

Acetone Material Safety Data Sheet (MSDS)

VII. First Aid Procedures

Inhalation	Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen and continue to monitor. Get immediate medical attention.
Eye Contact	Flush eye(s) with water for 15 minutes. Get medical attention.
Skin Contact	Immediately flush skin with plenty of water. Remove clothing. Get medical attention immediately. Wash clothes separately before reuse.
Ingestion	If swallowed, DO NOT INDUCE VOMITING. Give victim a glass of water or milk. Call a physician or poison control center immediately. Never give anything by mouth to an unconscious person. Get medical attention immediately. See Section X for additional first aid information.

VIII. Preventive Measures

Consult with a Health and Safety Professional for Specific Selections

A. PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection	Concentrations in air determines the level of respiratory protection needed. Use only NIOSH certified respiratory equipment. Half-mask air purifying respirator with organic vapor cartridges is acceptable for exposure to ten (10) times the exposure limit. Full-face air purifying respirator with organic vapor cartridges is acceptable for exposures to fifty (50) times the exposure limit. Exposure should not exceed the cartridge limit of 1000 ppm. Protection by air purifying respirators is limited. Use a positive pressure-demand full-face supplied air respirator or SCBA for exposures greater than fifty (50) times the exposure limit. If exposure is above the IDLH (Immediately Dangerous to Life and Health) or there is a possibility of an uncontrolled release, or exposure levels are unknown, then use a positive pressure-demand full-face air respirator with escape bottle or SCBA. Wear a NIOSH-approved (or equivalent) full-face piece airline respirator in the positive pressure mode with emergency escape provisions.
Eye/Face Protection	Splash proof chemical goggles or full-face shield recommended to protect against splash of product.
Clothing/Gloves	The glove(s) list below may provide protection against permeation. Gloves or other chemically resistant materials may not provide adequate protection. Protective gloves are recommended to protect against contact with product. Neoprene, Natural rubber.
Engineering Controls	Use with adequate ventilation. Ventilation is normally required when handling or using this product to keep exposure to airborne contaminants below the exposure limit. Use explosion-proof ventilation equipment.
Other	The following materials are acceptable for use as protective clothing; Neoprene, Natural rubber. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Remove contaminated clothing and wash before reuse.
B. STORAGE AND HANDLING	
Storage Conditions	Keep away from heat, sparks and flame. Store in a cool, dry place. Keep container closed when not in use.
Handling Procedure	Use only in a well-ventilated area. Ground and bond containers when transferring material. Avoid breathing (dust, vapor, mist, gas). Avoid contact with this material. Wash thoroughly after handling. Do not use air pressure to unload containers.

Continued on Next Page

Acetone Material Safety Data Sheet (MSDS)

VIII. Preventive Measures (Continued)

C. ENVIRONMENTAL PROTECTION

Spill and Leak Procedure	Prevent ignition, stop leak and ventilate the area. Contain spilled liquid with sand or earth. DO NOT use combustible materials such as sawdust. Use appropriate personal protective equipment as stated in Section VIII of this MSDS. Advise the Environmental Protection Agency (EPA) and appropriate state agencies, if required. U.S. regulations require reporting spills of this material could that reach any surface waters. The toll-free number for the U.S. Coast Guard National Response Center is (800) 424-8802. After removal, flush contaminated area thoroughly with water.
Waste Disposal	Follow federal, state and local regulations. In Canada, follow federal, provincial and local regulations. This material is a RCRA hazardous waste. DO NOT flush material to drain or storm sewer. Contract to authorized disposal service.
Ecological Information	This product is not expected to persist in the environment.

D. TRANSPORTATION INFORMATION

Governing Body	U.S. DOT
Proper Shipping Name	Acetone
Mode	Ground
Hazard Class	3 (Flammable Liquid)
UN/NA Number	UN1090

IX. Regulatory Information/Classifications

Regulatory List	Component	CAS Number
ACGIH - Occupational Exposure Limits - Carcinogens	Acetone	67-64-1
ACGIH - Occupational Exposure Limits - TWAs	Acetone	67-64-1
ACGIH - Short Term Exposure Limits	Acetone	67-64-1
CAA (Clean Air Act) - HON Rule - SOCM Chemicals	Acetone	67-64-1
Canada - WHMIS - Ingredient Disclosure	Acetone	67-64-1
CERCLA/SARA - Hazardous Substances and their RQs	Acetone	67-64-1
CERCLA/SARA - Hazardous Substances and their RQs	Acetone	67-64-1
CERCLA/SARA - Hazardous Substances and their RQs	Acetone	67-64-1
Inventory - Australia - (AICS)	Acetone	67-64-1
Inventory - Canada - Domestic Substances List	Acetone	67-64-1
Inventory - China	Acetone	67-64-1
Inventory - European - EINECS Inventory	Acetone	67-64-1
Inventory - Japan - (ENCS)	Acetone	67-64-1
Inventory - Korea - Existing and Evaluated	Acetone	67-64-1
Inventory - Philippines - (PICCS)	Acetone	67-64-1
Inventory - TSCA - Section 8(b) Inventory	Acetone	67-64-1
Massachusetts - Right to Know List	Acetone	67-64-1
New Jersey - Department of Health RTK List	Acetone	67-64-1
New Jersey - Special Hazardous Substances	Acetone	67-64-1
OSHA - Final PELs - Time Weighted Averages	Acetone	67-64-1
Pennsylvania - Right to Know List	Acetone	67-64-1
TSCA - Section 12(b) - Export Notification	Acetone	67-64-1
TSCA - Section 4 - Chemical Test Rules	Acetone	67-64-1

Continued on Next Page

Acetone Material Safety Data Sheet (MSDS)

IX. Regulatory Information/Classifications - Continued

Regulatory Information/Classifications Title III, Sections 311, 312				
Acute	Chronic	Fire	Reactivity	Sudden Release of Pressure
YES	NO	YES	NO	NO

X. Other Information

If swallowed, acetone should be removed by emesis and/or gastric lavage. Mechanical assisted ventilation may be necessary. In severe cases, an initial period of hypoglycemia may require correction by intravenous solutions of dextrose. In some cases, an initial period of hyperglycemia has occurred during the recovery phase and has lasted for a few days. Treatment with insulin may be beneficial but should be used cautiously. Empty containers retain product residue (liquid and/or vapor) and can be dangerous. DO NOT pressurize, cut, weld, braze, solder, drill, grind or expose such containers to heat, flame, sparks, static electricity or other sources of ignition. They may explode and cause injury or death. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner or properly disposed of. This product is subject to the Chemical Division and Trafficking Act of 1988 and subject to specific record keeping requirements. WHMIS Classification: Class B, Division 2 – Flammable Liquids.

The information contained in this Material Safety Data Sheet is furnished without warranty of any kind, express or implied, and relates only to the specific material designated herein. User assumes responsibility for use or reliance on this data and assumes liability for damages related to the use or misuse of this product. The user is responsible for determining the conditions of safe use of this product and for complying with all Federal, State and Local governmental laws and regulations.

2) ACID-OUT Sodium Hydroxide Liquid

Acid-Out

MATERIAL SAFETY DATA SHEET

**Envirocycle/SurfChem
29655 Vacation Drive
Canyon Lake, Ca 92587**

**Tel: 909-244-1275
Fax: 909-244-1242**

2. COMPOSITION/INFORMATION ON INGREDIENTS

Material/CAS Number	Percent
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Sodium Hydroxide 1310-73-2	50
Wetting Agents	50

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

DANGER! Corrosive - Causes severe burns to eyes and skin.

Precautions: Do not get in eyes, on skin, or on clothing. Corrosive to skin. Even a small amount in the eye can cause blindness. Do not swallow. Avoid breathing dusts or mists from solutions. Use only with adequate ventilation. Ventilation must be sufficient to limit employee exposure to this product below permissible exposure limits. When making solutions or diluting, only add caustic soda slowly to

surface of cold water while stirring. Do not add to warm or hot water, a violent eruption or explosive reaction can result. Avoid contact with organic materials and concentrated acids - may cause violent reactions. Caustic soda reacts with magnesium, aluminum, zinc (galvanized), tin, chromium, brass and bronze, generating hydrogen which is explosive. Caustic soda may react with various sugars to generate carbon monoxide. Hazardous carbon monoxide gas can form upon contact with food and beverage products in enclosed vessels and can cause death. Wash thoroughly after handling. Do not eat, drink or smoke in work area. Liquid caustic soda is shipped hot (100-180 F). Avoid skin contact - can cause thermal burns.

4. FIRST AID MEASURES

INHALATION: Move person to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.

EYE/SKIN CONTACT: In case of contact, immediately flush eyes and skin with plenty of water (soap and water for skin) for at least 15 minutes, while removing contaminated clothing and shoes. Hold eyelids open during this flushing with water. Call a physician. If skin feels slippery, this product may still be present in sufficient quantities to cause rash or burn. Continue washing until slick skin feeling is gone. Thoroughly clean contaminated clothing and shoes before reuse or discard.

INGESTION: If swallowed, give at least 3-4 glasses of water or acidic beverages (tomato or orange juice, carbonated soft drinks). Do not induce vomiting. Do not give anything by mouth to an unconscious or convulsing person. Get medical attention.

NOTES TO PHYSICIAN: Treat symptomatically.

5. FIRE FIGHTING MEASURES

FLASH POINT: None

EXTINGUISHING MEDIA: Not applicable.

SPECIAL FIREFIGHTING PROCEDURES: Contact with some metals (particularly magnesium, aluminum and galvanized zinc) can rapidly generate hydrogen, which is explosive.

6. ACCIDENTAL RELEASE MEASURES

ACTION TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

2) ACID-OUT Sodium Hydroxide Liquid

Only trained personnel equipped with NIOSH approved, full piece combination dust/mist respirators should be permitted in area. For dry material, use appropriate methods, shovels, brooms, and vacuums to clean up the spill. If mixed with water, or likely to become mixed with water or any liquid, dike area to contain spill. Reclaim if possible. Or, dilute spill with large amounts of water then neutralize with dilute acid. Use vacuum truck to pick up neutralized material for proper disposal. Properly neutralized liquid residues (pH 8 to 9) may be disposed of in waste water treatment facilities which allow the discharge of neutral salt solutions. After all visible traces have been removed, flush area with large amounts of water.

7. HANDLING AND STORAGE**PRECAUTIONS TO BE TAKEN DURING HANDLING AND STORAGE:**

Wear appropriate personal protective equipment. Never touch eyes or face with hands or gloves that may be contaminated with this product. When making solutions or diluting, only add caustic soda slowly to surface of cold water while stirring. Do not add to warm or hot water, a violent eruption or explosive reaction can result. Avoid contact with organic materials and concentrated acids - may cause violent reactions. Caustic soda reacts with magnesium, aluminum, zinc (galvanized), tin, chromium, brass and bronze, generating hydrogen which is explosive. Caustic soda may react with various sugars to generate carbon monoxide. Hazardous carbon monoxide gas can form upon contact with food and beverage products in enclosed vessels and can cause death. Follow appropriate tank entry procedures (see ANSI Z177.1 - 1977). Do not enter a storage tank or container (truck or rail) that has contained this product, even if it appears empty. Liquid caustic soda is shipped hot (100-180 F). Avoid skin contact - can cause thermal burns.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Exposure Limits:**

8-hour Time Weighted Average (TWA); 15-minute Short-Term Exposure Limit (STEL)

OSHA: 2 mg/cu.m. Ceiling, 29 CFR 1910.1000 (Rev. 3/1/89).

RESPIRATORY PROTECTION: Use a NIOSH approved dust/mist filter respirator for all routine activities when exposure to dusts/mists exceed the permissible exposure limits. The respiratory use limitations made by NIOSH or the manufacturer must be observed. Respiratory protection programs must be in accordance with 29 CFR 1910.134.

VENTILATION: Use local exhaust sufficient to maintain dust/mist levels below permissible exposure limits.

EYE AND FACE PROTECTION: Close fitting chemical safety goggles with face shield.

2) ACID-OUT Sodium Hydroxide Liquid

PROTECTIVE GLOVES: Nitrile. Neoprene. Natural rubber.

OTHER PROTECTIVE EQUIPMENT: Rubber boots with safety toes, rubber aprons, PVC clothing, and plastic hard hats should be used when necessary to prevent skin contact. Personal protective clothing and use of equipment must be in accordance with 29 CFR 1910.132 (general requirements), .133 (eye and face protection), and .138 (hand protection).

9. PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT: 142°C
VAPOR DENSITY (Air=1): NA
SPECIFIC GRAVITY (Water=1): 1.530 @ 60/60°F
pH: Strongly basic
FREEZING/MELTING POINT: 5-11°C (41-51°F)
SOLUBILITY (wt-% in water): 347g/100g water @ 100°C
BULK DENSITY: 12.76 lbs/gal @ 60°F
VOLUME % VOLATILE: 50
VAPOR PRESSURE: 1 mm Hg
EVAPORATION RATE: NA
HEAT OF SOLUTION: Exothermic
PHYSICAL STATE: Liquid
ODOR: Odorless
COLOR: Water white to slightly turbid

10. STABILITY AND REACTIVITY

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur.

INCOMPATIBILITY (CONDITIONS/MATERIALS TO AVOID):

Contact with organic materials and concentrated acids may cause violent reactions. Contact with magnesium, aluminum, galvanized zinc, tin, chromium, brass and bronze generates explosive hydrogen. Reactions with various food sugars may form carbon monoxide.

HAZARDOUS THERMAL DECOMPOSITION/COMBUSTION PRODUCTS:

Carbon monoxide.

11. TOXICOLOGICAL INFORMATION

2) ACID-OUT Sodium Hydroxide Liquid

ACUTE INHALATION LC50: . . . Corrosive
SKIN IRRITATION: Corrosive.
EYE IRRITATION: Corrosive.
ACUTE ORAL LD50: LDLo (rabbit) 500 mg/kg. Corrosive.

CHRONIC EFFECTS/CARCINOGENICITY: This product is NOT listed as a carcinogen or suspected carcinogen by NTP, IARC, or OSHA.

MEDICAL CONDITIONS AGGRAVATED: None known.

EFFECTS OF OVEREXPOSURE:

ACUTE:

Eye/Skin: Causes severe burns to the eyes. Small quantities can result in permanent damage and/or loss of vision. For skin contact, corrosive action causes burns and frequently deep ulcerations with subsequent scarring. Prolonged contact destroys tissue. Dust or mist from solutions can cause irritant dermatitis.

Ingestion: Ingestion either in solid or liquid form can cause very serious damage to the mucous membranes or other tissues with which contact is made, and may be fatal.

Inhalation: Inhalation of dusts or mists can cause damage to the upper respiratory tract and to the lung tissue depending on severity of exposure. Effects can range from mild irritation of mucous membranes, severe pneumonitis and destruction of lung tissues.

CHRONIC: The effects of long-term, low level exposures to this product have not been determined. Safe handling of this material on a long-term basis should emphasize the avoidance of all effects from repetitive acute exposures.

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION:

Highly toxic to aquatic life. 240 ug/l (Bluegill) 96-hour TLM LC50

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD:

PPG recommends disposal of dry residues in an approved hazardous waste management facility or by neutralizing and disposing of according to local or permitted regulations. Care must be taken when using or disposing of chemical materials and/or their containers to prevent environmental

contamination. It is your duty to dispose of the chemical materials and/or their containers in accordance with the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act, as well as any other relevant Federal, State, or local laws/regulations regarding disposal.

14. TRANSPORT INFORMATION**USA DOT DESCRIPTION:**

Proper Shipping Name: Acid-Out
Hazard Class: 8 (Corrosive)
Identification Number: UN1824
Packing Group: II
Reportable Quantity: 1000 lbs/454 kg

15. REGULATORY INFORMATION

USA TSCA: This product is listed on the TSCA Inventory.

EUROPE EINECS: This product is listed on EINECS. (204-825-9)

CANADA DSL: This product is listed on the Canadian DSL.

AUSTRALIA AICS: This product is listed on AICS.

KOREA ECL: This product is listed on ECL. (2-1258)

JAPAN MITI (ENCS): This product is listed on MITI.

SARA TITLE III:

SARA (311, 312) Hazard Class: Acute Health Hazard, Reactive Hazard.

SARA (313) Chemicals: Not listed.

SARA Section 302: Not listed as an Extremely Hazardous Substance.

CERCLA HAZARDOUS SUBSTANCE: Listed in Table 302.4 of 40 CFR Part 302 as a hazardous substance with a reportable quantity of 1000 pounds. Releases to air, land or water which exceed the RQ must be reported to the National Response Center, 800-424-8802.

CANADA REGULATIONS (WHMIS): Class E - Corrosive Material. Sensitization to product: None known. Reproductive toxicity: None known. Odor threshold: No odor. Product use: Neutralization, chemical processing.

HAZARD RATING SYSTEM (HMIS/NFPA):

Health 3, Flammability 0, Reactivity 1

16. OTHER INFORMATION

Other Information:

2) ACID-OUT Sodium Hydroxide Liquid

NSF Drinking Water Treatment Chemicals Listing - PPG sodium hydroxide/caustic soda is certified for maximum use at 200 mg/l under ANSI/NSF Standard 60.

In case of emergency in Canada, contact PPG Canada, Inc., B.P.2010, Beauharnois, Quebec J6N 3C3, 514-429-3552, or Canutec 613-998-6888.

The following has been revised since the last issue of this MSDS:

Date. Edition. MSDS has been reformatted into 16 sections.

Previous revision date: 12/12/1996

Previous edition number: 015

NA = Not Available

Safety Data Sheet

Product Trade Name: ALU-BRAZE ADDITIVE AF
ID: ALBRAZAAF

*** Section 1 - Chemical Product and Company Identification ***

Product Trade Name: ALU-BRAZE ADDITIVE AF
Manufacturer Information
Heatbath Corporation
 P.O. Box 51048
 Indian Orchard, MA 01151-5048

Contact Phone: (413) 452-2000
 8:00 AM – 5:00 PM
CHEMTREC Emergency Phone: (800) 424-9300
 24 Hours
CHEMTREC International: (703) 527-3887
Product Description Aluminum dip brazing salt.

*** Section 2 - Hazards Identification ***

OSHA Hazard Communication Standard

This product is considered hazardous as defined by 29 CFR 1910.1200 (Hazard Communication).

Classification: Skin Irritation, Category 2 Eye Irritation, Category 2

Labeling:
Symbol: Exclamation Point

Signal Word: WARNING!

Hazard Statements: May be harmful if swallowed. Causes eye irritation. Causes skin irritation. Harmful if inhaled.

Precautionary Statements: Do not eat, drink, or use tobacco when using this product. Use only in a well-ventilated area. Do not breathe dust. Wash thoroughly after handling.

*** Section 3 - Composition / Information on Ingredients ***

HAZARDOUS INGREDIENT	CAS #	OSHA PEL(mg/m3)	ACGIH TLV(mg/m3)
ALUMINUM FLUORIDE	7784-18-1	2.5 (as F)	2.5 (as F)

*OSHA-PEL and ACGIH-TLV are 8-Hour TWA unless otherwise noted.
*per CFR 29, Part 1910.1200; ingredients listed only if deemed hazardous and comprise 1% or greater of the composition (0.1% or greater for carcinogens).
Component Related Regulatory Information:

This product may be regulated, have exposure limits or other information identified.

*** Section 4 - First Aid Measures ***

FIRST AID: **INHALATION:** Move victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention. **EYES:** Hold eyelids apart and flush with running water for at least 15 minutes. Get medical attention. **SKIN:** Wash affected area with soap and water. Remove contaminated clothing. If irritation or burns are present, get medical attention. **INGESTION:** If conscious, give plenty of water. Do not induce vomiting. Get immediate medical attention.

Special Treatment/Notes to Physician: None

Safety Data SheetProduct Trade Name: **ALU-BRAZE ADDITIVE AF**

ID: ALBRAZAAF

Respiratory Protection:

If ventilation is not sufficient to effectively prevent buildup of dust, mists or vapors, provide appropriate NIOSH/MSHA respiratory protection.

Personal Protective Equipment:

Provide eyewash fountains in areas where there is any possibility that workers could be exposed to the substance; this is irrespective of the recommendation involving the wearing of eye protection.
Provide facilities for quickly drenching the body within the immediate work area for emergency use where there is a possibility of exposure. Depending on the specific circumstances, a deluge shower, a sink or hose could be considered adequate.

***** Section 9 - Physical & Chemical Properties *****

Physical State:	Solid	Appearance/Odor:	odorless, white powder.
pH:	N.A.	Boiling Point:	N.A.
Specific Gravity:	N.E.	Melting Point:	1900 F
Evaporation Rate:	N.A.	Flash Point:	None.
Solubility Water:	complete.	Auto-ignition Temperature	N.E.
Vapor Density:	N.A.	Decomposition Point:	N.E.
Vapor Pressure:	N.A.	Flammability Limits - Low:	N.A.
Octanol-Water Coefficient:	N.E.	Hi:	N.A.

***** Section 10 - Chemical Stability & Reactivity Information *******Chemical Stability:**

STABLE

Conditions to Avoid:

None.

Incompatibility:

strong acids.

Decomposition Products:

hydrogen fluoride under thermal decomposition in the presence of moisture.

Hazardous Polymerization:

Will not occur.

***** Section 11 - Toxicological Information *******Emergency Overview:**

Contains FLUORIDES. May cause severe eye, skin and respiratory tract irritation. May cause eye and skin burns. Harmful if inhaled. Harmful and may be fatal if swallowed. Chronic exposure to Fluoride-Ion has been reported to result in tooth mottling, bone fluorosis and osteosclerosis in humans. Avoid contact with eyes, skin or clothing. Avoid inhalation of dust.

Routes of Exposure:

eye/skin contact, inhalation, ingestion.

Acute Toxicity:**A: General Product Information****Eye Contact:**

Causes eye irritation.

Skin Contact:

May cause skin irritation.

Safety Data SheetProduct Trade Name: **ALU-BRAZE ADDITIVE AF**

ID: ALBRAZAAF

***** Section 14 - Transportation Information *******US DOT Information**

ALUMINUM FLUORIDE MIXTURE HEAT TRANSFER OR BRAZINGSALTS, NON D.O.T. REGULATED

Marine Pollutant:

Not classified as a marine pollutant.

IMDG Classification

Not determined.

IATA Classification

Not determined

***** Section 15 - Regulatory Information *******US Federal Regulations****A: General Product Information**

No additional information available.

B: Component Analysis

This material may contain chemicals, requiring identification under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), or CERCLA (40 CFR 302.4).

HAZARDOUS COMPONENT	CERCLA RQ LBS.	SECT 302 TPQ LBS.	SECT 313* TOXIC	% by Wt.
No CERCLA or SARA 313 components	N.A.	N.A.	No	

SARA 311/312 HAZARDS:

Immediate (Acute)..... True
 Chronic* True
 Fire..... False
 Sudden Release-of-Pressure.. False
 Reactive False

State Regulations**A: General Product Information**

No information available.

Other Regulations**A: General Product Information**

All components are on the U.S. EPA TSCA Inventory List.

B: Component Analysis - Inventory

CAS #	Component	TSCA	DSL	EINECS
7784-18-1	ALUMINUM FLUORIDE	YES	YES	YES

***** Section 16 - Other Information *******HMIS Ratings:** Health: 2 Fire: 0 Reactivity: 0 Personal Protection: X

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

MSDS Change History:

2/18/02 Rev2

10/29/10 Rev3 Format update (all sections)

Information update (all sections)

MATERIAL SAFETY DATA SHEET

PARK METALLURGICAL CORPORATION
8074 Military Avenue
Detroit, Michigan 48204
(313) 895-7215

SECTION 1

Product Name: ALUMINUM BRAZING SALT 060 Rev.01
Formula Number: ALBRAZS060
Date: 11/03/97

SECTION 2 - HAZARDOUS INGREDIENTS

Table with 3 columns: CAS Registry No., Ingredient, TLV (Other). Rows include Sodium Fluoride (7681-49-4) and Aluminum Fluoride (7784-19-1) with TLV values of 2.5 mg/kg (F).

SECTION 3 - PHYSICAL DATA

Boiling Point: NA Percent Volatile: NA
Vapor Pressure: NA Evaporation Rate: NA
Water Solubility: APPREC. pH: NA
Specific Gravity: >1.0 Appearance: POWDER

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

Flash Point: NA Flammable Limits: NA
Extinguishing Media: NA
Special Fire Fighting Procedures: NA
Usual Fire and Explosion Hazards: NA



APR. 26, 2000 9:30AM HEALTH

SECTION 5 - HEALTH HAZARD DATA

Threshold Limit Value: SEE SCT II

Effects of Overexposure: SKIN - CONTACT MAY CAUSE FORMATION OF LARGE, OPEN, BOIL-LIKE SORES ESPECIALLY IN THE PRESENCE OF MOISTURE, IRRITATION - MAY PRODUCE CHRONIC POISONING. EYES - MODERATELY IRRITATING.

Emergency and First Aid Procedures: SKIN AND EYES - FLUSH WITH LARGE AMOUNTS OF WATER. OBTAIN MEDICAL ATTENTION. INHALATION - REMOVE PERSON FROM CONTAMINATED AREA. IF SYMPTOMS OF RESPIRATORY DISCOMFORT PERSIST OBTAIN MEDICAL ATTENTION IMMEDIATELY.

SECTION 6 - REACTIVITY DATA

Stability: YES

Incompatibility: NONE KNOWN

Hazardous Decomposition Products: HF

Hazardous Polymerization: NO

SECTION 7 - SPILL OR LEAK PROCEDURES

Spill Information: SWEEP UP AND RETURN TO DRUM FOR REUSE IF SALT HAS NOT BECOME WET.

Waste Disposal: THIS MATERIAL IS CLASSIFIED AS A NON-HAZARDOUS WASTE UNDER THE RESOURCE, CONSERVATION AND RECOVERY ACT.

SECTION 8 - SPECIAL PROTECTION INFORMATION

Respiratory Protection: NIOSH APPROVED DUST MASK IS RECOMMENDED FOR HANDLING DRY PRODUCT OR IF FUMES BECOME EXCESSIVE.

Ventilation: MECHANICAL VENTILATION IS RECOMMENDED TO COMPLY WITH THRESHOLD LIMIT VALUE STATED IN SECTION 2.

Protective Gloves: THERMAL PROTECTION RECOMMENDED.

Eye Protection: SAFETY GOGGLES RECOMMENDED.

Other Protective Equipment: THERMAL PROTECTION RECOMMENDED.

SECTION 9 - SPECIAL PRECAUTIONS

Handling and Storage Precautions: STORE IN CLOSED CONTAINERS TO AVOID MOISTURE PICK UP.

Other Precautions: DO NOT ADD WET SALT TO MOLTEN SALT BATH.

ENGELHARD

MATERIAL SAFETY DATA SHEET

Product: AMMONIUM BIFLUORIDE FLAKE SPEC 104

BR # 1
"SURF CHEM"

SECTION I SUPPLIER INFORMATION

Common Name : AMMONIUM ACID FLUORIDE
 Chemical Name : AMMONIUM BIFLUORIDE
 Formula : NH₄HF₂
 Product CAS # : 1341-49-7
 Supplier : ENGELHARD CORPORATION, ENGINEERED MATERIALS DIVISION,
 ADVANCED FINISHING TECHNOLOGIES GROUP
 Address : 29001 BOLON ROAD
 City, St, Zip : SOLON, OH 44139
 Phone : 216-292-9200

EMERGENCY PHONE #: 216-292-9200

SECTION II HAZARDOUS INGREDIENT INFORMATION

INGREDIENT	% Wt.	PEL-OSHA	TLV-ACGIH
AMMONIUM BIFLUORIDE CAS #: 1341-49-7	98.9	2.5 mg/m ³ as F 35 ppm as NH ₃ STEL	2.5 mg/m ³ as F 25 ppm as NH ₃

INGREDIENT HAZARD STATEMENT

Causes eye and skin burns.
 Causes skin and respiratory tract irritation.
 Harmful if swallowed.
 Unless otherwise noted, all values are reported as 8-hour Time-Weighted
 Averages (TWAs) and total dust (particulates only). All ACGIH TLVs
 refer to the 1988-89 Standards. All OSHA PELs refer to 29 CFR Part
 1910 Air Contaminants: Final Rule, January 19, 1989.

SECTION III PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point: 239.5°C
 Specific Gravity (H₂O=1): 1.503
 Melting Point: 126.2°C
 Vapor Pressure (mm Hg): Not applicable
 Vapor Density (Air=1): Not applicable
 Evaporation Rate (Butyl Acetate=1): Not applicable
 % Solubility/Water: 58.3 g/100 g water

APPEARANCE AND ODOR

White translucent flakes; ammoniacal odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

Flash Point: Not available
Auto-Ignition: Not available
LEL: Not available
UEL: Not available

NFPA HAZARD CLASSIFICATION

Health: 3 Flammable: 0 Reactivity: 0

HMIS HAZARD CLASSIFICATION

Health: 3* Flammable: 0 Reactivity: 0

EXTINGUISHING MEDIA

Use carbon dioxide or chemical foam.

SPECIAL FIRE FIGHTING PROCEDURES

Wear positive-pressure self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Not a fire or explosion hazard. However, in a fire situation this product will emit toxic gases. Contact with water will form corrosive sulfuric acid.

SECTION V REACTIVITY DATA

Stability: Generally considered stable.
Avoid: Temperatures above 400°F.

INCOMPATIBILITY (Materials to Avoid)

Strong acids, alkalies, chlorine, cyanides, sulfides.

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS

Sulfur oxides, ammonia and hydrogen fluoride. Will form hydrofluoric acid on contact with strong acids; ammonia on contact with alkalies.

Polymerization: Polymerization is not expected to occur.
 Avoid: Not applicable.

SECTION VI. HEALTH HAZARD DATA**ROUTES OF ENTRY**

Eyes? YES Skin? YES Inhalation? YES Ingestion? YES

EFFECTS OF OVEREXPOSURE

EYE CONTACT causes burns.

SKIN CONTACT causes severe irritation and fluoride-like burns which may not be immediately evident.

INHALATION causes severe irritation to the upper respiratory tract.

INGESTION causes irritation of the gastrointestinal tract, nausea, vomiting and diarrhea.

CARCINOGENICITY

NTP? NO IARC? NO OSHA? NO

CHRONIC HEALTH HAZARDS

Exposure to FLUORIDES over years may produce embrittlement and decalcification of bones, and increased calcification of ligaments and vertebrae resulting in spinal stiffness (fluorosis).

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE

May aggravate existing respiratory and/or skin ailments.

EMERGENCY AND FIRST AID PROCEDURES

EYES: Immediately flush with plenty of water for at least 30 minutes. Do NOT use Zephiran Chloride solutions on eyes. Call a physician.

SKIN: Immediately flush with cold water for at least 15 minutes. Use alkaline soap if available. If irritation occurs, immerse and soak affected area in 0.13% (1:750) iced, aqueous Zephiran Chloride solution

MATERIAL SAFETY DATA SHEET

Page 4

Code: 10303

Date: 04-22-89

for 30-60 minutes (saturated compresses can be used if area can't be immersed) and call a physician.

CLOTHING: Remove contaminated clothing and wash before reuse. Destroy contaminated shoes.

INHALATION: Remove to fresh air. If breathing is difficult, give oxygen. Call a physician.

INGESTION: If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Call a physician immediately. Never give anything by mouth to an unconscious person.

SECTION VII PRECAUTIONS FOR SAFE HANDLING AND USE

EPA Waste #: Corrosive waste

UN #: UN 1727

DOT Classification: Corrosive Material

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Contain spillage and scoop up or vacuum. Avoid dusting. Notification of the National Response Center (800/424-8802) may be required. Refer to EPA, DOT and applicable state and local regulations for current response information.

It is recommended that each user establish a spill prevention, control and countermeasure plan (SPCC). Such plan should include procedures applicable to proper storage, control and clean-up of spills, including reuse or disposal as appropriate (see waste disposal method, below).

WASTE DISPOSAL METHOD

Federal, state and local disposal laws and regulations will determine the proper waste disposal procedure. All waste materials should be reviewed to determine the applicable hazards (testing may be necessary). Disposal requirements are dependent on the hazard classification and will vary by location and the type of disposal selected. Some waste materials are amenable to recycle/reuse.

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Page - 1

ACHESON COLLOIDS COMPANY

Date - 9/12/94

Customer Number : 84000

SHIPPER NUMBER : 47969

MATERIAL SAFETY DATA SHEET

* REVISION NO. : 002 PRODUCT CODE : 5300051 REVISION DATE : 1/30/90 *

SECTION I - SOURCE AND NOMENCLATURE

Manufacturer's Name

ACHESON COLLOIDS COMPANY

Emergency Telephone No.

810-984-5581

Address

PO Box 611747 Port Huron, MI 48061-1747

Chemical Family

Graphite in Water

Trade Name and Synonyms

PRODAG

Chemical Name and Synonyms

Mixture

SECTION II - OSHA REGULATED INGREDIENTS

C.A.S. Reg.No.	Material	Wt. %	Exposure Limit
7782-42-5	Graphite	24.00	15.00 MPPCF

SECTION III - PHYSICAL DATA

Boiling Point	212F	Vapor Pressure	17.00	Vapor Density	N/A
Melting Point	N/A	Evaporation Rate	N/A	Volatile	70.0
Specific Gravity	1.20	Solubility in Water :	Miscible		
V.O.C. :	0000				

Appearance/Odor

Black Paste; Ammoniacal Odor pH 10.0 minimum

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flash Point : N/A

FLAMMABLE (EXPLOSIVE) LIMITS	Upper	N/A
	Lower	N/A

MethodExtinguishing Media

NONE.

Special Fire Fighting Procedures

NONE.

Unusual Fire and Explosion Hazards

NONE.

SECTION V - HEALTH HAZARD DATA

Effects of OverexposureInhalation

NO ACUTE EFFECTS EXPECTED WITHIN EXPOSURE LIMITS.

Ingestion

LOW ORDER OF TOXICITY.

Eye

MAY CAUSE TEMPORARY EYE IRRITATION.

Skin

REPEATED OR PROLONGED CONTACT CAN CAUSE IRRITATION AND DERMATITIS.

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Page - 2 Cust.No. 84000, Shipper No. 47969,

PRODAG

Emergency and First Aid Procedures

Inhalation

IF AFFECTED, REMOVE INDIVIDUAL TO FRESH AIR.

Ingestion

KEEP INDIVIDUAL CALM AND SEEK MEDICAL ATTENTION IMMEDIATELY.

Eye

FLUSH EYES WITH WATER AND SEEK MEDICAL ATTENTION IF IRRITATION OCCURS.

Skin

WASH WITH SOAP AND WATER; REMOVE CONTAMINATED CLOTHING AND LAUNDRER BEFORE REUSE.

SECTION VI - REACTIVITY DATA

Conditions Contributing to Instability

STABLE.

Conditions Contributing to Hazardous Polymerization

NONE.

Incompatibility (MATERIALS TO AVOID)

STRONG OXIDIZERS.

Hazardous Decomposition of Products

CO, CO2.

SECTION VII - SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled

APPLY ABSORBENT MATERIAL AND TRANSFER TO CONTAINERS.

Waste Disposal Method

CONSULT WITH FEDERAL, STATE AND LOCAL WASTE REGULATIONS.

SECTION VIII - SPECIAL PROTECTION INFORMATION

Ventilation Requirements

PROVIDE SUFFICIENT MECHANICAL VENTILATION TO MAINTAIN EXPOSURE BELOW TLV(S).

Protective Equipment :

Eye

WEAR SPLASH GOGGLES OR OTHER APPROPRIATE EYE PROTECTION.

Glove

WEAR PROTECTIVE GLOVES TO PREVENT REPEATED OR PROLONGED CONTACT.

Respirator

NONE.

Other

NO SPECIAL EQUIPMENT DEEMED NECESSARY UNDER NORMAL USAGE.

SECTION IX - SPECIAL PRECAUTIONS

Precautions to be Taken in Handling and Storage

AVOID PROLONGED INHALATION OF MISTS OR VAPORS.

These data are offered in good faith as typical values and not as a product specification. No warranty, either expressed or implied, is hereby made. The recommended industrial hygiene and safe handling procedures are believed to be generally applicable. However, each user should review these recommendations in the specific context of the intended use and determine whether they are appropriate.

Material Safety Data Sheet

HYDROFLUORIC ACID, AQUEOUS (49%)

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Hydrofluoric Acid, Aqueous (49%)

OTHER/GENERIC NAMES: Aqueous HF, Hydrofluoric Acid Solution, 49% HF, Ultra High Purity HF, Electronic Grade HF

PRODUCT USE: Metal Pickling, Glass Etching, Chemical Derivatives, Semiconductor etching

MANUFACTURER: Honeywell International
Industrial Fluorines
101 Columbia Road
Box 1053
Morristown, New Jersey 07962-1053

FOR MORE INFORMATION CALL:
(Monday-Friday, 8:00am-4:30pm EST)
HF Technical Service Department
800-622-5002

IN CASE OF EMERGENCY CALL:
(24 Hours/Day, 7 Days/Week)
800-707-4555 or 602-365-4980
For Transportation Emergencies:
800-424-9300 (CHEMTREC for US)
613-996-6666 (CANUTEC for Canada)

2. COMPOSITION/INFORMATION ON INGREDIENTS

<u>INGREDIENT NAME</u>	<u>CAS NUMBER</u>	<u>WEIGHT %</u>
Hydrofluoric Acid	7664-39-3	49
Water	7732-18-5	51

Trace impurities and additional material names not listed above may also appear in the Regulatory Information Section 15 towards the end of the MSDS. These materials may be listed for local "Right-To-Know" compliance and for other reasons.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Clear, colorless, corrosive fuming liquid with an extremely acrid odor. May produce white fumes if spilled. Both liquid and vapor can cause severe burns to all parts of the body. Specialized medical treatment is required for all exposures.

MATERIAL SAFETY DATA SHEET
Hydrofluoric Acid, Aqueous (49%)

POTENTIAL HEALTH HAZARDS

SKIN: Both liquid and vapor can cause severe burns, which may not be immediately painful or visible. HF will penetrate skin and attack underlying tissues. Large or multiple burns totaling over 25 square inches of body surface area may also cause hypocalcemia (depletion of calcium in the body) and other toxic effects which may be fatal. Prolonged contact with very dilute HF solutions will cause burns.

EYES: Both liquid and vapor can cause irritation or corneal burns.

INHALATION: **Mild exposure:** Can irritate nose, throat and respiratory system. Onset of symptoms may be delayed for several hours.

Severe exposure: Can cause nose and throat burns, lung inflammation and pulmonary edema (fluid in the lungs). Also results in other toxic effects including hypocalcemia (depletion of calcium in the body) which if not properly treated can result in death.

INGESTION: Can cause severe mouth, throat and stomach burns and may be fatal if swallowed. Even with small amounts of dilute solutions, profound and possibly fatal hypocalcemia (depletion of calcium in body) and systematic toxicity is likely to occur unless medical treatment is promptly initiated.

DELAYED EFFECTS: The effects of contact with dilute solutions of hydrofluoric acid or its vapors may be delayed. The potential delay in clinical signs or symptoms for dilute solutions is given below:

<u>HF Concentration</u>	<u>Delay in Symptoms</u>
>50%	Immediately Apparent
20%-50%	1-8 hours
0%-20%	Up to 24 hours

Can also cause bone and joint changes in humans (Fluorosis).

Carcinogenicity: Hydrofluoric Acid is not listed by NTP, IARC, OSHA or ACGIH as a carcinogen.

4. FIRST AID MEASURES

SKIN: Remove the victim from the contaminated area and immediately wash the burned area with plenty of water for a minimum of 15 minutes. Limit washing to 5 minutes if treatment specific for HF exposure is available. Remove all contaminated clothing while washing continuously. After thorough washing for at least 5 minutes, the burned area should be immersed in a solution of 0.13% iced aqueous Zephiran® Chloride until pain is relieved. As an alternate first aid treatment, 2.5% calcium gluconate gel may be continuously massaged into the burn area until the pain is relieved. For larger burns or burns treated with calcium gluconate gel (in which pain is present longer than 30 minutes), a physician should inject 5% aqueous calcium gluconate beneath, around and in the burned area. Use of local anesthetics is not recommended, as reduction in pain is an indicator of effectiveness of treatment.

MATERIAL SAFETY DATA SHEET
Hydrofluoric Acid, Aqueous (49%)

EYES: Irrigate eyes for at least 15 minutes with copious quantities of water, keeping eyelids apart and away from eyeballs during irrigation. Get competent medical attention immediately, preferably an eye specialist. If a physician is not immediately available, apply one or two drops of 0.5% tetracaine hydrochloride solution, or other aqueous topical ophthalmic anesthetic and continue irrigation. Do not use the solution described for skin treatment. Use no oils or greases unless instructed to do so by a physician. Irrigate with 1% calcium gluconate in normal saline for 1 to 2 hours to prevent or lessen corneal damage.

INHALATION: Move to fresh air. Keep the victim lying down, quiet and warm. Get competent medical attention immediately. If breathing has stopped, start artificial respiration at once. An authorized person should administer oxygen to a victim who is having difficulty breathing, until the victim is able to breathe easily by himself. Do not give stimulants unless instructed to do so by a physician. Victim should be examined by a physician and held under observation for at least 24 hours. Calcium Gluconate, 2.5% in normal saline may be given by nebulizer with oxygen.

INGESTION: Drink large amounts of water to dilute. Do not induce vomiting. Several glasses of milk or several ounces of milk of magnesia may be given for their soothing effect. Take victim to a doctor.

ADVICE TO PHYSICIAN: For burns of large skin areas (greater than 25 square inches), for ingestion and for significant inhalation exposure, severe systemic effects may occur. Monitor and correct for hypocalcemia, cardiac arrhythmias, hypomagnesemia and hyperkalemia. In some cases renal dialysis may be indicated. For certain burns, especially of the digits, use of intra-arterial calcium gluconate may be indicated. For inhalation exposures, treat as chemical pneumonia. Monitor for hypocalcemia. 2.5% calcium gluconate in normal saline by nebulizer or by IPPB with 100% oxygen may decrease pulmonary damage. Bronchodilators may also be administered.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT: Not flammable
FLASH POINT METHOD: Closed cup
AUTOIGNITION TEMPERATURE: Not applicable
UPPER FLAME LIMIT (volume % in air): Not applicable
LOWER FLAME LIMIT (volume % in air): Not applicable
FLAME PROPAGATION RATE (solids): Not applicable
OSHA FLAMMABILITY CLASS: Not applicable

EXTINGUISHING MEDIA:

Use water or suitable agent for fires adjacent to non-leaking tanks or containers of HF. Do not use solid water streams near ruptured tanks or spills of HF. Acid reacts with water and can splatter acid onto personnel.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

Reaction with certain metals generates flammable and potentially explosive hydrogen gas. Considerable heat is evolved when contacted with many substances. Heat increases pressure and may explode container. Will react violently with water.

SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS:

Wear self-contained breathing apparatus approved by NIOSH and full chemical protective clothing. Use water spray to keep containers cool.

MATERIAL SAFETY DATA SHEET
Hydrofluoric Acid, Aqueous (49%)

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE: (Always wear recommended personal protective equipment.)

Good ventilation is necessary. Discharge will ordinarily be a vapor or a liquid that gives off fumes of HF gas. Those treating spills or repairing leaks must use full protective equipment. Take actions to minimize environmental impact. Try to contain spillage and avoid drainage to areas which cannot be treated. Rapid dilution of the spill with water will reduce the amount of fumes given off.

Carefully neutralize the dilute liquid with lime slurry, soda ash, limestone, caustic soda or other alkaline material. (See Sections 10 and 13 for more information.)

Spills and releases may have to be reported to Federal and/or local authorities. See Section 15 regarding reporting requirements.

7. HANDLING AND STORAGE

NORMAL HANDLING: (Always wear recommended personal protective equipment.)

Do not breathe vapor or mist. Use only with adequate ventilation. Avoid all contact with skin, eyes and clothing, even dilute solutions. Do not add water to acid.

STORAGE RECOMMENDATIONS:

Store in approved containers only. Store in cool, well-ventilated area. Flammable hydrogen gas can be generated in contact with metals. Diking of storage tanks is recommended.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:

Sufficient to reduce vapor and acid mists below permissible TLV levels. Packaging and unloading areas and open processing equipment may require mechanical exhaust systems.

PERSONAL PROTECTIVE EQUIPMENT

SKIN PROTECTION:

For routine product use, wear hydrofluoric acid-resistant jacket, trousers, boots and gauntlet gloves. For increased protection, use air-supplied totally encapsulating HF resistant protective suit.

EYE PROTECTION:

As a minimum, wear hard hat, chemical safety goggles (plastic lenses), and full face plastic shield. For increased protection, use air-supplied hydrofluoric acid resistant hood.

RESPIRATORY PROTECTION:

Where required, use a respirator approved by NIOSH for HF gas or mists, as applicable. Some exposures may require a NIOSH-approved, self-contained breathing apparatus or air supplied respirator.

ADDITIONAL RECOMMENDATIONS:

Eyewash and quick-drench shower facilities, protected from freezing, should be available where HF is stored or handled.

MATERIAL SAFETY DATA SHEET

Hydrofluoric Acid, Aqueous (49%)

EXPOSURE GUIDELINES (Guidelines exist for the following ingredients)

<u>INGREDIENT NAME</u>	<u>ACGIH TLV</u>	<u>OSHA PEL</u>	<u>OTHER LIMIT</u>
Hydrofluoric acid	3 ppm – CEILING	3 ppm (TWA)	3 mg(F)/g creatinine in urine pre-shift 10 mg(F)/g creatinine post-shift***
		<u>OSHA STEL</u> 6 ppm (15 min.)	<u>IDLH</u> 30 ppm
	<u>AIHA Emergency Response Planning Guideline</u>		
	<u>ERPG-1</u> 2 ppm	<u>ERPG-2</u> 20 ppm	<u>ERPG-3</u> 50 ppm

*** = Biological Exposure Index

OTHER EXPOSURE LIMITS FOR POTENTIAL DECOMPOSITION PRODUCTS: None

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Colorless liquid, fumes in air
PHYSICAL STATE: Liquid
MOLECULAR WEIGHT 20.01 (HF)
CHEMICAL FORMULA 49% HF in water by weight
ODOR Sharp pungent odor
SPECIFIC GRAVITY (Water = 1.0) 1.175 at 60°F, (15.5°C) 1.16 at 80°F (26.6°C)
SOLUBILITY IN WATER (Weight %) 100% by weight
pH: Not applicable
BOILING POINT: 224°F (106°C)
MELTING POINT: -34°F (-37°C)
VAPOR PRESSURE: 27 mm Hg at 70°F (21°C)
VAPOR DENSITY (Air = 1.0): 2.21 @ 70°F, 1.76 @ 80°F
EVAPORATION RATE: Not applicable
% VOLATILES: Unknown
IONIZATION POTENTIAL: 15.98 eV
FLASH POINT: Not flammable.

(Flash point method and additional flammability data are found in section 5.)

10. STABILITY AND REACTIVITY

NORMALLY STABLE? (CONDITIONS TO AVOID): Stable under normal conditions.

INCOMPATIBILITIES:

Glass, concrete and other silicon bearing materials: yield silicon tetrafluoride gas. Pressure buildup from this process has been known to blow up glass containers. Carbonates, sulfides and cyanides: yield toxic gases: carbon dioxide, hydrogen sulfide and hydrogen cyanide. Alkalis, some oxides: cause strong violent exothermic reactions. Common metals: yield hydrogen gas, a fire and explosive reactive hazard. Corrosive to many materials including natural leather, rubber and many organics. Considerable heat is evolved and a violent reaction can occur when water is added to HF.

MATERIAL SAFETY DATA SHEET
Hydrofluoric Acid, Aqueous (49%)

HAZARDOUS DECOMPOSITION PRODUCTS:

Not applicable; boils away as hydrogen fluoride gas and water.

HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL INFORMATION**IMMEDIATE (ACUTE) EFFECTS:**

Inhalation: LC ₅₀ (Rat)	=	5,100 ppm/5 min
LC ₅₀ (Rat)	=	1,300 ppm/60 min
LC ₅₀ (Mouse)	=	6,247 ppm/5 min

Skin: 2% solution of HF was corrosive to rabbit skin with 1 hour exposure, but not with 1 minute exposure.

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:

Prolonged exposure can cause bone and joint changes in humans. (Fluorosis – Increased bone density and mottling of teeth)

OTHER DATA: None

12. ECOLOGICAL INFORMATION

Aquatic toxicity: 60 ppm*/fish/lethal/fresh water. (*time period not specified).

13. DISPOSAL CONSIDERATIONS**RCRA**

Is the unused product a RCRA hazardous waste if discarded? Yes

If yes, the RCRA ID number is: U134 (hydrofluoric acid) and D002 (Corrosive)

OTHER DISPOSAL CONSIDERATIONS: As waste disposal methods may vary, contact the supplier for specific recommendations. Treat small amounts by adding to an excess of water and neutralize with lime slurry, soda ash, limestone, caustic soda or other alkali. Add to water and neutralize cautiously as reaction is immediate and can be violent. Considerable amounts of harmful vapors may be released. Good ventilation is required. Dispose of residue (or slurry) by removal to an approved chemical waste landfill or by an approved waste contractor.

The information offered here is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal method.

14. TRANSPORT INFORMATION

US DOT HAZARD CLASS: CLASS 8 (CORROSIVE), PACKING GROUP, PG II,
POISON

PROPER SHIPPING NAME: RQ, HYDROFLUORIC ACID (for quantities greater than 204 lbs.)

US DOT ID NUMBER: UN 1790
UN 1790 (PIN # in Canada)

MSDS Number: HF-0013

Current Issue Date: February, 2002

MATERIAL SAFETY DATA SHEET
Hydrofluoric Acid, Aqueous (49%)

For additional information on shipping regulations affecting this material, contact the information number found in Section 1.

15. REGULATORY INFORMATION

TOXIC SUBSTANCES CONTROL ACT (TSCA)

TSCA INVENTORY STATUS: Hydrofluoric Acid, Aqueous is listed.

OTHER TSCA ISSUES: None

SARA TITLE III/CERCLA:

RQs and TPQs:

"Reportable Quantities" (RQs) and/or "Threshold Planning Quantities" (TPQs) exist for the following ingredients.

<u>INGREDIENT NAME</u>	<u>SARA/CERCLA RQ (lbs)</u>	<u>SARA EHS TPO (lbs)</u>
Hydrofluoric Acid	100 as 100% HF	100 as 100% HF

Spills or releases resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center [(800) 424-8802] and to your Local Emergency Planning Committee.

SECTION 311 HAZARD CLASS: Immediate, Delayed

SARA 313 TOXIC CHEMICALS:

The following ingredients are SARA 313 "Toxic Chemicals". CAS numbers and weight percents are found in Section 2.

<u>INGREDIENT NAME</u>	<u>COMMENT</u>
Hydrofluoric Acid	None

STATE RIGHT-TO-KNOW

In addition to the ingredients found in Section 2, the following are listed for state right-to-know purposes.

<u>INGREDIENT NAME</u>	<u>WEIGHT %</u>	<u>COMMENT</u>
No ingredients in this section		

ADDITIONAL REGULATORY INFORMATION: None

MATERIAL SAFETY DATA SHEET
Hydrofluoric Acid, Aqueous (49%)

WHMIS CLASSIFICATION (CANADA):

Class D, Division 1, Subdivision A and
Class E

This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

FOREIGN INVENTORY STATUS:

Canadian DSL (Domestic Substances List)
EINECS (European Inventory of Existing Chemical Substances) (EINECS #:231-634-8)

16. OTHER INFORMATION

CURRENT ISSUE DATE: January, 2002

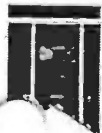
PREVIOUS ISSUE DATE: January, 2001

CHANGES TO MSDS FROM PREVIOUS ISSUE DATE ARE DUE TO THE FOLLOWING:

Minor wording changes in Sections 1,3,4,6,7,8,10, & 13 for clarification. (Jan '02)

OTHER INFORMATION: National Fire Prevention Association (NFPA) Rating
Health 4, Flammability 0, Reactivity 1, Special Instruction -- None
Hazardous Materials Information System (HMIS) Rating
Health 3, Flammability 0, Reactivity 1, Personal Protective Equipment - X

MATERIAL SAFETY DATA SHEET



MacDermid

INCORPORATED

245 FREIGHT ST. • WATERBURY, CT 06702 • (203) 575-5700

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Health Flammability Reactivity Other

Issue Date: 10/20/1993 Page: 1
 Revised Date: 7/23/1997 4

PRODUCT

IRIDITE 14-2

PRODUCT CODE

78659

PRODUCT CODE MUST ACCOMPANY ALL INQUIRIES REGARDING THIS PRODUCT

24 HR. EMERGENCY NUMBER: CHEMTREC (800) 424-9300

SECTION 1 PRODUCT IDENTIFICATION

TRADE NAME: IRIDITE 14-2

CHEMICAL FAMILY: ACID

FORMULA: Proprietary Mixture

HMIS RATING:

3 HEALTH 0 FLAMMABILITY 1 REACTIVITY OX OTHER
 (0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme)

SECTION 2 HAZARDOUS INGREDIENTS

MacDermid Inc. has identified the following chemical ingredient(s) as hazardous.

INGREDIENT(S)	CAS #	BY WEIGHT %
Chromic Acid	1333-82-0	35 - 55
Barium Nitrate	10022-31-8	10 - 20
Sodium silicofluoride	16893-85-9	7 - 17
Ferricyanide		7 - 10

SECTION 3 PHYSICAL DATA

DENSITY: 70.000 LB/CU FT FORM: SOLID
 SPECIFIC GRAVITY: Not Applicable PH: N/A as a solid
 FREEZING POINT: NA FLASH POINT: NA
 VAPOR PRESSURE: Not Applicable VOLATILE %: Not Determined
 CHEMICAL OXYGEN DEMAND (COD): NOT DETERMINED
 SOLUBILITY IN WATER: Moderate Solubility
 COLOR / ODOR: Red/odorless

NOTE: These physical properties are typical values for this product

SECTION 4 FIRE AND EXPLOSION DATA

FLASH POINT: NA

EXTINGUISHING MEDIA:

NEVER allow run-off to enter sewers or waterways.
Flood with water. Other agents may be ineffective.

UNUSUAL FIRE & EXPLOSION HAZARDS:

Supply oxygen which may sustain or intensify fire. Under fire



MACDERMID INCORPORATED

245 Freight Street - Waterbury, CT06702 - Telephone (203)575-5700 - Telex 4436011 - Fax 203-575-5630

MATERIAL SAFETY DATA SHEET

Issue Date: 10/20/1993 Page: 3

Product: IRIDITE 14-2

Revised Date: 7/23/1997

Product Code: 78659

24 Hour Emergency Number: CHEMTREC (1-800-424-9300)

SECTION 6 HEALTH EFFECTS DATA (Continued)

Itching sensation will occur

Contact with liquid or mists can cause severe burns
May cause irritation and damage to skin
Causes painful sensation to skin

INGESTION (ACUTE):

May burn mouth/throat and stomach
Damage to digestive tract including corrosive effects

Irritation and burning sensation of lips/mouth and throat
May cause nausea; vomiting; diarrhea

INGESTION (CHRONIC):

Stomach or abdominal pain may develop
Systemic illness may develop from ingestion

INHALATION (ACUTE):

Irritation of mucous membrane of nose/mouth/throat may occur

INHALATION (CHRONIC):

Repeated or prolonged exposure may cause systemic effects

SECTION 7 PERSONAL PROTECTIVE DATA

RESPIRATORY PROTECTION:

If there is a value for OSHA-PEL/ACGIH-TLV in section 13 and it is exceeded, it is recommended that a NIOSH approved respirator be used. Consult with your Industrial Hygienist for appropriate cartridge selection and use.

For large spills, entry into large tanks, vessels or enclosed small spaces with inadequate ventilation, a pressure demand, self contained breathing apparatus is recommended.

VENTILATION:

General ventilation is recommended. Additionally, local exhaust ventilation is recommended where vapors, dusts, mists or aerosols may be released.

PROTECTIVE EQUIPMENT:

Safety glasses and/or splash proof goggles, face shields and the availability of an eye wash is recommended. Chemically resistant apron, boots and gloves. The availability of a safety shower is recommended. If clothing is contaminated remove clothing and thoroughly wash the affected body area. Launder contaminated clothing before reuse.

These are general recommendations to provide a safe level of protection for various material handling conditions. Consult with your Safety Professional/Industrial Hygienist for specific information regarding applications at your facility.

MACDERMID INCORPORATED

245 Freight Street - Waterbury, CT06702 - Telephone (203)575-5700 - Telex 4436011 - Fax 203-575-5630

MATERIAL SAFETY DATA SHEET

Issue Date: 10/20/1993 Page: 5
 Revised Date: 7/23/1997

Product: IRIDITE 14-2
 Product Code: 78659

24 Hour Emergency Number: CHEMTREC (1-800-424-9300)

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SECTION 9 REACTIVITY DATA (Continued)

=====

HAZARDOUS POLYMERIZATION:
 No hazardous polymerization.

=====

SECTION 10 SPILLS & DISPOSAL DATA

=====

In case of Transportation Accidents, call the following 24 hour
 telephone number: CHEMTREC (1-800-424-9300)

SPILL CONTROL AND RECOVERY:

Wear protective clothing and equipment during cleanup. Sweep up
 powder spills and place in a plastic recovery drum. For
 liquid spills, absorb with an inert material such as earth,
 sand or vermiculite; sweep up and dispose of in accordance
 with federal, state and local regulations.

DISPOSAL:

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

to more restrictive waste disposal regulations, NEVER wastetreat
 or dispose of material until you check your appropriate local, state
 & federal regulations for requirements. Spills may REQUIRE notification
 to FEDERAL, STATE and/or LOCAL AUTHORITIES.

=====

SECTION 11 TRANSPORTATION DATA

=====

DOT PROPER SHIPPING NAME: CHROMIUM TRIOXIDE, ANHYDROUS MIXTURE

HAZARD: 5.1/OXIDIZER/CORROSIVE/TOXIC

UN/NA#: UN1463

Pkg Grp: II

DOT REPORTABLE QUANTITY (RQ): 18 LB

IMO: CHROMIUM TRIOXIDE, ANHYDROUS MIXTURE

IMO Class/Sub Class: OXIDIZER/CORROSIVE/TOXIC/5.1/8, Pkg Grp:

II

UN/NA# ; UN1463/5145

IATA: CHROMIUM TRIOXIDE, ANHYDROUS MIXTURE

IATA Cls/Sub Cls: OXIDIZER/CORROSIVE/TOXIC/5.1/8, Pkg Grp:

II

UN/NA# UN1463

EXPORT LICENSE MAY BE REQUIRED TO EXPORT THIS PRODUCT

=====

SECTION 12 GENERAL STORAGE DATA

=====

STORAGE TEMPERATURE: MAXIMUM: 120.00F 48.88C Minimum: NA

Material should be stored in the properly sealed original container

MACDERMID INCORPORATED

245 Freight Street - Waterbury, CT06702 - Telephone (203)575-5700 - Telex 4436011 - Fax 203-575-5630

MATERIAL SAFETY DATA SHEET

Issue Date: 10/20/1993 Page: 7

Revised Date: 7/23/1997

Product: IRIDITE 14-2

Product Code: 78659

24 Hour Emergency Number: CHEMTREC (1-800-424-9300)

=====

SECTION 13 REGULATORY DATA (Continued)

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Chromium compounds	1333-82-0	35 - 55
Barium compounds	10022-31-8	10 - 20

TOXIC SUBSTANCE CONTROL ACT (TSCA): The chemical ingredient(s) in this product are listed on the 8(b) Inventory List (40 CFR 710).

RESOURCE CONSERVATION & RECOVERY ACT (RCRA), 40 CFR 261 SUBPARTS C & D:
C & D:

Please refer to Section 10, disposal information for pertinent data.

TOTAL TOXIC ORGANICS

This product does not contain ingredients on the List of Total Toxic Organics

OSHA PROCESS SAFETY (1910.119):

This product does not contain ingredient(s) listed in Appendix A of 29 CFR 1910.119 list of Highly Hazardous Chemicals, Toxics and Reactives of OSHA process safety management.

CLEAN AIR ACT:

This product contains ingredient(s) listed in CAA Hazardous Air Pollutants (HAPs) CAA 40 CFR 112(G).

CHEMICAL NAME	CAS #	BY WEIGHT %
-----	-----	-----
Chromic Acid	1333-82-0	35 - 55

OZONE DEPLETING SUBSTANCES:

This product does not contain ingredient(s) listed on Ozone Depleting Substances of CAA 40 CFR 82.

STATE REGULATIONS:

California Proposition 65:

This product does not comply with the MSDS and labeling requirements of the Safe Drinking Water and Toxic Enforcement Act of 1986.

This product contains ingredient(s) listed on California Prop 65 List

CHEMICAL NAME	CAS #	BY WEIGHT %
-----	-----	-----
Chromic Acid	1333-82-0	35 - 55

Michigan Critical Materials:

This product contains ingredient(s) listed on the Michigan Critical Materials Register.

CHEMICAL NAME	CAS #	BY WEIGHT %
-----	-----	-----

MATERIAL SAFETY DATA SHEET**MacDermid**

INCORPORATED

245 FREIGHT ST. • WATERBURY, CT 06702 • (203) 575-5700

PRODUCT

ISOPREP 35

PRODUCT CODE

10531

PRODUCT CODE MUST ACCOMPANY ALL INQUIRIES REGARDING THIS PRODUCT

3	0	1	
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Health Flammability Reactivity Other

Issue Date: 5/01/1994

Page: 1

Revised Date: 3/02/1995

1

24 HR. EMERGENCY NUMBER: CHEMTREC (800) 424-9300

SECTION 1**PRODUCT IDENTIFICATION**

TRADE NAME: ISOPREP 35

CHEMICAL FAMILY: INORGANIC /ORGANIC MIXTURE

FORMULA: Proprietary Mixture

HMIS RATING: 3 HEALTH 0 FLAMMABILITY 1 REACTIVITY OTHER

 0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

3

SECTION 2**HAZARDOUS INGREDIENTS**

MacDermid Inc. has identified the following chemical ingredient(s) as hazardous:

INGREDIENT(S)	CAS #	BY WEIGHT %
Sodium Hydroxide	1310-73-2	20 - 30

SECTION 3**PHYSICAL DATA**

DENSITY: 55.000 LB/CU FT

FORM: SOLID

SPECIFIC GRAVITY: 0.000

pH: NOT DETERMINED

FREEZING POINT: NOT DETERMINED

FLASH POINT: NOT DETERMINED

VAPOR PRESSURE: NOT DETERMINED

VOLATILE %: NOT DETERMINED

CHEMICAL OXYGEN DEMAND (COD): NOT DETERMINED

SOLUBILITY IN WATER: Moderate Solubility

COLOR / ODOR: White to off-white
Mild

NOTE: These physical properties are typical values for this product

SECTION 4**FIRE AND EXPLOSION DATA**

FLASH POINT: NOT DETERMINED

EXTINGUISHING MEDIA:

NEVER allow run-off to enter sewers or waterways.

Dry chemical; carbon dioxide; foam; water

For massive fires use unmanned hose holder or monitor nozzle.

UNUSUAL FIRE & EXPLOSION HAZARDS:

Reacts with metals to form hydrogen gas which is explosive

POSTED

IMPORTANT HEALTH & SAFETY INFORMATION

MacDermid Incorporated

245 FREIGHT STREET - WATERBURY, CT06702 - TELEPHONE (203)575-5700 - TELEX 4436011 - FAX 203-575-5830

MATERIAL SAFETY DATA SHEET

Product: ISOPREP 35

Issue Date: 5/01/1994

Page: 3

Product Code: 10531

Revised Date: 3/02/1995

24 Hour Emergency Number: CHEMTREC (1-800-424-9300)

SECTION 6 HEALTH EFFECTS DATA (Continued)

May cause irritation and damage to skin

SKIN CONTACT (CHRONIC):

Profound damage to tissues may occur with prolonged exposure

INGESTION (ACUTE):May burn mouth/throat and stomach
Damage to digestive tract including corrosive effects**INGESTION (CHRONIC):**

Stomach or abdominal pain may develop

INHALATION (ACUTE):No effects likely except through misting
May cause burns to entire respiratory system.
Acute pulmonary edema may develop**SECTION 7 PERSONAL PROTECTIVE DATA****RESPIRATORY PROTECTION:**

If there is a value for OSHA-PEL/ACGIH-TLV in section 13 and it is exceeded, it is recommended that a NIOSH approved respirator be used. Consult with your Industrial Hygienist for appropriate cartridge selection and use.

For large spills, entry into large tanks, vessels or enclosed small spaces with inadequate ventilation, a pressure demand, self contained breathing apparatus is recommended.

VENTILATION:

General ventilation is recommended. Additionally, local exhaust ventilation is recommended where vapors, dusts, mists or aerosols may be released.

PROTECTIVE EQUIPMENT:Safety glasses and/or splash proof goggles, face shields and the availability of an eye wash is recommended.
Chemical apron, boots and gloves. Recommended material of construction: PVC, rubber, neoprene. The availability of a safety shower is recommended. If clothing is contaminated remove clothing and thoroughly wash the affected body area.
Launder contaminated clothing before reuse.

Consult with your Safety Professional/Industrial Hygienists for specific information regarding applications at your facility.

MacDermid Incorporated

245 FREIGHT STREET - WATERBURY, CT06702 - TELEPHONE (203)575-5700 - TELEX 4436011 - FAX 203-575-5630

MATERIAL SAFETY DATA SHEET

Product: ISOPREP 35

Issue Date: 5/01/1994

Page: 5

Product Code: 10531

Revised Date: 3/02/1995

24 Hour Emergency Number: CHEMIREC (1-800-424-9300)

SECTION 10 SPILLS & DISPOSAL DATA (Continued)**SPILL CONTROL AND RECOVERY:**

Avoid dusting. Sweep up and collect for disposal in plastic recovery drum. Do not return to original container. Flush residue to chemical drain with large quantities of water.

DISPOSAL:

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

Due to more restrictive waste disposal regulations, NEVER wastetreat or dispose of material until you check your appropriate local, state, & federal regulations for requirements. Spills may REQUIRE notification to FEDERAL, STATE and/or LOCAL AUTHORITIES.

SECTION 11 TRANSPORTATION DATA

DOT PROPER SHIPPING NAME: SODIUM HYDROXIDE SOLID, MIXTURE

HAZARD: 8/CORROSIVE MATERIAL

UN/NA# : UN1823

Pkg Grp: II

DOT REPORTABLE QUANTITY (RQ): NOT APPLICABLE

IMO: SODIUM HYDROXIDE, SOLID, MIXTURE

IMO Class/Sub Class: CORROSIVE/8/0

Pkg Grp: II

UN/NA# : UN1823/8225

IATA: SODIUM HYDROXIDE, SOLID, MIXTURE

IATA CIs/Sub CIs: CORROSIVE/8/0

Pkg Grp: II

UN/NA# : UN1823

EXPORT LICENSE MAY BE REQUIRED TO EXPORT THIS PRODUCT

SECTION 12 GENERAL STORAGE DATA

STORAGE TEMPERATURE: MAXIMUM: 120.00F 48.88C Minimum: NA

Material should be stored in the properly sealed original container

Wear protective clothing and equipment while handling.

SECTION 13 REGULATORY DATA

MacDermid Incorporated

245 FREIGHT STREET - WATERBURY, CT08702 - TELEPHONE (203)575-5700 - TELEX 4438011 - FAX 203-575-5630

MATERIAL SAFETY DATA SHEET

Product: ISOPREP 35

Issue Date: 5/01/1994

Page: 7

Product Code: 10531

Revised Date: 3/02/1995

24 Hour Emergency Number: CHEMTREC (1-800-424-9300)

SECTION 13**REGULATORY DATA****(Continued)**

This product does not contain ingredients on the List of Total Toxic Organics

OSHA PROCESS SAFETY (1910.119):

This product does not contain ingredient(s) listed in Appendix A of 29 CFR 1910.119 list of Highly Hazardous Chemicals, Toxics and Reactives of OSHA process safety management.

CLEAN AIR ACT:

This product does not contain ingredient(s) listed on the Hazardous Air Pollutants of CAA 40 CFR 112(G).

OZONE DEPLETING SUBSTANCES:

This product does not contain ingredient(s) listed on Ozone Depleting Substances of CAA 40 CFR 82.

STATE REGULATIONS:**California Proposition 65:**

This product complies with the MSDS and labeling requirements of the Safe Drinking Water and Toxic Enforcement Act of 1986.

This product does not contain ingredient(s) listed on California Prop65 List

Michigan Critical Materials:

This product does not contain ingredient(s) listed on the Michigan Critical Materials Register.

The information listed above does not include all Federal, State, and International regulations. The regulations listed above may change from time to time; it is the users responsibility to keep advised of current regulatory requirements.

Prepared by MacDermid Inc. Safety & Regulatory Compliance Department, based upon publicly available reference information.

SECTION 14**USER NOTIFICATION**

To the best of our knowledge the information contained herein is correct. All chemicals may present unknown health hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards which exist. Final determination of suitability of the chemical is the sole responsibility of the user. Users of any chemical should satisfy themselves that the conditions and methods of use assure that the chemical is used safely. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER NATURE ARE MADE HERE UNDER RESPECT TO THE INFORMATION CONTAINED HEREIN OR THE CHEMICAL TO WHICH THE INFORMATION REFERS.



MacDermid

INCORPORATED

245 Freight Street - Waterbury, CT 06702
Telephone (203)575-5700 - FAX (203)575-5630

1	0	-
Health	Flammability	Reactivity
		Other

MATERIAL SAFETY DATA SHEET

PRODUCT ISOPREP 44 ISSUE DATE 5/01/1994
PRODUCT CODE 70111 REVISED DATE 3/31/99
24 Hour Emergency Number: CHEMTREC(1-800-424-9300) 2

SECTION 1 :- PRODUCT IDENTIFICATION

TRADE NAME ISOPREP 44
CHEMICAL FAMILY INORGANIC /ORGANIC MIXTURE
FORMULA Proprietary Mixture

HMIS RATING:

1 Health 0 Flammability
0 Reactivity - Other

(0 = Insignificant, 1 = Slight, 2 = Moderate, 3 = High and 4 = Extreme)

4

SECTION 2 :- HAZARDOUS INGREDIENTS

MacDermid Inc. has concluded that the ingredients in this product may pose a minor hazard or slight risk under certain conditions for some individuals.

Irritants	Trade Secret	50 - 60
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SECTION 3 :- PHYSICAL DATA

DENSITY	Unknown	FORM	Solid
SPECIFIC GRAVITY	NOT DETERMINED	PH	alkaline in solution
FREEZING POINT	NA	FLASH POINT	NA
VAPOR PRESSURE	NOT APPLICABLE	VOLATILE %	NOT APPLICABLE
CHEMICAL OXYGEN DEMAND (COD)	NOT DETERMINED		
BIOLOGICAL OXYGEN DEMAND (BOD)	NOT DETERMINED		
SOLUBILITY IN WATER	Moderate		
COLOR/ODOR	Blue/ Mild		

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

SECTION 4 :- FIRE AND EXPLOSION DATA

FLASH POINT
EXTINGUISHING MEDIA Dry chemical, carbon dioxide, foam, water. For massive fires use unmanned hose holder or monitor nozzle. NEVER allow run-off to enter sewers or waterways.
UNUSUAL FIRE & EXPLOSION HAZARDS When heated to decomposition toxic fumes are emitted. Wear self-contained breathing apparatus/protective clothing.

SECTION 5 :- FIRST AID DATA

EYES Wash affected eyes under slowly running water for 15 minutes. Contact physician immediately.

SKIN If contacted wash the skin with water for 15 minutes. Remove and isolate all contaminated clothes and shoes.



- INGESTION** Induce vomiting Give water. Contact physician
- INHALATION** Remove the victim to cool uncontaminated area Monitor the patient for respiratory distress
- CAUTION** If unconscious - having trouble breathing - or in convulsions do not induce vomiting or give water.

Always clean contaminated clothing and gear prior to reuse. NEVER administer anything to an unconscious person.

SECTION 6 :-	HEALTH EFFECTS DATA
---------------------	----------------------------

Primary Route(s) of Exposure : Eye, Skin, Inhalation and Ingestion

- EYE CONTACT (ACUTE)** Chemical irritation follows initial mechanical irritation May cause slight irritation to sensitive individuals Intense watering of eyes will occur
- SKIN CONTACT (ACUTE)** Itching sensation will occur May cause irritation and damage to skin
- SKIN CONTACT (CHRONIC)** Prolonged or repeated contact may cause irritation
- INGESTION (ACUTE)** Irritation and burning sensation of lips/mouth and throat The substance is moderately toxic if swallowed. Headache and general weakness may occur
- INHALATION (ACUTE)** Mild irritation to respiratory system Temporary headache may occur Irritation of mucous membrane of nose/mouth/throat may occur

SECTION 7 :-	PERSONAL PROTECTIVE DATA
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- RESPIRATORY PROTECTION** DUSTS: Whether or not there is a value for OSHA-PEL/ACGIH-TLV in section 13, and it is exceeded, a NIOSH approved respirator should be used. Consult with your Industrial Hygienist for appropriate cartridge selection and use. See 29CFR 1910-134 for details. For large spills, entry into large tanks, vessels or enclosed small spaces with inadequate ventilation, a pressure demand, self contained breathing apparatus is recommended.
- VENTILATION** General ventilation is recommended. Additionally, local exhaust ventilation is recommended where vapors, dusts, mists or aerosols may be released.
- PROTECTIVE EQUIPMENT** Chemically resistant apron, boots and gloves. Recommended material of construction: PVC, rubber, neoprene. The availability of a safety shower is recommended. If clothing is contaminated, remove clothing and thoroughly wash the affected body area. Launder contaminated clothing before reuse. Safety glasses and/or splash proof goggles, face shields and the availability of an eye wash is recommended. Consult with your Safety Professional/Industrial Hygienists for specific information regarding applications at your facility.

These are general recommendations to provide a safe level of protection for various material handling conditions. Consult with your Safety Professional/Industrial Hygienist for specific information regarding applications at your facility

SECTION 8 :- TOXICOLOGY DATA**TOXICITY STUDIES :**

Toxicity studies have not been conducted on this product. However toxicity literature surveys have been conducted on the ingredient(s) in section 2. The results are as follows:

ACUTE ORAL TOXICITY Unknown

ACUTE DERMAL TOXICITY Unknown

ACUTE RESPIRATORY TOXICITY Unknown

TOXICITY HAZARD REVIEW (THR) IRRITANT: Normally, a chemical which is not corrosive, but may cause a reversible inflammatory effect on living tissue by chemical action at the site of contact. Some irritants may act as potential sensitizers. Some irritants are stronger than others and may cause tissue damage to the skin, lungs, or eyes if prolonged contact.

Listed as suspected carcinogen by :

IARC NO

NTP NO

OSHA NO

SECTION 9 :- REACTIVITY DATA

INCOMPATIBILITY Strong oxidizing agents

HAZARD DECOMPOSITION PRODUCTS Thermal decomposition may yield carbon monoxide and/or carbon dioxide and/or phosphorus compounds.

STABILITY Stable

CONDITIONS TO AVOID Material will absorb moisture from air; keep containers tightly closed.

HAZARDOUS POLYMERIZATION No hazardous polymerization.

SECTION 10 :- SPILLS & DISPOSAL DATA

In case of Transportation Accidents, call the following 24 hour telephone number :
CHEMTREC (1-800-424-9300)

SPILL CONTROL AND RECOVERY Caution - spills cause floors to become slippery. Sweep up and collect for disposal in plastic recovery drums. Avoid dusting. Do not return to original containers. Flush residue to chemical drain with large quantities of water. Avoid discharge to sewers or natural waterways.

DISPOSAL Contains phosphates, silicates. Dispose of in accordance with all applicable federal, state and local regulations.

Due to more restrictive waste disposal regulations, NEVER wastetreat or dispose of material until you check your appropriate local, state, & federal regulations for requirements. Spills may REQUIRE notification to FEDERAL, STATE and/or LOCAL AUTHORITIES.

SECTION 11 :- TRANSPORTATION DATA

NOT PROPER SHIPPING NAME

HAZARD 0 / NON REGULATED

UN/NA# 000000

DOT REPORTABLE QUANTITY (RQ) NOT APPLICABLE Pkg Grp

IMO NAME CLEANING COMPOUND 000000

IMO Class/Sub Class 0/NON-REGULATED/0

UN/NA# Pkg Grp

IATA NAME CLEANING COMPOUND

IATA Cls/Sub Cls NON-REGULATED/0/0

UN/NA# 000000 Pkg Grp

EXPORT LICENSE MAY BE REQUIRED TO EXPORT THIS PRODUCT

SECTION 12 :- GENERAL STORAGE DATA

STORAGE TEMPERATURE: Maximum: 120.00°F 48.88°C Min: N/A

Material should be stored in the properly sealed original container. Keep container closed until ready for use.

SECTION 13 :- REGULATORY DATA

The following regulations apply to this product.

FEDERAL REGULATIONS

OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200: Based on our evaluation, the following ingredients in this product are subject to this rule:

Ingredient Name	Trade Secret	Exposure	Acute RfD	Chronic RfD
Irritants	Trade Secret	50 - 60	0	0

CERCLA/SUPERFUND, 40 CFR 117, 302/304 : Notification of spills of this product is not required

SARA/SUPERFUND AMENDMENTS & REAUTHORIZATION ACT OF 1986 (TITLE III)

Sections 302, 311, 312 & 313

SECTION 302 : Extremely Hazardous Substances

This product does not contain ingredient(s) listed in APPENDIX A of 40 CFR 355.

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

This product does not contain ingredient(s) listed under 40 CFR 372.65

TOXIC SUBSTANCE CONTROL ACT (TSCA)

The chemical ingredient(s) in this product are listed on the 8(b) Inventory list

(40 CFR 372.65)

RESOURCE CONSERVATION & RECOVERY ACT (RCRA), 40 CFR 261 SUBPARTS C & D

Please refer to section 10, disposal information for pertinent data.

TOTAL TOXIC ORGANICS

This product does not contain ingredient(s) on the list of Total Toxic Organics.

OSHA PROCESS SAFETY (1910.119)

This product does not contain ingredient(s) listed in APPENDIX A of 29 CFR 1910.119 of Highly Hazardous Chemicals, Toxics, and Reactives of OSHA process safety management.

CLEAN AIR ACT

This product does not contain ingredient(s) listed on the Hazardous Air Pollutants of CAA 40 CFR 112(G).

OZONE DEPLETING SUBSTANCES

This product does not contain ingredient(s) listed on Ozone Depleting Substances of CAA 40 CFR 82.

STATE REGULATIONS

CALIFORNIA PROPOSITION 65

This product does not contain ingredient(s) listed on California Prop 65 suspected carcinogen List.

MICHIGAN CRITICAL MATERIALS

This product does not contain ingredient(s) listed on the Michigan Critical Material Register.

The information listed above does not include all Federal, State, and International regulations. The regulations listed above may change from time to time; it is the users responsibility to keep advised of current regulatory requirements.

Prepared by MacDermid Inc. Safety & Regulatory Compliance Department, based upon publicly available reference information.

SECTION 14 :-

USER NOTIFICATION

To the best of our knowledge the information contained herein is correct. All chemicals may present unknown health hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards which exist. Final determination of suitability of the chemical is the sole responsibility of the user. Users of any chemical should satisfy themselves that the conditions and methods of use assure that the chemical is used safely. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER NATURE ARE MADE HERE UNDER WITH RESPECT TO THE INFORMATION CONTAINED HEREIN OR THE CHEMICAL TO WHICH THE INFORMATION REFERS.

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ISOPREP® 184
**LIQUID, NON-CHROMATED DEOXIDIZER/
DESMUTTER OF ALUMINUM**
PRODUCT CODE NO. 12617

order 5 gal.
DESCRIPTION:


Non-chromated Isoprep 184 is an effective replacement for chromate-based deoxidizer/desmutters. Isoprep 184 provides deoxidizing/desmutting performance, comparable or better plus other benefits that cut operating costs. Isoprep 184 works effectively at room temperature to save energy dollars; its bath is regenerative, which means extended bath life and less frequent maintenance additions; it produces corrosion-free work even when used with high chloride-containing water; and it is formulated without chromium compounds to reduce waste disposal costs and to provide a safer working environment.

**FEATURES &
BENEFITS:**

- Effective deoxidizer/desmutter for a wide variety of aluminum alloys
- No heat necessary
- No chromate disposal problems
- Exceptional bath life - as much as three times longer than chromate-based systems
- Liquid product for easy mixing

APPLICATIONS:

Isoprep 184 is intended for use with etch cleaners, such as Isoprep 33 or Isoprep 35, for smut removal; and with non-etch cleaners, such as Isoprep 44 or Chemidize® 740, for surface oxide removal. These systems provide a clean, oxide- and smut-free surface in preparation for spot welding, anodizing, chromate conversion coating and barrel burnishing. Isoprep 184 also removes heat treat and weld discolorations from aluminum and most aluminum alloys.

Satisfactory deoxidizing/desmutting of most aluminum alloys is normally accomplished in less than one minute. If deoxidizing/desmutting is not satisfactorily complete in less than three minutes, with copper containing alloys, Isoprep 185 should be used instead of Isoprep 184 (refer to Isoprep 185 technical bulletin).

EQUIPMENT:
Tank.

Use 316 or 320 stainless steel tanks. Also may use mild steel tanks lined with PVC or polyethylene.

Agitation.

Continuous air agitation is recommended to prolong solution life and increases the effectiveness of Isoprep 184.

**OPERATING
DATA:****Range****Optimum**

Isoprep 184 conc.	22 to 25% by volume
Solution temperature	70 - 110°F (21-43°C)
Immersion time	1 to 3 minutes

**SOLUTION
MAKEUP AND
MAINTENANCE.:**

CAUTION: Before making up or replenishing the working solution, refer to the Safety And Handling section on page 3 to be certain you are aware of the protective gear you must wear, the correct method of adding Isoprep 184 to the bath, and the first-aid procedures to follow in the event of accidental exposure to Isoprep 184 concentrate or solutions.

Solution makeup.

1. Fill tank 2/3 full with water.
2. Carefully add required volume of Isoprep 184.

CAUTION: To prevent excessive heat buildup and spattering, add Isoprep 184 slowly over entire surface of bath **with constant agitation.**

3. Add water to operating level and mix thoroughly.

Solution maintenance.

Check Isoprep 184 concentration with a Drop Test Kit, which is available from your MacDermid representative. For more accurate results, determine Isoprep 184 concentration by titration analysis as described in the Analytical Control section. Maintain working solution at proper concentration with required additions of Isoprep 184 concentrate.

**ANALYTICAL
CONTROL:****Isoprep 184 analysis.**

Reagents: Methyl orange indicator
0.2N sodium hydroxide (NaOH)

Procedure:

1. Pipette 10mL of working solution into 100mL volumetric flask and dilute with water to mark.
2. Pipette 10mL aliquot of above sample into 250mL Erlenmeyer flask and add 75 to 100 mL of water.

3. Add 4 to 5 drops of methyl orange indicator.
4. Titrate with 0.2N sodium hydroxide, drop by drop, to a distinct yellow-orange endpoint.

Calculation:

$$\% \text{ by volume Isoprep 184} = \text{mL } 0.2\text{N sodium hydroxide} \times 2.64$$

**SAFETY &
WARNING:**

MacDermid, Inc. recommends that the company/operator read and review the MacDermid Material Safety Data Sheets for the appropriate health and safety warnings before use.

Material Safety Data Sheets are available from MacDermid Incorporated.

**WASTE
TREATMENT:**

Prior to using any recommendations or suggestions by MacDermid, Inc. for waste treatment, the user is required to know the appropriate local/state/federal regulations for on-site or off-site treatment which may require permits. If there is any conflict regarding our recommendations, local/state/federal regulations take precedent.

**ORDER
INFORMATION:**

<u>Product</u>	<u>Product Code</u>	<u>Container</u>
Isoprep 184	12617	5 gallons 15 gallons 55 gallons

NOTE: 1 gal of Isoprep 184 weighs approx. 12.33 lb (1 L weighs approx. 1.5 kg)