

40 OCT W955
Lead-free Solder

Solder, Lead-free



MATERIAL SAFETY DATA SHEET

SOLDERS

SECTION 1 - MATERIAL IDENTIFICATION

Manufacturer Name J. W. Harris Co., Inc. Distributor Name (if Applicable) _____
 Address 10930 Deerfield Road
 Address Cincinnati, Ohio 45242
 Emergency Telephone (513) 891-2000
 MSDS Date November 1985

The following table lists the trade name and composition of products covered by this Material Safety Data Sheet. See section 2 and especially section 6 for important health hazard data.

Trade Name	Wire Composition wt%					
	Pb	Fe	Ag	Cu	Zn	Other
Stay Solder	95		4			
Stay Solder 40	95		5			
Aluminum 500				99	77	
95/5	95		5			
90/10	90	90				
80/20	80	40				
40/60	40	60				
63/37	63	37				
30/70	30	70				

Core Composition for Flux Coated Solders

Core	Core Composition	
	Zinc Chloride	Resin
Agit Core	70	1-3
Resin Core	100	1-3

SECTION 2 - HAZARDOUS MATERIALS

Solder wire is a non-hazardous solid at ambient temperature. Hazards (as defined by OSHA 29CFR 1910.1200) may result from fume generated during soldering. Section 1 lists product designations and composition as manufactured. IMPORTANT - See Section 6 for information on potential fume hazard resulting from use of the product.

SECTION 3 - PHYSICAL DATA

Wire, grey to silver in color. Solder may be solid or contain an inner core of flux.

SECTION 4 - FIRE AND EXPLOSION DATA

Nonflammable. Open flame and sparks can ignite combustibles. See ANSI/ASC Z39.1-1983 Section 6.

SECTION 5 - HEALTH HAZARD DATA

Exposure - Section 1 lists nominal composition of solders. Section 6 lists exposure limits for hazardous decomposition products which might be present in fumes generated during soldering. Actual exposure should be determined by monitoring the fume in the operator's breathing zone.

Primary Route of Exposure - Inhalation of fume. Possible lead dust ingestion from smoking or eating after handling lead bearing solders.

Pri-Existing Medical Conditions - Individuals with impaired pulmonary functions or illness may have symptoms exacerbated by fume irritants.

Possible Effects of Exposure - Ingestion of lead dust or inhalation of lead oxide fume is one of the main hazards. Over exposure can produce symptoms such as headache, nausea, dizziness, body aches, and anorexia. Symptoms are similar to other illnesses and require medical verification. Lead accumulates in the body and small amounts can build up over a period of time to toxic levels. Short term exposure to cadmium fume causes irritation of the nose and throat. Chest pain, cough, fever or shortness of breath may develop after several hours. Severe over exposure can cause pulmonary edema. Prolonged inhalation exposure may cause lung or kidney damage. Cadmium compounds should be considered suspected carcinogens based on some animal tests and recent epidemiological studies. Tin and antimony fumes may cause metal fume fever, characterized by fever, body aches, chills. Fumes from acid and resin core can irritate nose, throat. Zinc chloride in acid core solder may irritate the skin.

Emergency First Aid - Remove from dust or fume exposure. If breathing has stopped perform artificial respiration. Summon medical aid immediately.

Other Health Considerations - Solid wire solders are frequently used with a zinc chloride type flux. If applicable, flux fume should be considered in evaluation of hazards.

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SECTION 6 - REACTIVITY DATA

Solid Wire

Soldering fumes cannot be classified simply. The composition and quantity are dependent upon the metal being soldered, the process, procedures, and filler metals used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being soldered (such as paint, plating, or galvanizing), the number of operators and the volume of the work area, the quality and amount of ventilation, the position of the operator's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities).

A stable material in closed containers at room temperature under normal storage and handling conditions. This material can be considered a weak acid. It can be mildly corrosive to some metals, especially when hot.

Zinc chloride flux in acid core solders is incompatible with cyanides, may release HCN gas when mixed with zinc cyanide. If combined with sulfides, the liquid flux may release H₂S gas.

Element	CAS#	PEL mg/m ³ (1)	TLV mg/m ³ (2)
Tin (oxide)	7440-31-5	2.0	2.0
Lead (no dust & fume)	7439-92-1	0.05	0.15
Silver (metal)	7440-22-4	0.01	0.1
Silver (soluble compounds)	7440-22-4	0.01	0.01
Antimony	7440-36-0	0.5	0.5
Chromium (oxide fume)	1306-19-0	0.1	0.05
Zinc (oxide)	1314-13-2	0.3 (dusting fume)	0.3 (dusting fume)
		5.0	5.0 (fume)
Additional Data for Flux Cores			
Zinc Chloride (acid core)	7446-81-7	1.0	1.0
Activated Flux (Rosin core)	No Listing	None	None

(1) Permissible exposure limit OSHA 1910 Subpart Z.

(2) Threshold limit value American Conference of Government Industrial Hygienists.

One recommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample in the worker's breathing zone. See ANSI/AWS F1.1, available from the American Welding Society, P.O. Box 351040, Miami, Florida 33135.

SECTION 7 - SPILL OR LEAK PROCEDURES

Not Applicable.

SECTION 8 AND 9 - SPECIAL PROTECTION INFORMATION AND PRECAUTIONS

Read and understand the manufacturer's instructions and the precautionary label on the product. See American National Standard Z49.1, *Safety in Welding and Cutting* published by the American Welding Society, P.O. Box 351040, Miami, FL 33135 and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, Washington, D.C. 20402 for more detail on many of the following.

Ventilation

Use enough ventilation, local exhaust at the arc (or flame) to keep the fumes and gases below TLV's in the worker's breathing zone and the general area. Train the employee to keep his head out of the fumes. See ANSI/ASC Z49.1 Section 5.

Respiratory Protection

Use respirable fume respirator or air supplied respirator when soldering in confined space or where local exhaust or ventilation does not keep exposed below TLV.

Eye Protection

Wear helmet or use face shield with filter lens of appropriate shade number (see ANSI/ASC Z49.1 -Section 4.2). Provide protection screens and flash goggles, if necessary, to shield others.

Protective Clothing

Wear head and body protection which help to prevent injury from sparks and flame. See ANSI Z49.1. At a minimum this includes gloves and a protective face shield, and may include arm protectors, aprons, full, shoulder protection, as well as dark substantial clothing.

Other Precautions

Wash hands thoroughly before smoking or eating after using lead bearing solders.

The information and recommendations contained in this publication have been compiled from sources believed to be reliable and to represent the best information on the subject at the time of issue. No warranty, guarantee, or representation is made by Unibrax Corp. or J.W. Harris Co., Inc. as to the absolute correctness or sufficiency of any representation contained in this and other publications; Unibrax Corp. and J.W. Harris Co., Inc. assume no responsibility in connection therewith; nor can it be assumed that all acceptable safety measures are contained in this (and other publications), or that other or additional measures may not be required under particular or exceptional conditions or circumstances.



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