

Handy & Harman of Canada, Limited

MATERIAL SAFETY DATA SHEET

SECTION 1 MATERIAL IDENTIFICATION AND USE CODE VTG-20 rev 10/03

MATERIAL NAME IDENTIFIER: HI-TEMP 096 BRAZING ALLOY

Manufacturer's Name: **HANDY & HARMAN OF CANADA, LIMITED** *Street Address:* **290 CARLINGVIEW DRIVE**

City: **REXDALE** *Province/State/Country:* **ONTARIO, CANADA M9W 5G1** *Emergency Phone No:* **(416) 675-1860**

Supplier's Name: _____ *Street Address:* _____

City: _____ *Province/State/Country:* _____ *Emergency Phone No:* _____

Chemical Name: Brazing Filler Metal	Chemical Family: Copper and Others	Chemical Formula: Refer To Chart
Molecular Weight: N/Avl.	Trade Names, Synonyms: Refer To Chart	Material Use: Filler Metals For Brazing

SECTION 2 HAZARDOUS CHEMICAL COMPONENTS

Chemical Component	CAS Number	(Refer to filler metal chart below for nominal composition %)
COPPER (Cu)	7440-50-8	ACGIH: TLVs (2000) 0.2 mg/m ³ TWA (fume); 1.0 mg/m ³ TWA (dusts & mists) OSHA PEL: 0.1 mg/m ³ TWA (fume); 1.0 mg/m ³ TWA (dusts & mists) LD ₅₀ 470 mg/kg oral-mouse LC ₅₀ N/Avl.
NICKEL (Ni)	7440-02-0	ACGIH: TLVs (2000) 1.5 mg/m ³ TWA (metal)(inhalable fraction); 0.2 mg/m ³ TWA (insoluble compounds, as Ni)(inhalable fraction) OSHA PEL: 1.0 mg/m ³ TWA metal & insoluble compounds as Ni LD ₅₀ N/Avl. LC ₅₀ N/Avl.
MANGANESE (Mn) (red allotropic form)	7439-96-5	ACGIH: TLVs (2000) 0.2 TWA (elemental & inorganic compounds, as Mn) OSHA PEL: 5 mg/m ³ ceiling LD ₅₀ 9 gm/kg oral-rat LC ₅₀ N/Avl.

HANDY & HARMAN BRAZING FILLER METALS CHART

FILLER METAL NAME	PRODUCT CODE	Nominal Composition, %			Solidus (Melt Point)		Liquidus (Flow Point)		Max.Recommended Brazing Temp.		Specific Gravity
		Cu	Ni	Mn	°F	°C	°F	°C	°F	C	
Hi-Temp 096	77-096	52.5	9.5	38	1615	880	1700	925	2000	1093	7.67

SECTION 3 PHYSICAL DATA

Physical State: Gas <input type="checkbox"/> Liquid <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Odour Threshold (ppm): N/Avl. Evaporation Rate: Solid - N/Appl. % Volatile (By Volume): N/Appl. Specific Gravity: Refer To Chart	Odour & Appearance: No Odour; Solid Metal Wire, Strip, Powder, Paste Vapour Pressure (mm.Hg): N/Avl. Vapour Density (AIR=1): Solid-N/Appl. Boiling Point (°C): Solid - N/Appl. Freezing Point (°C): Solid - N/Appl. Solubility in Water (20°C): Insoluble pH: N/Appl. Coeff.-Water Oil Disp.: N/Appl.
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SECTION 4 FIRE AND EXPLOSION DATA

Flammability: Yes No **If yes, under which conditions?**
 Dust, powder and fumes are flammable when exposed to flame or by chemical reaction with oxidizing agents (see Section 5 for incompatible materials). Fires or explosions involving these alloys may release potentially toxic emissions of metal or metal oxide fumes (see Section 2 for hazardous components).

Means Of Extinction: Dry powder for metal fires. Do not use water on dust, powder or fume fires.

Special Procedures: Use self-contained breathing apparatus with full face-piece operated in pressure demand or other positive pressure mode.

Flashpoint(°C) & Method: Solid Metal - Non-Flammable Lower Explosion Limit (%By Volume): Solid Metal-N/Appl. TDG Flammability Classification: None Sensitivity To Impact Explosion Data: N/Appl. Explosive Power: N/Appl.	Upper Explosion Limit (% By Volume): N/Appl. Auto Ignition Temperature (°C): Solid Metal - N/Appl. Hazardous Combustion Products: Solid Metal - N/Appl. Rate Of Burning: N/Appl. Sensitivity To Static Discharge: N/Appl.
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SECTION 5	REACTIVITY DATA	CODE VTG-20 rev 10/03
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AVOID DISPERSION OF FINELY DIVIDED PARTICLES IN AIR

Chemical Stability: Yes No If yes, under which conditions? Normal Ambient Environment.

Incompatibility With Other Substances: Yes No If yes, which ones?

Strong Oxidizers; Se; P; Mg; Chlorates; NH₃; HNO₃; Azides; Ethanol; Ethylenimine; ClF₃; Inorganic and Organic Peroxides; Peroxyformic Acid; Chlorine and Fluorine; Permonosulphuric Acid; CrO₃; Mg, and Ca Chlorides; CS₂; Hydrazine Mononitrate; Nitrobenzene; Fe (CO)₅; Seleninyl Bromide.

Reactivity And Under What Conditions: Stable under normal temperatures and pressures.

Hazardous Decomposition Products: Hazardous polymerization will not occur at normal temperatures and pressures. Danger is mostly from inhalation of elemental oxide fumes or dusts. Use appropriate exhaust ventilation to carry all dusts/fumes away from work area.

Avoid overheating. Avoid dust accumulation.

SECTION 6	TOXICOLOGICAL PROPERTIES
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Route Of Exposure: *Inhalation* Inhalation of the components of these products are not known to present a significant risk to health when used according to instructions and with appropriate protective measures (see Section 7). Inhalation of the component/elements has been reported to cause one or more of the following symptoms/effects upon excessively high and/or prolonged inhalation/exposure.

COPPER:

- Acute** Acute exposure to dust or fume may cause respiratory tract irritation, fever, muscle ache, chills, cough, weakness, and a metallic taste.
- Chronic** Exposure may cause damage to the liver, kidney, spleen, pancreas, and brain.

NICKEL

- Acute** Dust or fumes may produce headache, nausea, vertigo, asthma, pulmonary fibrosis, and pulmonary edema.
- Chronic** May increase the risk of cancer to the nasopharyngeal region, lungs, prostate, and kidney.

MANGANESE

- Acute:** Exposure to dust and fume can produce irritation to eyes, nose, and throat; cough, chest pain; flu-like symptoms and/or pneumonia.
- Chronic** Chronic exposure may cause manganism, a disease of the central nervous system characterized by languor, sleeplessness, weakness in muscles, mental confusion, and spastic responses..

Miscellaneous Toxicological Information

Nickel is classified as a potential human carcinogen by the following organizations (with respective sub-classifications):

1. IARC (Group 2B)
2. NTP (Group 2B)

Nickel has also produced fetotoxic and teratogenic effects in animal studies, and mutagenic responses in mammalian cell cultures.

Neither Copper nor Manganese are classified as potential or demonstrated human carcinogens by IARC, NIOSH, NTP, OSHA, or ACGIH.

Health Conditions Aggravated By Exposure: Pre-existing pulmonary diseases (e.g., bronchitis, emphysema) may be aggravated by inhalation exposure to these materials, particularly as fume. Chronic exposure by inhalation and/or ingestion may aggravate pre-existing diseases of the liver, kidneys, gastrointestinal system, central nervous system, and musculoskeletal system.

Route Of Exposure

Skin: In solid form, materials are not known to be hazardous. In finely divided form, skin contact may produce localized irritation, localized argyria, skin discoloration, and contact or allergic dermatitis.

Eyes: Exposure of the eyes to finely divided form of these materials may produce localized argyria, irritation, conjunctivitis, and ulceration of the cornea.

Ingestion: Finely divided form of these materials may produce gastric irritation, vomiting, abdominal pain, hemorrhage, and diarrhea. Long-term chronic ingestion may produce damage to the liver, kidney, spleen, pancreas, musculoskeletal system, blood-forming organs, and central nervous system.

LD₅₀ Of Material Specify Species And Route: N/Avl.	LC₅₀ Of Material Specify Species: N/Avl.	Exposure Limit Of Material: N/Avl.	Irritancy Of Material: N/Avl.
Sensitizing Capability Of Material: N/Avl.	Carcinogenicity Of Material: Unknown	Reproductive Effects Of Material: N/Avl.	Synergistic Materials: N/Avl.

SECTION 7	PREVENTATIVE MEASURES
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Personal Protective Equipment: Personal protective equipment will be required when using these materials. The nature of the processing activity will determine what form of equipment is necessary, i.e., safety glasses, respirator, protective clothing, etc. Personal protective equipment should not be substituted for proper handling and engineering controls.

Gloves: Wear appropriate protective gloves to prevent injury from the hazards of processing and/or repeated contact with finely divided material. Avoid flammable fabrics.

Respiratory: Local exhaust, mechanical ventilation, and/or respiratory equipment may be required to maintain a protection factor appropriate to the airborne concentrations of the contaminants generated and provide sufficient clean air for breathing. If exposure levels exceed OSHA PELs, wear a NIOSH/MSHA-approved respirator (or other approving authority) for protection from the airborne contaminants. All adjacent persons in the immediate vicinity of processing operations shall be similarly protected as necessary by ventilation or approved respirators.

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SECTION 7 (cont'd)	PREVENTATIVE MEASURES	CODE VTG-20 rev 10/03
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Eyes: Wear eye protection (safety glasses, dust-proof goggles) adequate to prevent eye contact with this material in finely divided form and to prevent eye injury from the hazards of processing.

Footwear: Refer to workplace safety regulations.

Clothing: Avoid flammable fabrics. Wear appropriate clothing to prevent skin injuries from the hazards of processing.

Other Protection: Practice good housekeeping and personal hygiene procedures. To avoid ingestion of material, wash hands and face before eating, drinking, or using tobacco or cosmetics.

Engineering Controls: Adequate ventilation, sinks, showers, and eyewash stations should be provided. The best industrial control practice is to maintain concentrations of all chemical fumes and dusts as low as is practical.

Leak And Spill Procedure: If metal is molten, allow to solidify and cool. Clean up any spilled material so as to minimize dispersion of dusts. Wet sweeping or vacuuming using HEPA, or similarly approved filtration, are recommended methods.

Waste Disposal: Return to manufacturer for reclaim.

Handling Procedure And Equipment: Use sufficient atmosphere to protect the metals and minimize oxidation/vapourization during use.

Storage Requirements: Avoid storage near incompatible materials (*see also Section 5*). Also avoid conditions which create toxic fumes or dusts. Wash exposed skin after handling material. Stable at room temperature.

Special Shipping Information: No special requirements.

WHMIS Classification: Class D, Division 2, Subdivision A.

SECTION 8	FIRST AID MEASURES	
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Emergency And First Aid Procedures

Inhalation: Move victim to fresh air at once. Give oxygen if breathing is laboured, artificial respiration if victim is not breathing. Keep person warm and quiet. Get medical attention immediately.

Skin: Contact in solid forms is not known to be hazardous. If clothing is contaminated with finely divided particles, remove. Wash affected area with large quantities of water for at least 5 minutes. Get medical attention if necessary.

Eyes: Flush immediately with large amounts of water for at least 15 minutes while lifting the lower and upper eyelids. If irritation continues, get medical attention.

Ingestion: If person is conscious, give large amounts of water and induce vomiting. Seek medical attention. If person is unconscious or convulsive, get immediate medical attention.

SEEK MEDICAL ATTENTION IN ALL CASES OF EXPOSURE

SIGNS AND SYMPTOMS OF EXPOSURE:

Acute

Inhalation: Acute exposure to nickel dust or fume may produce headache, nausea, vertigo, asthma, pulmonary fibrosis/edema.

Skin: Particles may cause irritation.

Eyes: Particles may cause irritation, redness, itching.

Ingestion: May produce gastric irritation, vomiting, abdominal pain, diarrhea and hemorrhage.

Chronic

Inhalation: May increase the risk of cancer to the nasopharyngeal region, lungs, prostate, and kidneys.

Skin: May produce contact and/or allergic dermatitis.

Eyes: Irritation may cause, conjunctivitis, and/or ulceration of the cornea.

Ingestion: In finely divided forms may cause damage to the liver, kidneys, spleen, pancreas, musculoskeletal system and nervous system.

Medical Conditions Generally Aggravated By Exposure: Respiratory and skin disorders.

Sources Used: Canadian Centre For Occupational Health And Safety, Hamilton, Ontario; American Welding Society, Miami, Florida; ACGIH, Cincinnati, Ohio; Lucas-Milhaupt Inc., Cudahy, Wisconsin.

SARA Title III Notifications and Information

SARA Title III - Hazard Classes: Acute Health Hazard; Chronic Health Hazard

SARA Title III - Section 313 Supplier Notification: This product contains the following toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372:

CAS #	Chemical Name	Percent of Mixture
7440-02-0	Nickel	52.0 - 53.0
7440-50-8	Copper	9.0 - 10.0
7439-96-5	Manganese	37.5 - 38.5

This information must be included on all MSDSs that are copied and distributed for this material.

WARNING: This product contains a chemical(s) known to the State of California to cause cancer.

SECTION 9	PREPARATION DATE OF MSDS	
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PREPARED BY: Marketing Department	PHONE NO: (416) 675-1860	DATE: Revised 10/03
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