

U.S. DEPARTMENT OF LABOR  
Occupational Safety and Health Administration

FORM APPROVED  
DMS NO. 44-R-1387

# MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing,  
Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

## SECTION I

MANUFACTURER'S NAME THERMACOTE-WELCO CO.		EMERGENCY TELEPHONE NO. 1-704-739-6421
ADDRESS 161 YORK ROAD, KINGS MOUNTAIN, N.C. 28086		
CHEMICAL NAME AND SYNONYMS LOW FINING BRONZE		TRADE NAME AND SYNONYMS WELCO 15 - 15FC
CHEMICAL FAMILY B-Cu-Zn-C	FORMULA 58% Cu 1.0% Sn 0.1% Si bal. Zn	

## SECTION II. HAZARDOUS INGREDIENTS\*

IMPORTANT! This section covers the materials from which this product is manufactured. The fumes and gases produced during welding with normal use of this product are covered in Section V.

Material (CAS No.)	Weight %	Exposure Limit	
		1984-85 TLV-TWA	(OSHA PEL)
WELCO 15	Less Than		
Copper (7440-50-8)	60.0	.2 mg/m <sup>3</sup>	(.1 mg/m <sup>3</sup> )
Iron (7439-89-6)	1.5	5 mg/m <sup>3</sup> Fe <sub>2</sub> O <sub>3</sub> as Fe	(10 mg/m <sup>3</sup> )
Tin (7440-31-5)	3.0	2 mg/m <sup>3</sup>	
Zinc (7440-66-6)	Bal.	5 mg/m <sup>3</sup> as oxide fume	
WELCO 15FC			
Copper (7440-50-8)	60.0	.2 mg/m <sup>3</sup>	(.1 mg/m <sup>3</sup> )
Iron (7439-89-6)	1.5	5 mg/m <sup>3</sup> Fe <sub>2</sub> O <sub>3</sub> as Fe	(10 mg/m <sup>3</sup> )
Tin (7440-31-5)	3.0	2 mg/m <sup>3</sup>	
Zinc (7440-66-6)	40.0	5 mg/m <sup>3</sup> as oxide fume	
Boric Acid (10043-35-3)	5.0	5 mg/m <sup>3</sup> (NOC)	
Borax Glass (1303-96-4)	20.0	1 mg/m <sup>3</sup>	

\*The term "hazardous" should be interpreted as a term required and defined in the OSHA Hazard Communications Standard (29CFR 1910.1200) and does not necessarily imply the existence of any hazard. Some of the products listed may not contain all of the ingredients shown in Section II. Typical analyses can be found in the appropriate AWS Specification or from your supplier.

## SECTION III. PHYSICAL/CHEMICAL CHARACTERISTICS

Appearance: WELCO 15 - bare, solid bronze rods.  
WELCO 15FC bronze rods coated with white flux.

## SECTION IV. FIRE & EXPLOSION HAZARD DATA

Non-flammable. Welding arc and sparks can ignite combustible and flammable products. See ANSI Z49.1 "Safety in Welding and Cutting" (referenced in Section III) for fire prevention and protection information.

## SECTION V. REACTIVITY DATA

## Hazardous Decomposition Products

Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedures, and electrodes 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 welded (such as paint, plating, or galvanizing), the number of welders and the volume of the work area, the quality and amount of ventilation, the position of the welder'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).

When the rods are consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section II. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section II, plus those from the base metal and coating, etc., as noted above.

Reasonably expected fume constituents of this product would include:

Primarily oxides of Copper and Zinc. Secondarily complex oxides of Iron, Tin, Boron and Sodium.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by radiation from the arc.

One recommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample inside the welder's helmet if worn or in the worker's breathing zone. See ANSI AWS F1.1 "Method for Sampling Airborne Particles Generated by Welding and Allied Processes" available from the American Welding Society, P. O. Box 351040, Miami, FL 33135.

## SECTION VI. HEALTH HAZARD DATA

**THRESHOLD LIMIT VALUE:** The ACGIH 1984-85 recommended limit for welding fume, not otherwise classified (NOC) is  $5 \text{ mg/m}^3$ . TLV-TWA's should be used as a guide in the control of health hazards and not as fine lines between safe and dangerous concentrations. See Section V for specific fume constituents which may modify this TLV-TWA.

**EFFECTS OF OVEREXPOSURE:** Electric arc welding or oxy-fuel gas processes may create one or more of the following hazards:

- **FUMES & GASES** can be dangerous to your health. Primary route of entry is by inhalation.
  - Short term (acute) overexposure to welding fumes may result in discomfort such as dizziness, nausea, or dryness or irritation of the nose, throat, or eyes.
  - Long term (chronic) overexposure to welding fumes can lead to siderosis (iron deposits in lung) and affect pulmonary function.
- **ARC RAYS** can injure eyes and burn skin. **HEAT RAYS** (infrared radiation from flame or hot metal) can injure eyes.
- **ELECTRIC SHOCK** can kill.
- **NOISE** can damage hearing.
- **CARCINOGENIC ASSESSMENT:** N/A
- **EMERGENCY FIRST AID PROCEDURES:** Call for medical aid. Employ first aid techniques recommended by the American Red Cross. IF BREATHING IS DIFFICULT, give oxygen. Call a physician. IN CASE OF ELECTRICAL SHOCK disconnect and turn off power. IF NOT BREATHING, begin artificial respiration, preferably mouth-to-mouth. If no detectable pulse, begin external heart massage. Immediately call a physician. IN CASE OF ARC BURN call a physician.

## SECTION VII. PRECAUTIONS FOR SAFE HANDLING AND USE

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; OSHA Publication 2206 (29CFR1910), U. S. Government Printing Office, Washington, D. C. 20402;

- **VENTILATION:** Use enough ventilation, local exhaust at the arc, or both, to keep the fumes and gases below TLV's in the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes. Use respirable fume respirator or air supplied respirator when welding in confined space or where local exhaust or ventilation does not keep exposure below TLV. Select as per OSHA 29 CFR 1910.134.
- **EYE PROTECTION:** Wear helmet or use face shield with filter lens. As a rule of thumb, start with a shade that is too dark to see the weld zone and then go to the next lighter shade (See ANSI Z49.1). Provide protective screens and flash goggles, if necessary, to shield others.
- **PROTECTION CLOTHING:** Wear hand, head, and body protection which help to prevent injury from radiation, sparks, and electrical shock. See ANSI Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing. Train the welder not to touch live electrical parts and to insulate himself from work and ground.
- **WASTE DISPOSAL:** Dispose any product, residue, disposable container or liner in an environmentally acceptable manner, in full compliance with federal, state, and local regulations.