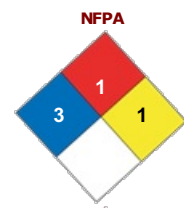


<b>Personal Protective Equipment</b> 				<b>WHMIS Pictograms</b> 		<b>GHS Pictograms</b> 	<b>DOT Pictograms</b> 
Chemical Splash Goggles	Safety Glasses	Protective Gloves	Face shield	Corrosive Material	D2B Toxic	Causes severe skin burns and eye damage	Corrosive

## SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

**Product Name:** 817  
**Product Code:** 817  
**MSDS Manufacturer Number:** 817  
**Product Use/Restriction:** Soldering flux  
**Manufacturer Name:** Kester  
**Address:** 800 W. Thorndale Avenue  
Itasca, IL 60143  
**General Phone Number:** (630)-616-4000  
**Customer Service Phone Number:** (800)-2KESTER (253-7837)  
**CHEMTREC:** For emergencies in the US, call CHEMTREC: 800-424-9300  
Outside of the U.S. and Canada: (703) 527-3887  
**Website:** msds@kester.com  
**MSDS Creation Date:** August 15, 2008  
**MSDS Revision Date:** September 17, 2009  
**MSDS Format:** According to ANSI Z400.1-2004



HMIS	
Health Hazard	3
Fire Hazard	1
Reactivity	1
Personal Protection	x

\* Chronic Health Effects

## SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS#	Ingredient Percent	EC Num.
Distilled Water	7732-18-5	30 - 60 by weight	
Ammonium chloride	12125-02-9	1 - 5 by weight	
Hydrochloric Acid (Hydrogen Chloride)	7647-01-0	10 - 30 by weight	
Zinc Chloride	7646-85-7	30 - 60 by weight	

## SECTION 3 - HAZARDS IDENTIFICATION

**Emergency Overview:** DANGER! Corrosive. Flux fumes during soldering may cause irritation and damage of mucous membranes and respiratory system.  
**Route of Exposure:** Eyes. Skin. Inhalation. Ingestion.  
**Acute Health Effects:** Corrosive. Causes burns.  
**Eye:** Corrosive. Will cause eye burns and permanent tissue damage.  
**Skin:** Contact causes severe skin irritation and possible burns. may cause permanent skin damage.  
**Inhalation:** May cause severe respiratory system irritation.  
**Ingestion:** Harmful if swallowed. Corrosive to the gastrointestinal tract. Causes irritation, a burning sensation of the mouth, throat and gastrointestinal tract and abdominal pain.  
**Chronic Health Effects:** Prolonged skin contact causes burns.  
Repeated or prolonged inhalation may cause toxic effects.  
**Signs/Symptoms:** Depending on solution concentration, material may be corrosive to skin, mucous membranes and eyes. Vapors may cause respiratory irritation.  
**Target Organs:** Eyes. Skin. Respiratory system. Digestive system.  
**Aggravation of Pre-Existing Conditions:** May aggravate pre-existing respiratory disorders, allergy, eczema, or skin conditions.

## SECTION 4 - FIRST AID MEASURES

<b>Eye Contact:</b>	Immediately flush eyes with plenty of water for 15 to 20 minutes. Get medical attention, if irritation or symptoms of overexposure persists.
<b>Skin Contact:</b>	Immediately wash skin with plenty of soap and water for 15 to 20 minutes, while removing contaminated clothing and shoes. Get medical attention if irritation develops or persists.
<b>Inhalation:</b>	If inhaled, remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Seek immediate medical attention.
<b>Ingestion:</b>	If swallowed, do NOT induce vomiting. Call a physician or poison control center immediately. Never give anything by mouth to an unconscious person.

## SECTION 5 - FIRE FIGHTING MEASURES

<b>Flash Point:</b>	Not applicable.
<b>Lower Flammable/Explosive Limit:</b>	Not applicable.
<b>Upper Flammable/Explosive Limit:</b>	Not applicable.
<b>Extinguishing Media:</b>	Use alcohol resistant foam, carbon dioxide, dry chemical, or water fog or spray when fighting fires involving this material.
<b>Unsuitable Media:</b>	Do not use a solid water stream as it may scatter and spread fire.
<b>Protective Equipment:</b>	As in any fire, wear Self-Contained Breathing Apparatus (SCBA), MSHA/NIOSH (approved or equivalent) and full protective gear.
<b>Hazardous Combustion Byproducts:</b>	Oxides of carbon, oxides of nitrogen, aliphatic aldehydes, and other organic substances may be formed during combustion..
<b>NFPA Ratings:</b>	
<b>NFPA Health:</b>	3
<b>NFPA Flammability:</b>	1
<b>NFPA Reactivity:</b>	1

## SECTION 6 - ACCIDENTAL RELEASE MEASURES

<b>Personnel Precautions:</b>	Evacuate area and keep unnecessary and unprotected personnel from entering the spill area. Avoid breathing vapor, aerosol or mist. Avoid contact with skin, eyes and clothing.
<b>Environmental Precautions:</b>	Avoid runoff into storm sewers, ditches, and waterways.
<b>Methods for containment:</b>	Contain spills with an inert absorbent material such as soil, sand or oil dry.
<b>Methods for cleanup:</b>	Absorb spill with inert material (e.g., dry sand or earth), then place in a chemical waste container. Provide ventilation. Clean up spills immediately observing precautions in the protective equipment section.

## SECTION 7 - HANDLING and STORAGE

<b>Handling:</b>	Corrosive. Use proper personal protective equipment as listed in section 8. Use with adequate ventilation. Avoid breathing vapor and fumes. Use only in accordance with directions.
<b>Storage:</b>	Store in a cool, dry, well ventilated area away from sources of heat and incompatible materials. Keep container tightly closed when not in use.
<b>Hygiene Practices:</b>	Wash thoroughly after handling. Avoid inhaling vapors, mists, or fumes.

## SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION - EXPOSURE GUIDELINES

<b>Engineering Controls:</b>	Use appropriate engineering control such as process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Where such systems are not effective wear suitable personal protective equipment, which performs satisfactorily and meets OSHA or other recognized standards. Consult with local procedures for selection, training, inspection and maintenance of the personal protective equipment.
<b>Eye/Face Protection:</b>	Tightly fitting safety goggles. Wear a face shield also when splash hazard exist.
<b>Hand Protection Description:</b>	Wear appropriate protective gloves. Consult glove manufacturer's data for permeability data. Nitrile rubber or natural rubber gloves are recommended.
<b>Respiratory Protection:</b>	A NIOSH approved air-purifying respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection.
<b>Other Protective:</b>	Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

### EXPOSURE GUIDELINES

#### **Ammonium chloride:**

<b>Guideline ACGIH:</b>	TLV-TWA: 10 mg/m <sup>3</sup> TLV-STEL: 20 mg/m <sup>3</sup>
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**Zinc Chloride :**

Guideline ACGIH: TLV-TWA: 1 mg/m3  
TLV-STEL: 2 mg/m3  
Guideline OSHA: PEL-TWA: 1 mg/m3

**SECTION 9 - PHYSICAL and CHEMICAL PROPERTIES**

Physical State Appearance: Liquid.  
Color: Clear to pale yellow  
Odor: Mild chemical.  
Boiling Point: 113 °C (235 °F)  
Melting Point: Not determined.  
Density: 1.422 g/cm<sup>3</sup> @ 20°C (68°F)  
pH: < 1.0 @ 20°C (68°F)  
Flash Point: Not applicable.

**SECTION 10 - STABILITY and REACTIVITY**

Chemical Stability: Stable under normal temperatures and pressures.  
Hazardous Polymerization: Not reported.  
Conditions to Avoid: Heat, flames, incompatible materials, freezing or temperatures below 32 deg. F.  
Incompatible Materials: Oxidizing agents. Strong acids and alkalis.  
Special Decomposition Products: Hydrogen chloride (HCl) Ammonia Zinc oxide Zinc chloride

**SECTION 11 - TOXICOLOGICAL INFORMATION****Ammonium chloride :**

RTECS Number: BP4570000

**Hydrochloric Acid (Hydrogen Chloride) :**

RTECS Number: MW4031000

Inhalation: Inhalation. - Rat LC50: 45000 mg/m3/5M [Lungs, Thorax, or Respiration - acute pulmonary edema]  
Inhalation. - Rat LC50: 8300 mg/m3/30M [Lungs, Thorax, or Respiration - acute pulmonary edema]  
Inhalation. - Mouse LC50: 8300 mg/m3/30M [Lungs, Thorax, or Respiration - acute pulmonary edema] (RTECS)

**Zinc Chloride :**

RTECS Number: ZH1400000

Ingestion: Oral - Rat LD50: 350 mg/kg [Details of toxic effects not reported other than lethal dose value.]  
Oral - Mouse LD50: 329 mg/kg [Details of toxic effects not reported other than lethal dose value.] (RTECS)

**SECTION 12 - ECOLOGICAL INFORMATION**

Ecotoxicity: No ecotoxicity data was found for the product.  
Environmental Fate: No environmental information found for this product.

**SECTION 13 - DISPOSAL CONSIDERATIONS**

Waste Disposal: Consult with the US EPA Guidelines listed in 40 CFR Part 261.3 for the classifications of hazardous waste prior to disposal. Furthermore, consult with your state and local waste requirements or guidelines, if applicable, to ensure compliance. Arrange disposal in accordance to the EPA and/or state and local guidelines.

**SECTION 14 - TRANSPORT INFORMATION**

DOT Shipping Name: Corrosive liquid, acidic, inorganic, n.o.s. (Hydrochloric acid, Zinc chloride)  
DOT UN Number: UN3264  
DOT Hazard Class: 8  
DOT Packing Group: III  
IATA Shipping Name: Corrosive liquid, acidic, inorganic, n.o.s. (Hydrochloric acid, Zinc chloride)  
IATA UN Number: UN3264  
IATA Hazard Class: 8  
IATA Packing Group: III  
IMDG UN Number : UN3264  
IMDG Shipping Name : Corrosive liquid, acidic, inorganic, n.o.s. (Hydrochloric acid, Zinc chloride)  
IMDG Hazard Class : 8  
IMDG Packing Group : III  
RID UN Number : UN3264  
RID Shipping Name : Corrosive liquid, acidic, inorganic, n.o.s. (Hydrochloric acid, Zinc chloride)  
RID Hazard Class : 8  
RID Packing Group : III

## SECTION 15 - REGULATORY INFORMATION

**Canada Reg. Status:** This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by the Controlled Products Regulations.

**Canada WHMIS:** Controlled - Class E - Corrosive material  
Controlled - Class : D2B Toxic

### **Ammonium chloride :**

**TSCA Inventory Status:** Listed

**Canada DSL:** Listed

### **Hydrochloric Acid (Hydrogen Chloride) :**

**TSCA Inventory Status:** Listed

**Canada DSL:** Listed

### **Zinc Chloride :**

**TSCA Inventory Status:** Listed

**Canada DSL:** Listed

### **WHMIS Pictograms**



## SECTION 16 - ADDITIONAL INFORMATION

**General Use:** Soldering flux

**HMIS Health Hazard:** 3

**HMIS Fire Hazard:** 1

**HMIS Reactivity:** 1

**HMIS Personal Protection:** x

**MSDS Creation Date:** August 15, 2008

**MSDS Revision Date:** September 17, 2009

**Disclaimer:** The information contained herein is based on data considered accurate and is offered solely for information, consideration and investigation. Kester extends no warranties, makes no representations and assumes no responsibility as to the accuracy, completeness or suitability of this data for any purchaser's use. The data on this Material Safety Data Sheet relates only to this product and does not relate to use with any other material or in any process. All chemical products should be used only by, or under the direction of, technically qualified personnel who are aware of the hazards involved and the necessity for reasonable care in handling. Hazard communication regulations require that employees must be trained on how to use a Material Safety Data Sheet as a source for hazard information.

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