

Ingredients & Exposure Limits (Continued):

CHEMICAL NAME(S)	CAS No.	RTECS No.	EINECS No.	%	EXPOSURE LIMITS IN AIR (mg/m ³)								OTHER
					ACGIH		NOHSC			OSHA			
					ppm		ppm			ppm			
					TLV	STEL	ES-TWA	ES-STEL	ES-PEAK	PEL	STEL	IDLH	
TUNGSTEN	7440-33-7	YO7175000	231-143-9	0.0-10	5	10	5	10	NF	5	10	NA	
	Flam. Sol. 1; Self-heat.2; H228, H252												
CALCIUM FLUORIDE	7789-75-5	EW1760000	232-188-7	0.0-5.0	NA	NA	NF	NF	NF	NA	NA	NA	
	Skin Irrit. 2; Eye Irrit. 2; STOT SE 3; H315, H319												
COBALT	7440-48-4	GF8750000	231-158-0	0.0-9.0	(0.02)	NA	(0.05)	NA	NA	(0.01)	NA	NA	DUST
	Skin Sens. 1, Resp. Sens. 1, Aquatic Chronic 4; H317, H334, H413												
NICKEL	7440-02-0	QR5950000	231-111-4	0.0-5.0	(5.0)	NA	NF	NF	NF	(5.0)	NA	NA	
	Carc. 2; STOT RE 1; Skin Sens. 1; Aquatic Chronic 3; H351, H372**, H317, H412												
MANGANESE	7439-96-5	OO9275000	231-105-1	0.0-5.0	(0.2)	(3)	(10.0)	NF	NF	(10.0)	NA	NA	
SILICON	7440-21-3	VW0400000	231-130-8	0.0-2.0	(10.0)	NA	(10.0)	NF	NF	(10.0)	NA	NA	
ALUMINUM OXIDE	11092-32-3	NA	215-691-6	0.0-2.0	NA	NA	NF	NF	NF	NA	NA	NA	
IRON OXIDE	1332-37-2	NO7380000	215-570-8	0.0-2.0	15	NA	NF	NF	NF	10	NA	NA	FUME
SILICON DIOXIDE	7631-86-9	VV7310000	231-545-4	0.0-2.0	NA	NA	NF	NF	NF	20	NA	3000	
	Eye Irrit. 2A; STOT SE 3; H319, H335												
POTASSIUM TITANATE	12030-97-6	NA	234-748-6	0.0-2.0	NA	NA	NF	NF	NF	NA	NA	NA	
ZIRCONIUM OXIDE	1314-23-4		215-227-2	0.0-2.0	(5)	NA	(5)	NF	NF	(5)	NA	NA	
	Skin Irrit., 2; Eye Irrit. 2A; STOT SE 3; H315, H319, H335												
VANADIUM	1314-62-1	YW2460000	215-239-8	0.0-2.0	NA	NA	(0.05)	NF	NF	NA	NA	35	
	Muta. 2; Repr. 2; STOT RE 1; Acute Tox. 4 *; Acute Tox. 4 *; STOT SE 3; Aquatic Chronic 2; H341, H361d ***, H372 **, H332, H302, H335, H411												

The exposure limit for welding fume has been established at 5 mg/m³ with OSHA's PEL and ACGIH's TLV. The individual complex compounds within the fume may have lower exposure limits than the general welding fume PEL/TLV. An Industrial Hygienist, the OSHA Permissible Exposure Limits For Air Contaminants (29 CFR 1910.1000), and the ACGIH Threshold Limit Values should be consulted to determine the specific fume constituents present and their respective exposure limits.

Welding fumes cannot be classified simply. The composition and quantity of both are dependent on the metal being welded, the process, procedures, and alloys used. Other conditions which also influence the composition and quality of the fumes and gases to which workers may be exposed include coating on the metal being welded (such as paint, plating, or galvanizing), the number of welders, 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, and presence of contaminants in the atmosphere (ie, chlorinated hydrocarbon vapors from cleaning & degreasing activities). When the alloy is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in the alloy. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials in the alloy, plus those from the base metal and coating, etc.

The international agency for research on cancer (IARC) has indicated that nickel and certain nickel compounds are probably carcinogenic for humans, but that the specified compounds which may be carcinogenic cannot be specified precisely. Chromium has also been listed by IARC because of "sufficient evidence for the carcinogenicity of chromium and certain chromium compounds." The studies forming the basis for the conclusion were from operations different from the production or welding of nickel and chromium alloys. Recent studies of workers melting and working alloys containing nickel/chromium have found increased risk of cancer.

Use enough ventilation, local exhaust at the arc, or both, to keep the fumes and gases below TLVs (threshold limit values) in the workers' breathing zone and the general area. Train the welder to keep his head out of the fumes. Use respirable fume respirator or air supplied respirator when welding in confined space or where local exhaust or ventilation does not keep exposure below the TLV.

Wear helmet or use a face shield with filter lens. Wear hand, head, and body protection, which help to prevent injury from radiation, sparks, and electrical shock. Train the welder not to touch live electrical parts and insulate himself from work and ground.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance	N/A	Upper/lower flamability or exposure limits	N/A
Odor	N/A	Vapor Pressure	N/A
Odor threshold	N/A	Vapor density	N/A
pH	N/A	Relative Density	N/A
Melting point/freezing point	N/A	Solubility	N/A
Initial boiling point and boiling range	N/A	Flash point	N/A
Evaporation rate	N/A	Flammability	N/A
Partition coefficient	N/A	Auto-ignition temperature	N/A
Decomposition temperature	N/A	Viscosity	N/A

SECTION 10 – STABILITY AND REACTIVITY

Chemical Stability: The product is stable under normal conditions. When using it may produce dangerous fumes and gases.

Hazardous Decomposition: The composition and quantity of welding fumes generated are dependent upon several variables including the base material, base material contaminants and/or coatings (paint, galvanized, etc.) welding process utilized. Other factors that will effect the quantity of fumes available for inhalation are the number of welding operators in a designated work area, the quality of ventilation, the position of the operator with respect to the fume plume, as well as the presence of contaminants in the atmosphere from other manufacturing operations. Reasonably expected fume constituents of this product would include: complex oxides of iron, manganese, silicon, chromium, nickel, molybdenum, calcium, magnesium, and titanium. No hazard exists until this product is used in welding.

SECTION 11 – TOXICOLOGICAL INFORMATION

Acute toxicity: Harmful if swallowed.

Skin sensitisation: May cause an allergic skin reaction

SECTION 12 – ECOLOGICAL INFORMATION

No environmental data available.

SECTION 13 – DISPOSAL CONSIDERATIONS

Dispose of in accordance with local, state, and federal regulations.

SECTION 14 – TRANSPORTATION INFORMATION

Special shipping considerations for this product are limited to those necessary to prevent damaging the product.

SECTION 15 – REGULATORY INFORMATION

- SARA Reporting Requirements: The following chemicals are listed on the SARA Title III (EPCRA 313 Toxic Chemical List): Chromium, Manganese, Cobalt, Nickel.
- SARA TPQ: There are no specific Threshold Planning Quantities for the components of this product.
- TSCA Inventory Status: All chemical substances of this product are listed on the TSCA inventory or are otherwise exempt from inventory status.
- CERCLA Reportable Quantity: Chromium: 2,270 kg (5,000 lbs); Nickel: 45.4 kg (100 lbs)
- Other Federal Requirements: Manganese (and its compounds), Chromium (and its compounds), Cobalt (and its compounds) and Nickel (and its compounds) are listed as Hazardous Air Pollutants (HAPs). Manganese (and its compounds), Chromium (and its compounds), Cobalt (and its compounds) and Nickel (and its compounds) are listed as Toxic Pollutants under the Clean Water Act (CWA). Chromium and Nickel are listed as Priority Pollutants under the Clean Water Act (CWA). This product does not contain any Class 1 or Class 2 ozone depleters.
- Other Canadian Regulations: This product has been classified according to the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all of the information required by the CPR. The components of this product are listed on the DSL/NDL. The following chemicals are listed on the Ingredient Disclosure List: Chromium, Manganese, Nickel and Molybdenum. WHMIS Classification: D2B (Other Toxic Effects).



SECTION 16 – OTHER INFORMATION

Vulcan Systems, LLC, believes this data to be accurate, but no warranty, expressed or implied, is made.