PORSF 11.3.125.1ul 11/11/85

# FEDERATED-FRY METALS, WEST

## FEDERATED-FRY METALS
A Cookson Group Company

## MATERIAL SAFETY DATA SHEET

## A. GENERAL INFORMATION

| TRADE NAME (COMMON NAME OR SYNONYM) | FEDERATED-FRY PRODUCT CODE # |
|---|---|
| Aluminum Bronze Grade D #418 | 2 |

CHEMICAL NAME

| FORMULA | MOLECULAR WEIGHT |
|---|---|
| Cu-Al-Fe-Ni | NOT APPLICABLE |

ADDRESS (No. STREET, CITY, STATE AND ZIP CODE)
Federated-Fry Metals, Inc.
1901 Army Street
San Francisco, CA 94124

| CONTACT | PHONE NUMBER | ISSUED DATE | REVISED DATE |
|---|---|---|---|
| Federated-Fry Metals, Inc.<br>1901 Army Street<br>San Francisco, CA 94124 | (415) 824-5252 | 11/11/85 | 11/11/85 |

## B. HAZARDOUS INGREDIENTS

| MATERIAL OR COMPONENT | C.A.S. # | WT % | PERMISSIBLE AIR CONCENTRATION |
|---|---|---|---|
| Copper | 7440-50-8 | 78-84<br>90.2 | 0.1 mg/cu.m.-fume<br>1.0 mg/cu.m.-dust |
| Aluminum | 7429-90-5 | 10.0-<br>11.5 | 15.0 mg/cu.m. |
| Iron | 7439-89-6 | 3-5<br>1.5 | 10.0 mg/cu.m.-fume |
| Nickel | 7440-02-0 | 3-5.5 | 1.0 mg/cu.m. |
| Manganese | 7439-96-5 | <3.5 | 5.0 mg/cu.m.-ceiling<br>☒ OSHA ☐ ACGIH<br>☐ OTHER |

## C. FIRST AID MEASURES

Inhalation: Remove from exposure; place individual under care of physician. symptomatic treatment such as bed rest and aspirin may afford some relief from chills and fever. Recovery is usually complete in 24 hours. If symptoms persist, consult a physician.

Ingestion: Induce vomiting in conscious individual and call a physician.

Skin: Wash thoroughly with soap and water if symptoms appear. If symptoms persist contact physician.

USEPA SF
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| Classification | Copper Alloy UNS No. | Composition, % max except as indicated | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper[B] | Tin | Lead | Zinc[B] | Iron | Antimony | Nickel (incl Cobalt) | Sulfur | Phosphorus | Aluminum | Manganese | Silicon | Arsenic | Magnesium |
| High-lead tin bronze *Continued* | C93800 | 76.0–79.0 | 6.5–7.5 | 14.0–16.0 | 0.8 | 0.10 | 0.50 | 0.8[C] | 0.08 | 0.05 | 0.005 | | 0.005 | | |
| | C93900 | 76.5–79.5 | 5.3–7.0 | 14.0–17.7 | 1.5 | 0.35 | 0.50 | 0.8 | 0.08 | 0.05 | 0.005 | | 0.005 | | |
| | C94000 | 69.0–72.0 | 12.3–14.0 | 14.0–15.7 | 0.50 | 0.25 | 0.50 | 0.50–1.0 | 0.08 | 0.05 | 0.005 | | 0.005 | | |
| | C94100 | 72.0–79.0 | 4.7–6.5 | 15.0–21.7 | 3.0 | 0.10 | 0.7 | 0.8[C] | 0.08 | 0.05 | 0.005 | | 0.005 | | |
| | C94300 | 69.0–73.0 | 4.7–5.8 | 22.0–24.5 | 0.8 | 0.10 | 0.7 | 0.8[C] | 0.08 | 0.05 | 0.005 | | 0.005 | | |
| | C94400 | 78.0–82.0 | 7.3–9.0 | 9.0–11.7 | 0.8 | 0.10 | 0.7 | 0.8[C] | 0.08 | 0.05 | 0.005 | | 0.005 | | |
| | C94500 | 70.0–75.0 | 6.3–8.0 | 16.0–21.5 | 1.0 | 0.10 | 0.7 | 0.8[C] | 0.08 | 0.05 | 0.005 | | 0.005 | | |
| Nickel tin bronze and leaded nickel tin bronze | C94700 | 86.0–89.0 | 4.7–6.0 | 0.08[G] | 1.3–2.5 | 0.20 | 0.10 | 4.5–6.0 | 0.05 | 0.05 | 0.005 | | 0.005 | | |
| | C94800 | 85.0–89.0 | 4.7–6.0 | 0.30–0.9 | 1.3–2.5 | 0.20 | 0.10 | 4.5–6.0 | 0.05 | 0.05 | 0.005 | | 0.005 | | |
| | C94900 | 79.0–81.0 | 4.3–6.0 | 4.0–5.7 | 4.3–6.0 | 0.25 | 0.25 | 4.5–6.0 | 0.08 | 0.05 | 0.005 | | 0.005 | | |
| Aluminum bronze | C95200 | 86.0 min[I] | | | | 2.5–4.0 | | | | | 8.5–9.5 | | | | |
| | C95300 | 86.0 min[I] | | | | 0.8–1.5 | | | | | 9.0–11.0 | | | | |
| | C95400 | 83.0 min[D] | | | | 3.0–5.0 | | 1.5 max | | | 10.0–11.5 | 0.5 | | | |
| | C95410 | 83.0 min | | | | 3.0–5.0 | | 1.5–2.5 | | | 10.0–11.5 | 0.5 | | | |
| | C95500 | 78.0 min[D] | | | | 3.0–5.0 | | 3.0–5.5 | | | 10.0–11.5 | 3.5 | | | |
| | C95600 | 88.0 min[I] | | | | | | 0.25 | | | 6.0–8.0 | | 1.8–3.3 | | |
| | C95700 | 71.0 min[D] | | 0.03 | | 2.0–4.0 | | 1.5–3.0 | | | 7.0–8.5 | 11.0–14.0 | 0.10 | | |
| | C95800 | 78.0 min[D] | | 0.02 | | 3.5–4.5[L] | | 4.0–5.0[L] | | | 8.5–9.5 | 0.8–1.5 | 0.05 | | |
| Cupro-nickel | C96200 | 84.5–87.0 | 0.05C | 0.005 | 1.0Cb | 1.0–1.8 | | 9.0–11.0 | 0.02 | 0.02 | 0.005 | 0.8–1.5 | 0.25 | | |
| | C96400 | 65.0–67.0 | 0.05C | 0.005 | 0.7–1.5Cb | 0.25–1.0 | | 29.5–31.5 | 0.02 | 0.02 | 0.005 | 0.8–1.5 | 0.30–0.50 | | |
| | C96800 | remainder | 7.5–8.5 | | 0.1–0.3 Cb | | | 9.5–10.5 | | | | 0.05–0.30 | | | 0.005–0.15 |
| Leaded nickel bronze | C97300 | 53.0–58.0 | 1.5–3.0 | 8.0–11.0 | 17.0–25.0 | 1.0 | 0.35 | 11.0–14.0 | 0.08 | 0.05 | 0.005 | 0.5 | 0.05 | | |
| | C97600 | 63.0–66.0 | 3.5–4.5 | 3.5–5.0 | 3.0–9.0 | 1.0 | 0.25 | 19.5–21.0 | 0.08 | 0.05 | 0.005 | 1.0 | 0.05 | | |
| | C97800 | 64.0–67.0 | 4.5–5.5 | 1.0–2.0 | 1.0–4.0 | 1.0 | 0.20 | 24.0–26.0 | 0.08 | 0.05 | 0.005 | 1.0 | 0.05 | | |

## D. HAZARDS INFORMATION

### HEALTH

INHALATION Acute copper exposure may cause irritation of the respiratory tract or metal fume fever with symptoms of fever, chills, nausea, chest tightness or metallic taste.
~~Aluminum is considered to be a nuisance material on inhalation.~~

INGESTION
Copper is moderately irritating to the lining of the stomach and intestines.
Aluminum is relatively non-toxic by mouth but may cause nausea, stomach cramps or diarrhe
~~in large doses.~~

SKIN Dermatitis may result from contact with nickel compounds.
Sensitization to nickel may occur.
~~Possible mechanical irritation of skin.~~

EYES

Mechanical irritation

MEDICAL CONDITIONS POSSIBLY AGGRAVATED

Wilson's disease may be affected by copper exposure.

UNUSUAL CHRONIC TOXICITY Manganese may affect the central nervous system with neurological disturbances and symptoms of anorexia, fatigue, memory loss, weakness or nervousness.

### FIRE AND EXPLOSION

| FLASH POINT °C | AUTO IGNITION TEMPERATURE °C | FLAMMABLE LIMITS IN AIR (% BY VOL.) |
|---|---|---|
| ☐ OPEN CUP ☐ CLOSE CUP | | Aluminum dust--0.035 pz/cu.ft. |

UNUSUAL FIRE AND EXPLOSION HAZARDS

## E. PRECAUTIONS/PROCEDURES

FIRE EXTINGUISHING AGENTS RECOMMENDED
No specific agents recommended.

FIRE EXTINGUISHING AGENTS TO AVOID

No specific agents.

SPECIAL FIRE FIGHTING PRECAUTIONS
Use Niosh/MSHA approved self-contained breathing apparatus and full protective clothing in involved in fire.

ENGINEERING CONTROLS
Local exhaust ventilation is required for melting, grinding, screening, soldering, or other operations where excessive exposures may occur.

NORMAL HANDLING
Use of approved respirators is required for applications where adequate ventilation cannot be provided. When melted, the temperature should be kept as low as possible.
~~Activities which generate dust or fume should be avoided.~~

STORAGE

AVOID storage near acetylene, chlorine or hydrogen peroxide.

SPILL OR LEAK
A clean-up procedure which minimizes exposure is required. Vacuuming is preferred. Place all material in closed containers. Do not use compressed air for cleaning. Use approved respiratory protection if possibility of dust/fume exposure exists.

SPECIAL: PRECAUTIONS/PROCEDURES/LABEL INSTRUCTIONS

Label signal word:

PERSONAL HYGIENE

Avoid inhalation of ingestion. Practice good housekeeping and personal hygiene procedures.

## F. PERSONAL PROTECTIVE EQUIPMENT

**RESPIRATORY PROTECTION**

NIOSH/MSHA approved respirator for toxic dust and/or fume.

**EYES AND FACE**

Safety glasses recommended for grinding or other operations generating flying particles.

**HANDS, ARMS, AND BODY**

NOT APPLICABLE

**OTHER CLOTHING AND EQUIPMENT**

NOT APPLICABLE

## G. PHYSICAL DATA

| | | |
|---|---|---|
| MATERIAL IS (AT NORMAL CONDITIONS): ☐ LIQUID ☒ SOLID ☐ GAS ☐ _____ | APPEARANCE AND ODOR<br>Yellow-red metal<br>Various shapes and sizes | |
| BOILING POINT<br>MELTING POINT 1038-1054 C | SPECIFIC GRAVITY ($H_2O$ = 1)<br>7.53 | VAPOR DENSITY (AIR = 1)<br>NOT APPLICABLE |
| SOLUBILITY IN WATER (% by Weight)<br>INSOLUBLE | pH<br>NOT APPLICABLE | VAPOR PRESSURE (mm Hg at 20° C) ☐ (PSIG) ☐<br>NOT APPLICABLE |
| EVAPORATION RATE (Butyl Acetate = 1) ☐ (Either = 1) ☐<br>NOT APPLICABLE | % VOLATILES BY VOLUME (At 20° C)<br>NOT APPLICABLE | |

## H. REACTIVITY DATA

| | |
|---|---|
| STABILITY<br>☐ UNSTABLE ☒ STABLE | CONDITIONS TO AVOID<br>NOT APPLICABLE |

**INCOMPATIBILITY (MATERIALS TO AVOID)**

Contact with acetylene may form unstable acetylides.
Burns spontaneously in gaseous chlorine.
Hydrogen peroxide decomposes violently on contact.

**HAZARDOUS DECOMPOSITION PRODUCTS**

At temperatures above the melting point, metal oxide fumes may be evolved.

| | |
|---|---|
| HAZARDOUS POLYMERIZATION<br>☐ MAY OCCUR ☒ WILL NOT OCCUR | CONDITIONS TO AVOID<br>NOT APPLICABLE |

## I. ENVIRONMENTAL

EPA HAZARDOUS SUBSTANCE? ☐ YES ☒ NO IF SO, REPORTABLE QUANTITY _____ #

40 CFR 116-117

WASTE DISPOSAL METHODS (DISPOSER MUST COMPLY WITH FEDERAL, STATE, AND LOCAL DISPOSAL OR DISCHARGE LAWS)

If hazardous under 40 CFR 261, Subparts B and C, material must be treated or disposed in a facility meeting the requirements of 40 CFR 264 or 265. If non-hazardous, material should be disposed in a facility meeting the requirements of 40 CFR 257.
This material may have value on a recycled basis.

RCRA STATUS OF UNUSED MATERIAL:

40 CFR 261-11

If discarded in unaltered form, material should be considred a hazardous waste due to listing in 40 CFR 261.11(3), Appendix VIII.
Under specicific circumstances, application can be made to the EPA Administrator

## J. REFERENCES


PERMISSIBLE CONCENTRATION REFERENCES

OSHA regulations for airborne contaminants 29 CFR 1910.1000
ACGIH "Threshold Limit Values for Chemical Substances..." (1981)

HAZARD INFORMATION REFERENCES

"Documentation of the Threshold Limit Values," 4th Ed., ACGIH
Patty's Industrial Hygiene and Toxicology, Vol. 2A, 3rd Rev. Ed., 1981
NFPA "Fire Protection Guide on Hazardous Materials," 6th Ed., 1975
"Registry of Toxic Effects of Chemical Substances," NIOSH, 1980.
"Handbook of Toxic and Hazardous Chemicals"; Sittig, Marshall; Noyes Publications, 1981.

GENERAL

"Handbook of Chemistry and Physics, 57th Ed.," 1976-77, Weast, R.C., Editor, CRC Inc.
Jacobson, M., et al.; "Explosibility of Metal Powders," Bureau of Mines RI 6516, 1964.
Hartmann, I., et al., "Inflammability and Explosibility of Metal Powders," Bureau of Mines RI 3722, 1943.


## K. ADDITIONAL INFORMATION

Information (hazards, precautions, first aid, etc.) is abbreviated. More detailed information is contained in references found in Section J.

Hazard Information--Inhalation: Manganese exposure may cause pneumonitis.


THIS MATERIAL SAFETY DATA SHEET IS OFFERED SOLELY FOR YOUR INFORMATION. CONSIDERATION AND INVESTIGATION.

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