

# MATERIAL SAFETY DATA SHEET

Updated – November 2011

## Section 1 - Product Identification

### Product Name: Cored Welding Wire

3602 North Perkins Road  
Stillwater, OK 74075  
(405) 377-5050

Type	Product Name	Specification	Product Description
1	TRU-CORE FC 70T TRU-CORE FC 71T	AWS A5.20	Carbon Steel Electrodes for Flux Cored arc welding with gas shielding.
2	TRU-CORE MC 70C TRU-CORE MC 70C PLUS	AWS A5.18	Carbon steel composite metal cored electrodes for gas shielded arc welding.
3	TRU-CORE MC 409 DS TRU-CORE MC 409 Ti TRU-CORE MC 439 Ti	AWS A5.9	Stainless Steel composite metal cored electrodes for gas shielded electrodes.

## Section 1-A - Trade Name and Nominal Composition

Approximate Composition (Wt. %) of those elements and materials contained in the various types of cored welding wire products.

Type	Fe	Cr	Mn	Si	SiO <sub>2</sub>	ZrSiO <sub>4</sub>	Cu	Ni	Mb	Ti	Nb
1	80-95	0.0 - 0.5	1.0 - 3.0	0.0 - 2.0	0.5 - 3.5	0.0 - 2.0		0.0 - 3.0	0.0 - 0.5	0.0 - 0.5	
2	95-98	0.0 - 0.5	1.0 - 2.5	0.3 - 1.0			0.0 - 0.5	0.0 - 2.5	0.0 - 0.5		
3	75-90	10.5-19.5	0.0 -1.0	0.0 - 1.0				0.0 - 1.0		0.0 - 1.5	0.0 - 1.0

## Section 2 - Hazardous Ingredients

This section lists the elements and materials contained in the cored welding wire products. The fumes and gases produced during normal use (welding) are covered in Section 10.

Element/Material	CAS No.	PEL <sup>3</sup>	TLV <sup>4</sup>	REL <sup>5</sup>	STEL <sup>6</sup>	IDLH <sup>7</sup>
Chromium (Cr)	7440-47-3	1.0	0.5	0.5		25
Copper Dust (as Cu)	7440-50-8	1.0	0.2	1.0		100
Iron (Fe)	7439-89-6	5.0	10.0			
Iron Oxide Dust (as Fe)	1309-37-1	10.0	10.0	5.0		2500
Manganese (Mn)	7439-96-5	(C)5.0 <sup>8</sup>	0.2	1.0	3.0	500
Molybdenum (Mo)	7439-98-7	5.0	10.0			1000
Nickel <sup>2</sup> (Ni)	7440-02-0	1.0	1.5	0.015		10
Niobium (Columbium) (Nb)	7440-03-1					
Silicon (Si)	7440-21-3	5.0	10.0			
Silica <sup>1</sup> (SiO <sub>2</sub> )	14808-60-7	0.1	0.025			
Titanium (Ti)	7440-32-6	5.0	10.0			
Titanium Oxide (TiO)	1317-70-0	5.0	10.0			5000
Zirconium Silicate (ZrSiO <sub>4</sub> )	10101-52-7	5.0	10.0			

Note: All values are in mg/m<sup>3</sup>

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### **Section 3 - Hazard ID and Emergency Overview**

**WARNING!** Before using this product read and understand the manufactures instructions, this MSDS and your employer's safety practices. Protect yourself and others. When this product is used for its intended purpose (welding) fumes and gases produced as a byproduct can be hazardous to your health. Aggravation of pre-existing respiratory or allergic conditions may occur in some workers. Arc Rays can injure eyes and burn skin. Electric shock can kill.

**SHORT-TERM (ACUTE) EXPOSURE:** Acute overexposure to welding fumes may result in symptoms like metallic taste; nausea; dizziness; tightness of chest; fever; irritation of eyes, nose, throat and skin; loss of consciousness/death due to welding gases or lack of oxygen. Metal Fume Fever is characterized by chills, fever, vomiting, irritation of throat, upset stomach, and body aches, and siderosis.

**LONG-TERM (CHRONIC) EXPOSURE:** Chronic overexposure to welding fume, gases, or dusts may cause permanent health effects. These effects may include skin sensitization, neurological damage, and respiratory disease such as bronchial asthma, lung fibrosis or pneumoconiosis. Prolonged inhalation of Nickel and Chromium compounds above exposure limits can cause cancer. Nickel and Nickel compounds are on the International Agency for Research on Cancer (IARC) and the National Toxicology Program (NTP) lists as posing a possible carcinogenic risk to humans. Hexavalent Chromium and Silica are listed as known human carcinogens by IARC and NTP. Welding Fumes are listed by IARC as possibly carcinogenic to humans. Overexposure to Manganese above exposure limits can cause irreversible damage to the central nervous system, including the brain, symptoms of which may include slurred speech, lethargy, tremor, muscular weakness, psychological disturbances and spastic gate.

**EXPOSURE LIMITS:** The ACGIH recommended exposure limit for total welding fumes is 5mg/m<sup>3</sup>. When this product is used for its intended purpose specific fumes (Copper, Chromium, Manganese, Nickel and others) are produced. The Threshold Limit Value (TLV) of these materials may be exceeded before reaching the recommended maximum exposure for welding fumes. OSHA requires employers to ensure exposures below individual constituent PEL's (See Section 10). Determine actual exposure by industrial hygiene monitoring.

### **Section 4 - First Aid Measures**

**EMERGENCY AND FIRST AID:** Remove from exposure and obtain prompt medical attention. If victim is unconscious, administer oxygen. If not breathing, resuscitate immediately. If flu-like symptoms (cough, muscle pain, fever, chills, insomnia, or mental confusion) develop after use, obtain medical help immediately.

### **Section 5 - Fire and Explosion Hazard Data**

**Flammability:** This material is not flammable. However, welding arc and sparks can ignite combustible and flammable materials.

**National Fire Protection Association (NFPA) Rating:** Health - 2 Flammability - 0 Reactivity - 0

**Note:** The NFPA Health rating is based on the fumes generated during normal use.

### **Section 6 - Spill or Leak Procedure**

**Spill of Leak Procedure:** Not Applicable

### **Section 7 - Handling and Storage**

**Precautions:** None.

### **Section 8 - Exposure Controls & Personal Protection**

**VENTILATION:** Use enough ventilation and/or local exhaust to keep fumes and gasses from your breathing zone and below all published exposure limits (See Section 10). Train the welder to keep his head out of the fumes.

**RESPIRATORY PROTECTION:** Use air-purifying fume respirator or air-supplied respirator when welding in confined space or where local exhaust or ventilation is not sufficient to keep exposure below all published exposure limits (See Section 10). Use special care when welding painted or coated steels since hazardous substances from the coating may be emitted.

**EYE PROTECTION:** Wear welding helmet or use face shield with filter lens, Shade No. 10 or darker. Provide protective screens or flash goggles if necessary to shield others.

**Electric Shock:** Electrical arc can cause serious burns or death. Do not touch welding wire (Rod) while welding. Do not touch live

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electrical parts. Make sure equipment is properly grounded. Train the welder not to touch live electrical parts and to insulate himself from work and ground.

**PROTECTIVE 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, and shoulder protection as well as dark, substantial clothing.

### Section 9 - Physical and Chemical Properties

Cored Welding Wire is comprised of a solid tubular steel sheath, with a core containing chemical, mineral or alloy powders, or a mixture of any combination of them.

### Section 10 - Stability & Reactivity Information

**Materials to Avoid:** Avoid contact with mineral acids and oxidizing agents which may generate hydrogen gas.

**Stability:** These products are stable under normal conditions.

**Hazardous Polymerization:** Will Not Occur

**Hazardous Decomposition Products:** Welders are exposed to a range of fumes and gases. Fume particles contain a wide variety of oxides and salts of metals and other compounds, which are produced mainly from electrodes, filler wire and flux materials. Fumes from the welding of stainless-steel and other alloys contain nickel compounds and chromium [VI] and [III]. Ozone is formed during most electric arc welding, and exposures can be high in comparison to the exposure limit, particularly during metal inert gas welding of aluminum. Oxides of nitrogen are found during manual metal arc welding and particularly during gas welding. Welders who weld painted mild steel can also be exposed to a range of organic compounds produced by pyrolysis.

#### Welding Fume & Gases By-product Exposure Limits

Ingredient	CAS No.	PEL <sup>2</sup>	TLV <sup>3</sup>	REL <sup>4</sup>	STEL <sup>5</sup>	IDLH <sup>6</sup>
Carbon Monoxide (CO)	630-08-0	55	28.6	40		1200
Chromium (Cr II and Cr III)	7440-47-3	0.5	0.5	0.5		25
Copper Fume (as CuO & Cu)	1317-38-0	0.1	0.2	0.1		100
Hexavalent Chromium <sup>1</sup> (Cr VI)	1333-82-0	0.005	0.01	0.5		25
Iron Oxide Fume (as Fe <sub>2</sub> O <sub>3</sub> )	1309-37-1	10.0	5.0	5.0		2500
Manganese Fume (Mn)	7439-96-5	(C) 5.0 <sup>7</sup>	0.2	1.0	3.0	500
Molybdenum (Soluble) (Mo)	7439-98-7	5.0	10.0			1000
Nickel Compounds (soluble)		1.0	0.1			
Nickel Compounds <sup>2</sup> (insoluble)		1.0	0.2	0.007		
Nitrogen Dioxides (as NO <sub>2</sub> )	10102-44-0	(C) 9.0 <sup>7</sup>	5.6	1.8		37.6
Ozone (O <sub>3</sub> )	10028-15-6	0.2	0.4	(C) 0.2 <sup>7</sup>		9.8
Phosgene (COCl <sub>2</sub> )	75-44-5	0.4	0.4	0.4	0.8	8.1
Silica <sup>1</sup> (SiO <sub>2</sub> )	14808-60-7	0.1	0.025			
Titanium Dioxide <sup>2</sup> (TiO <sub>2</sub> )	13463-67-7	5.0	10.0			

**Note:** All values are in mg/m<sup>3</sup>.

### Section 11 - Toxicological Information

**Toxicological Information:** There is *limited evidence* in humans for the carcinogenicity of welding fumes and gases. Hexavalent Chromium (Cr VI) and Silica (Si) are listed as Class 1 human carcinogens by IARC. IARC identifies Welding Fumes, Nickel (Ni), Nickel Compounds, and Titanium Dioxide (TiO<sub>2</sub>) as Group 2B possible human carcinogens.



Canadian WHMIS Class D, Division 2b Toxic.

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### **Section 12 - Ecological Information**

**Ecological Information:** Not Applicable

### **Section 13 - Disposal Considerations**

**Waste Disposal Methods:** Prevent waste from contaminating surrounding environment. Discard any product, residue, disposable container, or liner in an environmentally acceptable manor, in full compliance with federal state and local regulations. In the United States, unused products or product residue containing chromium is considered hazardous waste if discarded (RCRA D007)

### **Section 14 - MSDS Transportation Information**

**Proper Shipping Name:** Not regulated by DOT, IMO, or IATA.

### **Section 15 - Regulatory Information**

**SARA Title III:** The following metallic compounds are listed as SARA 313 Toxic Chemicals and depending on your usage may be subject to annual reporting: Chromium, Copper, Manganese, and Nickel.

**TSCA:** All material contained within this product are on the TCSA Inventory List or are excluded from listing.

**California Proposition 65 Warning:** This product, when used for welding produces fumes or gases which contain chemicals known to the state of California to cause cancer (California Health & Safety Code § 25249.6).

### **Section 16 - Other Information**

See American National Standard Institute (ANSI) Z49.1, *Safety in Welding, Cutting and Allied Processes* published by the American Welding Society, 550 N.W. LeJeune Rd., Miami, FL 33126 ([www.aws.org](http://www.aws.org)); OSHA *Safety and Health Standards*, available from the U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954. ([www.osha.gov](http://www.osha.gov)).

#### **MSDS NOTES:**

- (1) Listed as a Human Carcinogen by IARC and/or NTP.
- (2) Listed as a Possible Human Carcinogen by IARC and/or NTP.
- (3) Permissible Exposure Limit (PEL) - 8-hour TWA exposure as defined by OSHA (29CFR1910).
- (4) Threshold Limit Value (TLV) - 8-hour TWA as defined by American Conference of Governmental Industrial Hygienists (ACGIH).
- (5) Recommended Exposure Limit (REL) - 8-hour TWA as defined by National Institute of Occupational Safety & Health (NIOSH).
- (6) Short Term Exposure Limit (STEL) - 15 minute TWA exposure as defined by OSHA (29CFR1910.1200) or certain state regulations.
- (7) Immediately Dangerous to Life & Health (IDLH) – As defined by OSHA and NIOSH.
- (8) Ceiling Value (C) - Exposure which shall not be exceeded at any time during the working day.

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**Approved By:** Ronald F. Spears, Jr., CHMM, Mgr. EHS&S **Date:** November 23, 2011

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