT NAME: **KR-F2311**
CHEMICAL DESCRIPTION: Anionic polyacrylamide in water-in-oil emulsion
PRODUCT CLASS: Polymers
VERSION: 3-18-11

SECTION 2: INFORMATION ON INGREDIENTS

Chemical Name	CAS #	Weight %	OSHA PEL	ACGIH TLV
Petroleum distillate, hydrotreated, light	64742-47-8	20.5-22.5	TWA: 500 ppm*	None established
C_{12-14} alcohol, ethoxylated	68439-50-9	0-2.7	None established	None established
Alcohols (C_{10-16}), ethoxylated	68002-97-1	0-2.7	None established	None established
Alcohols (C_{12-16}), ethoxylated	68551-12-2	0-2.7	None established	None established

*Supplier PEL: 1,200 mg/m^3, 165 ppm

SECTION 3: HAZARDS IDENTIFICATION

**********EMERGENCY OVERVIEW **********

Grayish-white emulsion.
WARNING!
May cause mild eye irritation.
May cause moderate skin irritation.
Product spills will make floors extremely slippery.

****

PRIMARY ROUTES OF ENTRY: Eye contact and skin contact

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Conditions of the skin may be aggravated by overexposure to this product.

POTENTIAL HEALTH EFFECTS:

EYE CONTACT: Contact may cause mild eye irritation.

SKINCONTACT: Contact may cause moderate skin irritation.

INGESTION: This product would be expected to have low toxicity by ingestion.

INHALATION: This product is not expected to present an inhalation hazard under normal conditions of handling and use.

SUBCHRONIC, CHRONIC: This product contains petroleum distillates, hydrotreated, light. Prolonged or repeated skin contact with this component tends to remove skin oils, possibly leading to irritation and dermatitis. For more information on the toxicological effects of the product components, see Section 11 (Toxicological Information).

CARCINOGENICITY:
NTP: No ingredients listed in this section
IARC: No ingredients listed in this section
OSHA: No ingredients listed in this section

SECTION 4: FIRST AID MEASURES

EYE CONTACT: Immediately flush eyes with plenty of water for at least 15 minutes, lifting the upper and lower eyelids occasionally to ensure complete rinsing. Get medical attention if irritation occurs.

SKIN CONTACT: Remove contaminated clothing and shoes without delay. Wash immediately with plenty of water. Do not reuse contaminated clothing without laundering. Get medical attention if pain or irritation persists after washing or if signs and symptoms of overexposure appear.

INGESTION: If swallowed, call a physician immediately. Only induce vomiting at the instruction of a physician. Never give anything by mouth to an unconscious person.

INHALATION: Remove victim to fresh air. If breathing stops, give artificial respiration. If breathing is difficult, have a trained medical person give oxygen. Obtain medical attention if symptoms occur.

SECTION 5: FIRE-FIGHTING MEASURES

FLASH POINT: 200 °F (93.3 °C)

LOWER FLAMMABLE LIMIT: Not available

UPPER FLAMMABLE LIMIT: Not available

AUTO-IGNITION TEMPERATURE: Not available

EXTINGUISHING MEDIA: Water stream may be ineffective. Use water spray, alcohol foam, carbon dioxide, or dry chemical to extinguish fires.

FIRE-FIGHTING INSTRUCTIONS: Exercise caution when fighting any chemical fire. Wear a self-contained breathing apparatus and full firefighting protective clothing. Keep fire-exposed containers cool by spraying with water.

FIRE & EXPLOSION HAZARDS: Product emits toxic gases under fire conditions.

DECOMPOSITION PRODUCTS: Thermal decomposition or combustion may produce carbon monoxide, carbon dioxide, ammonia, and nitrogen oxides.

NFPA RATINGS: Health = 2 Flammability = 1 Reactivity = 0 Special Hazard = None

Hazard rating scale: 0=Minimal; 1=Slight; 2=Moderate; 3=Serious; 4=Severe

SECTION 6: ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS: Where the exposure level is NOT known, wear an approved, positive pressure, self-contained respirator. Where the exposure level is known, wear an approved respirator suitable for the level of exposure. In addition to the protective clothing/equipment in Section 8 (Exposure Controls/Personal Protection), wear impermeable boots.

WARNING: Spilled product may create a slip and fall hazard.

METHODS FOR CLEANING UP: Spilled material should be absorbed onto an inert material and scooped up. Flush spill area with water. If slipperiness remains, apply more dry-sweeping compound.

DISPOSAL: Dispose of used absorbent according to federal, state, and local regulations.

SECTION 7: HANDLING AND STORAGE

HANDLING:
Avoid contact with eyes, skin, and clothing.
Avoid breathing product vapor or mist.
Use with adequate ventilation.
Wash thoroughly after handling.
Do not take internally.

Keep containers closed when not in use.
Ensure that containers are properly labeled.
Since empty containers retain product residues (vapors, liquid), observe all warnings and precautions listed for the product.
Have emergency equipment (for fires, spills, leaks, etc.) readily available

STORAGE: In order to maintain product integrity, store at room temperature in a dry, well-ventilated area away from incompatibles.

INCOMPATIBLE MATERIALS OF CONSTRUCTION: To avoid product degradation and equipment corrosion, do not use iron, copper, or aluminum containers or equipment.

NOTE: Flashpoint determinations on materials of this type are required by certain regulations and scientific standards to be performed using a Pensky-Martens Type Closed Cup Method. This method indicates a flashpoint greater than 200 °F (93.3 °C). Although there was no flashpoint detected below 200 °F (93.3 °C), by the Pensky-Martens Closed Tester Method, some flammable vapors were evolved during the test as evidenced by the enlargement of the test flame; therefore, caution should be exercised during storage and handling.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

EYE/FACE PROTECTION: Chemical splash goggles or face shield

SKIN PROTECTION: Chemical resistant gloves and protective clothing as appropriate to prevent skin contact.

RESPIRATORY PROTECTION: If airborne concentrations exceed published exposure limits, use a NIOSH approved respirator in accordance with OSHA respiratory protection requirements (29 CFR 1910.134)

ENGINEERING CONTROLS: A system of local and/or general exhaust is recommended to keep employee exposures below irritating levels or airborne exposure limits, whichever is lower. Local exhaust ventilation if preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the latest edition of the ACGIH document *Industrial Ventilation, A Manual of Recommended Practices* for details.

WORK PRACTICES: An eye wash station and safety shower should be accessible in the immediate area of use.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

pH: 6.0-8.0 (upon dilution in water)

SPECIFIC GRAVITY: ~1.0 g/mL

SOLUBILITY IN WATER: Limited by viscosity

BOILING POINT: ~177-260 °F (~80.6-126.7 °C)

FREEZING POINT: -0.4 °F (-18 °C)

VAPOR PRESSURE: Not available

VAPOR DENSITY (air=1): Not available

% VOLATILE (by weight): 64-65

VOLATILE ORGANIC CONTENT: ~21.2% (g/g)

PARTITION COEFFICIENT (n-octanol/water): Not available

APPEARANCE AND ODOR: Greyish-white emulsion with an ammonia type odor

SECTION 10: STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur

CONDITIONS TO AVOID: Incompatibles

INCOMPATIBILE MATERIALS: Strong oxidizers. This material reacts slowly with iron, copper, and aluminum, resulting in corrosion and product degradation.

DECOMPOSITION PRODUCTS: Thermal decomposition or combustion may produce carbon monoxide, carbon dioxide, ammonia, and nitrogen oxides.

SECTION 11: TOXICOLOGICAL INFORMATION

ON PRODUCT/INGREDIENTS

Chemical Name	Oral LD50 (rat)	Dermal LD50 (rabbit)	Inhalation LC50 (rat)
Product	>5,000 mg/Kg estimated	>2,000 mg/Kg estimated	>20 mg/L-4H estimated
Petroleum distillates, hydrotreated light	>5,000 mg/Kg	>3,160 mg/Kg	Not available
Ethoxylated alcohols	1,600-2,500 mg/Kg	>2,000 mg/Kg	Not available

Toxicological information for the product is found under Section 3: HAZARDS IDENTIFICATION. Toxicological information on the regulated components of this product is as follows:

Petroleum distillates, hydrotreated light (CAS# 64742-47-8) has acute oral (rat) and dermal (rabbit) LD50 values of >5 g/Kg and >3.16 g/Kg, respectively. Prolonged or repeated skin contact tends to remove skin oils, possibly leading to irritation and dermatitis. Direct contact may cause eye irritation. Overexposure to high vapor concentrations, > ~700 ppm, are irritating to the eyes and respiratory tract and may cause headaches, dizziness, drowsiness, and other central nervous system effects, including death. Aspiration of minute amounts during ingestion or vomiting may cause mild to severe pulmonary injury and possibly death. In a 90-day oral gavage (rats) study at 100, 500, or 1,000 mg/Kg, no treatment-related mortalities were observed. There were no significant changes in body weights or food consumption in any dose groups. Increased liver weights were observed in male and female rats at 500 and 1,000 mg/Kg. Increased kidney weights were observed only in male rats at 500 and 1,000 mg/Kg. Testes weights were significantly elevated in male rats at 1,000 mg/Kg. Kidney effects, indicative of light hydrocarbon nephropathy, occurred in male rat kidneys at all dose levels. Histological findings of hepatocellular hypertrophy were seen in the livers of male rats at 1,000 mg/Kg and in female rats at 500 and 1,000 mg/Kg. All treatment-related effects were reversible within the 4-week recovery period. Observed kidney effects (including light hydrocarbon nephropathy and increased kidney weight) are a unique response by male rats to chronic hydrocarbon exposure, which the U.S. EPA has declared `not relevant to humans`. High-dose liver effects (including hepatocellular hypertrophy, or enlarged liver cells) are a direct consequence of the sustained high-fat `hydrocarbon diet`. The No Observed Adverse Effect Level (NOAEL) for this study was 1,000 mg/Kg.

Alcohols (C_{10-16}), ethoxylated toxicological properties have not been fully investigated. Based on similar materials, the acute oral (rat) LD50 is estimated to range from 1,600-2,500 mg/Kg and the acute dermal (rabbit) LD50 value is estimated to be >2,000 mg/Kg. Similar materials produced severe eye irritation and moderate skin irritation in studies with rabbits.

C_{12-14} alcohol ethoxylated toxicological properties have not been fully investigated. The oral LD50 (rat) of this mixture is expected to be consistent with the chemical family of ethoxylated alcohol surfactants, and range from 1,600-2,500 mg/Kg. The acute dermal (rabbit) LD50 value is estimated to be >2,000 mg/Kg. One expected component of this mixture was severely irritating to rabbit eyes (undiluted, Draize score = 60). This mixture is expected to be moderately irritating to skin, based on data reported for C_9-C_{11} 6EO: (primary irritation index) PII = 5.3/8.

Alcohols (C_{12-16}), ethoxylated toxicological properties have not been fully investigated. Based on similar materials, the acute oral (rat) LD50 is estimated to range from 1,600 – 2,500 mg/Kg and the acute dermal (rabbit) LD50 value is estimated to be >2,000 mg/Kg. Similar materials produced severe eye irritation and moderate skin irritation in studies with rabbits.

California Proposition 65 Warning (applicable in California only) - This product contains (a) chemical(s) known to the State of California to cause birth defects or other reproductive harm.

SECTION 12: ECOLOGICAL INFORMATION

ON INGREDIENTS (Polymer tested in environmentally relevant water):

Test	Aquatic Toxicity Data
OECD 202	48 hr EC50 (Water flea, Daphnia magna): >100 mg/L*
PARCOM	48 hr EC50 (Marine copepod, Acartia tonsa): 7.4 mg/L
PARCOM	10 day EC50 (Marine amphipod, Corophium volutator): 857 mg/L
OECD 203	96 hr LC50 (Zebra fish, Brachydanio rerio): >100 mg/L*
OECD 201	72 hr IC50 (Green algae, Selenastrum capricornutum): >100 mg/L*
ISO 10253	72 hr IC50 (Marine algae, Skeletonema costatum): ~27 mg/L

* structurally similar polymer

DEGRADATION:
Test: CO_2 Evolution: Modified Sturm (OECD 301B):
The large polymer size is incompatible with transport across biological membranes and diffusion; the bioconcentration factor is therefore considered to be zero. The polymeric ingredient is not readily biodegradable.

Test: Seawater Shake Flask Method (OECD 306):
Duration: 28 day
Procedure: Biodegradability in seawater
Result: 13%

SECTION 13: DISPOSAL

The information on RCRA waste classification and disposal methodology provided below applies only to the product, as supplied. If the material has been altered or contaminated, or it has exceeded its recommended shelf life, the guidance may be inapplicable. Hazardous waste classification under federal regulations (40 CFR Part 261 et seq) is dependent upon whether a material is a RCRA `listed hazardous waste` or has any of the four RCRA `hazardous waste characteristics.` Refer to 40 CFR Part 261.33 to determine if a given material to be disposed of is a RCRA `listed hazardous waste`; information contained in Section 15 of this MSDS is not intended to indicate if the product is a `listed hazardous waste'.

RCRA Hazardous Waste Characteristics: There are four characteristics defined in 40 CFR Section 261.21-261.24: Ignitability, Corrosivity, Reactivity, and Toxicity. To determine Ignitability, see Section 5 of this MSDS (Flash Point). For Corrosivity, see Sections 9 and 14 (pH and DOT corrosivity). For Reactivity, see Section 10 (Incompatible Materials). For Toxicity, see Section 2 (Composition). Federal regulations are subject to change. State and local requirements, which may differ from or be more stringent than the federal regulations, may also apply to the classification of the material if it is to be disposed.

The Company encourages the recycle, recovery and reuse of materials, where permitted, as an alternate to disposal as a waste. The Company recommends that organic materials classified as RCRA hazardous wastes be disposed of by thermal treatment or incineration at EPA approved facilities. The Company has provided the foregoing for information only; the person generating the waste is responsible for determining the waste classification and disposal method.

SECTION 14: TRANSPORTATION

DOT CLASSIFICATION:
ID Number: Not applicable
Proper Shipping Name: Not applicable
Class/Division: Not restricted
Packing Group: Not applicable
Label: None

SECTION 15: REGULATORY INFORMATION

OSHA Hazard Communication Status: Hazardous

TSCA: The ingredients of this product are listed on the Toxic Substances Control Act (TSCA) Chemical Substances Inventory.

CERCLA: EPA Hazardous Substances (40 CFR 302):

Chemical Name	CERCLA Reportable Quantity (RQ)
None	Not applicable

SARA TITLE III (Sections 302, 311, 312, and 313):

Section 302 Extremely Hazardous Substances (40 CFR 355):

Chemical Name	CAS#	RQ	TPQ
None			

Section 311 and 312 Health and Physical Hazards:

Immediate	Delayed	Fire	Pressure	Reactivity
yes	no	no	no	no

Section 313 Toxic Chemicals (40 CFR 372):

Chemical Name	CAS Number	Percent by Weight
None		

SECTION 16: OTHER INFORMATION

HMIS RATINGS: Health = 2 Flammability = 1 Reactivity = 0

Hazard Rating Scale: 0=Minimal; 1=Slight; 2=Moderate; 3=Serious; 4=Severe

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The preceding information is accurate to the best of our knowledge. However, since data, safety standards, and government regulations are subject to change, and the conditions of handling and use or misuse are beyond our control, Kroff Chemical Company, Inc. makes no warranty, either express or implied, with respect to the completeness or continuing accuracy of the information contained herein, and disclaims all liability for reliance thereon. User should satisfy himself that he has all current data relevant to his particular use.

Date Modified:

10/19/2010
2/25/2011

Brenntag Northeast, Inc.

MSDS: 10112
Print Date: 02/10/2012
Revision Date: 02/10/2012

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name:	**ULTRAFLOC EIBI**
Synonyms:	None
Product Description:	Anionic polyacrylamide in water-in-oil emulsion
Chemical Family:	Anionic polyacrylamide
Molecular Formula:	Mixture
Intended/Recommended **Use:**	Water treating chemical

BRENNTAG NORTHEAST, INC., 81 WEST HULLER LANE, READING, PA 19605, USA
For Product Information call 610-926-4151
EMERGENCY PHONE: For emergency involving spill, leak, fire, exposure or accident call CHEMTREC: 1-800-424-9300.
Outside the USA and Canada call 1-703-527-3887.

2. COMPOSITION/INFORMATION ON INGREDIENTS

OSHA REGULATED COMPONENTS

Component I CAS No.	% (w/w)	**OSHA (PEL): ACGIH (TLV) Carcinogen**
Petroleum distillate hydrotreated light 64742-47-8	22 - 25	No OSHA limits; Recommend: TWA 1200 mg/m^3 (165 ppm) for vapor. (hud) -

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

APPEARANCE AND ODOR:

Color:	colorless to light straw
Appearance:	Clear to slightly hazy liquid.
Odor:	petroleum distillate

STATEMENTS OF HAZARD:

WARNING! CAUSES SKIN IRRITATION MAY CAUSE EYE IRRITATION

POTENTIAL HEALTH EFFECTS

EFFECTS OF EXPOSURE:

Direct contact with this material can cause moderate skin and mild eye irritation. Refer to Section 11 for toxicology information on the regulated components of this product. Overexposure to vapor may cause respiratory tract irritation and central nervous system depression. The estimated acute oral (rat) LD50, acute dermal (rabbit) LD50 and 4-hour inhalation (rat) LC50 values for this material are >5,000 mg/kg, >2,000 mg/kg and >20 mg/L, respectively.

4. FIRST AID MEASURES

Ingestion:
Only induce vomiting at the instruction of a physician. Never give anything by mouth to an unconscious person. If swallowed, call a physician immediately.

Skin Contact:
Do not reuse contaminated clothing without laundering. Wash immediately with plenty of water. Remove contaminated clothing and shoes without delay. Get medical attention if pain or irritation persists after washing or if signs and symptoms of overexposure appear.

Eye Contact:
Rinse immediately with plenty of water for at least 15 minutes.

Inhalation:
Remove to fresh air. If breathing is difficult, give oxygen. Obtain medical advice if there are persistent symptoms.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media:
Use water spray or fog, carbon dioxide or dry chemical.

Protective Equipment:
Wear full firefighting protective clothing. See MSDS Section 8 (Exposure Controls/Personal Protection). Firefighters, and others exposed, wear self-contained breathing apparatus.

Special Hazards:
Keep containers cool by spraying with water if exposed to fire.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions:
Where exposure level is not known, wear approved, positive pressure, self-contained respirator. Where exposure level is known, wear approved respirator suitable for level of exposure. In addition to the protective clothing/equipment in Section 8 (Exposure Controls/Personal Protection), wear impermeable boots.

Methods For Cleaning Up:
Spilled material should be absorbed onto an inert material and scooped up. Flush spill area with water. Product may cause a slip hazard. If slipperiness remains apply more dry-sweeping compound.

7. HANDLING AND STORAGE

HANDLING

Precautionary Measures: Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

Special Handling Statements: None

STORAGE
To avoid product degradation and equipment corrosion, do not use iron, copper or aluminum containers or equipment. Flashpoint determinations on materials of this type are required by certain regulations and scientific standards to be performed using a Pensky-Martens type closed cup test method. This method indicates a flash point greater than 93.3 C (200 F). Although there was no flashpoint detected below 93.3 C (200 F) by the Pensky-Martens Closed Tester method, some flammable vapors were evolved during the test as evidenced by the enlargement of the test flame; therefore, caution should be exercised during storage and handling.

Storage Temperature: Store at < 32 °C 90 °F
Reason: Integrity.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Measures:
Where this material is not used in a closed system, good enclosure and local exhaust ventilation should be provided to control exposure.

Respiratory Protection:
Where exposures are below the established exposure limit, no respiratory protection is required. Where exposures exceed the established exposure limit, use respiratory protection recommended for the material and level of exposure.

Eye Protection:
Eyewash equipment and safety shower should be provided in areas of potential exposure. Wear eye/face protection such as chemical splash proof goggles or face shield.

Skin Protection:
Wear impermeable gloves and suitable protective clothing. Avoid skin contact.

Additional Advice:
Before eating, drinking, or smoking, wash face and hands thoroughly with soap and water. Food, beverages, and tobacco products should not be carried, stored, or consumed where this material is in use.

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9. PHYSICAL AND CHEMICAL PROPERTIES

Color:	Colorless to light straw	
Appearance:	Clear to slightly hazy liquid.	
Odor:	Petroleum distillate	
Boiling Point:	Similar to water	
Melting Point:	Not available	
Vapor Pressure:	Not available	
Specific Gravity/Density:	1.03 - 1.06	
Vapor Density:	Similar to water	
Percent Volatile (% by wt.):	56 - 62	
pH:	6 - 8	
Saturation In Air (% By Vol.):	Not available	
Evaporation Rate:	Not available	
Solubility In Water:	Limited by viscosity	
Volatile Organic Content:	-23 - 27 % (g/g)	
Flash Point:	>102 °C 215 °F	Pensky-Martens Closed Cup
Flammable Limits (% By Vol):	Not available	
Autoignition Temperature:	Not available	
Decomposition Temperature:	Not available	
Partition coefficient (n-octanol/water):	Not available	
Odor Threshold:	Not available	

10. STABILITY AND REACTIVITY

Stability:	Stable
Conditions To Avoid:	None known
Polymerization:	Will not occur
Conditions To Avoid:	None known
Materials To Avoid:	No specific incompatibility
Hazardous Decomposition Products:	Ammonia (NH3) Carbon dioxide Carbon monoxide (CO) oxides of nitrogen oxides of sulfur (includes sulfur di and tri oxides)

11. TOXICOLOGICAL INFORMATION

Toxicological information for the product is found under Section 3. HAZARDS IDENTIFICATION.
Toxicological information on the regulated components of this product is as follows:

Ethoxylated oleyl amine toxicological properties have not been fully investigated. It is reported to have an oral (rat) LD50 value of 1500 mg/kg. It is also reported to be severely irritating to eyes and moderately irritating to the skin.

Petroleum distillates, hydrotreated light (CAS# 64742-47-8) has acute oral (rat) and dermal (rabbit) LD50 values of >5 g/kg and >3.16 g/kg, respectively. Prolonged or repeated skin contact tends to remove skin oils, possibly leading to irritation and dermatitis. Direct contact may cause eye irritation. Overexposure to high vapor concentrations, >-700 ppm, are irritating to the eyes and respiratory tract and may cause headaches, dizziness, drowsiness, and other central nervous system effects, including death. Aspiration of minute amounts during ingestion or vomiting may cause mild to severe pulmonary injury and possibly death. In a 90-day oral gavage (rats) study at 100, 500, or 1000 mg/kg, no treatment-related mortalities were observed. There were no significant changes in body weights or food consumption in any dose groups. Increased liver weights were observed in male and female rats a 500 and 1000 mg/kg. Increased kidney weights were observed only in male rats at 500 and 1000 mg/kg. Testes weights were significantly elevated in male rats at 1000 mg/kg. Kidney effects, indicative of light hydrocarbon nephropathy, occurred in male rat kidneys at all dose levels. Histological findings of hepatocellular hypertrophy were seen in the livers of male rats at 1000 mg/kg and in female rats at 500 and 1000 mg/kg. All treatment-related effects were reversible within the 4-week recovery period. Observed kidney effects (including light hydrocarbon nephropathy and increased kidney weight) are a unique response by male rats to chronic hydrocarbon exposure, which the U.S. EPA has declared 'not relevant to humans'. High-dose liver effects (including hepatocellular hypertrophy, or enlarged liver cells) are a direct consequence of the sustained high-fat 'hydrocarbon diet'. The No Observed Adverse Effect Level (NOAEL) for this study was 1000 mg/kg.

Alcohols (C12-16), ethoxylated toxicological properties have not been fully investigated. Based on similar materials, the acute oral (rat) LD50 is estimated to range from 1600 - 2500 mg/kg and the acute dermal (rabbit) LD50 value is estimated to be >2000 mg/kg. Similar materials produced severe eye irritation and moderate skin irritation in studies with rabbits.

C12-14 alcohol ethoxylated toxicological properties have not been fully investigated. The oral LD50 (rat) of this mixture is expected to be consistent with the chemical family of ethoxylated alcohol surfactants, and range from 1.6 to 2.5 g/kg. The acute dermal (rabbit) LD50 value is estimated to be > 2.0 g/kg. One expected component of this mixture was severely irritating to rabbit eyes (undiluted, Draize score = 60). This mixture is expected to be moderately irritating to skin, based on data reported for C9-C1 1 6E0: (primary irritation index) PII = 5.3/8.

Alcohols (Cl 0-15), ethoxylated toxicological properties have not been fully investigated. Based on similar materials, the acute oral (rat) LD50 is estimated to range from 1600 - 2500 mg/kg and the acute dermal (rabbit) LD50 value is estimated to be >2000 mg/kg. Similar materials produced severe eye irritation and moderate skin irritation in studies with rabbits.

11. TOXICOLOGICAL INFORMATION

California Proposition 65 Warning (applicable in California only) - This product contains (a) chemical(s) known to the State of California to cause cancer and birth defects or other reproductive harm.

12. ECOLOGICAL INFORMATION

All ecological information provided was conducted on a structurally similar product. This material is not classified as dangerous for the environment.
Acute toxicity tests conducted on the polymer using environmentally representative water gave the following results:

ALGAE TEST RESULTS

Test: Growth Inhibition (OECD 201)
Duration: 72 hr
Species: Green Algae (Selenastrum capricornutum)
>100 mg/l IC50

FISH TEST RESULTS

Test: Acute toxicity, freshwater (OECD 203)
Duration: 96 hr.
Species: Zebra Fish (Brachydanio rerio)
>100 mg/l LC50

INVERTEBRATE TEST RESULTS

Test: Acute immobilization (OECD 202)
Duration: 48 hr
Species: Water Flea (Daphnia magna)
>100 mg/l EC50

DEGRADATION

Test: CO2 Evolution: Modified Sturm (OECD 301B)
The large polymer size is incompatible with transport across biological membranes and diffusion; the bioconcentration factor is therefore considered to be zero. The polymeric ingredient is not readily biodegradable.

13. DISPOSAL CONSIDERATIONS

The information on RCRA waste classification and disposal methodology provided below applies only to the product, as supplied. If the material has been altered or contaminated, or it has exceeded its recommended shelf life, the guidance may be inapplicable. Hazardous waste classification under federal regulations (40 CFR Part 261 et seq) is dependent upon whether a material is a RCRA 'listed hazardous waste' or has any of the four RCRA 'hazardous waste characteristics.' Refer to 40 CFR Part 261.33 to determine if a given material to be disposed of is a RCRA 'listed hazardous waste; information contained in Section 15 of this MSDS is not intended to indicate if the product is a 'listed hazardous waste. 'RCRA Hazardous Waste Characteristics: There are four characteristics defined in 40 CFR Section 261.21-61.24: Ignitability, Corrosivity, Reactivity, and Toxicity. To determine Ignitability, see Section 9 of this MSDS (flash point). For Corrosivity, see Sections 9 and 14 (pH and DOT corrosivity). For Reactivity, see Section 10 (Incompatible materials). For Toxicity, see Section 2 (composition). Federal regulations are subject to change. State and local requirements, which may differ from or be more stringent than the federal regulations, may also apply to the classification of the material if it is to be disposed. Brenntag Northeast encourages the recycle, recovery and reuse of materials, where permitted, as an alternate to disposal as a waste. Brenntag Northeast recommends that organic materials classified as RCRA hazardous wastes be disposed of by thermal treatment or incineration at EPA approved facilities. Brenntag Northeast has provided the foregoing for information only; the person generating the waste is responsible for determining the waste classification and disposal method.

14. TRANSPORT INFORMATION

This section provides basic shipping classification information. Refer to appropriate transportation regulations for specific requirements.

US DOT

Proper Shipping Name: Environmentally hazardous substance, liquid, n.o.s.
Hazard Class: 9
Packing Group: III
UN/ID Number: UN3082
Transport Label Required: Miscellaneous
Technical Name (N.O.S.): Contains ammonium acetate
Hazardous Substances:

Component I CAS No.	Reportable Quantity of Product (lbs)
Ammonium acetate	50000

Comments: Hazardous Substances I Reportable Quantities - DOT requirements specific to Hazardous Substances only apply if the quantity in one package equals or exceeds the reportable quantity.

TRANSPORT CANADA

Proper Shipping Name: Not applicable/Not regulated

ICAO I IATA

Proper Shipping Name: Not applicable/Not regulated
Packing Instructions/Maximum Net Quantity Per Package:
Passenger Aircraft: -
Cargo Aircraft: -

IMO

Proper Shipping Name: Not applicable/Not regulated

15. REGULATORY INFORMATION

15. REGULATORY INFORMATION

INVENTORY INFORMATION

United States (USA): All components of this product are included on the TSCA Chemical Inventory or are not required to be listed on the TSCA Chemical Inventory.

Canada: All components of this product are included on the Domestic Substances List (DSL) or are not required to be listed on the DSL.

European Union (EU): All components of this product are included in the European Inventory of Existing Chemical Substances (EINECS) or the 'No Longer Polymer' list in compliance with Council Directive 67/548/EEC and its amendments.

Australia: All components of this product are included in the Australian Inventory of Chemical Substances (AICS) or are not required to be listed on AICS.

China: All components of this product are NOT included on the Chinese inventory. The Chinese State Environmental Protection Administration (SEPA) has granted a Polymer Exemption for the non-listed substance to Brenntag Northeast and the product can be imported into China ONLY under specific conditions.

Japan: All components of this product are NOT included on the Japanese (ENCS) inventory.

Korea: All components of this product are NOT included on the Korean (ECL) inventory.

Philippines: All components of this product are NOT included on the Philippine (PICCS) inventory.

OTHER ENVIRONMENTAL INFORMATION

The following components of this product may be subject to reporting requirements pursuant to Section 313 of CERCLA (40 CFR 372), Section 12(b) of TSCA, or may be subject to release reporting requirements (40 CFR 307, 40 CFR 311, etc.) See Section 13 for information on waste classification and waste disposal of this product.

Component / CAS No.	%	TPQ (lbs)	RQ(lbs)	S313	TSCA 12B
Ammonium acetate 631-61-8	2.0 - 10.0	None	5000	No*	No

While this product does not contain any component CAS numbers directly listed under SARA 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA), it does contain ammonia chemical(s) that may be sources per EPA of aqueous ammonia, a reportable chemical. For our customer's use evaluation for reporting purposes we have listed these above with their quantities when present at >1%. Please refer to EPA Guidance for Reporting Aqueous Ammonia, EPA 745-R-00-005.

PRODUCT HAZARD CLASSIFICATION UNDER SECTION 311 OF SARA •

Acute

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16. OTHER INFORMATION

NFPA Hazard Rating (National Fire Protection Association)

Health: 2 - Materials that, under emergency conditions, can cause temporary incapacitation or residual injury.

Fire: 1 - Materials that must be preheated before ignition can occur.

Reactivity: 0 - Materials that in themselves are normally stable, even under fire exposure conditions.

Reasons For Issue: Revised Section 2