K5122

4-1500A, B, C
4-1503A

U10528
SB7676

Olin

MATERIAL SAFETY DATA

1046

U10528 4-1503.
SB7676
4-1500A, B, C

OCEAN NETWORK EMERGENCY PHONE 1-800-OLIN-911

THIS MATERIAL SAFETY DATA SHEET (MSDS) HAS BEEN PREPARED IN COMPLIANCE WITH THE FEDERAL OSHA HAZARD COMMUNICATION STANDARD,29 CFR 1910.1200.THIS PRODUCT MAY BE CONSIDERED TO BE A HAZARDOUS CHEMICAL UNDER THAT STANDARD.(REFER TO THE OSHA CLASSIFICATION IN SEC.I.)THIS INFORMATION IS REQUIRED TO BE DISCLOSED FOR SAFETY IN THE WORKPLACE.THE EXPOSURE TO THE COMMUNITY,IF ANY,IS QUITE DIFFERENT.

I. PRODUCT IDENTIFICATION

REVISION NO : 9
REVISION DATE : 1/01/94
PRODUCT CODE : BPE01A000
FILE NUMBER : BPE00111.0001
PRODUCT NAME: COPPER 1XXX SERIES

SYNONYMS: Copper Alloys- 101, 102, 103, 104, 105, 107, 108, 1092, 1093, 1094, 110, 1103, 113, 114, 115, 116, 120, 122, 1441, 145, 1451, 151, 1576, 182, 1921, 194, 195, or 197.
CHEMICAL FAMILY: Copper
FORMULA: Not Applicable/Mixture
DESCRIPTION: Metal
OSHA HAZARD CLASSIFICATION: Dust or fume is classified as: skin and eye irritant, lung toxin.
Finished metal alloy is not hazardous.

Oster MSDS# 43
Location Used CS, CA, MEX, RE

II. COMPONENT DATA

PRODUCT COMPOSITION
CAS or CHEMICAL NAME: Copper
CAS NUMBER: 7440-50-8
PERCENTAGE RANGE: 96-100%
HAZARDOUS PER 29 CFR 1910.1200: Yes
EXPOSURE STANDARDS:

	OSHA(PEL)		ACGIH(TLV)		
	ppm	mg/cubic-meter	ppm	mg/cubic-meter	ppm
TWA:					
FUME:		0.1		0.2	
DUST:		1		1	
CEILING:	None		None		
STEL:	None		None		

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D65625

CAS or CHEMICAL NAME: Iron
CAS NUMBER: 7439-89-6
PERCENTAGE RANGE: 0-2.6%
HAZARDOUS PER 29 CFR 1910.1200: Yes
EXPOSURE STANDARDS:

	OSHA(PEL)		ACGIH(TLV)	
	ppm	mg/cubic-meter	ppm	mg/cubic-meter
TWA:				
TOTAL PARTICULATE:		10		
FUME:		None		
				5
CEILING:		None		None
STEL:		None		None

CAS or CHEMICAL NAME: Cobalt
CAS NUMBER: 7440-48-4
PERCENTAGE RANGE: 0-1.3%
HAZARDOUS PER 29 CFR 1910.1200: Yes
EXPOSURE STANDARDS:

	OSHA(PEL)		ACGIH(TLV)	
	ppm	mg/cubic-meter	ppm	mg/cubic-meter
TWA:		0.1		0.05
CEILING:		None		None
STEL:		None		None

CAS or CHEMICAL NAME: Chromium
CAS NUMBER: 7440-47-3
PERCENTAGE RANGE: 0-1.2%
HAZARDOUS PER 29 CFR 1910.1200: Yes
EXPOSURE STANDARDS:

	OSHA(PEL)		ACGIH(TLV)	
	ppm	mg/cubic-meter	ppm	mg/cubic-meter
TWA:		0.5		0.5
CEILING:		None		None
STEL:		None		None

CAS or CHEMICAL NAME: Tin
CAS NUMBER: 7440-31-5
PERCENTAGE RANGE: 0-1.0%
HAZARDOUS PER 29 CFR 1910.1200: Yes
EXPOSURE STANDARDS:

	OSHA(PEL)		ACGIH(TLV)	
	ppm	mg/cubic-meter	ppm	mg/cubic-meter
TWA:		2		2
CEILING:		None		None
STEL:		None		None

III. PRECAUTIONS FOR SAFE HANDLING AND STORAGE

AVOID CONTACT OF DUST OR FUME WITH SKIN, EYES, AND CLOTHING. UPON CONTACT WITH SKIN OR EYES, WASH OFF WITH WATER.

STORAGE CONDITIONS

DO NOT STORE AT TEMPERATURES ABOVE: Not Applicable

PRODUCT STABILITY AND COMPATIBILITY

SHELF LIFE LIMITATIONS: Not known

INCOMPATIBLE MATERIALS FOR PACKAGING: None known

INCOMPATIBLE MATERIALS FOR STORAGE OR TRANSPORT: None known

IV. PHYSICAL DATA

APPEARANCE: Red metallic color

MELTING POINT: 1080L-1090L/965S-1085S Deg.C
1976L-1995L/1769S-1985S Deg.F

BOILING POINT: Not Applicable

DECOMPOSITION TEMPERATURE: Not Applicable

SPECIFIC GRAVITY: 8.94

BULK DENSITY: 8.94(g/cc)

pH @ 25 DEG.C: Not Applicable

VAPOR PRESSURE @ 25 DEG.C: Not Applicable

SOLUBILITY IN WATER: Not Applicable

VOLATILES, PERCENT BY VOLUME: Not Applicable

EVAPORATION RATE: Not Applicable

VAPOR DENSITY: Not Applicable

MOLECULAR WEIGHT: Not Applicable/Mixture

ODOR: None

COEFFICIENT OF OIL/WATER DISTRIBUTION: Not Applicable

V. PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

PERSONAL PROTECTION FOR ROUTINE USE OF PRODUCT:

RESPIRATORY PROTECTION: Respiratory protection not normally needed. If significant dusting occurs, wear a NIOSH/MSHA approved dust respirator.

VENTILATION: Local exhaust ventilation is recommended if significant dusting occurs. Otherwise, use general exhaust ventilation.

SKIN PROTECTIVE EQUIPMENT: Wear impervious gloves.

OTHER: Use safety glasses.

EQUIPMENT SPECIFICATIONS (when applicable):

RESPIRATOR TYPE:	Wear NIOSH/MSHA approved respirator with HEPA filters
GLOVE TYPE:	Impervious
BOOT TYPE:	None needed
APRON TYPE:	None needed
PROTECTIVE SUIT:	None needed

VI. FIRE AND EXPLOSION HAZARD INFORMATION

FLAMMABILITY DATA:

FLAMMABLE:	No
COMBUSTIBLE:	No
PYROPHORIC:	No
FLASH POINT:	None

AUTOIGNITION TEMPERATURE: No Data

FLAMMABLE LIMITS AT NORMAL ATMOSPHERIC TEMPERATURE AND PRESSURE (PERCENT VOLUME IN AIR): LEL: Not Applicable UEL: Not Applicable

NFPA RATINGS: Not Established

HMIS RATINGS:

Health:	1 (dust or fume only)
Flammability:	0
Reactivity:	0

EXTINGUISHING MEDIA:

Use extinguishing media suitable for surrounding materials.

FIRE FIGHTING TECHNIQUES AND COMMENTS:

See Section XI for protective equipment for fire fighting. Dust may cause an ignitable and/or an explosive atmosphere.

VII. REACTIVITY INFORMATION

CONDITIONS UNDER WHICH THIS PRODUCT MAY BE UNSTABLE

TEMPERATURES ABOVE: Not Applicable
MECHANICAL SHOCK OR IMPACT: No
ELECTRICAL (STATIC) DISCHARGE: No
HAZARDOUS POLYMERIZATION: Will not occur
INCOMPATIBLE MATERIALS: Dust and Fume - acetylene, chlorine
HAZARDOUS DECOMPOSITION PRODUCTS: Copper Fume
OTHER CONDITIONS TO AVOID: Copper monoxide during melting.

SUMMARY OF REACTIVITY:

OXIDIZER:	No
PYROPHORIC:	No
ORGANIC PEROXIDE:	No
WATER REACTIVE:	No

Olin **MATERIAL SAFETY DATA**

VIII. FIRST AID

EYES: Immediately flush with large amounts of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If eye irritation develops, call a physician.

SKIN: Not a skin irritant. Washing any substance off the skin with water is a good safety practice.

INGESTION: Not a likely route of exposure.

INHALATION: If metal fume is inhaled remove from exposure to fresh air. If respiratory irritation develops treat symptomatically.

IX. TOXICOLOGY AND HEALTH INFORMATION

ROUTES OF ABSORPTION
For dust: ingestion, dermal contact, inhalation, and eye contact.
For fume: inhalation, eye contact, and dermal contact
The finished alloy metal is not hazardous

WARNING STATEMENTS AND WARNING PROPERTIES
MAY BE HARMFUL IF METAL FUME OR DUST IS INHALED, INGESTED OR EXPOSED TO SKIN OR EYES. METAL DUST AND/OR FUME MAY CAUSE SKIN, EYE, MUCOUS MEMBRANE AND RESPIRATORY IRRITATION. THE FINISHED ALLOY METAL IS NOT HAZARDOUS.

HUMAN THRESHOLD RESPONSE DATA
ODOR THRESHOLD: No Data
IRRITATION THRESHOLD: No Data
IMMEDIATELY DANGEROUS TO LIFE OR HEALTH: No IDLH level has been established for this product.

SIGNS, SYMPTOMS, AND EFFECTS OF EXPOSURE:

INHALATION
ACUTE:
If the metal dust or fume is inhaled, mild irritation may result to the throat, upper respiratory tract, and lungs. The metal fume may also produce influenza-like symptoms, known as metal fume fever.

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Location Used (Sct, RI, (AH))

Symptoms of this reaction may include metallic taste, runny nose, nausea, fever and chills. These effects usually disappear within 24 hours.

CHRONIC:

Inhalation of large amounts of the dust and/or fume of this product may cause lung inflammation which may progress to bronchitis and permanent lung damage.

SKIN

ACUTE:

Skin contact with the dust or fume may cause irritation consisting of transient redness. This irritant effect would not result in permanent damage.

CHRONIC:

No effects would be expected other than those described under acute exposure.

EYE

The dust or fume can irritant the eyes with effects consisting of reversible redness, swelling, and mucous discharge to the conjunctiva. No corneal involvement or visual impairment would be expected. Copper metal foreign body from the dust may cause similar irritation, but may also cause an inflammatory reaction around the foreign body, which may lead to extrusion of the particle. If the copper foreign body reaches the posterior (back) portion of the eye, the consequences are severe, with widespread degenerative changes, discoloration of the eye and possible loss of sight.

INGESTION

ACUTE:

Ingestion of the dust may cause gastroenteritis with any or all of the following symptoms: nausea, vomiting, lethargy, or diarrhea. Excessive oral exposures to copper (> 75 grams) have caused hemolysis of red blood cells, and liver and kidney damage.

CHRONIC:

There is no data available on the chronic ingestion of the alloy.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:

Asthma and emphysema may be aggravated by exposure to the dust or fume.

INTERACTIONS WITH OTHER CHEMICALS WHICH ENHANCE TOXICITY:

There are no chemicals known to enhance the toxicity of the product.

ANIMAL TOXICOLOGY

ACUTE TOXICITY:

Inhalation LC 50: No Data
Dermal LD 50: No Data
Oral LD 50: No Data
Irritation: Metal dust or fume may cause skin, eye, mucous membrane, and respiratory irritation. The alloy is not a skin or eye irritant.

ACUTE TARGET ORGAN TOXICITY:

No organs known to be damaged from exposure to this alloy. Lung damage may occur from inhalation of large amounts of dust or fume.

CHRONIC TARGET ORGAN TOXICITY:

There are no known or reported effects from repeated exposure to this alloy.

Chromium has been shown to cause an allergic skin sensitization type of dermatitis. It is judged that the low concentration of chromium in the product would preclude the risk of development of this symptom.

Chronic inhalation of cobalt dust may produce an asthma-like disease and pneumoconiosis. Cobalt has also been shown to cause an allergic skin sensitization type of dermatitis. It is judged that the low concentration of cobalt in the product would preclude the risk of development of these symptoms.

Inhalation of tin may produce benign condition called stannosis without fibrosis or pulmonary dysfunction. It is judged that the low concentration of tin in the product would preclude the risk of development of stannosis.

Inhalation of iron dust or fume has been shown to cause a benign pneumoconiosis known as siderosis. This condition is characterized by deposition of iron in the lungs without subsequent fibrotic changes or impairment of lung function. It is judged that the low concentration of iron in the product would preclude the risk of development of siderosis.

REPRODUCTIVE AND DEVELOPMENTAL TOXICITY:

There are no known or reported effects on reproductive function or fetal development from exposure to this product.

Cobalt (as Cobalt II Chloride) has been tested and was found to be non-teratogenic and non-fetotoxic in rats at oral doses as high as 100 mg/kg/day.

CARCINOGENICITY:

This product is not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP, or EPA.

Cobalt is listed by IARC as a Group 2B carcinogen: Sufficient evidence for carcinogenicity in experimental animals, inadequate evidence for carcinogenicity in humans. Cobalt and cobalt compounds are therefore considered to be possibly carcinogenic to humans by IARC. Cobalt has been reported to cause cancer from subcutaneous or intramuscular injection, or injection directly into bone and at the site of orthopaedic implants containing cobalt. Cancer is not associated with inhalation of cobalt and it is judged that this product presents an insignificant risk of cancer from inhalation of the dust or fume.

Chromium metal and chromium compounds have been tested for carcinogenicity by a wide variety of routes in mice, rats and rabbits. Chromium and certain chromium compounds are reported to be carcinogenic by IARC and NTP. They are classified as follows: Chromium Metal and Trivalent Chromium Compounds - Group 3 Carcinogens (inadequate evidence for carcinogenicity to humans and animals), Hexavalent Chromium Compounds - Group 1 Carcinogen (sufficient evidence for carcinogenicity to humans and animals). The risk of cancer from exposure to this alloy is judged not significant based on the low percentage of chromium in the product and its physical nature.

MUTAGENICITY:

This product is not known or reported to be mutagenic.

Cobalt (II) compounds have been shown to produce a mutagenic response in both in vitro and in vivo studies. Cobalt (II) compounds had weak or no genetic effect in bacteria. It is judged that this product presents an insignificant risk of mutation from inhalation of the dust or fume due to the low concentration of cobalt.

Hexavalent Chromium Compounds have been shown to be mutagenic in a variety of in vivo and in vitro test systems. Conflicting results have been obtained using Trivalent Chromium Compounds in a variety of in vivo and in vitro mutagenicity and genotoxicity test systems. Trivalent Chromium did not induce mutations in bacteria. No data is available on the mutagenic activity of Chromium metal.

AQUATIC TOXICITY:
No data is available on this product. Individual constituents are as follows:

Copper:
The toxicity of copper to aquatic organisms varies significantly not only with the species, but also with the physical and chemical characteristics of the water, such as its temperature, hardness, turbidity and carbon dioxide content. Copper concentration varying from 0.1 to 1.0 mg/l have been found by various investigators to be not toxic for most fish. However, concentrations of 0.015 to 3.0 mg/l have been reported as toxic, particularly in soft water to many kinds of fish, crustacea, mollusks, insects, and plankton.

X. TRANSPORTATION INFORMATION

THIS MATERIAL IS NOT REGULATED AS A DOT HAZARDOUS MATERIAL.

XI. SPILL AND LEAKAGE PROCEDURES

FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC AT 800-424-9300.

REPORTABLE QUANTITY: 5000 lb. if 100 micrometers or smaller
(Per 40 CFR 302.4)

SPILL MITIGATION PROCEDURES:
This product may represent an explosion hazard in a dust form. Remove all sources of ignition.

AIR RELEASE: Not Applicable
WATER RELEASE: Not Applicable
LAND SPILL: Spill response is normally only required when the material is in a dust or powdered form. Material may be picked up with a vacuum system or other means which will reduce the amount of airborne particles.

SPILL RESIDUES:
Dispose of per guidelines under Section XII, WASTE DISPOSAL.

PERSONAL PROTECTION FOR EMERGENCY SPILL AND FIRE-FIGHTING SITUATIONS:
No extra protection required beyond that listed in Section V (In case of fire, use normal fire fighting equipment).

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Location Used LS, CTR, T (AHL)

XII. WASTE DISPOSAL

If this product becomes a waste, it DOES NOT meet the criteria of a hazardous waste as defined under 40 CFR 261, in that it does not exhibit the characteristics of hazardous waste of Subpart C, nor is it listed as a hazardous waste under Subpart D.

If this material becomes a waste, it should be sent to a metal reclaimer.

CARE MUST BE TAKEN TO PREVENT ENVIRONMENTAL CONTAMINATION FROM THE USE OF THIS MATERIAL. THE USER OF THIS MATERIAL HAS THE RESPONSIBILITY TO DISPOSE OF UNUSED MATERIAL, RESIDUES AND CONTAINERS IN COMPLIANCE WITH ALL RELEVANT LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS REGARDING TREATMENT, STORAGE AND DISPOSAL FOR HAZARDOUS AND NONHAZARDOUS WASTES.

XIII. ADDITIONAL REGULATORY STATUS INFORMATION

TOXIC SUBSTANCES CONTROL ACT:
The components of this product are listed on the Toxic Substance Control Act inventory.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT TITLE III:
HAZARD CATEGORIES, PER 40 CFR 370.2:
HEALTH: Acute (dust or fume only)
PHYSICAL: None

EMERGENCY PLANNING AND COMMUNITY RIGHT TO KNOW, PER 40 CFR 355, APP. A:
EXTREMELY HAZARDOUS SUBSTANCE - THRESHOLD PLANNING QUANTITY:
None Established

SUPPLIER NOTIFICATION REQUIREMENTS, PER 40 CFR 372.45:
This mixture or tradename product contains a toxic chemical or chemicals subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR 372.

CHEMICALS LISTED ARE: Copper, cobalt, chromium

XIV. ADDITIONAL INFORMATION

MSDS REVISION STATUS: Revision to Composition, Toxicology and Regulatory Information, synonyms added

XV. MAJOR REFERENCES

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9. Code of Federal Regulations, Titles 21, 29, 40 and 49. Washington, DC: U.S. Government Printing Office.
10. Fire Protection Guide on Hazardous Materials, 10th Ed., National Fire Protection Association, Batterymarch Park, Quincy, MA, 1991.
11. Gosselin, R., et al., Gosselin-Clinical Toxicology of Commercial Products, 5th Ed., Baltimore: Williams and Wilkins, 1984.
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19. NIOSH Pocket Guide to Chemical Hazards. Washington, DC: U.S. Government Printing Office, 1990.
20. Olin Respiratory Protection Manual.
21. Sax, N. Irving, Dangerous Properties of Hazardous Materials 6th Ed., New York: Van Nostrand Reinhold Company, 1984.
22. Threshold Limit Values and Biological Exposure Indices for 1992-93. Cincinnati, OH: American Conference of Government Industrial Hygienists, 1992.

23. Toxic Substances Control Act Inventory, Washington, DC: U.S. Government Printing Office, 1986.
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25. Sittig, Marshall, Handbook of Toxic and Hazardous Chemicals and Carcinogens, 2nd Ed., Noyes Publications, Park Ridge, NJ, 1985.
26. U.S. Dept. of Health and Human Services, National Toxicology Program, "Sixth Annual Report on Carcinogens, Summary 1991," Research Triangle Park, NC.
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28. Shepard, Thomas H., Catalog of Teratogenic Agents, 6th Edtion, The Johns Hopkins University Press, Baltimore, MD, 1989.

THE INFORMATION IN THIS MATERIAL SAFETY SHEET SHOULD BE PROVIDED TO ALL WHO WILL USE, HANDLE, STORE, TRANSPORT, OR OTHERWISE BE EXPOSED TO THIS PRODUCT. THIS INFORMATION HAS BEEN PREPARED FOR THE GUIDANCE OF PLANT ENGINEERING, OPERATIONS AND MANAGEMENT AND FOR PERSONS WORKING WITH OR HANDLING THIS PRODUCT. OLIN BELIEVES THIS INFORMATION TO BE RELIABLE AND UP TO DATE AS OF THE DATE OF PUBLICATION, BUT MAKES NO WARRANTY THAT IT IS. ADDITIONALLY, IF THIS MATERIAL SAFETY DATA SHEET IS MORE THAN THREE YEARS OLD, YOU SHOULD CONTACT OLIN AT THE PHONE NUMBER LISTED BELOW TO MAKE CERTAIN THAT THIS SHEET IS CURRENT.

OLIN MSDS CONTROL GROUP
Olin Corporation
120 Long Ridge Road
Stamford, CT 06904

Phone Number: (203) 356-3449

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