

Material Safety Data Sheet

Metglas® MBF-1000 Series Brazing Foil

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Metglas® MBF-1000 Series Nickel-Based Brazing Foil

OTHER/GENERIC NAMES: MBF-1000 Series Brazing Foil; MBF-1000 Series Brazing Filler Metals
The MBF-1000 Series includes the following grades: 1001, 1002, 1004, 1005, 1006, 1007, 1008, 1010, 1011, 1012, 1020, 1022

PRODUCT USE: Metal joining; Hard facing

MANUFACTURER: Metglas®, Inc.
440 Allied Dr.
Conway, SC - 29526

FOR MORE INFORMATION CALL:
(Monday-Friday, 8:00am-5:00pm)
1-800-581-7654

IN CASE OF EMERGENCY CALL:
(24 Hours/Day, 7 Days/Week)
1-800-581-7654 or Chemtrec 1-800-424-9300

2. COMPOSITION/INFORMATION ON INGREDIENTS

<u>INGREDIENT NAME</u>	<u>CAS NUMBER</u>	<u>WEIGHT %</u>
Boron (present in grades 1001, 1002, 1012 and 1022)	7440-42-8	0 - 5
Chromium (present in grades 1001, 1002, and 1012)	7440-47-3	0 - 15
Cobalt (present in grades 1011, 1020 and 1022)	7440-48-4	0 - 15
Iron (present in grades 1001, 1002 and 1010)	7439-89-6	0 - 25
Palladium (present in all grades)		25 - 90
Molybdenum (present in grades 1011 and 1022)	7439-98-7	0 - 8
Nickel (present in all grades)	7440-02-0	5 - 60
Silicon (present in all grades <u>except</u> 1001 and 1002)	7440-21-3	0 - 10

Trace impurities and additional material names not listed above may also appear in Section 15 toward the end of the MSDS. These materials may be listed for local "Right-To-Know" compliance and for other reasons.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: A shiny metallic foil. As shipped, the primary hazard is the sharp edges of the product. Some individuals may develop allergic skin reactions after repeated handling. If melted in a fire, toxic fumes may be released.

POTENTIAL HEALTH HAZARDS

SKIN: Handling of sharp edges may cause cuts. Repeated contact may cause allergic skin reaction resulting in irritation or dermatitis.

EYES: Not a normal route of entry. Solid particles generated by grinding and sanding may cause irritation.

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INHALATION: Vapors and fumes resulting from the grinding, sanding, cutting and/or welding of this material are harmful if inhaled. Symptoms may include irritation of throat and respiratory tract. Exposures may result in "metal fume fever" which can produce flu-like symptoms.

INGESTION: Not a route of entry.

DELAYED EFFECTS: Repeated inhalation of vapors and fumes may result in toxic effects to the lungs. Cobalt and cobalt foils and nickel and nickel compounds have caused cancer in laboratory animals and should be treated as 'possible' carcinogens. At present there is no reliable evidence that cobalt or nickel metal has caused cancer in humans. Long term nickel exposure may affect kidney function. Although hexavalent chrome is considered a potential carcinogen, the trivalent (metallic) chrome in this product is not considered to be a carcinogen.

Ingredients found on one of the OSHA designated carcinogen lists are listed below.

<u>INGREDIENT NAME</u>	<u>NTP STATUS</u>	<u>IARC STATUS</u>	<u>OSHA LIST</u>
Cobalt	None	2b - possible carcinogen	None
Nickel	Suspect carcinogen	2b - possible carcinogen	None

Health Rating (HMIS): Health: 2 Fire: 0 Reactivity: 0 Special: None

4. FIRST AID MEASURES

SKIN: Wash hands with soap and water.

EYES: For irritation caused by particles of dust flush eyes with running water. Seek medical assistance if irritation persists.

INHALATION: Remove to fresh air immediately. If breathing is difficult, get immediate medical assistance. Oxygen may be given by a person trained and qualified to administer it.

INGESTION: Not a route of entry.

ADVICE TO PHYSICIAN: Treat symptomatically.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT: None

FLASH POINT METHOD: Not applicable

AUTOIGNITION TEMPERATURE: Not applicable

UPPER FLAME LIMIT (volume % in air): Not applicable

LOWER FLAME LIMIT (volume % in air): Not applicable

FLAME PROPAGATION RATE (solids): Not determined.

OSHA FLAMMABILITY CLASS: None

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EXTINGUISHING MEDIA:

Use any standard agent for surrounding fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

None

SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS:

Toxic and irritating vapors may be released if the product melts or burns in a fire. Use self-contained respiratory protection.

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE:

Material is shipped as an article. Pick up and place into proper storage. Use caution in handling as edges are very sharp.

Spills and releases may have to be reported to Federal and/or local authorities. See Section 15 regarding reporting requirements.

7. HANDLING AND STORAGE

NORMAL HANDLING: (Always wear recommended personal protective equipment.)

Handle with care. Edges of material are very sharp.

STORAGE RECOMMENDATIONS:

Store in a facility that will protect product from physical damage and/or contamination with foreign material. (Do not exposure to moisture or any other substance.)

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:

Use mechanical ventilation when cutting, grinding, sanding and/or welding product.

PERSONAL PROTECTIVE EQUIPMENT

SKIN PROTECTION:

Wear cut-resistant gloves.

EYE PROTECTION:

Wear safety glasses when grinding, sanding, cutting and/or welding product.

RESPIRATORY PROTECTION:

If necessary to meet exposure limits listed in section 8, wear an air-purifying respirator during grinding, sanding, cutting and/or welding activities.

ADDITIONAL RECOMMENDATIONS:

A safety shower, eyewash or another source of running water should be available in areas where grinding, sanding, cutting and/or welding operations take place.

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EXPOSURE GUIDELINES

<u>INGREDIENT NAME</u>	<u>ACGIH TLV</u>	<u>OSHA PEL</u>	<u>OTHER LIMIT</u>
Chromium (trivalent)	0.5 mg/m ³ (TWA)	1 mg/m ³ (TWA) metal	None
Cobalt	0.02 mg/m ³ (TWA)	0.1 mg/m ³ (TWA)	***End of shift: 15 ug/l - urine 1 ug/l - blood
Iron	5 mg/m ³ (TWA) as iron oxide	10 mg/m ³ (TWA) as iron oxide fume	None
Molybdenum	10 mg/m ³ (TWA)	10 mg/m ³ (TWA)	None
Nickel	1.5 mg/m ³ (TWA) inhalable fraction	1 mg/m ³ (TWA)	None
Silicon	10 mg/m ³ (TWA)	15 mg/m ³ (TWA) as total dust. 5 mg/m ³ (TWA) as respirable dust.	None

*** = Biological Exposure Index (ACGIH).

OTHER EXPOSURE LIMITS FOR POTENTIAL DECOMPOSITION PRODUCTS:

None

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	A shiny metallic ribbon.		
PHYSICAL STATE:	Solid		
MOLECULAR WEIGHT:	Metal alloy mixture		
CHEMICAL FORMULA:	Metal alloy mixture		
ODOR:	None		
SPECIFIC GRAVITY (water = 1.0 g/cm³):	MBF-1001	8.80	
	MBF-1002	8.85	
	MBF-1004	not determined	
	MBF-1005	9.93	
	MBF-1006	9.60	
	MBF-1007	9.11	
	MBF-1008	11.04	
	MBF-1010	10.13	
	MBF-1012	8.82	
	MBF-1020	not determined	
	MBF-1022	8.88	

SOLUBILITY IN WATER (weight %): None

pH: Not applicable

BOILING POINT: Not applicable

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MELTING RANGE, T_s, T_L	MBF-1001: 1733 - 1825°F (945 - 996°C)	MBF-1008: 1422 - 1508°F (772 - 820°C)
	MBF-1002: 1693 - 1814°F (923 - 990°C)	MBF-1010: 1760 - 1868°F (960 - 1020°C)
	MBF-1004: not determined	MBF-1011: 1557 - 1643°F (847 - 895°C)
	MBF-1005: 1490 - 1564°F (810 - 851°C)	MBF-1012: 1508-1760°F (820-960°C)
	MBF-1006: not determined	MBF-1020: 1508 - 1598°F (820 - 870°C)
	MBF-1007: 1508-1598°F (820-870°C)	MBF-1022: 1539 - 1605°F (837 - 874°C)

VAPOR PRESSURE: Not applicable

VAPOR DENSITY (air = 1.0): Not applicable

EVAPORATION RATE: Not applicable

% VOLATILES: None

FLASH POINT: None

(Flash point method and additional flammability data are found in Section 5.)

COMPARED TO:

10. STABILITY AND REACTIVITY

NORMALLY STABLE? (CONDITIONS TO AVOID):

Normally stable.

INCOMPATIBILITIES:

Product can be attacked by moisture and corrosive materials.

HAZARDOUS DECOMPOSITION PRODUCTS:

Toxic vapors and metallic fumes may be released if melted in a fire (see section 3).

HAZARDOUS POLYMERIZATION:

Not applicable.

11. TOXICOLOGICAL INFORMATION

IMMEDIATE (ACUTE) EFFECTS:

Iron: LD₅₀ (oral, rat) 30 g/kg

Nickel: LD₅₀ (dermal, rabbit) >2 g/kg Nickel may cause dermal sensitization.

Silicon: LD₅₀ (oral, rat) 3.16 g/kg

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:

Chromium: Repeated inhalation of trivalent chrome may cause respiratory tract inflammation and lung effects.

Cobalt: IARC lists cobalt compounds as class 2b possible carcinogens based on animal test data.

Nickel: IARC lists nickel as a class 2b possible carcinogen based on animal test data. Listed as a 'suspect carcinogen by

NTP. Chronic inhalation may cause pneumoconiosis and kidney effects.

Silicon: Repeated inhalation of silicon may cause lung effects.

OTHER DATA:

None

12. ECOLOGICAL INFORMATION

Not anticipated to present an ecological hazard.

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Is the unused product a RCRA hazardous waste if discarded? No
 If yes, the RCRA ID number is:

OTHER DISPOSAL CONSIDERATIONS: Observe all Federal, State, and Local Environmental regulations. Some local regulations may restrict disposal of metallic waste based on composition. Recycling of metallic products is recommended where recycling programs are available.

The information offered here is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal method.

14. TRANSPORT INFORMATION

US DOT PROPER SHIPPING NAME: Not regulated
US DOT HAZARD CLASS: Not regulated
US DOT ID NUMBER: Not regulated

For additional information on shipping regulations affecting this material, contact the information number found in Section 1.

15. REGULATORY INFORMATION**TOXIC SUBSTANCES CONTROL ACT (TSCA)**

TSCA INVENTORY STATUS: An article manufactured from ingredients listed on the TSCA Inventory.
OTHER TSCA ISSUES: None

SARA TITLE III/CERCLA

"Reportable Quantities" (RQs) and/or "Threshold Planning Quantities" (TPQs) exist for the following ingredients.

<u>INGREDIENT NAME</u>	<u>SARA/CERCLA RQ (lb)</u>	<u>SARA EHS TPQ (lb)</u>
Chromium	5000	None
Nickel	100	None

Spills or releases resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center [(800) 424-8802] and to your Local Emergency Planning Committee.

SECTION 311 HAZARD CLASS: Immediate

SARA 313 TOXIC CHEMICALS:

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The following ingredients are SARA 313 "Toxic Chemicals". CAS numbers and weight percents are found in Section 2.

<u>INGREDIENT NAME</u>	<u>COMMENT</u>
Chromium (Present in grades 1001, 1002, and 1012 only)	None
Cobalt (Present in grades 1011, 1020 and 1022 only)	None
Nickel (Present in all Series 1000 grades)	None

STATE RIGHT-TO-KNOW

In addition to the ingredients found in Section 2, the following are listed for state right-to-know purposes.

<u>INGREDIENT NAME</u>	<u>WEIGHT %</u>	<u>COMMENT</u>
Cobalt	15 max	Listed as California Proposition 65 carcinogen. (Present in grades 1011, 1020 and 1020 only)
Nickel	5 - 60	Listed as California Proposition 65 carcinogen (Present in all Series 1000 grades)

ADDITIONAL REGULATORY INFORMATION:

None

WHMIS CLASSIFICATION (CANADA):

D2B (sensitizer). Basis: Product as shipped.

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

FOREIGN INVENTORY STATUS:

Article: Ingredients are listed on Canadian DSL and European EINECS.

16. OTHER INFORMATION

CURRENT ISSUE DATE: October 12, 2007

PREVIOUS ISSUE DATE: October, 2003

CHANGES TO MSDS FROM PREVIOUS ISSUE DATE ARE DUE TO THE FOLLOWING:

Content Review and added HMIS Rating to Section 3.

OTHER INFORMATION: Contact Metglas®, Inc. if you have specific questions regarding the handling of or applications for this product.