AMERICAN FILLER METALS

MATERIAL SAFETY DATA SHEET (MSDS)

REVISED 10-2011

For Welding Consumables and Related Products
Conforms to OSHA Hazard Communication Standard 29 CFR 1910.1200
And Superfund Amendments and Reauthorization Act (SARA) of 1986 Public Law 99-499
Standard Must Be Consulted for Specific Requirements

SECTION I – IDENTIFICATION

Manufacturer/Supplier Name: American Filler Metals Company	Telephone No.: 713-649-8785
Address: 6015 Murphy Street, Houston, TX 77033	Emergency No.: Chemtrec: 800-424-9300
Trade Name: AFM E308T-1, AFM E308LT-1, AFM E309T-1, AFM E309LT-1, AFM E309MoLT-1, AFM E312T-1, AFM E316T-1, AFM E316LT-1, AFM E317LT-1, AFM E347T-1, AFM E347LT-1, AFM E410T-1, AFM E2209T-1, AFM E2553T-1	Classification: AWS A5.22

SECTION II – HAZARDOUS MATERIALS*

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

*The term "HAZARDOUS MATERIALS" should be interpreted as a term required and defined in OSHA HAZARD COMMUNICATION STANDARD 29 CFR 1910.1200 however the use of this term does not necessarily imply the existence of any hazard.

Flux or other ingredients	% Weight	CAS No.	Exposure Limit (mg/m³)	
			OSHA PEL	ACGIH TLV
Iron	60 – 70	7439-89-6	5	Not Reported
Manganese	less than 3	7439-96-5	5*	5*
Nickel	2 – 8	7440-02-0	1	1
Molybdenum (A)	less than 5	7439-98-7	5 (Mo)	10 (Mo), 20**
Chromium	4 – 12	7440-47-3	1	0.5
Silicon	less than 3	7440-21-3	Nothing Found	10, 20**
Titanium Oxide	3 – 7	13463-37-7	15	10, 20**
Zirconium	less than 4	7440-67-2	5	5

Occupational Safety and Health Administration 29 CFR 1910.1000 Permissible Exposure Limit (PEL). American Conference of Governmental industrial Hygienists (ACGIH) Threshold Limit Value (TLV[R]). *Ceiling Limit **Short Term Exposure Limit (A) in AFM 316T-1, AFM316LT-1, and AFM 317LT-1

SECTION III – PHYSICAL DATA

NOT APPLICABLE

SECTION IV – FIRE AND EXPLOSION HAZARD DATA

Non-Flammable: Welding arc and sparks can ignite combustibles. See Z-49.1 referenced in Section VI

SECTION V – REACTIVITY DATA

Hazardous Decomposition Products

Welding fumes and gases cannot be classified simply. The composition and quantity of these fumes and gases are dependent upon the metal being welded, the procedures followed and the electrodes used.

Workers should be aware that the composition and quantity of fumes and gases to which they may be exposed, are influenced by coatings which may be present on the metal being welded (such as paint, plating, or galvanizing), the number of welders in operation 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 procedures). When the electrode is consumed, the fumes and gas decomposition products generated are different in percent and form from the ingredients listed in Section II. The composition of these fumes and gases are the concerning matter and not the composition of the electrode itself. Decomposition products include those originating from the volatilization, reaction, or oxidation of the ingredients shown in Section II, plus those from the base metal, coating and the other factors noted above.

Reasonable expected fume constituents of this product would include: Complex oxides of iron, manganese, silicon, titanium, chromium, nickel and molybdenum (AFM 316T-1, AFM316LT-1, and 317LT-1 only). Fume limit for Cr(VI)(0.05 mg/m³) may be reached before limit of 5 mg/m³ for general welding fumes is reached. Watch the Cr(VI) level.

Flux or other ingredients	CAS No.	Exposure Limit (mg/m³)	
		OSHA PEL	ALGIH TLV
Iron Oxide	1309-38-2	5	10 (as Fe^2O^3)
Nickel Oxide	1313-99-1	Nothing Found	1 (as Ni)
Molybdenum	7439-98-7	15 (Mo)	10 (Mo), 20**
Manganese	7439-96-5	5*	1* (Fume)
Chromium Oxide	1308-38-9	0.5 (as Cr)	0.5 (Ox)
Chromic Acid	1333-82-0	0.1*	0.05 (as Cr)
Silicon Oxide	7631-86-9	5	3
Titanium Oxide	13463-67-7	15	10, 20**
Nickel (Soluble)	—	1 (as Ni)	0.1 (as Ni)

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Gaseous reaction products may include carbon monoxide and carbon dioxide.
Ozone and nitrogen oxides may be formed by the radiation from the arc.
One method of determining the composition and quantity of the fumes and gases to which the workers are exposed is to take an air sample from inside the welder's helmet while worn or within the worker's breathing zone. See ANSI/AWS F1.1 publication available from the American Welding Society 550 N.W. LeJeune Road, Miami, Florida 33126.

SECTION VI – HEALTH HAZARD DATA

Threshold Limit Value: The ACGIH recommended general limit for welding fume NOC (not otherwise classified) is 5 mg/m³. ACGIH-1985 preface states: "The TLV-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations." See section V for specific fume constituents which may modify this TLV.
Common Entry is by Inhalation or Through the Eyes and Skin.
Effects of Overexposure: Inhalation of welding fumes and gases can be dangerous to your health. Short-term (acute) overexposure to welding fumes may result in discomfort such as dizziness, nausea, or dryness or irritation of nose, throat, or eyes. Chromium (VI) compounds present in the fume may cause severe irritaion of the bronchial tubes and lungs. Ingesting chromium (VI) salts may cause injury or death. Chromium (VI) compounds may burn eyes. Chromium (VI) compounds may cause allergic reactions in some people. Nickel oxides present in the fume may cause tightness around the chest, fever and allergic reactions in some people.
Manganese – Manganese dioxide (MnO2): Short-term overexposure should be treated by removal from exposure and applying artificial respiration if needed. Wash eyes and/or skin with water to remove any dust particles. Long-term (chronic) overexposure to welding fumes can lead to siderosis (iron deposits in lung) and is believed to affect pulmonary function. Constant inhalation of chromium (VI) compounds may cause an ulceration and perforation of the nasal septum as well as liver and kidney damage. Repetitive overexposure to nickel oxides may lead to lung fibrosis or pneumoconiosis. Workers exposed to chromium (VI) compounds and/or nickel oxides have a higher incidence of lung fibrosis and nasal cancers. Chromium and nickel compounds are on the IARC (International Agency for Research of Cancer) as posing a carcinogenic risk to humans.
Manganese – Manganese dioxide (MnO2): Long-term overexposure to manganese compounds may have an effect upon the central nervous system. Symptoms such as muscular weakness, body tremors and behavioral changes may appear. Employees exposed to manganese compounds should get medical examinations several times annually for early detection of manganese poisoning.
Arc Rays can injure eyes and burn skin.
Electric shock can kill.
See Section VII.
Emergency and First Aid Procedures: Call for medical assistance. Use first aid procedures recommended by the American Red Cross. If breathing is difficult-give oxygen. If not breathing-use CPR (cardiopulmonary resuscitation). Consult a physician if irritation of the eyes and skin or flesh burns develop after exposure.
Carcinogenicity
OSHA (29 CFR 1910.1200) lists Nickel and Chromium as possible carcinogens.

SECTION VII – CONTROL MEASURES AND PRECAUTIONS FOR SAFE HANDLING AND USE

Read and understand the manufacturer's instructions and precautionary label on this product. See American Standard Z-49.1 Safety in Welding and Cutting published by the AMERICAN WELDING SOCIETY, 550 N.W. LeJeune Road, Miami, Florida 33126 and OSHA Publication 2206 (29 CFR 1910). U.S. Government Printing Office, Washington D.C. 20402 for more details on the following topics.
Ventilation: Use plenty of ventilation and/or local exhaust at the arc, to keep the fumes and gases below the threshold limit value within the worker's breathing zone and the general work area. Welders should be advised to keep their head out of the fumes.
Respiratory Protection: Use respirable fume respirator or air supplied respirator when welding in a confined space or general work area where local exhaust and/or ventilation does not keep exposure below the threshold limit value.
Eye Protection: Wear a helmet or face shield with a filter lens shade number 12-14 or darker. Shield other workers by providing screens and flash goggles.
Protective Clothing: Wear approved head, hand and body protection which help to prevent injury from radiation, sparks, and electrical shock. See ANSI Z-49.1. This would include wearing welder's gloves and a protective face shield and may include arm protectors, apron, hats, shoulder protection, as well as dark substantial clothing. Welders should be trained not to allow electrically live parts to contact the skin or wet clothing and gloves. The welders should insulate themselves from the work and ground.
Waste Disposal Method: Discard any product, residue, disposal container, or liner in an environmentally acceptable manner approved by Federal, State and Local regulations.