

# SAFETY DATA SHEET

## 1. Identification

<b>Product identifier</b>	<b>Worthington General Purpose Soft Solder Liquid Flux, inorganic acid soldering flux</b>	
<b>Other means of identification</b>		
<b>SDS number</b>	WC040	
<b>Recommended use</b>	Soldering metal joints	
<b>Recommended restrictions</b>	None known.	
<b>Manufacturer/Importer/Supplier/Distributor information</b>		
<b>Manufacturer/Supplier</b>	Worthington Industries Incorporated	
<b>Address</b>	1690 Lowery Street, Winston-Salem, NC 27101 United States cylinders@worthingtonindustries.com	
<b>Telephone number</b>	1-336-831-8601	
<b>Emergency telephone number</b>	1-703-527-3887 International / CHEMTREC 1-800-424-9300 Domestic	

## 2. Hazard(s) identification

<b>Physical hazards</b>	Corrosive to metals	Category 1
<b>Health hazards</b>	Acute toxicity, oral	Category 4
	Skin corrosion/irritation	Category 1B
	Serious eye damage/eye irritation	Category 1
	Specific target organ toxicity, single exposure	Category 3 respiratory tract irritation
<b>Environmental hazards</b>	Hazardous to the aquatic environment, acute hazard	Category 1
	Hazardous to the aquatic environment, long-term hazard	Category 1

### Label elements



<b>Signal word</b>	Danger
<b>Hazard statement</b>	May be corrosive to metals. Harmful if swallowed. Causes severe skin burns and eye damage. May cause respiratory irritation. Very toxic to aquatic life with long lasting effects.
<b>Precautionary statement</b>	
<b>Prevention</b>	Keep only in original packaging. Do not breathe mist or vapor. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection.
<b>Response</b>	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. Wash contaminated clothing before reuse. IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor. Absorb spillage to prevent material-damage. Collect spillage.
<b>Storage</b>	Store in a well-ventilated place. Keep container tightly closed. Store locked up. Store in corrosive resistant container with a resistant inner liner.
<b>Disposal</b>	Dispose of contents/container in accordance with local/regional/national/international regulations.
<b>Other hazards</b>	None known.
<b>Supplemental information</b>	None.

### 3. Composition/information on ingredients

#### Mixtures

Chemical name	CAS number	%
ZINC CHLORIDE	7646-85-7	30 - 45
AMMONIUM CHLORIDE	12125-02-9	4 - 15
Hydrochloric acid	7647-01-0	3 - 15

**Composition comments** All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.  
Components not listed are either non-hazardous or are below reportable limits.

### 4. First-aid measures

**Inhalation** Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.

**Skin contact** Take off immediately all contaminated clothing. Rinse skin with water/shower. Call a physician or poison control center immediately. Chemical burns must be treated by a physician. Wash contaminated clothing before reuse.

**Eye contact** Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician or poison control center immediately.

**Ingestion** Call a physician or poison control center immediately. Rinse mouth. Do not induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.

**Most important symptoms/effects, acute and delayed** Harmful if swallowed. Burning pain and severe corrosive skin damage. Causes digestive tract burns. Irritation of nose and throat. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. May cause respiratory irritation. Coughing.

**Indication of immediate medical attention and special treatment needed** Provide general supportive measures and treat symptomatically. Chemical burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. Keep victim under observation. Symptoms may be delayed.

**General information** If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

### 5. Fire-fighting measures

**Suitable extinguishing media** Water fog. Foam. Dry chemical powder. Carbon dioxide (CO<sub>2</sub>).

**Unsuitable extinguishing media** Do not use water jet as an extinguisher, as this will spread the fire.

**Specific hazards arising from the chemical** During fire, gases hazardous to health may be formed.

**Special protective equipment and precautions for firefighters** Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

**Fire fighting equipment/instructions** Move containers from fire area if you can do so without risk.

**Specific methods** Use standard firefighting procedures and consider the hazards of other involved materials.

**General fire hazards** During fire, gases hazardous to health may be formed.

### 6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures** Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Keep out of low areas. Wear appropriate protective equipment and clothing during clean-up. Do not breathe mist or vapor. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

**Methods and materials for containment and cleaning up**

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Cover spill with sodium bicarbonate or soda ash and mix. Absorb spillage to prevent material damage. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Prevent entry into waterways, sewer, basements or confined areas. Following product recovery, flush area with water.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.

**Environmental precautions**

Avoid release to the environment. Inform appropriate managerial or supervisory personnel of all environmental releases. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.

**7. Handling and storage****Precautions for safe handling**

Do not breathe mist or vapor. Do not get in eyes, on skin, or on clothing. Avoid prolonged exposure. Do not taste or swallow. When using, do not eat, drink or smoke. Provide adequate ventilation. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Avoid release to the environment. Observe good industrial hygiene practices.

**Conditions for safe storage, including any incompatibilities**

Store in plastic containers in cool area away from heat. Do not store in glass or porcelain containers. Store in corrosive resistant container with a resistant inner liner. Store locked up. Keep only in the original container. Store away from incompatible materials (see Section 10 of the SDS).

**8. Exposure controls/personal protection****Occupational exposure limits****US. ACGIH Threshold Limit Values**

Components	Type	Value	Form
AMMONIUM CHLORIDE (CAS 12125-02-9)	STEL	20 mg/m <sup>3</sup>	Fume.
Hydrochloric acid (CAS 7647-01-0)	TWA	10 mg/m <sup>3</sup>	Fume.
	Ceiling	2 ppm	
ZINC CHLORIDE (CAS 7646-85-7)	STEL	2 mg/m <sup>3</sup>	Fume.
	TWA	1 mg/m <sup>3</sup>	Fume.

**Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2)**

Components	Type	Value	Form
AMMONIUM CHLORIDE (CAS 12125-02-9)	STEL	20 mg/m <sup>3</sup>	Fume.
Hydrochloric acid (CAS 7647-01-0)	TWA	10 mg/m <sup>3</sup>	Fume.
	Ceiling	3 mg/m <sup>3</sup>	
ZINC CHLORIDE (CAS 7646-85-7)	STEL	2 ppm	Fume.
	TWA	2 mg/m <sup>3</sup>	Fume.

**Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)**

Components	Type	Value	Form
AMMONIUM CHLORIDE (CAS 12125-02-9)	STEL	20 mg/m <sup>3</sup>	Fume.
Hydrochloric acid (CAS 7647-01-0)	TWA	10 mg/m <sup>3</sup>	Fume.
	Ceiling	2 ppm	
ZINC CHLORIDE (CAS 7646-85-7)	STEL	2 mg/m <sup>3</sup>	Fume.
	TWA	1 mg/m <sup>3</sup>	Fume.

**Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act)**

Components	Type	Value	Form
AMMONIUM CHLORIDE (CAS 12125-02-9)	STEL	20 mg/m3	Fume.
Hydrochloric acid (CAS 7647-01-0)	TWA	10 mg/m3	Fume.
	Ceiling	2 ppm	
ZINC CHLORIDE (CAS 7646-85-7)	STEL	2 mg/m3	Fume.
	TWA	1 mg/m3	Fume.

**Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents)**

Components	Type	Value	Form
AMMONIUM CHLORIDE (CAS 12125-02-9)	STEL	20 mg/m3	Fume.
Hydrochloric acid (CAS 7647-01-0)	TWA	10 mg/m3	Fume.
	Ceiling	2 ppm	
ZINC CHLORIDE (CAS 7646-85-7)	STEL	2 mg/m3	Fume.
	TWA	1 mg/m3	Fume.

**Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment)**

Components	Type	Value	Form
AMMONIUM CHLORIDE (CAS 12125-02-9)	STEL	20 mg/m3	Fume.
Hydrochloric acid (CAS 7647-01-0)	TWA	10 mg/m3	Fume.
	Ceiling	7.5 mg/m3	
ZINC CHLORIDE (CAS 7646-85-7)	TWA	5 ppm	Fume.
		1 mg/m3	

**Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21)**

Components	Type	Value
Hydrochloric acid (CAS 7647-01-0)	Ceiling	2 ppm

<b>Biological limit values</b>	No biological exposure limits noted for the ingredient(s).
<b>Appropriate engineering controls</b>	Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Eye wash facilities and emergency shower must be available when handling this product.
<b>Individual protection measures, such as personal protective equipment</b>	
<b>Eye/face protection</b>	Wear safety glasses with side shields (or goggles) and a face shield.
<b>Skin protection</b>	
<b>Hand protection</b>	Wear appropriate chemical resistant gloves. Be aware that the liquid may penetrate the gloves. Frequent change is advisable.
<b>Other</b>	Wear appropriate chemical resistant clothing. Rubber apron.
<b>Respiratory protection</b>	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. Selection and use of respiratory protective equipment should be in accordance with CSA Standard Z94.4.
<b>Thermal hazards</b>	Wear appropriate thermal protective clothing, when necessary.
<b>General hygiene considerations</b>	Keep away from food and drink. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

**9. Physical and chemical properties**

<b>Appearance</b>	Clear, colorless liquid.
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<b>Physical state</b>	Liquid.
<b>Form</b>	Liquid.
<b>Color</b>	Clear, colorless.
<b>Odor</b>	Odorless.
<b>Odor threshold</b>	Not available.
<b>pH</b>	Not available.
<b>Melting point/freezing point</b>	32 °F (0 °C)
<b>Initial boiling point and boiling range</b>	219.2 °F (104 °C)
<b>Flash point</b>	Not available.
<b>Evaporation rate</b>	0.6 (Butyl acetate = 1)
<b>Flammability (solid, gas)</b>	Not applicable.
<b>Upper/lower flammability or explosive limits</b>	
<b>Flammability limit - lower (%)</b>	Not available.
<b>Flammability limit - upper (%)</b>	Not available.
<b>Vapor pressure</b>	Not available.
<b>Vapor density</b>	Not available.
<b>Relative density</b>	1.32 (H2O=1)
<b>Solubility(ies)</b>	
<b>Solubility (water)</b>	Completely soluble in water.
<b>Partition coefficient (n-octanol/water)</b>	Not available.
<b>Auto-ignition temperature</b>	Not available.
<b>Decomposition temperature</b>	Not available.
<b>Viscosity</b>	Not available.
<b>Other information</b>	
<b>Explosive properties</b>	Not explosive.
<b>Oxidizing properties</b>	Not oxidizing.
<b>Percent volatile</b>	64 % v/v

## 10. Stability and reactivity

<b>Reactivity</b>	May be corrosive to metals.
<b>Chemical stability</b>	Material is stable under normal conditions.
<b>Possibility of hazardous reactions</b>	Hazardous polymerization does not occur.
<b>Conditions to avoid</b>	Contact with metals. Contact with incompatible materials. Excessive heat or cold.
<b>Incompatible materials</b>	Strong oxidizing agents. Strong reducing agents. Alkaline materials. Cyanides. Combustibles.
<b>Hazardous decomposition products</b>	When heated to decomposition may emit toxic fumes of hydrogen chloride.

## 11. Toxicological information

### Information on likely routes of exposure

<b>Inhalation</b>	May cause irritation to the respiratory system.
<b>Skin contact</b>	Causes severe skin burns.
<b>Eye contact</b>	Causes serious eye damage.
<b>Ingestion</b>	Harmful if swallowed. Causes digestive tract burns.

**Symptoms related to the physical, chemical and toxicological characteristics** Harmful if swallowed. Burning pain and severe corrosive skin damage. Causes digestive tract burns. Irritation of nose and throat. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. May cause respiratory irritation. Coughing.

### Information on toxicological effects

**Acute toxicity** Harmful if swallowed.

**Components** **Species** **Test Results**

AMMONIUM CHLORIDE (CAS 12125-02-9)

**Acute**

*Oral*

LD50 Rat 1650 mg/kg

Hydrochloric acid (CAS 7647-01-0)

**Acute**

*Inhalation*

LC50 Rat 3124 ppm, 1 Hours

ZINC CHLORIDE (CAS 7646-85-7)

**Acute**

*Oral*

LD50 Mouse 350 mg/kg

**Skin corrosion/irritation** Causes severe skin burns.

**Serious eye damage/eye irritation** Causes serious eye damage.

**Respiratory or skin sensitization**

**Canada - Alberta OELs: Irritant**

AMMONIUM CHLORIDE (CAS 12125-02-9) Irritant

Hydrochloric acid (CAS 7647-01-0) Irritant

ZINC CHLORIDE (CAS 7646-85-7) Irritant

**Respiratory sensitization** This product is not expected to cause respiratory sensitization.

**Skin sensitization** This product is not expected to cause skin sensitization.

**Germ cell mutagenicity** No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

**Carcinogenicity** Not classifiable as to carcinogenicity to humans.

**ACGIH Carcinogens**

Hydrochloric acid (CAS 7647-01-0) A4 Not classifiable as a human carcinogen.

**Canada - Manitoba OELs: carcinogenicity**

Hydrochloric acid (CAS 7647-01-0) Not classifiable as a human carcinogen.

**IARC Monographs. Overall Evaluation of Carcinogenicity**

Hydrochloric acid (CAS 7647-01-0) 3 Not classifiable as to carcinogenicity to humans.

**Reproductive toxicity** This product is not expected to cause reproductive or developmental effects.

**Specific target organ toxicity - single exposure** May cause respiratory irritation.

**Specific target organ toxicity - repeated exposure** Not classified.

**Aspiration hazard** Not an aspiration hazard.

**Chronic effects** Chronic effects are not expected when this product is used as intended.

**Further information** None known.

**12. Ecological information**

**Ecotoxicity** Very toxic to aquatic life with long lasting effects.

**Components** **Species** **Test Results**

ZINC CHLORIDE (CAS 7646-85-7)

**Aquatic**

Crustacea EC50 American or virginia oyster (Crassostrea virginica) 0.1511 - 0.2782 mg/l, 48 hours

Fish LC50 Rainbow trout,donaldson trout (Oncorhynchus mykiss) 0.101 - 0.197 mg/l, 96 hours

**Persistence and degradability** No data is available on the degradability of this product.

**Bioaccumulative potential** No data available.

<b>Mobility in soil</b>	This product is water soluble and may disperse in soil.
<b>Other adverse effects</b>	The product may affect the acidity (pH-factor) in water with risk of harmful effects to aquatic organisms.

### 13. Disposal considerations

<b>Disposal instructions</b>	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations.
<b>Local disposal regulations</b>	Dispose in accordance with all applicable regulations.
<b>Hazardous waste code</b>	Not regulated.
<b>Waste from residues / unused products</b>	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
<b>Contaminated packaging</b>	Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

### 14. Transport information

<b>TDG</b>	
<b>UN number</b>	UN3264
<b>UN proper shipping name</b>	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Zinc chloride; Hydrochloric acid)
<b>Transport hazard class(es)</b>	
<b>Class</b>	8
<b>Subsidiary risk</b>	-
<b>Packing group</b>	III
<b>Environmental hazards</b>	Yes
<b>Special precautions for user</b>	Read safety instructions, SDS and emergency procedures before handling.
<b>IATA</b>	
<b>UN number</b>	UN3264
<b>UN proper shipping name</b>	Corrosive liquid, acidic, inorganic, n.o.s. (Zinc chloride; Hydrochloric acid)
<b>Transport hazard class(es)</b>	
<b>Class</b>	8
<b>Subsidiary risk</b>	-
<b>Label(s)</b>	8
<b>Packing group</b>	III
<b>Environmental hazards</b>	Yes
<b>ERG Code</b>	8L
<b>Special precautions for user</b>	Read safety instructions, SDS and emergency procedures before handling.
<b>IMDG</b>	
<b>UN number</b>	UN3264
<b>UN proper shipping name</b>	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (ZINC CHLORIDE; HYDROCHLORIC ACID)
<b>Transport hazard class(es)</b>	
<b>Class</b>	8
<b>Subsidiary risk</b>	-
<b>Label(s)</b>	8
<b>Packing group</b>	III
<b>Environmental hazards</b>	
<b>Marine pollutant</b>	Yes
<b>EmS</b>	F-A, S-B
<b>Special precautions for user</b>	Read safety instructions, SDS and emergency procedures before handling.
<b>Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code</b>	Not applicable.

### 15. Regulatory information

<b>Canadian regulations</b>	This product has been classified in accordance with the hazard criteria of the HPR and the SDS contains all the information required by the HPR.
<b>Controlled Drugs and Substances Act</b>	Not regulated.

**Export Control List (CEPA 1999, Schedule 3)**

Not listed.

**Greenhouse Gases**

Not listed.

**Precursor Control Regulations**

Hydrochloric acid (CAS 7647-01-0)

Class B

**International regulations****Stockholm Convention**

Not applicable.

**Rotterdam Convention**

Not applicable.

**Kyoto protocol**

Not applicable.

**Montreal Protocol**

Not applicable.

**Basel Convention**

Not applicable.

**International Inventories**

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

\*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

**16. Other information****Issue date** 17-July-2016**Revision date** -**Version #** 01**Further information** The classification for health and environmental hazards is derived by a combination of calculation methods and test data, if available.

**References**

EPA: ACQUIRE database  
 NLM: Hazardous Substances Data Base  
 US. IARC Monographs on Occupational Exposures to Chemical Agents  
 HSDB® - Hazardous Substances Data Bank  
 IARC Monographs. Overall Evaluation of Carcinogenicity  
 National Toxicology Program (NTP) Report on Carcinogens  
 ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices

**Disclaimer**

All information in this Safety Data Sheet is believed to be accurate and reliable. However, no guarantee or warranty of any kind is made with regard to the accuracy of information or the suitability of the recommendations contained herein. It is the user's responsibility to assess the safety and toxicity of this product under their own conditions of use and to comply with all applicable laws and regulations.