

SECTION 1: Identification

1.1. Identification

Product form : Mixture
 Trade name : Metalon™ ICI-003 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

NCC Nano LLC dba Novacentrix
 400 Parker Drive, Suite 1110
 Austin, TX 78728
 T (512) 491-9500
msds@novacentrix.com

1.4. Emergency telephone number

Emergency number : ChemTel Inc. 1 (800) 255-3924 ; Intl. +01 (813) 248-0585 (24 hr)

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS-US classification

Skin Sens. 1 H317 - May cause an allergic skin reaction
 Repr. 2 H361 - Suspected of damaging fertility or the unborn child

Full text of H-statements: see section 16

2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US) :



GHS07

GHS08

Signal word (GHS-US) : Warning

Hazard statements (GHS-US) : H317 - May cause an allergic skin reaction
 H361 - Suspected of damaging fertility or the unborn child

Precautionary statements (GHS-US) : P201 - Obtain special instructions before use
 P202 - Do not handle until all safety precautions have been read and understood
 P261 - Avoid breathing fume, mist, spray, vapors
 P272 - Contaminated work clothing must not be allowed out of the workplace
 P280 - Wear eye protection, protective clothing, protective gloves
 P302+P352 - If on skin: Wash with plenty of water
 P308+P313 - If exposed or concerned: Get medical advice/attention
 P333+P313 - If skin irritation or rash occurs: Get medical advice/attention
 P363 - Wash contaminated clothing before reuse
 P405 - Store locked up
 P501 - Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation

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

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

3.2. Mixture

Name	Product identifier	%	GHS-US classification
Copper (II) oxide (CuO)	(CAS No) 7440-50-8	5 - 20	Not classified
Proprietary adhesion promoter *	(CAS No) Trade Secret	7.5 - 8.5	Skin Sens. 1, H317 STOT SE 3, H335
Diphenyl-2,4,6-trimethylbenzoyl phosphine oxide	(CAS No) 75980-60-8	0.7 - 1.3	Skin Sens. 1B, H317 Repr. 2, H361

*Chemical name, CAS number and/or exact concentration have been withheld as a trade secret

Full text of H-statements: see section 16

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.
- 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.
- Symptoms/injuries after inhalation : Inhalation of airborne droplets or aerosols may cause irritation of the respiratory tract.
- Symptoms/injuries after skin contact : May cause an allergic skin reaction.
- Symptoms/injuries after eye contact : May cause slight temporary irritation.
- Symptoms/injuries after 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).

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.

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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

- 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. Refrigerate at a temperature between 0° and 10°C for long-term storage.
- 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 ³)	0.2 mg/m ³ Fume, as Cu 1 mg/m ³ Dusts and mists, as Cu
OSHA	OSHA PEL (TWA) (mg/m ³)	1 mg/m ³ Dusts and mists, as Cu 0.1 mg/m ³ 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.

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

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	: 1.1 - 1.2
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 (NOx), 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)

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Serious eye damage/irritation	: Not classified (Based on available data, the classification criteria are not met)
Respiratory or skin sensitization	: May cause an allergic skin reaction.
Germ cell mutagenicity	: Not classified (Based on available data, the classification criteria are not met)
Carcinogenicity	: Not classified (Based on available data, the classification criteria are not met)
Reproductive toxicity	: Suspected of damaging fertility or the unborn child.
Specific target organ toxicity (single exposure)	: Not classified (Based on available data, the classification criteria are not met)
Specific target organ toxicity (repeated exposure)	: Not classified (Based on available data, the classification criteria are not met)
Aspiration hazard	: Not classified (Based on available data, the classification criteria are not met)
Symptoms/injuries after inhalation	: Inhalation of airborne droplets or aerosols may cause irritation of the respiratory tract.
Symptoms/injuries after skin contact	: May cause an allergic skin reaction.
Symptoms/injuries after eye contact	: May cause slight temporary irritation.
Symptoms/injuries after 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.

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

Air transport

Not regulated for transport

SECTION 15: Regulatory information

15.1. US Federal regulations

Copper (II) oxide (CuO) (7440-50-8)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

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Diphenyl-2,4,6-trimethylbenzoyl phosphine oxide (75980-60-8)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. International regulations

CANADA

Copper (II) oxide (CuO) (7440-50-8)

Listed on the Canadian DSL (Domestic Substances List)

WHMIS Classification

Uncontrolled product according to WHMIS classification criteria

Diphenyl-2,4,6-trimethylbenzoyl phosphine oxide (75980-60-8)

Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

Copper (II) oxide (CuO) (7440-50-8)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

Diphenyl-2,4,6-trimethylbenzoyl phosphine oxide (75980-60-8)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

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

Skin Sens. 1

H317

Aquatic Chronic 3

H412

National regulations

Copper (II) oxide (CuO) (7440-50-8)

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)

Diphenyl-2,4,6-trimethylbenzoyl phosphine oxide (75980-60-8)

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 Japanese ISHL (Industrial Safety and Health Law)

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	: 08/25/2015
Other information	: None.

Full text of H-statements:

Repr. 2	Reproductive toxicity, Category 2
Skin Sens. 1	Sensitization — Skin, Category 1
Skin Sens. 1B	Sensitization — Skin, category 1B
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
H317	May cause an allergic skin reaction
H335	May cause respiratory irritation
H361	Suspected of damaging fertility or the unborn child

SDS US (GHS HazCom 2012)

The information contained herein is believed to be accurate but is not warranted to be so. Data and calculations are based on information furnished by the manufacturer of the product and manufacturers of the components of the product. Users are advised to confirm in advance of need that information is current, applicable and suited to the circumstances of use. Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Furthermore, vendor assumes no responsibility for injury caused by abnormal use of this material even if reasonable safety procedures are followed. Any questions regarding this product should be directed to the manufacturer of the product as described in Section 1.