



Code: SSD-3A  
Date: 13 NOV 1996  
Revised: 08 AUG 2011  
Printed: 08 AUG 2011

WOLVERINE JOINING TECHNOLOGIES, LLC.

MATERIAL SAFETY DATA SHEET

Product: DISPENSABLE SOLDER FLUX

SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Common Name : SOLDER FLUX  
Chemical Name : CHEMICAL MIXTURE  
Formula : CHEMICAL MIXTURE  
Product CAS No.: CHEMICAL MIXTURE  
Product Use : Welding/Brazing/Soldering

Supplier : WOLVERINE JOINING TECHNOLOGIES, LLC.  
Address : 235 KILVERT STREET  
City, St, Zip : WARWICK, RI 02886  
Phone : 1-401-739-9550

FOR CHEMICAL EMERGENCY CALL CHEMTREC (24 HOURS):  
1-800-424-9300 (US, Canada, Puerto Rico, Virgin Islands)  
1-703-527-3887 (Outside Above Area)

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT	CAS NO.	% Wt.
POLYETHYLENE GLYCOL	25322-68-3	70-80
ZINC CHLORIDE	7646-85-7	5-15
AMMONIUM CHLORIDE	12125-02-9	5-15

INGREDIENT NOTES

NOTE: The percentage by weight values reported for the ingredients in this product represent approximate formulation values. See Section 8 for Exposure Limits and Section 11 for Toxicological Information.

### SECTION 3: HAZARDS IDENTIFICATION

#### EMERGENCY OVERVIEW

Grey paste

Odorless

Flash Point: 98.9°C Open Cup

Overexposure may cause lung and kidney damage.

Causes eye, skin and respiratory tract irritation.

May cause burns.

May cause allergic skin reaction.

Harmful if swallowed. Causes severe irritation and may cause burns, abdominal pain, vomiting and diarrhea.

Not a fire or explosion hazard. However, toxic emissions are possible in a fire situation.

#### ROUTES OF ENTRY

Eyes? YES

Skin? YES

Inhalation? YES

Ingestion? YES

#### POTENTIAL HEALTH EFFECTS

EYE CONTACT causes irritation and may cause burns.

SKIN CONTACT causes irritation. Prolonged contact may cause burns, dermatitis and allergic skin reactions.

INHALATION of vapors or mists causes irritation to the respiratory tract and can cause metallic taste, burning sensation, coughing, sore throat, difficulty breathing, bronchitis, pneumonitis and pulmonary edema.

INGESTION is harmful. Can cause severe irritation and possible burns to mucous membranes. May cause severe abdominal pain, vomiting and diarrhea.

#### CARCINOGENICITY

NTP? NO

IARC? NO

OSHA? NO

#### CHRONIC HEALTH HAZARDS

Overexposure to ZINC CHLORIDE may result in sensitization dermatitis.

Prolonged or repeated overexposure may cause lung and kidney damage.

#### MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE

May aggravate existing medical conditions such as skin, respiratory and kidney disorders.

NOTE: See Section 8 for Exposure Limits, Section 11 for Toxicological Information and Section 12 for Ecological Information.

#### SECTION 4: FIRST AID MEASURES

**EYE CONTACT:** Immediately flush eyes with plenty of water for at least 30 minutes. Hold eyelids open during this flushing with water. Call a physician immediately.

**SKIN CONTACT:** Immediately wash skin with soap and plenty of water. If irritation persists, call a physician.

**INHALATION:** Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician.

**INGESTION:** If swallowed, "DO NOT INDUCE VOMITING", give 3-4 glasses of water. Do not give anything by mouth to an unconscious or convulsing person. Get immediate medical attention.

#### SECTION 5: FIRE-FIGHTING MEASURES

Flash Point: 98.9° C Open Cup  
Auto-Ignition: Not Determined  
LEL: 12 %  
UEL: 2 %

##### NFPA HAZARD CLASSIFICATION

Health: 3                      Flammable: 1                      Reactivity: 0

##### HMIS HAZARD CLASSIFICATION

Health: 3\*                      Flammable: 1                      Reactivity: 0                      Special: C

\* Indicates the possibility of chronic health effects. See Chronic Health Hazards in Section 3 for more information.

##### EXTINGUISHING MEDIA

Use water spray, dry chemical, alcohol foam, or carbon dioxide. Use water to keep fire-exposed containers cool.

##### SPECIAL FIRE FIGHTING PROCEDURES

Wear NIOSH/MSHA approved positive-pressure self-contained breathing apparatus and protective clothing as specified in 29 CFR 1910.156.

##### UNUSUAL FIRE AND EXPLOSION HAZARDS

Not a fire or explosion hazard. However, toxic emissions are possible in a fire situation.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

Contain spillage, soak up with inert absorbent and scoop into container for disposal. 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 Section 13: Disposal Considerations).

**\*\*NOTE\*\*** In the event of an accidental release of this material, the above procedures should be followed. Additionally, proper exposure controls and personal protection equipment should be used (see Section 8: Exposure Control/Personal Protection), and disposal of the material should be in accordance with Section 13: Disposal Considerations.

## SECTION 7: HANDLING AND STORAGE

Wash thoroughly after handling.

Keep container closed.

Store in a cool, dry location away from incompatible materials.

Avoid breathing vapors or mists.

Avoid contact with eyes, skin and clothing.

Use with adequate ventilation.

Provide a safety shower and eye wash close to where this material is being used.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### EXPOSURE LIMITS

INGREDIENT	PEL-OSHA	TLV-ACGIH
POLYETHYLENE GLYCOL CAS NO.: 25322-68-3	None Established	None Established
ZINC CHLORIDE CAS NO.: 7646-85-7	1 mg/m <sup>3</sup> (Fume)	1 mg/m <sup>3</sup> (Fume) 2 mg/m <sup>3</sup> (Fume) STEL
AMMONIUM CHLORIDE CAS NO.: 12125-02-9	None Established	10 mg/m <sup>3</sup> (Fume) 20 mg/m <sup>3</sup> (Fume) STEL

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 1998 Standards. All OSHA PELs refer to 29 CFR Part 1910 Air Contaminants: Final Rule, January 19, 1989.

## RESPIRATORY PROTECTION

A NIOSH/MSHA-approved respirator as necessary.

## VENTILATION

General; local exhaust ventilation as necessary to control any air contaminants to within their PELs or TLVs during the use of this product.

## PROTECTIVE EQUIPMENT

Chemical goggles.

Rubber or neoprene gloves.

Body protection as necessary to prevent skin contact.

Refer to ANSI/ASC Z49.1-94 (Safety in Welding, Cutting and Allied Processes), published by the American Welding Society, for further information on the selection of personal protective equipment.

## PERSONNEL SAMPLING PROCEDURE

For CHLORIDE: Refer to NIOSH Manual of Analytical Methods, 2ND Edition, Volume 1, Method 115.

For ZINC COMPOUNDS: Refer to NIOSH Manual of Analytical Methods (NMAM), 4th Edition, Method 7030.

For ZINC CHLORIDE: Refer to OSHA Analytical Method ID 121.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Grey paste

Odor: Odorless

Boiling Point: 80 °C

Specific Gravity (H<sub>2</sub>O=1): Not Determined

Melting Point: Not Determined

Vapor Pressure (mm Hg): 2 mm Hg at 25°C

Vapor Density (Air=1): Not Determined

Evaporation Rate: <0.1 % Solubility In Water: Dispersible

pH: Not Determined

## SECTION 10: STABILITY AND REACTIVITY

Stability: Generally considered stable.

Avoid: None expected.

INCOMPATIBILITY (Materials to Avoid)

Strong acids, strong oxidizing agents, strong alkali.

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS

Thermal decomposition may produce ammonia, chlorides, oxides of carbon, oxides of nitrogen and metal oxide fumes. Polymerization: Polymerization is not expected to occur.

Avoid: Not applicable.

SECTION 11: TOXICOLOGICAL INFORMATION

CHEMICAL NAME	% Wt. LD50	LC50
POLYETHYLENE GLYCOL CAS NO.: 25322-68-3	70-80 27,500 mg/kg RAT, oral	Not Available
ZINC CHLORIDE CAS NO.: 7646-85-7	5-15 350 mg/kg RAT, oral	Not Available
AMMONIUM CHLORIDE CAS NO.: 12125-02-9	5-15 1650 mg/kg RAT, oral	Not Available

NOTE: See Sections 3, 8 and 12 for additional information.

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICITY

No data available.

ENVIRONMENTAL FATE

No data available.

SECTION 13: DISPOSAL CONSIDERATIONS

US EPA Waste Number: Not Regulated

Federal, state and local disposal laws and regulations will determine the proper waste disposal/recycling/reclamation procedure. All waste material should be reviewed to determine the applicable hazards (testing may be necessary). Any waste solution with a pH of  $\leq 2$  or  $\geq 12.5$  is considered a hazardous waste under EPA hazardous waste regulations. Disposal requirements are dependent on the hazard classification and will vary by location and the type of disposal selected.

**\*\*NOTE\*\*** Chemical additions, processing or otherwise altering this material may make the waste management information presented above incomplete, inaccurate or otherwise inappropriate.

As local regulations may vary; all waste must be disposed/recycled/reclaimed in accordance with federal, state, and local environmental control regulations.

SECTION 14: TRANSPORT INFORMATION

INTERNATIONAL

UN Number: UN1840

UNITED STATES

EPA Waste Number: Not Regulated

DOT Classification: 8 Corrosive material

DOT Proper Shipping Name: Zinc chloride, solution, Class 8, UN #1840,  
PG III

Packing Group: III

CANADA

PIN Number: UN1840

TDG Class: 8 Corrosive Material

EC

DGL: Corrosive substance

SECTION 15: REGULATORY INFORMATION

US FEDERAL REGULATIONS

TSCA: IN TSCA

SARA 311 AND 312 HAZARD CATEGORIES

IMMEDIATE (Acute) Health Hazard: YES

DELAYED (Chronic) Health Hazard: YES

FIRE Hazard: NO

REACTIVITY Hazard: NO

Sudden Release of PRESSURE: NO

SARA SECTION 313 NOTIFICATION

This product contains a toxic chemical (or chemicals) subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

CHEMICAL NAME	CAS Number	% Wt.
ZINC CHLORIDE	7646-85-7	5-15
AMMONIUM CHLORIDE	12125-02-9	5-15

OZONE DEPLETING SUBSTANCES (ODS)

This product neither contains nor is manufactured with an ozone depleting substance subject to the labeling requirements of the Clean Air Act Amendments 1990 and 40 CFR Part 82.

VOLATILE ORGANIC COMPOUNDS (VOC)

Not Determined

US STATE REGULATIONS

VOLATILE ORGANIC COMPOUND (CARB): Not Determined

CANADIAN REGULATIONS

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

DSL/NDSL: DSL

WHMIS Classification: Class D Division 2 Subdivision B  
Class E

EUROPEAN REGULATIONS

EINECS: No

OTHER REGULATIONS

MITI (Japan): Yes

AICS (Australia): Yes

SECTION 16: OTHER INFORMATION

REVISIONS

Revision Number: 6

PREPARATION INFORMATION

Prepared By: Wolverine Joining Technologies, and Wolverine Tube Inc.  
Corporate Environmental, Health and Safety Group.

Phone Number/Address: See Section 1

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This Material Data Sheet is offered pursuant to OSHA's Hazard Communication Standard (29 CFR 1910.1200). Other government regulations must be reviewed for applicability to these products. The information in this Material Safety Data Sheet should be provided to all who will use, handle, store, transport, or otherwise be exposed to this product. This information has been prepared for the guidance of plant engineering, operations, and management and for persons working with or handling these products. The information presented in the MSDS is premised upon proper handling and anticipated uses and is for the material without chemical additions/alterations. We believe this information to be reliable and up-to-date as of the date of publication, but make no warranty that it is. Additionally, if this Material Safety Data Sheet is more than three years old, please contact the supplier at the phone number listed in Section 1 to make certain that this sheet is the most current. Copyright Wolverine Joining Technologies, LLC. License granted to make unlimited copies for internal use only.