



G.O. CARLSON Inc.

Material Safety Data Sheet

Section I

Manufacturing Name: G. O. Carlson, Inc.
Street Address: 350 Marshallton-Thorndale Road, Downingtown, PA 19335-2063
Telephone: * 610-384-2800 or 800-338-5622 (USA & Canada)
Fax: 610-383-3429

- During Normal Business Hours – 08:00 AM to 05:00 PM Eastern Standard Time.

Product Name: **Nickel, Nickel Alloys and Copper Nickel Alloys**

Section II – Hazardous Ingredients

GOC 276, GOC 22, C 600, C 601, C625, C HX

Chemical Components

Primary Metals	% Weight	C.A.S. Nbr	OSHA PEL (mg/m ³)	ACGIH TLV (mg/m ³)
Iron	4.0 - 22.0	7439-89-6	10.0 (as Fe ₂ O ₃ fume)	5.0 (as Fe ₂ O ₃ fume)
Chromium *	14.0 - 25.0	7440-47-3	1.0 (as Fe ₂ O ₃ fume)	0.5
Nickel *	38.0 - 72.0	7440-02-0	1.0	0.1 (soluble Ni comps)
Manganese *	0 - 2.0	7439-96-5	5.0	1.0 (as fume)
Molybdenum	2.5 - 17.0	7439-98-7	5.0 (soluble comps)	5.0 (soluble comps)
Copper *	0 - 3.0	7440-50-8	0.1 (as fume)	0.2 (as fume)
Cobalt *	0 - 2.5	7440-48-4	0.1 (metal fume & dust)	0.1 (metal fume & dust)
Columbium/ Tantalum	3.0 - 9.0 0 - 5.0	7440-25-7 7440-03-1	None listed 5.0	None listed 5.0
Tungsten	0 - 5.0	7440-33-7	None	1.0 (soluble comps)
Aluminum *	0 - 1.7	7429-90-5	None	5 (as welding fumes)

C 200, C201; Nickel Alloy

Chemical Components

Primary Metals	% Weight	C.A.S. Nbr	OSHA PEL (mg/m ³)	ACGIH TLV (mg/m ³)
Chromium *	< 0.5	7440-47-3	1.0 (as Fe ₂ O ₃ fume)	0.5
Nickel *	99.0 +	7440-02-3	1.0	0.1 (soluble Ni comps)
Manganese *	0 - 15.0	7439-96-5	5.0	1.0 (as fume)
Cobalt *	< 0.5	7440-48-4	0.1 (metal fume & dust)	0.1 (metal fume & dust)

* This substance is regulated under section 313 of the Emergency Planning and Community Right-to-Know Act of 1986.

□ C 400, Nickel, Copper Alloy**Chemical Components**

Primary Metals	% Weight	C.A.S. Nbr	OSHA PEL (mg/m ³)	ACGIH TLV (mg/m ³)
Iron	0 - 2.50	7439-89-6	10.0 (as Fe ₂ O ₃ fume)	5.0 (as Fe ₂ O ₃ fume)
Chromium *	< 1.0	7440-47-3	1.0 (as Fe ₂ O ₃ fume)	0.5
Nickel *	63.0 - 70.0	7440-02-0	1.0	0.1 (soluble Ni comps)
Manganese *	0 - 2.0	7439-96-5	5.0	1.0 (as fume)
Copper *	28.0 - 34.0	7440-50-8	0.1 (as fume)	0.2 (as fume)
Cobalt *	< 0.5	7440-48-4	0.1 (as fume)	0.1 (metal fume & dust)

□ 70-30 Cu Ni, 90-10 Cu Ni; Copper, Nickel Alloy**Chemical Components**

Primary Metals	% Weight	C.A.S. Nbr	OSHA PEL (mg/m ³)	ACGIH TLV (mg/m ³)
Copper *	65.0 - 91.0	7440-50-8	0.1 (as fume)	0.2 (as fume)
Nickel	9.0 - 33.0	7440-02-0	1.0	1.0 (as fume)
Iron *	.4 - 1.8	7439-89-6	10.0 (as Fe ₂ O ₃ fume)	5.0 (as Fe ₂ O ₃ fume)
Manganese *	0 - 1.0	7439-96-5	5.0	1.0 (as fume)

□ C 800, C 800H, C800AT; Nickel, Chromium, Iron; E36; Nickel, Iron**Chemical Components**

Primary Metals	% Weight	C.A.S. Nbr	OSHA PEL (mg/m ³)	ACGIH TLV (mg/m ³)
Iron	50.0 - 70.0	7439-89-6	10.0 (as Fe ₂ O ₃ fume)	5.0 (as Fe ₂ O ₃ fume)
Chromium *	19.0 - 23.0	7440-47-3	1.0 (as Fe ₂ O ₃ fume)	0.5
Nickel *	30.0 - 38.0	7440-02-0	1.0	0.1 (soluble Ni comps)
Manganese *	< 1.5	7439-96-5	5.0	1.0 (as fume)
Cobalt*	< 0.5	7440-48-4	0.1 (metal fume & dust)	0.1 (metal fume & dust)

□ C 825, C 20 Plus, 904L, 926 Mo; Nickel, Iron, Chromium, Molybdenum, Copper Alloys; C 330, Nickel, Iron, Chromium, Silicon Alloys**Chemical Components**

Primary Metals	% Weight	C.A.S. Nbr	OSHA PEL (mg/m ³)	ACGIH TLV (mg/m ³)
Nickel *	23.0 - 46.00	7440-02-0	1.0	0.1 (soluble Ni comps)
Iron	22.0 - 52.00	7439-89-6	1.0 (as Fe ₂ O ₃ fume)	5.0 (as Fe ₂ O ₃ fume)
Chromium *	17.0 - 23.50	7440-47-3	1.0 (as Fe ₂ O ₃ fume)	0.5
Molybdenum	2.0 - 7.00	7439-98-7	5.0 (soluble comps)	5.0 (soluble comps)
Copper *	0.5 - 4.00	7440-50-8	0.1 (as fume)	0.2 (as fume)
Manganese *	0 - 2.00	7439-96-5	5.0	1.0 (as fume)
Titanium	0 - 1.15	7440-32-6	---	(1) (as titanium dioxide)
Silicon	0 - 2.00	7440-21-3	None listed	10.0

(1) < 1% quartz, 15 mg/m³ of total dust or 5 mg/m³ respirable dust.

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□ C 718; Nickel, Chromium, Columbium/Tantalum, Molybdenum, Titanium, Aluminum, Iron**Chemical Components**

Primary Metals	% Weight		C.A.S. Nbr	OSHA PEL (mg/m ³)	ACGIH TLV (mg/m ³)
Nickel *	50.00	- 55.00	7440-02-0	1.0	0.1 (soluble Ni comps)
Chromium *	17.00	- 21.00	7440-47-3	1.0 (as Fe ₂ O ₃ fume)	5.0
Iron	10.00	- 25.00	7439-89-6	10.0 (as Fe ₂ O ₃ fume)	5.0 (as Fe ₂ O ₃ fume)
Columbium/ Tantalum	4.75	- 5.50	7440-25-7 7440-03-1	None listed 5.0	None listed 5.0
Molybdenum	2.80	- 3.30	7439-98-7	5.0 (soluble comps)	5.0 (soluble comps)
Aluminum *	0.20	- 0.60	7429-90-5	None listed	5.0 (as welding fumes)
Titanium	0.65	- 1.15	7440-32-6	----	(1) (as titanium dioxide)
Cobalt *	0	- 1.00	7440-84-4	0.1 (metal fume & dust)	0.1 (metal fume & dust)

(1) < 1% quartz, 15 mg/m³ of total dust or 5 mg/m³ respirable dust.

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Steel Products as shipped are inert. But, due to down stream processing such as welding, burning, grinding, heating and machining, metal fumes and gases may be generated, which may be dangerous to your health.

Note: Chromium, cobalt-chromium alloy and nickel have been identified as potential human carcinogens. See Section VI, Health Hazard Data.

Section III – Physical Data

⇒ Boiling Point (° F):	N/A (not applicable)
⇒ Vapor Pressure (mmHg @ 20° C):	N/A
⇒ Vapor Density (Air = 1):	N/A
⇒ Solubility in Water:	N/A
⇒ Specific Gravity (H ₂ O = 1):	Approximately 8.0 – 8.9
⇒ Percent Volatile by Volume:	N/A
⇒ Evaporative Rate (Ethyl Ether = 1):	N/A
⇒ PH Information:	N/A
⇒ Appearance and Odor:	Odorless solid with metallic lustre. Available plates, discs, heads and slabs.

Section IV – Fire and Explosion Hazard Data

⇒ Flash Point (°F):	N/A	Method Used: N/A
⇒ Flammability Limits (%/Vol):		
+ LEL: N/A		
+ UEL: N/A		
⇒ Auto-Ignition Temperature (°F):	N/A	
⇒ Extinguishing Media:	No fire or explosion hazards.	
⇒ Special Fire-Fighting Instructions:	N/A	
⇒ Unusual Fire & Explosion Hazards:	N/A	

Section V – Reactivity Data

- ⇒ **Stability (conditions to avoid):** Stable
- ⇒ **Incompatibility (materials to avoid):** None
- ⇒ **Hazardous Decomposition Products:** Metal fumes and certain noxious gases, such as CO, may be produced during welding or burning operations. Acid pickling of product may result in the formation of hexavalent chromium, which is a hazardous waste and suspect carcinogen. See Section VI and X for further information.
- ⇒ **Hazardous Polymerization:** Will not occur.

Section VI – Health Hazard Data

- ⇒ **Primary Route(s) of Entry:** Inhalation, skin contact.
- ⇒ **Effects of Exposure:** No toxic effects would be expected from its inert form. Prolonged, repeated exposure to fumes or dust generated during heating, cutting, brazing or welding may cause adverse health effects associated with the following constituents:

+ Inhalation:

- ▶ **Iron:** Siderosis, no fibrosis.
- ▶ **Chromium:** The dusts of chromium metal are usually reported to be relatively non-toxic, although there are reports of a nodular type of pulmonary disease with impairment of lung function. Some insoluble chromium compounds are suspect carcinogens.
- ▶ **Nickel:** Respiratory irritation and pneumonitis; several nickel compounds, including nickel oxide, are suspect lung and nasal carcinogens.
- ▶ **Manganese:** Pneumonitis, CNS involvement, including irritability, difficulty in walking, speech disorders, compulsive behavior, mask-like face and Parkinson-like syndrome.
- ▶ **Aluminum:** No known health effects. Generally considered to be in the nuisance dust category.
- ▶ **Silicon:** May produce x-ray changes in the lungs without disability.
- ▶ **Tungsten:** Some evidence of pulmonary involvement, such as cough.
- ▶ **Molybdenum:** Irritation of the nose and throat, weight loss and digestive disturbances in animals. No industrial poisoning has been reported.
- ▶ **Copper:** "Metal fume fever" – symptoms may include cough, headache, metallic taste in mouth, nausea, fever, chilling, pain in muscles and joints. This condition is transitory, usually lasting one day or less.
- ▶ **Cobalt:** May cause interstitial pneumonitis and sensitization of the respiratory system. Symptoms may include cough, dyspnea on exertion, decreased pulmonary function, wheezing and shortness of breath.
- ▶ **Titanium (as titanium dioxide):** Generally considered to be in the nuisance dust category. May cause irritation of eyes, nose and/or throat in high concentrations.

Note: Some constituents pose more potential hazards than others, depending upon their inherent toxicity and concentration. Of special concern are chromium, nickel and perhaps manganese.

- + **Skin Contact:** Dermatitis due to sensitization may occur in some individuals from exposure to nickel and chromium fumes.
- + **Eye Contact:** May cause irritation.
- + **Ingestion:** May cause irritation of the mouth and throat.

Section VII – Emergency & First Aide Procedures

- ⇒ **Inhalation:** Seek medical attention, if necessary.
- ⇒ **Skin Contact:** If irritation develops, remove contaminated clothing immediately and wash contaminated skin with soap or mild detergent and water for five minutes. If irritation persists, seek medical attention.
- ⇒ **Eyes:** In case of contact, immediately wash eyes with large amounts of water for fifteen minutes, occasionally lifting the lower and upper lids. Seek medical attention, if necessary.
- ⇒ **Ingestion:** Seek medical attention, if necessary.

Section VIII – Personnel Protection Information

For welding, burning, grinding and cutting operations, local exhaust ventilation should be provided. If fumes or dust cannot be controlled with exhaust ventilation, an appropriate NIOSH-approved respirator should be used to prevent excessive inhalation exposure.

- ⇒ **Gloves:** Gloves may be necessary to prevent skin sensitization and dermatitis.
- ⇒ **Eye Protection:** Approved safety glasses or goggles should be worn when working with dusty metals.

Section IX – Spill or Leak Procedures

- ⇒ Action to take for spills (use appropriate safety equipment): N/A
- ⇒ Waste Disposal Method: N/A

Section X – Special Protection Information

- ⇒ **Ventilation:** As described in the *Industrial Ventilation Manual* produced by the American Conference of Governmental Industrial Hygienists, shall be provided in areas where exposure are above the permissible exposure limits or threshold limit values specified by OSHA or other local, state and federal regulations.
- ⇒ **Respiratory Protection:** A properly fitted, NIOSH-approved dust-fume respirator should be worn during welding or burning whenever welding fumes exceed the threshold limit value (TLV) or other recommended limits, in accordance with the OSHA Respiratory Protection Standard (29 CFR 1910.134).

Section XI – Special Precautions

- ⇒ Precautions to be taken in handling and storage: None
- ⇒ DOT Information:
 - + **Hazard Material Proper Shipping Name:** N/A
 - + **Hazard Class:** N/A
 - + **Identification Number:** N/A
- ⇒ EPA Hazardous Waste Number: N/A

Additional Information:

During welding, precautions should be taken for airborne contaminants and noxious gases that may originate from the welding process or from components of the welding rod. Of special concern are silica or silicates, or both; fluorides; copper; manganese; carbon monoxide and nitrogen oxides. Arc and sparks generated when welding with this product could be a source of ignition for combustible and flammable materials.

While the information and recommendations set forth on this data sheet are believed to be accurate as of the present date, G. O. Carlson, Inc. makes no warranty with respect thereto and disclaims all liability from reliance thereon.