

SECTION 1: Identification

1.1. Identification

Product form : Mixture
 Trade name : Metalon™ HPS-FG77 High Performance Silver Ink
 Technical name : Silver Screen Ink

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

Use of the substance/mixture : Commercial 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

Serious eye damage/eye irritation, Category 2A H319
 Hazardous to the aquatic environment - Acute Hazard, Category 1 H400

Full text of H statements : see section 16

2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US) :



GHS07

GHS09

Signal word (GHS-US) :

Warning

Hazard statements (GHS-US) :

H319 - Causes serious eye irritation
 H400 - Very toxic to aquatic life

Precautionary statements (GHS-US) :

P260 - Do not breathe dust, mist, spray, vapors, gas, fume
 P264 - Wash hands thoroughly after handling
 P273 - Avoid release to the environment
 P280 - Wear protective gloves, protective clothing, eye protection
 P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
 P314 - Get medical advice/attention if you feel unwell
 P337+P313 - If eye irritation persists: get medical advice/attention
 P391 - Collect spillage
 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

No additional information available

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

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Name	Product identifier	%	GHS-US classification
Silver	(CAS No) 7440-22-4	65 - 90	Not classified
Diethylene glycol monobutyl ether	(CAS No) 112-34-5	15 - 35	Eye Irrit. 2, H319

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 victim to fresh air and keep at rest in a position 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 and 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 after inhalation : Inhalation of airborne droplets or aerosols may cause irritation of the respiratory tract.
- Symptoms/injuries after skin contact : May cause slight irritation to the skin. Silver may result in darkening of skin and cornea of eye (gray-blue patches or darkening) where the metal has contact; prolonged and heavy exposure may also affect lung function and may be manifested as mild or chronic bronchitis.
- Symptoms/injuries after eye contact : Causes serious eye irritation.
- Symptoms/injuries after ingestion : May cause irritation to the digestive tract.
- Chronic symptoms : May cause damage to organs through prolonged or repeated exposure.

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

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

- Suitable extinguishing media : Foam. Dry powder. Carbon dioxide. Water spray.
- Unsuitable extinguishing media : Do not use a heavy water stream.

5.2. Special hazards arising from the substance or mixture

- Fire hazard : Combustion generates smoke fumes, 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.

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 mist or vapor.

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.

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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 : Obtain special instructions before use. Ensure good ventilation of the work station. Do not handle until all safety precautions have been read and understood. Wear personal protective equipment. Avoid contact with skin and eyes. Avoid breathing mist or vapor.

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 in well-ventilated area. Keep cool. Long-term storage in closed containers.

Incompatible materials : Strong oxidizing agents. Light metals.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Silver (7440-22-4)		
ACGIH	ACGIH TWA (mg/m ³)	0.1 mg/m ³ (dust and fume)
OSHA	OSHA PEL (TWA) (mg/m ³)	0.01 mg/m ³
IDLH	US IDLH (mg/m ³)	10 mg/m ³ (dust)
NIOSH	NIOSH REL (TWA) (mg/m ³)	0.01 mg/m ³ (dust)
Diethylene glycol monobutyl ether (112-34-5)		
ACGIH	ACGIH TWA (ppm)	10 ppm (inhalable fraction and vapor)

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 impermeable 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.

Skin and body protection : Wear suitable protective clothing.

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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.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Viscous liquid
Color	: Gray
Odor	: Alcohol odor
Odor threshold	: No data available
pH	: No data available
Melting point	: No data available
Freezing point	: < 0°C
Boiling point	: > 100°C
Flash point	: No data available
Relative evaporation rate (butyl acetate=1)	: <= 1
Flammability (solid, gas)	: Non-flammable.
Explosive limits	: No data available
Explosive properties	: No data available
Oxidizing properties	: No data available
Vapor pressure	: No data available
Relative density	: 2.5 - 3.5 (at 25°C)
Relative vapor density at 20°C	: > 1
Solubility	: Water: Not 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. Open flame. Sparks. Incompatible materials.

10.5. Incompatible materials

Strong oxidizing agents. Light metals.

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced. During a fire, carbon monoxide and dioxide and various hydrocarbon compounds, may be produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Likely routes of exposure : Ingestion; Oral; Skin and Eye contact

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Acute toxicity : Not classified
(Based on available data, the classification criteria are not met)

Silver (7440-22-4)	
LD50 oral rat	> 2000 mg/kg
Diethylene glycol monobutyl ether (112-34-5)	
LD50 oral rat	7291 mg/kg
LD50 dermal rabbit	2764 mg/kg

Skin corrosion/irritation : Not classified
(Based on available data, the classification criteria are not met)

Serious eye damage/irritation : Causes serious eye irritation.

Respiratory or skin sensitisation : Not classified
(Based on available data, the classification criteria are not met)

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 : Not classified
(Based on available data, the classification criteria are not met)

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 slight irritation to the skin.

Symptoms/injuries after eye contact : Causes serious eye irritation.

Symptoms/injuries after ingestion : May cause irritation to the digestive tract.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : Very toxic to aquatic life.

Silver (7440-22-4)	
LC50 fish 1	0.00155 - 0.00293 mg/l (Exposure time: 96 h - Species: Pimephales promelas [static])
EC50 Daphnia 1	0.00024 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])
LC50 fish 2	0.0062 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [flow-through])
Diethylene glycol monobutyl ether (112-34-5)	
LC50 fish 1	1300 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [static])
EC50 Daphnia 1	> 100 mg/l (Exposure time: 48 h - Species: Daphnia magna)

12.2. Persistence and degradability

Metalon™ HPS-FG77 High Performance Silver Ink	
Persistence and degradability	Not established.

12.3. Bioaccumulative potential

Metalon™ HPS-FG77 High Performance Silver Ink	
Bioaccumulative potential	Not established.
Diethylene glycol monobutyl ether (112-34-5)	
BCF fish 1	(no bioconcentration expected)

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

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Effect on the global warming : No additional information available
Other information : Avoid release to the environment.

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

UN-No. (IMDG) : 3082
Proper Shipping Name (IMDG) : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
Class (IMDG) : 9 - Miscellaneous dangerous substances and articles
Packing group (IMDG) : III - substances presenting low danger
MFAG-No : 171

Air transport

UN-No. (IATA) : 3082
Proper Shipping Name (IATA) : Environmentally hazardous substance, liquid, n.o.s.
Class (IATA) : 9 - Miscellaneous Dangerous Goods
Packing group (IATA) : III - Minor Danger

SECTION 15: Regulatory information

15.1. US Federal regulations

All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory.

Chemical(s) subject to the reporting requirements of Section 313 or Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 and 40 CFR Part 372.

Silver	CAS No 7440-22-4	65 - 90 %
Diethylene glycol monobutyl ether	CAS No 112-34-5	15 - 35 %

Silver (7440-22-4)	
RQ (Reportable quantity, section 304 of EPA's List of Lists)	1000 lbs
SARA Section 313 - Emission Reporting	1.0 %
Diethylene glycol monobutyl ether (112-34-5)	
SARA Section 313 - Emission Reporting	1.0 %

15.2. International regulations

CANADA

Silver (7440-22-4)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Uncontrolled product according to WHMIS classification criteria
Diethylene glycol monobutyl ether (112-34-5)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Class B Division 3 - Combustible liquid : Flash point of 37.8 - 93.3°C Class D Division 2 Subdivision B - Toxic material causing other toxic effects

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EU-Regulations

Silver (7440-22-4)	
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)	
Classification according to Regulation (EC) No. 1272/2008 [CLP] Aquatic Acute 1	H400
Diethylene glycol monobutyl ether (112-34-5)	
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)	

National regulations

Silver (7440-22-4)	
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 Korean ECL (Existing Chemicals List) Listed on NZIoC (New Zealand Inventory of Chemicals) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances) Japanese Pollutant Release and Transfer Register Law (PRTR Law) Listed on the Canadian IDL (Ingredient Disclosure List) Listed on INSQ (Mexican National Inventory of Chemical Substances) Listed on CICR (Turkish Inventory and Control of Chemicals)	
Diethylene glycol monobutyl ether (112-34-5)	
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 the Canadian IDL (Ingredient Disclosure List) Listed on INSQ (Mexican National Inventory of Chemical Substances) Listed on CICR (Turkish Inventory and Control of Chemicals)	

15.3. US State regulations

California Proposition 65 - This product does not contain any substance(s) known to the state of California to cause cancer, developmental and/or reproductive harm.

SECTION 16: Other information

Date of Preparation	: 05/01/2017
Abbreviations and acronyms	: IARC (International Agency for Research on Cancer). ACGIH (American Conference of Government Industrial Hygienists). TWA- Time Weighted Average. IDLH - Immediately Dangerous to Life or Health. NIOSH (National Institute for Occupational Safety and Health). REL - recommended exposure limit. OSHA - Occupational Safety and Health Administration. WHMIS - Workplace Hazardous Materials Information System.

Full text of H-statements:

Eye Irrit. 2	Serious eye damage/eye irritation, Category 2
H319	Causes serious eye irritation
H400	Very toxic to aquatic life

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.