PRAXAIR

MSDS

Praxair Distribution, Inc.
2301 South East Creekview Drive
Ankeny, Iowa 50021

Dear Praxair Customer,

The attached document is the Material Safety Data Sheet for the product you recently purchased from Praxair Distribution, Inc. If this MSDS appears incomplete or is the incorrect MSDS for the product you purchased, please contact 3E Company 1-800-451-8346. When calling, please reference the following information:

3E MSDS Index:	TMHZ000002
Product Name:	E70T-3, E70T-4, E71T-GS, E71T-11, E71T-14 (See MSDS for other Trade Names)
Purchase Date:	07/19/2002
Manufacturer:	Select Arc Inc

Thank you for choosing Praxair.

This Material Safety Data Sheet has been sent to the above address based on our current records. To change the delivery method, recipient, or address, please complete the following and return to:

Sandy Laube
C/O Praxair Distribution, Inc.
2301 South East Creekview Drive
Ankeny, Iowa 50021
Phone: 515-965-6624
Fax: 515-965-6636

Customer Code: GB442

Contact Name: _____

Company Name: _____

Address 1: _____

Address 2: _____

City: _____

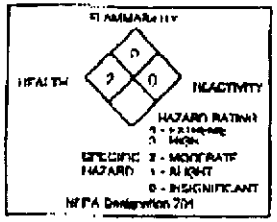
State/Province: _____

Postal Code: _____

I would like to receive future MSDS by fax: Yes ☐ No ☐
MSDS Fax Number: _____

I would like to receive future MSDS by e-mail: Yes ☐ No ☐
E-Mail Address: _____

Note: The MSDS will be received in PDF format, which will require Adobe Acrobat Reader 4.0 (or higher) to read or print. A free download is available online at www.adobe.com/products/acrobat/readstep/html. You may also contact Praxair for assistance.



MSDS NO: 001 Rev. 9
MARCH 6, 2001

MATERIAL SAFETY DATA SHEET

For U.S. Manufactured Welding Consumables and Related Products
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 must be consulted for specific requirements.

SECTION 1 – IDENTIFICATION

Emergency No.: 1-800-341-5215

Trade Name	Specification	Product Type
Type I: E70T-3, E70T-4, E71T-GS, E71T-11, E71T-14	AWS A5.20	Carbon steel electrode for flux cored arc welding without external gas shielding
Type II: E70T-1, E71T-1, E70T-2, E70T-5, E71T-9, E70T-9	AWS A5.20	Carbon steel electrode for flux cored arc welding with external gas shielding.
E80T1-A1, E80T1-B2, E80T1-Ni1, E80T5-B2, E80T5-Ni3, E81T1-A1, E81T1-B2, E81T1-K2, E81T1-Ni1, E81T1-Ni2, E81T1-W2, E90T1-B3, E90T1-D3, E90T1-Ni2, E90T5-K2, E91T1-B3, E91T1-K2, E91T1-Ni2, E100T1-K3, E100T5-D2, E101T1-K3, E110T1-K3, E110T1-K4 E110T5-K3, E111T1-K3, E120T5-K4	AWS A5.29	Low alloy steel electrode for flux cored arc welding with external gas shielding.
Type III: E70C-3M, E70C-6M	AWS A5.18	Carbon steel composite metal cored electrode for gas shielded arc welding.
E80C-G, E80CNi1, E80CNi2, E90C-B3, E90C-G, E100C-G, E110C-G	AWS A5.28	Low alloy steel composite metal cored electrode for gas shielded arc welding.
Type IV: EC409, EC409-Cb, 439, 18CrCb	AWS A5.9	Stainless steel composite metal cored electrode for gas shielded arc welding.

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 by Section 5. The term "Hazardous Materials" should be interpreted as a term required and defined in OSHA Hazard Communication Standard (29 CFR Part 1910.1200).

The following chemicals are subject to reporting under Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986: aluminum (fume or dust) and compounds of barium, chromium, copper, manganese, and nickel. Refer to this section for the presence and concentration of these chemicals for a particular product.

TYPE I

Ingredient	% Weight	CAS No.	Exposure Limit (mg/m³)	
			OSHA PEL	ACGIH TLV
IRON	80 - 95	7439-89-6	5R	10
MANGANESE	0.5 - 2	7439-96-5	5CL*	5
TITANIUM DIOXIDE	0 - 3	13463-67-7	5R	10
SILICON	0 - 2	7440-21-3	5R	10
FLUORSPAR	2 - 12	14542-23-5	2.5 (as F)	2.5 (as F)
ALUMINUM	1 - 5	7429-90-5	5R	10
MAGNESIUM	1 - 3	7439-95-4	5R	10
BARIUM FLUORIDE	1 - 5	7787-32-8	0.5 (as Ba)	0.5 (as Ba)

TYPE II

Ingredient	% Weight	CAS No.	Exposure Limit (mg/m³)	
			OSHA PEL	ACGIH TLV
IRON	75 - 95	7439-89-6	5R	10
MANGANESE	1 - 4	7439-96-5	5CL*	5
TITANIUM DIOXIDE	4 - 10	13463-67-7	5R	10
SILICON	0.5 - 3	7440 21 3	5R	10
FLUORSPAR	0 - 2	14542-23-5	2.5 (as F)	2.5 (as F)
NICKEL	0 - 4	7440-02-0	1	1, A1
CHROMIUM	0 - 3	7440-47-3	1	0.5
MOLYBDENUM	0 - 2	7439-98-7	5R	10
COPPER	0 - 1	7440-50-8	1 (Dust)	1 (Dust)

TYPE III

Ingredient	% Weight	CAS No.	Exposure Limit (mg/m³)	
			OSHA PEL	ACGIH TLV
IRON	80 - 98	7439-89-6	5R	10
MANGANESE	1 - 4	7439-96-5	5CL*	5
SILICON	0 - 3	7440-21-3	5R	10
NICKEL	0 - 4	7440-02-0	1	1, A1
CHROMIUM	0 - 3	7440-47-3	1	0.5
MOLYBDENUM	0 - 2	7439-98-7	5R	10
COPPER	0 - 1	7440-50-8	1 (Dust)	1 (Dust)

TYPE IV

Ingredient	% Weight	CAS No.	Exposure Limit (mg/m³)	
			OSHA PEL	ACGIH TLV
IRON	80 - 95	7439-89-6	5R	10
MANGANESE	< 1	7439-96-5	5CL*	5
CHROMIUM	11 - 20	7440-47-3	1	0.5
TITANIUM	< 1.5	7440-32-6	5R	10
SILICON	< 1.0	7440-21-2	5R	10

A1 — Confirmed Human Carcinogen; *CL — Ceiling Limit; R — Respirable Fraction; **STEL — Short Term Exposure Limit

SECTION 3 — PHYSICAL/CHEMICAL CHARACTERISTICS

Not Applicable

SECTION 4 — FIRE AND EXPLOSION HAZARD DATA

Non Flammable: Welding arc and sparks can ignite combustibles. See Z49.1 referenced in Section 7.

SECTION 5 — 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 electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 2. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section 2, plus those from the base metal and coating, etc., as noted above.

It is understood, however, that the elements and or oxides to be mentioned are virtually always present as complex oxides and not as metals. [Characterization of Arc Welding Fume: American Welding Society]. The elements or oxides listed below correspond to the ACGIH categories located in [TLV Threshold Limit Values for Chemical Substances and Physical Agents in the Workroom Environment].

Reasonably expected constituents of the fume would include: complex oxides of iron, manganese, silicon, and titanium. Types I, II, and III may have fluorides present. Type III may also contain chromium and/or nickel. Type IV contains chromium.

TYPE I

Ingredient	CAS No.	Exposure Limit (mg/m³)	
		OSHA PEL	ACGIH TLV
IRON OXIDE	1309-37-1	10 (as Fe)	5 (as Fe)
MANGANESE	7439-96-5	1, 3 STEL**	1, 3 STEL** (Fume)
TITANIUM DIOXIDE	13463-67-7	5R	10
SILICA	60676-86-0	0.1	0.1
FLUORIDES		2.5 (as F)	2.5 (as F)
MAGNESIUM OXIDE	1309-48-4	5R	10
ALUMINUM OXIDE	1344-28-1	5R	10
BARIUM[1]	7440-39-3	0.5 (sol.)	0.5

Section 5 (cont.)

TYPE II

Ingredient	CAS No.	Exposure Limit (mg/m³)	
		OSHA PEL	ACGIH TLV
IRON OXIDE	1309-37-1	10 (as Fe)	5 (as Fe)
MANGANESE	7439-96-5	1, 3 STEL**	1, 3 STEL** (Fume)
TITANIUM DIOXIDE	13463-67-7	5R	10
SILICA	60676-86-0	0.1	0.1
FLUORIDES		2.5 (as F)	2.5 (as F)
NICKEL (Soluble)		0.1 (as Ni)	0.1, A1 (as Ni)
NICKEL COMPOUNDS		1 (as Ni)	1, A1 (as Ni)
CHROMIUM OXIDE (as CR (II), Cr (III))		0.5 (as Cr (II), Cr (III))	0.5 (as Cr (II), Cr (III))
CHROMIUM (insoluble, as CR (VI)		0.1 CL* (as Cr (VI))	0.05 A1 (as Cr (VI))
COPPER	7440-50-8	0.1 (Fume)	0.2 (Fume)
MOLYBDENUM	7439-98-7	5R	10

TYPE III

Ingredient	CAS No.	Exposure Limit (mg/m³)	
		OSHA PEL	ACGIH TLV
IRON OXIDE	1309-37-1	10 (as Fe)	5 (as Fe)
MANGANESE	7439-96-5	1, 3 STEL**	1, 3 STEL** (Fume)
SILICA	60676-86-0	0.1	0.1
NICKEL (Soluble)		0.1 (as Ni)	0.1, A1 (as Ni)
NICKEL COMPOUNDS		1 (as Ni)	1, A1 (as Ni)
CHROMIUM OXIDE (as CR (II), Cr (III))		0.5 (as Cr (II), Cr (III)	0.5 (as Cr (II), Cr (III))
CHROMIUM (insoluble, as CR (VI)		0.1 CL* (as Cr (VI))	0.05 A1 (as Cr (VI))
COPPER	7440-50-8	0.1 (Fume)	0.2 (Fume)
MOLYBDENUM	7439 98 7	5R	10

TYPE IV

Ingredient	CAS No.	Exposure Limit (mg/m³)	
		OSHA PEL	ACGIH TLV
IRON OXIDE	1309-37-1	10 (as Fe)	5 (as Fe)
MANGANESE	7439-96-5	1, 3 STEL**	1, 3 STEL** (Fume)
CHROMIUM OXIDE (as Cr (II), Cr (III))		0.5 (as Cr (II), Cr (III))	0.5 (Cr (II), Cr (III))
CHROMIUM (Insoluble, as Cr (VI))		0.1 CL* (as Cr (VI))	0.05 (as Cr (VI))
TITANIUM DIOXIDE	13463-67-7	5R	10
SILICA	60676-86-0	0.1	0.1

A1 — Confirmed Human Carcinogen; *CL — Ceiling Limit; R — Respirable Fraction, **STEL — Short Term Exposure Limit.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the 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, available from the "American Welding Society," P. O. Box 351040, Miami, FL 33135. Also, from AWS is F1.3 "Evaluating Contaminants in the Welding Environment — A Sampling Strategy Guide," which gives additional advice on sampling]. At a minimum, materials listed in this section should be analyzed.

SECTION 6 — HEALTH HAZARD DATA

The exposure level for welding fume has been established at 5 mg / m³ with OSHA's PEL and ACGIH's TLV. See Section 5 for specific fume constituents which may modify the PEL and TLV.

Effects of Overexposure

Electric arc welding may create one or more of the following health hazards:
ARC RAYS can injure eyes and burn skin.
ELECTRIC SHOCK can kill. See Section 7.
FUMES AND GASES can be dangerous to your health.
PRIMARY ROUTES OF ENTRY are the respiratory system, eyes and/or skin.

SHORT - TERM (ACUTE) OVEREXPOSURE EFFECTS:

WELDING FUMES — May result in discomfort such as dizziness, nausea or dryness or irritation of nose, throat or eyes.
IRON, IRON OXIDE — None are known. Treat as a nuisance dust or fume.
MANGANESE — Metal fume fever characterized by chills, fever, upset stomach, vomiting, irritation of throat and aching of body.
FLUORIDES — Fluoride compounds evolved may cause skin and eye burns, pulmonary edema and bronchitis.
NICKEL, NICKEL COMPOUNDS — Metallic taste, nausea, tightness in chest, fever, allergic reactions.
CHROMIUM — Inhalation of fume with chromium (VI) compounds can cause irritation of the respiratory system, lung damage and asthma-like symptoms. Swallowing chromium (VI) salts can cause severe injury or death. Dust on the skin can form ulcers. Eyes may be burned by chromium (VI) compounds. Allergic reactions likely in some people from chromium compounds.
COPPER — Metal fume fever can be caused by fresh copper oxide.
BARIUM — Aching eyes, rhinitis, frontal headache, wheezing, laryngeal spasms, salivation or anorexia.
SILICA — None are known. Treat as a nuisance dust or fume.
MOLYBDENUM — None are known. Treat as a nuisance dust or fume.
TITANIUM DIOXIDE — None are known. Treat as a nuisance dust or fume.
ALUMINUM, ALUMINUM OXIDE — None are known. Treat as a nuisance dust or fume.
MAGNESIUM, MAGNESIUM OXIDE — None are known. Treat as a nuisance dust or fume.

LONG-TERM (CHRONIC) OVEREXPOSURE EFFECTS:

WELDING FUMES — Excess levels may cause bronchial asthma, lung fibrosis, pneumoconiosis or "siderosis".
IRON, IRON OXIDE FUMES — Siderosis or deposits of iron in lungs which is believed to affect pulmonary function. Lungs will clear in time when exposure to iron fumes and its compounds ceases. Iron and Magnetite (Fe_3O_4) are not regarded as fibrogenic materials.
MANGANESE — Central nervous system effects referred to as "Manganism". Symptoms include muscular weakness, tremors similar to Parkinson's Disease. Behavioral changes and changes in handwriting may also appear. Employees overexposed to manganese compounds should receive quarterly medical examinations for early detection of manganism.
FLUORIDES — Serious bone erosion (Osteoporosis) and mottling of teeth.
NICKEL, NICKEL COMPOUNDS — Lung fibrosis or pneumoconiosis. Studies of nickel refinery workers indicated a higher incidence of lung and nasal cancers.
CHROMIUM — Ulceration and perforation of the nasal septum. Respiratory irritation may occur with symptoms resembling asthma. Studies have shown that chromate production workers exposed to hexavalent chromium compounds have an excess of lung cancers. Chromium (VI) compounds are more readily absorbed through the skin than chromium (III) compounds. Good practice requires the reduction of employee exposure to chromium (III) and (VI) compounds.
COPPER — No adverse long-term health effects have been reported in the literature.
BARIUM — Exposure to soluble barium compounds may cause nervous disorders and may have deleterious effects on the heart, circulatory system and musculature.
SILICA — Treat as a nuisance dust. Little adverse effect on lungs. Does not produce significant organic disease or toxic effect when exposures are kept under reasonable control. Potentially reversible.
MOLYBDENUM — Treat as a nuisance dust. Little adverse effect on lungs. Does not produce significant organic disease or toxic effect when exposures are kept under reasonable control. Potentially reversible.
TITANIUM DIOXIDE — Treat as a nuisance dust. Little adverse effect on lungs. Does not produce significant organic disease or toxic effect when exposures are kept under reasonable control. Potentially reversible.
ALUMINUM, ALUMINUM OXIDE — Treat as a nuisance dust. Little adverse effect on lungs. Does not produce significant organic disease or toxic effect when exposures are kept under reasonable control. Potentially reversible.
MAGNESIUM, MAGNESIUM OXIDE — Treat as a nuisance dust. Little adverse effect on lungs. Does not produce significant organic disease or toxic effect when exposures are kept under reasonable control. Potentially reversible.

EMERGENCY AND FIRST AID PROCEDURES

Call for medical aid. Employ first aid techniques recommended by the American Red Cross.
~~Eyes & Skin: If irritation or flash burns develop after exposure, consult a physician.~~

CARCINOGENICITY

Nickel, Chromium (with the exception of metallic chromium and chromium (III)) must be considered as carcinogens under OSHA (29CFR 1910.1200).
Welding fumes must be considered as a possible carcinogen under OSHA (29 CFR 1910.1200).

CALIFORNIA PROPOSITION 65

Product Types III and IV contain or produce a chemical known to the State of California to cause cancer.
...ifornia Health and Safety Code Section 25249.6 et seq.).

SECTION 7 — PRECAUTIONS FOR SAFE HANDLING AND USE/APPLICABLE CONTROL MEASURES

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 and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, Washington, D.C. 20402, for more detail on many of the following.

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.

RESPIRATORY PROTECTION: Use NIOSH approved or equivalent 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 use face shield with filter lens. As a rule of thumb begin with Shade Number 14. Adjust if needed by selecting the next lighter and/or darker shade number. Provide protective screens and flash goggles, if necessary, to shield others.

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, shoulder protection, as well as dark nonsynthetic clothing. Train the welder not to touch live electrical parts and to insulate himself from work and ground.

PROCEDURE FOR CLEANUP OF SPILLS OR LEAKS: Not applicable

WASTE DISPOSAL: Prevent waste from contaminating surrounding environment. Discard any product, residue, disposable container or liner in an environmentally acceptable manner, in full compliance with federal, state and local regulations.

SPECIAL PRECAUTIONS: IMPORTANT: Maintain exposure below the PEL/TLV. Use industrial hygiene monitoring to ensure that your use of this material does not create exposures which exceed PEL/TLV. Always use exhaust ventilation. Refer to the following sources for important additional information.

ANSI Z49.1 The American Welding Society, P. O. Box 351040, Miami, FL 33135 — OSHA (29CFR1910) U.S. Dept. of Labor, Washington, D.C. 20210.

Manufacturer believes this data to be accurate and to reflect qualified expert opinion regarding current research. However, Manufacturer cannot make any express or implied warranty as to this information.