



**american  
welding  
systems**

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:** Quadchrome 411 NM

**PRODUCT CLASSIFICATION:** Covered Electrode for Shielded Metal Arc Welding (SMAW)

**SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION**

IMPORTANT: This section covers the 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 by the symbol #.

WARNING: This product contains or produces a chemical known to the State of California to cause birth defects (or other reproductive harm) and cancer. (California Health and Safety Code 25249.5 et seq.)

INGREDIENTS	CAS NO.	EXPOSURE LIMIT (mg/m3)		(By Weight)
		OSHA PEL	ACGIH TLV	PERCENT INGREDIENTS
Nickel #	7440-02-0	1	1	1-5
Iron	7439-89-6	10 (as Fe)	5 (as Fe)	40-70
Calcium Carbonate	1317-65-3	5	10	3-7
Titanium Dioxide	13463-67-7	5	10	1-5
Sodium Silicate	1344-09-8	n.a.	5	1-5
Calcium Fluoride	7789-75-5	2.5 (as F)	2.5 (as F)	7-13
Chromium #	7440-47-3	0.5	0.5	1-5
Manganese #	7439-96-5	5 (ceiling)	0.2	10-30
Molybdenum	7439-98-7	5	5	0.5-1.5
Potassium Oxalate	6487-48-5	n.a.	5	0.5-1.5
Carbon	7440-44-0	2.5	2	0.5-1.5
Iron Oxide	1309-37-1	10	5	1-5

**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 nonhazardous, nonflammable, non explosive, and non reactive. Rating under National Fire Protection 704: Health, 1: 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



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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, 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 metal 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, silicon, sodium, and potassium. Fluorides, nickel, and chromium oxides may also be present. The table below lists reasonably expected fumes that may be generated:

Substance	CAS No.	EXPOSURE LIMIT (mg/m3)	
		OSHA PEL	ACGIH TLV
Iron Oxide	1309-37-1	10	5
Manganese Dioxide #	1313-13-9	1	1
Nickel Oxide #	1313-99-1	1	1
Hydrogen Fluoride	7664-39-3	2.5 (as F)	2.5 (as F)
Nitric Oxide	10102-43-9	25 ppm	25 ppm
Nickel (soluble) #	7440-02-0	0.1 (as Ni)	0.1 (as Ni)
Chromium Oxide #	1308-38-9	0.5 (as Cr)	0.5 (as Cr)
Chromic Acid #	1333-82-0	0.1 CL (as CrO3)	0.05 (as Cr VI)
Titanium Oxide	13463-67-7	5	10

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may also be formed by radiation from the arc. Monitor fume levels. The fume limit for Cr VI (0.05 mg/m3) may be reached before general welding fumes of 5mg/m3 is reached. 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 5mg/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. Pre-existing 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.

Nickel, Nickel Oxide - Metallic taste, nausea, tightness in chest, fever, allergic reactions.

Chromium- Inhalation of chromium can cause irritation of nasal membranes and skin.

**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 cease.

Fluorides - Overexposure to fluorides can cause serious bone erosion.

Manganese - Long-term exposure 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.



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Chromium – Chromium VI is listed as a human carcinogen on IARC and NTP lists and is required by OSHA to be considered carcinogenic.

Nickel, Nickel Oxide – Long term overexposure to nickel products may cause lung fibrosis or pneumoconiosis. Nickel is listed as a human carcinogen on IARC and NTP lists and is required by OSHA to be considered carcinogenic.

Welding fumes (not otherwise classified) are considered to be carcinogenic defined with no further categorization by NIOSH. Silicon dioxide is listed as a probable carcinogenic to humans. ARC RAYS can injure eyes. ELECTRIC SHOCK can kill. See Section VII.

**Emergency and First Aid Procedures:** Call for medical aid. Employ first aid techniques recommended by The American Red Cross.

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 a large amount of fresh water for at least 15 minutes

Ingestion: Seek medical attention.

**WARNING:** This product contains or produces a chemical known to the State of California to cause birth defects (or other reproductive harm) and cancer. (California Health and Safety Code 25249.5 et seq.)

Carcinogenicity	NTP	NIOSH	IARC Monographs	OSHA Regulated
When Present	Ni,Cr	Welding Fumes (n.o.c.)	Cr,Ni	Cr

**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 (29CFR 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 workers breathing zone and the general area. Train the welder to keep his head out of the fumes.

**Respiratory Protection:** Use respirable fume respirator or air supplied respirator when welding in a confined space or where local exhaust or ventilation does not keep exposure below TLV.

**Eye Protection:** Wear a helmet or face shield with a filter lens. As a rule of thumb, start with a shade darker to see the weld zone.

Then go to the next lighter shade which 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 welders' 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.

**Storage:** Keep material sealed and dry before use. Keep remaining product sealed and dry.

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