MATERIAL SAFETY DATA SHEET

SECTION I PRODUCT IDENTIFICATION

Stock Number: **5826**

Product Description: **TURBALOY® 15-5**

Manufacturer's name: **UNITED STATES WELDING CORPORATION**
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While the information set forth on this Material Safety Data Sheet is believed to be accurate, United States Welding Corporation makes no warranty, expressed or implied, with respect thereto and disclaims all liability from reliance thereon.

SECTION II–HAZARDOUS INGREDIENTS

INGREDIENTS	%	INGREDIENTS	%
Manganese	0.75		
Silicon	0.60		
Chromium	15.30		
Nickel	5.50		
Copper	3.50		
Molybdenum	0.30		
Aluminum	0.025		
Iron	Balance		

The above percent concentrations are considered nominal and are provided for industrial hygiene purposes. They do not represent a certification of content.

SECTION III–HAZARDOUS INGREDIENTS

Boiling Point:	N/A	Specific Gravity:	N/A	Vapor Density:	N/A	Appearance:	Solid, Odorless Metal
Melting Point:	N/A	Vapor Pressure:	N/A	Solubility in Water:	Insoluble		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

Nonflammable; however, welding arc and sparks can ignite combustibles and flammables. Refer to ANSI Z49.1 for fire prevention during welding.

SECTION V REACTIVITY DATA

This material is non-reactive (stable) as shipped.

SECTION VI HEALTH HAZARD DATA

Welding alloys are generally not considered hazardous in the form shipped (solid rods or wire). However, when welding or using any other process that causes a release of dust or fume, hazardous levels of dust or fume of the constituents of these alloys could be generated. IARC has concluded that welding fumes are possibly carcinogenic to humans. The general PEL/TLV for Welding Fume (Not Otherwise Classified) is 5 mg/m^3; however, individual constituents of fumes may have lower allowable exposure levels. The ingredients of fumes and gases generated in user welding operations will depend on the filler metal alloy, base metal, flux and the specific process being used. Ingredients may include metals, metal oxides, chromates, fluorides, carbon monoxide, ozone, and oxides of nitrogen. Phosgene can be produced if chlorinated solvent vapors are present in user operations. The following is a list of potential health effects and exposure limits for hazardous elements that are possibly contained in any of our alloys.

Health Effects & Exposure Limits

Aluminum (Al): Exposure Limits: TLV: 10 mg/m^3 (Metal dust); 5 mg/m^3 (Welding fumes) PEL: 15 mg/m^3 (Total metal dust); 5 mg/m^3 (Metal dust - respirable fraction)
CAS No.: 7429-90-5
Metal dust and oxide is generally considered a "nuisance" particulate. May irritate the eyes and mucous membranes. Excessive concentrations have been known to cause fibrosis.

Beryllium (Be): Exposure Limits: TLV: 0.002 mg/m^3 PEL: 0.002 mg/m^3 , 0.005 mg/m^3 (ceiling); 0.025 mg/m^3 (water soluble)
CAS No.: 7440-41-7
Inhalation of excessive levels can result in acute pneumonitis (inflammation of lung tissues). Chronic inhalation above permissible limits can produce chronic berylliosis (progressive lung disease) and systemic beryllium disease.

Chromium (Cr): Exposure Limits: TLV: 0.5 mg/m^3 PEL: 1.0 mg/m^3 (Metal as Cr)
CAS No.: 7440-47-3
Ferrochrome alloy exposures have been associated with lung changes and skin irritation. Trivalent compounds are considered non-toxic. There is no evidence of carcinogenic effects from trivalent compounds in humans or animals. Hexavalent chromium compounds may be generated during welding operations, these compounds are considered carcinogenic.

Cobalt (Co): Exposure Limits: TLV: 0.05 mg/m^3 (Dust & fume as Co) PEL: 0.05 mg/m^3 (As Co metal)
CAS No.: 7440-48-4
Fume or dust may cause interstitial lung disease or dermatitis. May cause hypersensitivity pneumonitis which disappears when exposure ceases or may cause obstructive airway syndrome as an allergic response.

Copper (Cu): Exposure Limits: TLV: 1 mg/m^3 (Dusts & mists, as Cu), 0.2 mg/m^3 (Fume) PEL: 1 mg/m^3 (Dusts & mists, as Cu), 0.1 mg/m^3 (Fume as Cu)
CAS No.: 7440-50-8:
May irritate the upper respiratory tract or cause metal fume fever, an influenza like illness with fever, muscle aches and weakness. May also cause a metallic or sweet taste in the mouth.

Iron (Fe): Exposure Limits: TLV: No limit set (For Fe_2O_3 fume the TLV is 5 mg/m^3 as Fe) PEL: No limit set (For Fe_2O_3 dust and fume the PEL is 10 mg/m^3 as Fe)
CAS No.: 7439-89-6
Repeated exposure to fume over a period of years may cause a benign pneumoconiosis but generally does not cause symptoms in the exposed person.

Section VI - Health Hazard Data (continued on the reverse side)

SECTION VI HEALTH HAZARD DATA (CONTINUED)

Manganese (Mn): Exposure Limits: TLV: 5 mg/m^3 (Dust & compounds, as Mn); 1 mg/m^3 (Fume, as Mn); STEL 3 mg/m^3 (Fume as Mn)
PEL: 5 mg/m^3 (Ceiling, as Mn compounds); 1 mg/m^3 (Fume, as Mn); STEL 3 mg/m^3 (Fume as Mn)
CAS No.: 7439-96-5
Acute effects include skin and eye irritation and metal fume fever. Chronic exposure may lead to central nervous system effects: headache, changes in motor activity and psychological disturbances.

Molybdenum (Mo): Exposure Limits: TLV: 10 mg/m^3 (Insoluble compounds, as Mo) PEL: 10 mg/m^3 (Insoluble compounds, total dust as Mo)
CAS No.: 7439-98-7
Irritant to eyes and mucous membranes.

Nickel (Ni): Exposure Limits: TLV: 1 mg/m^3 as metal PEL: 1 mg/m^3 for metal and insoluble compounds as Ni
CAS No.: 7440-02-0
Known to cause contact dermatitis. A respiratory irritant, may cause pulmonary asthma. Nickel refining and specific nickel compounds are considered respiratory carcinogens to humans.

Silicon (Si): Exposure Limits: TLV: 10 mg/m^3 PEL: 10 mg/m^3 Total dust; 5 mg/m^3 Respirable fraction
CAS No.: 7440-21-3
Silicon in dust form is considered a nuisance dust with no toxic effects when exposures are kept under control. Inhalation of crystalline silica (SiO_2) over a long period of time can cause silicosis.

Titanium (Ti): Exposure Limits: TLV: No limit set PEL: No limit set
CAS No.: 7440-32-6
Considered a "nuisance" particulate. May cause irritation to eyes, nose and throat.

Tungsten (W): Exposure Limits: TLV: 5 mg/m^3 insoluble compounds, as W; STEL 10 mg/m^3 for insoluble compounds, as W
PEL: 5 mg/m^3 insoluble compounds, as W; STEL 10 mg/m^3 for insoluble compounds, as W
CAS No.: 7440-33-7
Skin and eye irritant. Low order of toxicity.

Carcinogenic References: Beryllium, Chromium, Cobalt-Chromium alloys and Nickel have been identified by either the International Agency for Research on Cancer (IARC) or The National Toxicology Program (NTP) or by OSHA as cancer causing agents.

Proposition 65: **WARNING: THIS PRODUCT CONTAINS A CHEMICAL KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.**

Exposure Routes: Acute exposure to specialty welding alloys occurs primarily from inhalation of dust or fumes. Specific constituents of these alloys may cause effect directly upon the skin or eyes. Certain constituents may also be harmful if swallowed

First Aid:
Inhalation - Move person to fresh air until recovered. If severe respiratory irritation persists consult a physician.
Skin - Wash with water and mild detergent. If rash develops consult a physician.
Eye - Flush thoroughly with water. If irritation persists consult a physician.
Ingestion - While ingestion of large enough quantities to cause health effects is unlikely, consult a physician if it occurs.

Aggravated Conditions
Medical conditions that are recognized as being possibly susceptible to aggravation by exposure include pre-existing chronic skin, eye, and respiratory disorders if prolonged or repeated overexposure to fumes and dust occur.

SECTION VII SPILL OR LEAK PROCEDURES

Product is a solid metal as shipped, no potential for spills or leak. Chips or pieces can be recycled as scrap.

SECTION VIII SPECIAL PROTECTION INFORMATION

Respiratory Protection:
Respiratory protection is necessary when exposure limits for airborne contaminants are exceeded during welding with these alloys. Use air-supplied respirator in confined spaces. Use only NIOSH approved respirators in accordance with 29 CFR 1910.134 - Respiratory Protection.

Ventilation:
Use local exhaust when welding. Maintain exposures below acceptable exposure limits. Confined spaces require special attention to provision of adequate ventilation and/or air-supplied respirators.

Eye Protection and Protective Clothing:
Protective equipment is required when welding. Wear gloves, face protection and flame retardant clothing. Do not expose skin or eyes to the heat and radiation from welding operations. Select welding lens shade from the American Welding Society publication F2.2.

IMPORTANT

Maintain exposures below the acceptable exposure limits. Use industrial hygiene air monitoring to ensure that your use of this material does not create exposures which exceed the recommended exposure limits. Always use exhaust ventilation in welding operations. Refer to the following sources for important additional information.

ANSI Z49.1
The American Welding Society
P.O. Box 351040
Miami, FL 33135

29 CFR 1910
OSHA - Dept. of Labor
Washington, D.C. 20210

SECTION IX ADDENDUM

SARA Title III Requirements
Individual filler metal may contain toxic chemicals subject to the reporting requirements under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40 CFR 372. Toxic chemicals may include Chromium, Beryllium, Nickel, Manganese, Cobalt, Copper, Titanium, or Aluminum (refer to Section II of these MSDS for specific hazardous ingredients).