

## 1. Identification

<b>Product identifier</b>	<b>BernzOmatic NS-3 Nickel Silver Brazing Rod</b>
<b>Other means of identification</b>	
<b>SDS number</b>	WC045
<b>Recommended use</b>	Brazing rod.
<b>Recommended restrictions</b>	None known.
<b>Manufacturer/Importer/Supplier/Distributor information</b>	
<b>Manufacturer/Supplier</b>	Worthington Cylinder Corporation
<b>Address</b>	200 Old Wilson Bridge Road Columbus, OH 43085 United States
<b>Email:</b>	cylinders@worthingtonindustries.com
<b>Telephone Number:</b>	866-928-2657
<b>CHEMTREC - 24 HOURS:</b>	
<b>Within US and Canada</b>	800-424-9300
<b>Outside US and Canada</b>	+1 703-741-5970 (collect calls accepted)

## 2. Hazard(s) identification

<b>Physical hazards</b>	Not classified.	
<b>Health hazards</b>	Sensitization, skin	Category 1
	Carcinogenicity	Category 1B
	Reproductive toxicity	Category 1B
	Specific target organ toxicity, repeated exposure	Category 1 (lung)
<b>OSHA defined hazards</b>	Not classified.	
<b>Label elements</b>		



<b>Signal word</b>	Danger
<b>Hazard statement</b>	May cause an allergic skin reaction. Suspected of causing cancer. May damage fertility or the unborn child. Causes damage to organs (lung) through prolonged or repeated exposure.
<b>Precautionary statement</b>	
<b>Prevention</b>	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe fumes and dusts. Contaminated work clothing must not be allowed out of the workplace. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Wear protective gloves/protective clothing/eye protection/face protection.
<b>Response</b>	If exposed or concerned: Get medical advice/attention. If on skin: Wash with plenty of water. If skin irritation or rash occurs: Get medical advice/attention. Wash contaminated clothing before reuse.
<b>Storage</b>	Store locked up.
<b>Disposal</b>	Dispose of contents/container in accordance with local/regional/national/international regulations.
<b>Hazard(s) not otherwise classified (HNOC)</b>	None known.

## 3. Composition/information on ingredients

### Mixtures

Chemical name	CAS number	%
Copper	7440-50-8	46-97
Zinc	7440-66-6	45
Nickel	7440-02-0	7-13
Manganese	7439-96-5	1.5
Iron	7439-89-6	1
Silicon	7440-21-3	0.04-0.5

Coating(s)		
Chemical name	CAS number	%
Boric acid	10043-35-3	50 - 80
Borax Glass	-	10 - 30
Methacrylate/Apliphatic & Napthenic Hydrocarbon Compound	NA	Proprietary

**Composition comments** All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

#### 4. First-aid measures

<b>Inhalation</b>	Immediately remove from further exposure. Get immediate medical assistance. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. Give supplemental oxygen, if available. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.
<b>Skin contact</b>	Remove contaminated clothes and rinse skin thoroughly with water for at least 15 minutes. If skin rash or an allergic skin reaction develops, get medical attention.
<b>Eye contact</b>	Rinse immediately with plenty of water for at least 15 minutes. Remove any contact lenses. Get medical attention if irritation develops or persists.
<b>Ingestion</b>	Immediately rinse mouth and drink a cupful of water. Never give anything by mouth to a victim who is unconscious or is having convulsions. Only induce vomiting at the instruction of medical personnel. Get medical attention immediately.
<b>Most important symptoms/effects, acute and delayed</b>	Dust and fumes may irritate eyes, skin and upper respiratory tract. Sensitization. Contact with molten material may cause thermal burns.
<b>Indication of immediate medical attention and special treatment needed</b>	Treat symptomatically. Exposure may aggravate pre-existing respiratory disorders. Symptoms may be delayed.
<b>General information</b>	Show this safety data sheet to the doctor in attendance.

#### 5. Fire-fighting measures

<b>Suitable extinguishing media</b>	Extinguish with foam, carbon dioxide or dry powder. Use fire-extinguishing media appropriate for surrounding materials.
<b>Unsuitable extinguishing media</b>	Do not use water or halogenated extinguishing media.
<b>Specific hazards arising from the chemical</b>	Fire or high temperatures create: Metal oxides.
<b>Special protective equipment and precautions for firefighters</b>	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
<b>Fire fighting equipment/instructions</b>	Move containers from fire area if you can do it without risk.
<b>General fire hazards</b>	Solid metal is not flammable; however, finely divided metallic dust or powder may form an explosive mixture with air.

#### 6. Accidental release measures

<b>Personal precautions, protective equipment and emergency procedures</b>	Keep unnecessary personnel away. Avoid inhalation of dust from the spilled material. Wear protective clothing as described in Section 8 of this SDS. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
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**Methods and materials for containment and cleaning up**

Stop leak if you can do so without risk. Local authorities should be advised if significant spillages cannot be contained.

For a dry material spill, use a HEPA (high efficiency particle air) vacuum to collect material and place in a sealable container for disposal. Avoid dust formation. Recover and recycle, if practical. Keep out of water supplies and sewers.

**Environmental precautions**

Prevent further leakage or spillage if safe to do so. Do not contaminate water. If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).

**7. Handling and storage****Precautions for safe handling**

Wear appropriate personal protective equipment (See Section 8). Keep formation of airborne dusts to a minimum. Provide appropriate exhaust ventilation at places where dust is formed. Avoid inhalation of dust and fumes. Avoid contact with skin and eyes. Do not get this material on clothing. Do not eat, drink or smoke when using the product. Wash thoroughly after handling. Avoid release to the environment.

Any surface that comes in contact with molten metal must be preheated or specially coated and rust free. Inadvertent contaminants to product such as moisture, ice, snow, grease, or oil can cause an explosion when charged to a molten metal bath or metal furnace (preheating metal will remove moisture from product).

**Conditions for safe storage, including any incompatibilities**

Store in tightly closed original container in a dry, cool and well-ventilated place. Store in a closed container away from incompatible materials. Keep out of reach of children. Keep away from food, drink and animal feedingstuffs.

**8. Exposure controls/personal protection****Occupational exposure limits****US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)**

Components	Type	Value	Form
Copper (CAS 7440-50-8)	PEL	1 mg/m <sup>3</sup> 0.1 mg/m <sup>3</sup>	Dust and mist. Fume.
Manganese (CAS 7439-96-5)	Ceiling	5 mg/m <sup>3</sup>	Fume.
Nickel (CAS 7440-02-0)	PEL	1 mg/m <sup>3</sup>	
Silicon (CAS 7440-21-3)	PEL	5 mg/m <sup>3</sup> 15 mg/m <sup>3</sup>	Respirable fraction. Total dust.

**ACGIH**

Components	Type	Value	Form
Copper (CAS 7440-50-8)	TWA	1 mg/m <sup>3</sup> 0.2 mg/m <sup>3</sup>	Dust and mist. Fume.

**US. ACGIH Threshold Limit Values**

Components	Type	Value	Form
Borax decahydrate (CAS 1303-96-4)	STEL	6 mg/m <sup>3</sup>	Inhalable fraction.
Nickel (CAS 7440-02-0)	TWA	2 mg/m <sup>3</sup>	Inhalable fraction.
	TWA	1.5 mg/m <sup>3</sup>	Inhalable fraction.
Coating(s)	Type	Value	Form
Boric acid (CAS 10043-35-3)	STEL	6 mg/m <sup>3</sup>	Inhalable fraction.
	TWA	2 mg/m <sup>3</sup>	Inhalable fraction.

**US. NIOSH: Pocket Guide to Chemical Hazards**

Components	Type	Value	Form
Borax decahydrate (CAS 1303-96-4)	TWA	5 mg/m <sup>3</sup>	
Copper (CAS 7440-50-8)	TWA	1 mg/m <sup>3</sup>	Dust and mist.
Manganese (CAS 7439-96-5)	STEL	3 mg/m <sup>3</sup>	Fume.
Nickel (CAS 7440-02-0)	TWA	1 mg/m <sup>3</sup>	Fume.
	TWA	0.015 mg/m <sup>3</sup>	

## US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value	Form
Silicon (CAS 7440-21-3)	TWA	5 mg/m <sup>3</sup> 10 mg/m <sup>3</sup>	Respirable. Total
<b>Biological limit values</b>	No biological exposure limits noted for the ingredient(s).		
<b>Exposure guidelines</b>	No exposure standards allocated.		
<b>Appropriate engineering controls</b>	Provide adequate ventilation. Observe Occupational Exposure Limits and minimize the risk of inhalation of dust. Keep melting/soldering temperatures as low as possible to minimize the generation of fume. Shower, hand and eye washing facilities near the workplace are recommended.		
<b>Individual protection measures, such as personal protective equipment</b>			
<b>Eye/face protection</b>	Wear safety glasses with side shields (or goggles). Wear a face shield when working with molten material.		
<b>Skin protection</b>			
<b>Hand protection</b>	Wear protective gloves (i.e. latex, nitrile, neoprene).		
<b>Other</b>	Chemical resistant clothing is recommended.		
<b>Respiratory protection</b>	Use a respirator when local exhaust or ventilation is not adequate to keep exposures below the OEL. In a confined space a supplied respirator may be required. Selection and use of respiratory protective equipment should be in accordance with OSHA General Industry Standard 29 CFR 1910.134; or in Canada with CSA Standard Z94.4. Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits.		
<b>Thermal hazards</b>	Heat resistant/insulated gloves and clothing are recommended when working with molten material.		
<b>General hygiene considerations</b>	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Observe any medical surveillance requirements.		

## 9. Physical and chemical properties

### Appearance

<b>Physical state</b>	Solid.
<b>Form</b>	Bare or coated rods.
<b>Color</b>	Bronze.
<b>Odor</b>	Odorless.
<b>Odor threshold</b>	Not available.
<b>pH</b>	Not applicable.
<b>Melting point/freezing point</b>	786.2 °F (419 °C) Zinc 1981.4 °F (1083 °C) Copper
<b>Initial boiling point and boiling range</b>	4172 °F (2300 °C) (Copper)  1664.6 °F (907 °C) (Zinc)
<b>Flash point</b>	Not applicable.
<b>Evaporation rate</b>	Not available.
<b>Flammability (solid, gas)</b>	Non flammable.
<b>Upper/lower flammability or explosive limits</b>	
<b>Flammability limit - lower (%)</b>	Not available.
<b>Flammability limit - upper (%)</b>	Not available.
<b>Explosive limit - lower (%)</b>	Not applicable.
<b>Explosive limit - upper (%)</b>	Not applicable.
<b>Vapor pressure</b>	1 mm Hg @1628°C Copper 1 mm Hg @487°C Zinc
<b>Vapor density</b>	Not applicable.
<b>Relative density</b>	7.14 (H <sub>2</sub> O=1) Zinc 8.9 (H <sub>2</sub> O=1) Copper

<b>Solubility(ies)</b>	
<b>Solubility (water)</b>	Not soluble
<b>Partition coefficient (n-octanol/water)</b>	Not available.
<b>Auto-ignition temperature</b>	Not applicable.
<b>Decomposition temperature</b>	Not available.
<b>Viscosity</b>	Not applicable.

## 10. Stability and reactivity

<b>Reactivity</b>	The product is non-reactive under normal conditions of use, storage and transport.
<b>Chemical stability</b>	Material is stable under normal conditions.
<b>Possibility of hazardous reactions</b>	Hazardous polymerization does not occur.
<b>Conditions to avoid</b>	Contact with incompatible materials. Avoid molten metal contact with water.
<b>Incompatible materials</b>	Strong acids. Strong oxidizing agents. Halogenated compounds.
<b>Hazardous decomposition products</b>	Toxic metal oxides are emitted when heated above the melting point.

## 11. Toxicological information

### Information on likely routes of exposure

<b>Inhalation</b>	Elevated temperatures or mechanical action may form dust and fumes which may be irritating to the mucous membranes and respiratory tract. Lung damage and possible pulmonary edema can result from dust exposure. Inhalation of fumes may cause a flu-like illness called metal fume fever.
<b>Skin contact</b>	Dust may irritate skin. May cause an allergic skin reaction. Contact with molten material may cause thermal burns.
<b>Eye contact</b>	Elevated temperatures or mechanical action may form dust and fumes which may be irritating to the eye.
<b>Ingestion</b>	Ingestion of dusts generated during working operations may cause nausea and vomiting. Copper poisoning can result in hemolytic anemia and kidney, liver and spleen damage.

<b>Symptoms related to the physical, chemical and toxicological characteristics</b>	Elevated temperatures or mechanical action may form dust and fumes which may be irritating to the eye, mucous membranes and respiratory tract. Sensitization. Contact with molten material may cause thermal burns.
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### Information on toxicological effects

<b>Acute toxicity</b>	High concentrations of freshly formed fumes/dusts of metal oxides can produce symptoms of metal fume fever. When heated, the vapors/fumes given off may cause respiratory tract irritation. Acute overexposure to Copper dust/fume can cause irritation of the eyes, nose, throat, and skin and under severe fume overexposure can cause metal fume fever with flu-like symptoms such as sweet metal taste, dry throat, coughing, fever and chills, tight chest, dyspnea, headache, blurred vision, back pain, nausea, vomiting, fatigue. Symptoms usually disappear within 24 hours. Copper may cause skin and hair discoloration. Inhalation of copper dusts may change the gums and mucous lining of the mouth which is generally attributable to localized tissue effect rather than general toxicity.
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Components	Species	Test Results
Iron (CAS 7439-89-6)		
<b>Acute</b>		
<i>Inhalation</i>		
LC50	Rat	> 100 mg/m <sup>3</sup> , 6 hours
LD50	Rat	> 5 mg/kg
<i>Oral</i>		
LD50	Rat	98.6 g/kg
Manganese (CAS 7439-96-5)		
<b>Acute</b>		
<i>Inhalation</i>		
LC50/LC90	Rat	> 1500 mg/kg

Components	Species	Test Results
Oral LD50	Rat	9000 mg/kg
Nickel (CAS 7440-02-0)		
<b>Acute</b>		
Oral LD50	Rat	> 9000 mg/kg
Silicon (CAS 7440-21-3)		
<b>Acute</b>		
Oral LD50	Rat	3150 mg/kg
Zinc (CAS 7440-66-6)		
<b>Acute</b>		
Inhalation LC50	Rat	> 5410 mg/m3
<b>Skin corrosion/irritation</b>	Dust may irritate skin.	
<b>Serious eye damage/eye irritation</b>	Elevated temperatures or mechanical action may form dust and fumes which may be irritating to the eye.	
<b>Respiratory or skin sensitization</b>		
<b>Respiratory sensitization</b>	Not classified.	
<b>Skin sensitization</b>	May cause an allergic skin reaction.	
<b>Germ cell mutagenicity</b>	No data available.	
<b>Carcinogenicity</b>	May cause cancer.	
<b>IARC Monographs. Overall Evaluation of Carcinogenicity</b>		
Nickel (CAS 7440-02-0)	2B Possibly carcinogenic to humans.	
<b>NTP Report on Carcinogens</b>		
Nickel (CAS 7440-02-0)	Reasonably Anticipated to be a Human Carcinogen.	
<b>OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)</b>		
	Not listed.	
<b>Reproductive toxicity</b>	May damage fertility or the unborn child.	
<b>Specific target organ toxicity - single exposure</b>	Not classified.	
<b>Specific target organ toxicity - repeated exposure</b>	Causes damage to organs (lung) through prolonged or repeated exposure.	
<b>Aspiration hazard</b>	Not relevant, due to the form of the product.	
<b>Chronic effects</b>	Workers allergic to nickel may develop eczema or rashes.	
<b>Further information</b>	No other specific acute or chronic health impact noted.	

## 12. Ecological information

**Ecotoxicity** Alloys in massive forms present a limited hazard for the environment. The product contains a substance which is very toxic to aquatic organisms and which may cause long-term adverse effects in the aquatic environment.

Components	Species	Test Results
Zinc (CAS 7440-66-6)		
<b>Aquatic</b>		
Fish	LC50 Rainbow trout, donaldson trout (Oncorhynchus mykiss)	0.24 mg/l, 96 hours
<b>Persistence and degradability</b>	The product is not biodegradable.	
<b>Bioaccumulative potential</b>	No data available.	
<b>Mobility in soil</b>	Alloys in massive forms are not mobile in the environment.	
<b>Other adverse effects</b>	None expected.	

### 13. Disposal considerations

<b>Disposal instructions</b>	Dispose in accordance with all applicable regulations.
<b>Local disposal regulations</b>	Dispose of in accordance with local regulations.
<b>Hazardous waste code</b>	Waste codes should be assigned by the user based on the application for which the product was used.
<b>Waste from residues / unused products</b>	Dispose of in accordance with local regulations. Scrapped material should be sent for refining to recover precious metal content. Solid metal and alloys in the form of particles may be reactive. Its hazardous characteristics, including fire and explosion, should be determined prior to disposal.
<b>Contaminated packaging</b>	Since emptied containers may retain product residue, follow label warnings even after container is emptied.

### 14. Transport information

#### DOT

Not regulated as dangerous goods.

#### IATA

Not regulated as dangerous goods.

#### IMDG

Not regulated as dangerous goods.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** Not applicable.

### 15. Regulatory information

**US federal regulations** This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.  
All components are on the U.S. EPA TSCA Inventory List.

#### TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

#### OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

#### CERCLA Hazardous Substance List (40 CFR 302.4)

Copper (CAS 7440-50-8)	LISTED
Manganese (CAS 7439-96-5)	LISTED
Nickel (CAS 7440-02-0)	LISTED
Zinc (CAS 7440-66-6)	LISTED

#### Superfund Amendments and Reauthorization Act of 1986 (SARA)

**Hazard categories** Immediate Hazard - Yes  
Delayed Hazard - Yes  
Fire Hazard - No  
Pressure Hazard - No  
Reactivity Hazard - No

#### SARA 302 Extremely hazardous substance

Not listed.

**SARA 311/312 Hazardous chemical** Yes

#### SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
Copper	7440-50-8	46-97
Zinc	7440-66-6	45
Nickel	7440-02-0	7-13
Manganese	7439-96-5	1.5

#### Other federal regulations

##### Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Manganese (CAS 7439-96-5)  
Nickel (CAS 7440-02-0)

##### Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

**Safe Drinking Water Act (SDWA)** Not regulated.

**US state regulations** WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

**US. Massachusetts RTK - Substance List**

Copper (CAS 7440-50-8)  
Manganese (CAS 7439-96-5)  
Nickel (CAS 7440-02-0)  
Silicon (CAS 7440-21-3)  
Zinc (CAS 7440-66-6)

**US. New Jersey Worker and Community Right-to-Know Act**

Boric acid (CAS 10043-35-3)  
Copper (CAS 7440-50-8)  
Manganese (CAS 7439-96-5)  
Nickel (CAS 7440-02-0)  
Silicon (CAS 7440-21-3)  
Zinc (CAS 7440-66-6)

**US. Pennsylvania Worker and Community Right-to-Know Law**

Copper (CAS 7440-50-8)  
Manganese (CAS 7439-96-5)  
Nickel (CAS 7440-02-0)  
Silicon (CAS 7440-21-3)  
Zinc (CAS 7440-66-6)

**US. Rhode Island RTK**

Copper (CAS 7440-50-8)  
Manganese (CAS 7439-96-5)  
Nickel (CAS 7440-02-0)  
Zinc (CAS 7440-66-6)

**US. California Proposition 65**

**US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance**

Nickel (CAS 7440-02-0)

**International Inventories**

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

\*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

**16. Other information, including date of preparation or last revision**

**Issue date** 30-June-2015  
**Revision date** -  
**Version #** 01  
**Further information** HMIS® is a registered trade and service mark of the NPCA.  
**HMIS® ratings** Health: 2\*  
Flammability: 0  
Physical hazard: 0

**NFPA ratings****References**

ACGIH  
EPA: AQUIRE database  
NLM: Hazardous Substances Data Base  
US. IARC Monographs on Occupational Exposures to Chemical Agents  
HSDB® - Hazardous Substances Data Bank  
IARC Monographs. Overall Evaluation of Carcinogenicity  
National Toxicology Program (NTP) Report on Carcinogens  
ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices

**Disclaimer**

All information in this Material Safety Data Sheet is believed to be accurate and reliable. However, no guarantee or warranty of any kind is made with regard to the accuracy of information or the suitability of the recommendations contained herein. It is the user's responsibility to assess the safety and toxicity of this product under their own conditions of use and to comply with all applicable laws and regulations.