

# NüMetal™ ZVNM-009BE Inkjettable Copper Ink

## Safety Data Sheet

according to the federal final rule of hazard communication revised on 2012 (HazCom 2012)

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### SECTION 1: Identification

#### 1.1. Identification

Product form: Mixture

Trade name: NüMetal™ ZVNM-009BE Inkjettable Copper Ink

#### 1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture: Ink

#### 1.3. Details of the supplier of the safety data sheet

ZeroValent NanoMetals, Inc

693 East Ave, Suite 103

Rochester, NY 14607

T (585) 764-1666

[kreed@zv-nm.com](mailto:kreed@zv-nm.com)

#### 1.4. Emergency telephone number

Emergency number: ChemTel Inc. 1 (585) 298-8582

### SECTION 2: Hazard(s) Identification

#### 2.1. Classification of the substance or mixture

##### GHS-US classification

Not classified

#### 2.2. Label elements

##### GHS-US labeling

No labeling applicable

#### 2.3. Other hazards

Other hazards which do not result in classification: Harmful to aquatic organisms; may cause long-term adverse effects in the aquatic environment. Contains copper (II) oxide nanoparticles. Copper exposure may result in complications for those individuals with Wilson's disease.

#### 2.4. Unknown acute toxicity (GHS US)

Not applicable

### SECTION 3: Composition/information on ingredients

#### 3.1. Substance

Not applicable

#### 3.2. Mixture

##### Name Product identifier % GHS-US classification

Copper (II) oxide (CuO) (CAS No) 7440-50-8 10 - 25 Not classified

### SECTION 4: First aid measures

#### 4.1. Description of first aid measures

First-aid measures general:

Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible). IF exposed or concerned: Get medical advice/attention.

First-aid measures after inhalation:

Remove person to fresh air and keep comfortable for breathing. If exposure symptoms persist, seek medical advice.

First-aid measures after skin contact:

Remove/take off immediately all contaminated clothing. Rinse and then wash skin thoroughly with water and soap. Wash contaminated clothing before reuse. If skin irritation or rash occurs: Get medical advice/attention.

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First-aid measures after eye contact: Immediately flush eyes thoroughly with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

First-aid measures after ingestion: If swallowed, rinse mouth with water (only if the person is conscious). Do not induce vomiting. Never give anything by mouth to an unconscious person. Seek immediate medical advice.

#### 4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : Copper exposure may result in complications for those individuals with Wilson's disease. Inhalation of airborne droplets or aerosols may cause irritation of the respiratory tract. Ingestion may cause irritation to the digestive tract.

#### 4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically. May aggravate individuals suffering from Wilson's disease.

### SECTION 5: Firefighting measures

#### 5.1. Extinguishing media

Suitable extinguishing media: Water spray. Dry powder. Foam. Carbon dioxide.

Unsuitable extinguishing media: Do not use a heavy water stream.

#### 5.2. Special hazards arising from the substance or mixture

Fire hazard: Combustion generates copper oxides, nitrogen oxides (NOx), carbon monoxide and dioxide, and various hydrocarbon compounds.

Explosion hazard: Prolonged exposure to fire may cause containers to rupture/explode.

Reactivity: The product is non-reactive under normal conditions of use, storage and transport.

#### 5.3. Advice for firefighters

Firefighting instructions: In case of fire: Wear self-contained breathing apparatus. Wear proper protective equipment. Evacuate personnel to a safe area. Do not allow run-off from firefighting to enter drains or water courses. Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire.

Protective equipment for firefighters: Use self-contained breathing apparatus and chemically protective clothing. Do not attempt to take action without suitable protective equipment.

Other information: On heating, there is a risk of bursting due to internal pressure build-up. Cool down the containers exposed to heat with a water spray. Hazardous decomposition products may be released during prolonged heating like smokes, carbon monoxide and dioxide, and nitrogen oxides (NOx), and various hydrocarbon compounds.

### SECTION 6: Accidental release measures

#### 6.1. Personal precautions, protective equipment and emergency procedures

General measures: Stop leak if safe to do so. Ensure adequate air ventilation.

##### 6.1.1. For non-emergency personnel

Emergency procedures: Ventilate spillage area. Avoid contact with skin and eyes. Avoid breathing fume, mist, vapors, and spray.

##### 6.1.2. For emergency responders

Protective equipment: Do not attempt to take action without suitable protective equipment. Avoid breathing dust, mist or spray. Wear suitable protective clothing, gloves and eye/face protection. For further information refer to section 8: Exposure-controls/personal protection.

Emergency procedures: Evacuate unnecessary personnel. Ventilate area.

#### 6.2. Environmental precautions

Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams. Collect in closed containers for disposal. Avoid release to the environment. Notify authorities if product enters sewers or public waters.

#### 6.3. Methods and material for containment and cleaning up

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For containment:	Stop leak, if possible without risk. Absorb with liquid-binding material (e.g. sand, diatomaceous earth, acid- or universal binding agents). Collect spillage. Put into a labeled container and provide safe disposal.
Methods for cleaning up:	Take up liquid spill into absorbent material. Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams. Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible. Collect all waste in suitable and labeled containers and dispose according to local legislation. Wear suitable protective clothing. Notify authorities if product enters sewers or public waters.
Other information:	Dispose of materials or solid residues at an authorized site.

### 6.4. Reference to other sections

For further information refer to section 8: Exposure-controls/personal protection. For disposal of residues refer to section 13: Disposal considerations.

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

Precautions for safe handling :	Ensure good ventilation of the work station. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear personal protective equipment. Avoid contact with skin and eyes. Avoid breathing fume, mist, spray, and vapors.
Hygiene measures :	Separate working clothes from town clothes. Launder separately. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

### 7.2. Conditions for safe storage, including any incompatibilities

Storage conditions:	Store locked up. Store in closed containers. Store in a well-ventilated place. Keep in a cool (15° - 25°C) environment. Do not refrigerate.
Incompatible materials:	Strong oxidizing agents. Strong acids.

## SECTION 8: Exposure Controls/personal protection

### 8.1. Control parameters

Copper (II) oxide (CuO) (7440-50-8)		
ACGIH	ACGIH TWA (mg/m <sup>3</sup> )	0.2 mg/m <sup>3</sup> Fume, as Cu 1 mg/m <sup>3</sup> Dusts and mists, as Cu
OSHA	OSHA PEL (TWA) (mg/m <sup>3</sup> )	1 mg/m <sup>3</sup> Dusts and mists, as Cu 0.1 mg/m <sup>3</sup> Fume, as Cu

### 8.2. Exposure controls

Appropriate engineering controls : Provide local exhaust or general room ventilation. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Ensure good ventilation of the work station.

Personal protective equipment : Avoid all unnecessary exposure. Gloves. Protective goggles. Protective clothing. Personal protective equipment should be selected based upon the conditions under which this product is handled or used.

Hand protection : Wear protective gloves. It is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves.

Eye protection : Chemical goggles or safety glasses. Safety glasses.

Skin and body protection : Wear suitable protective clothing.

Respiratory protection : Wear appropriate mask. Avoid breathing dust/fume/gas/mist/vapors/spray. Wear respiratory protection.

Environmental exposure controls : Avoid release to the environment.

Other information : Do not eat, drink or smoke during use.

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## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

Physical state:	Liquid
Color:	Dark gray to black
Odor:	Mild
Odor threshold:	No data available
pH:	6 - 7
Melting point:	Not applicable
Freezing point:	No data available
Boiling point:	No data available
Flash point:	> 93.3 °C (>200°F)
Relative evaporation rate (butyl acetate=1):	< 1
Flammability (solid, gas):	No data available
Explosive limits:	No data available
Explosive properties:	No data available
Oxidizing properties:	No data available
Vapor pressure:	No data available
Relative density:	No data available
Relative vapor density at 20 °C:	> 1
Density:	1.2 - 1.4
Solubility :	Water: Dispersible
Log Pow :	No data available
Auto-ignition temperature:	No data available
Decomposition temperature:	No data available
Viscosity:	No data available
Viscosity, kinematic:	No data available
Viscosity, dynamic:	No data available

### 9.2. Other information

No additional information available

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

The product is non-reactive under normal conditions of use, storage and transport.

### 10.2. Chemical stability

Stable under normal conditions.

### 10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use. Hazardous polymerization does not occur.

### 10.4. Conditions to avoid

High temperature. Incompatible materials.

### 10.5. Incompatible materials

Strong oxidizers. Strong acids.

### 10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced. During a fire, copper oxides, nitrogen oxides (NO<sub>x</sub>), carbon monoxide and dioxide, and various hydrocarbon compounds are generated.

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

Likely routes of exposure:	Ingestion; oral; Skin and eye contact
Acute toxicity:	Not classified (Based on available data, the classification criteria are not met)
Skin corrosion/irritation:	Not classified (Based on available data, the classification criteria are not met)
Serious eye damage/irritation:	Not classified (Based on available data, the classification criteria are not met)
Respiratory or skin sensitization:	Not classified

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Germ cell mutagenicity:	(Based on available data, the classification criteria are not met) Not classified
Carcinogenicity:	(Based on available data, the classification criteria are not met) Not classified
Reproductive toxicity:	(Based on available data, the classification criteria are not met) Not classified
Specific target organ toxicity (single exposure):	(Based on available data, the classification criteria are not met) Not classified
Specific target organ toxicity (repeated exposure):	(Based on available data, the classification criteria are not met) Not classified
Aspiration hazard:	(Based on available data, the classification criteria are not met) Not classified
Potential Adverse human health effects and Symptoms:	(Based on available data, the classification criteria are not met) Under normal conditions of use, no adverse effects to health have been observed. Copper exposure may result in complications for those individuals with Wilson's disease. Inhalation of airborne droplets or aerosols may cause irritation of the respiratory tract. Ingestion may cause irritation to the digestive tract.

## SECTION 12: Ecological information

### 12.1. Toxicity

Ecology - general: Harmful to aquatic life with long lasting effects.

### 12.2. Persistence and degradability

No additional information available

### 12.3. Bioaccumulative potential

No additional information available

### 12.4. Mobility in soil

No additional information available

### 12.5. Other adverse effects

Effect on the global warming : No additional information available

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

Waste treatment methods : Dispose of contents/container in accordance with licensed collector's sorting instructions.

Waste disposal recommendations : Dispose in a safe manner in accordance with local/national regulations.

Ecology - waste materials : Avoid release to the environment.

### Department of Transportation (DOT)

In accordance with DOT

Not regulated for transport

### TDG

Not regulated for transport

### Transport by sea

Not regulated for transport

### Air transport

Not regulated for transport

## SECTION 14: Transport information

### Department of Transportation (DOT)

In accordance with DOT

Not regulated for transport

### TDG

Not regulated for transport

### Transport by sea

Not regulated for transport

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### Air transport

Not regulated for transport

## SECTION 15: Regulatory Information

### 15.1. US Federal regulations

<b>Copper (II) oxide (CuO) (7440-50-8)</b>
Listed on the United States TSCA (Toxic Substances Control Act) inventory

### 15.2. International regulations

#### CANADA

<b>Copper (II) oxide (CuO) (7440-50-8)</b>	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Uncontrolled product according to WHMIS classification criteria

### EU-Regulations

<b>Copper (II) oxide (CuO) (7440-50-8)</b>
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

### Classification according to Regulation (EC) No. 1272/2008 [CLP]

Aquatic Chronic 3 H412

### National regulations

<b>Copper (II) oxide (CuO) (7440-50-8)</b>
Listed on the AICS (Australian Inventory of Chemical Substances) Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) Listed on the Japanese ENCS (Existing & New Chemical Substances) Inventory Listed on the Korean ECL (Existing Chemicals List) Listed on NZIoC (New Zealand Inventory of Chemicals) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances) Listed on INSQ (Mexican National Inventory of Chemical Substances) Listed on CICR (Turkish Inventory and Control of Chemicals)

### 15.3. US State regulations

No additional information available

## SECTION 16: Other Information

Indication of changes : None.

Sources of Key data : Data arise from reference works and literature.

Revision date : 09/23/2015

Other information : None.