



13 Executive Drive, Suite 19
Fairview Heights, Illinois 62208
Telephone: (618) 624-8783
Toll Free: (800) 272-7633
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MATERIAL SAFETY DATA SHEET

MAY BE USED TO COMPLY WITH OSHA'S HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200 AND SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA) OF 1986 PUBLIC LAW 99-499. STANDARD SHOULD BE CONSULTED FOR SPECIFIC REQUIREMENTS

SECTION I - IDENTIFICATION

MANUFACTURER'S NAME: AMERICAN WELDING SYSTEMS INC.

ADDRESS: 13 EXECUTIVE DRIVE, SUITE 19
FAIRVIEW HEIGHTS, IL 62208

IN CASE OF EMERGENCY: 1(800) 272-7633

PRODUCT NAME: Quadsteel 94

PRODUCT CLASSIFICATION: Flux Cored Filler Metal

SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

IMPORTANT: This section covers materials from which these products are manufactured. The fumes and gases produced during normal use of these products are covered in Section V. The term "Hazardous" in "Hazardous Ingredients" should not be interpreted as a term required and defined in OSHA Hazard Communication Standard (29 CFR Part 1910.1200). The chemicals or compounds subject to reporting under Title III, in Section 313, of the Superfund Amendments and Reauthorization Act (SARA) are marked with the symbol #.

INGREDIENTS	CAS NUMBER	% INGREDIENTS (by weight)	EXPOSURE LIMIT (mg/m3)	
			OSHA PEL	ACGIH TLV
Iron	7439-89-6	60-100	10	5
Manganese #	7439-96-5	1-5	1	1
Silicon	7440-21-3	1-5	5	10
Calcium Fluoride	14542-23-5	1-5	2.5 (as F)	2.5 (as F)
Molybdenum	7439-98-7	0.1-1	5	5

SECTION III (PHYSICAL DATA)

Not Applicable

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Non-Flammable: Welding arc and sparks can ignite combustibles. Refer to American National Standard Z49.1 for fire prevention during welding. These products as shipped are non-hazardous, non-flammable, non-explosive, and non-reactive. Rating under National Fire Protection 704: Health, 2; Flammability, 0; Reactivity, 0.

SECTION V- REACTIVITY DATA

Welding fumes cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedure, and the 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 the amount of ventilation, 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 electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section II. Fume and decomposition products, not the ingredients in the electrode, are important. Decomposition products include those originating from the volatilization, reaction, or oxidation of materials in Section II, plus those from the base metals and coating, etc., as noted above. These components are virtually always present as complex oxides and not as metals (Characterization of Arc Welding Fume: American Welding Society). Reasonably expected fume constituents of the fume could include: complex oxides of iron, manganese, and silicon. Fluorides will also be present. The table below lists some reasonably expected fumes that may be generated.



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SUBSTANCE	CAS NUMBER	OSHA PEL	ACGIH TLV
Iron Oxide	1309-37-1	10	5
Manganese Dioxide #	1313-13-9	1	1
Silicon Dioxide	7631-86-9	5	3

Gaseous reaction may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may also be formed by radiation from the arc. Monitor fumes levels. One recommended way to determine the composition and quantity of fumes and gas 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 available from the "American Welding Society", P.O. Box 351040, Miami, FL 33135).

SECTION VI - HEALTH HAZARD DATA

Threshold Limit Value: The ACGIH and OSHA have set the exposure level for welding fumes at 5 mg/m³. The ACGIH 1984-85 preface states: "The TLV-TWA should be used as guides in the control of health hazards and should not be used as firm lines between safe and dangerous concentrations." See Section V for specific fume constituents, which may modify the TLV.

Effects of Overexposure: Electric arc welding may create one or more of the following health hazards: FUMES AND GASES can be dangerous to your health. PRIMARY ROUTES OF ENTRY are the respiratory system, eyes, and/or skin. PREEXISTING respiratory or allergic conditions may be aggravated in some individuals. SHORT TERM (ACUTE) OVEREXPOSURE to welding fumes may result in discomfort such as dizziness, nausea, or dryness or irritation of nose, throat, or eyes. IRON, IRON OXIDE, MANGANESE – Remove from overexposure and apply artificial respiration if needed. FLUORIDES – Fluoride compounds produced may cause eye and skin burns, pulmonary edema bronchitis. LONG TERM (CHRONIC) OVEREXPOSURE may lead to siderosis (iron deposits in lungs) and is believed by some investigators to affect pulmonary functions. PRIMARY ROUTE OF ENTRY is the respiratory system. IRON, IRON OXIDE – Long term overexposure to iron fumes can cause deposits of iron in the lungs (siderosis). Lungs will clear in time when exposure to iron and its compounds ceases. FLUORIDES – Overexposure to fluorides can cause serious bone erosion. MANGANESE – Long-term overexposure may lead to "Manganism". Central nervous system is affected and symptoms include muscular weakness and tremors. Exposed workers should get quarterly medical examinations for manganism. FLUORIDES – Overexposure to fluorides can cause serious bone erosion. ARC RAYS can injure eyes. WELDING FUMES – Welding fumes (not otherwise classified) are considered to be carcinogenic defined with no further categorization by NIOSH. ELECTRIC SHOCK can kill. See Section VII.

Emergency & First Aid Procedures: Call for medical aid. Employ first aid techniques recommended by The American Red Cross. In case of electrical shock, turn off power prior to removal from exposure area and administration of first aid.

INHALATION: Remove to fresh air. If breathing is difficult, administer oxygen. If not breathing, begin artificial respiration. If no detectable pulse, begin external heart massage.

SKIN: Wash affected area with soap and water.

EYES: Flush with large amounts of fresh water for at least 15 minutes.

INGESTION: Seek medical attention.

Carcinogenicity	NTP	NIOSH	IARC Monographs	OSHA Regulated
When Present		Welding fumes (n.o.c.)		

SECTION VII - PRECAUTION FOR SAFE HANDLING AND USE/APPLICABLE CONTROL MEASURES

Read and understand the manufacturer's instructions and precautionary label on this 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 (29 CFR 1910), U.S. Government Printing Office, Washington D.C. 20402 for more detail on the following:

Ventilation: Use enough ventilation, local exhaust at the arc, or both, to keep the fumes and gases below the TLV's in the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes.



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Respiratory Protection: 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.

Eye Protection: Wear helmet or face shield with filter lens. As a rule of thumb, start with a shade darker to see the weld zone. Then go to the next lighter shade that gives sufficient view of the weld zone. Provide screens and flash goggles to shield others.

Protective Clothing: Wear head, hand, 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: Dispose of any grinding dust and waste residues in accordance with EPA or local regulations.

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