SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Metalon™ HPS-Series High Performance Silver Inks
GENERAL USE: Commercial ink
PRODUCT DESCRIPTION: Thick liquid or paste, dark gray color, characteristic sweet odor

MANUFACTURER'S NAME
NCC Nano LLC dba Novacentrix

DATE PREPARED: September 24, 2013
MANUFACTURER'S ADDRESS (NUMBER, STREET, P.O. BOX)
400 Parker Drive, Suite 1110

ADDRESS (NUMBER, STREET, P.O. BOX)
Austin, TX 78728

COUNTRY
USA

TELEPHONE NUMBER FOR INFORMATION
(512) 491-9500

EMERGENCY TELEPHONE NUMBER
ChemTel Inc. 1- (800) 255-3924 Intl. + 01 (813) 248-0585

SECTION 2 - HAZARDS IDENTIFICATION

GENERAL USE: Commercial ink
MATERIAL SAFETY DATA SHEET

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

SECTION 2 - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
Viscous liquid or paste, prolonged contact may cause skin & eye irritation. Ingestion may cause gastric distress. Hazard Symbols for this product - Xi. Risk Phrases - R36/38

POTENTIAL HEALTH EFFECTS

INHALATION: High concentrations are irritating to the respiratory tract; may cause headache, dizziness, nausea, vomiting and malaise.

SKIN: Brief contact may cause slight irritation; prolonged contact may cause moderate reddening, swelling and possible necrosis.

EYES: Contact causes severe irritation and pain associated with redness and swelling of the conjunctiva.

INGESTION: May cause headache, dizziness, diarrhea and general weakness; large doses may result in red blood cell hemolysis.

CARCINOGENICITY
NTP? No
IARC MONOGRAPHS? No
OSHA REGULATED? No

SECTION 3 - COMPOSITION / INFORMATION ON INGREDIENTS

HAZARDOUS COMPONENTS

Silver (a,b,c) 7440-22-4 231-131-3 50 - 90 0.01 0.1 1000
Diethylene glycol monobutyl ether (a) 112-34-5 203-961-6 2 - 15 not established

The remaining components of this product are non-hazardous or are in small enough quantities as to not meet regulatory thresholds for disclosure. These components contain no substances or impurities which would influence the classification of this product.

(a,c) See Section 15

(b) Indicates that the Resource Conservation and Recovery Act (RCRA) has determined the waste for this chemical is listed as hazardous and must be handled according to regulations in 40 CFR 260-281.
FLASH POINT  (METHOD USED)  LEL:  UEL:
> 200° F  (> 93.3° C) IIIB

FIRE FIGHTING PROCEDURES
Carbon dioxide, water fog, dry chemical, chemical foam.

Self - contained respiratory equipment; cool containers to prevent pressure buildup and possible explosion when exposed to extreme heat.

Caution - material will support combustion!

Smoke, fumes or vapors, oxides of carbon, oxides of silver.

SECTION 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

RESPIRATORY PROTECTION:  None required while threshold limits are kept below maximum allowable concentrations; if TWA exceeds limits, NIOSH approved respirator must be worn. Respiratory protection must be provided in accordance with OSHA regulations (29 CFR 1910.134) or European Standard EN 149, as applicable.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT:  Coveralls, apron, or other equipment should be worn to minimize skin contact.

WORK / HYGIENIC PRACTICES:  Practice safe workplace habits. Safety showers and safety eyewash nearby.

RESPIRATORY PROTECTION:
None required while threshold limits are kept below maximum allowable concentrations; if TWA exceeds limits, NIOSH approved respirator must be worn. Respiratory protection must be provided in accordance with OSHA regulations (29 CFR 1910.134) or European Standard EN 149, as applicable.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT:  Coveralls, apron, or other equipment should be worn to minimize skin contact.

WORK / HYGIENIC PRACTICES:  Practice safe workplace habits. Safety showers and safety eyewash nearby.
**SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>APPEARANCE AND ODOR</td>
<td>Thick liquid or paste, dark gray color, characteristic sweet odor</td>
</tr>
<tr>
<td>SPECIFIC GRAVITY (WATER = 1)</td>
<td>1.8 - 5.4</td>
</tr>
<tr>
<td>SOLUBILITY IN WATER Dispersion</td>
<td>% VOLATILE (BY WEIGHT) 5 - 35%</td>
</tr>
<tr>
<td>pH</td>
<td>7.5 - 8.0</td>
</tr>
<tr>
<td>BOILING POINT 212° F (100° C)</td>
<td>FREEZING POINT 32° F (0° C)</td>
</tr>
<tr>
<td>VISCOSITY</td>
<td>Not specified</td>
</tr>
<tr>
<td>VAPOR DENSITY (AIR = 1)</td>
<td>&gt; 1</td>
</tr>
<tr>
<td>EVAPORATION RATE (Water = 1)</td>
<td>≤ 1</td>
</tr>
<tr>
<td>VAPOR PRESSURE</td>
<td>17 mm Hg @ 20° C</td>
</tr>
<tr>
<td>VOLATILE ORGANIC COMPOUNDS (VOC's)</td>
<td>Not specified</td>
</tr>
</tbody>
</table>

**SECTION 10 - STABILITY AND REACTIVITY**

<table>
<thead>
<tr>
<th>Stability</th>
<th>Condition to Avoid</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNSTABLE: X</td>
<td>Extreme temperatures.</td>
</tr>
<tr>
<td>STABLE: X</td>
<td></td>
</tr>
</tbody>
</table>

**SECTION 11 - TOXICOLOGICAL INFORMATION**

<table>
<thead>
<tr>
<th>Hazardous Ingredients</th>
<th>CAS #</th>
<th>EINECS #</th>
<th>LD50 of Ingredient Species and Route</th>
<th>LC50 of Ingredient Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silver (a,b,c)</td>
<td>7440-22-4</td>
<td>231-131-3</td>
<td>Not established</td>
<td>Not established</td>
</tr>
<tr>
<td>Diethylene glycol monobutyl ether (a)</td>
<td>112-34-5</td>
<td>203-961-6</td>
<td>5660 mg / kg Oral - rat</td>
<td>Not established</td>
</tr>
</tbody>
</table>

(a,c) See Section 15

**SECTION 12 - ECOLOGICAL INFORMATION**

No data are available on the adverse effects of this material on the environment. Neither COD nor BOD data are available. Based on the chemical composition of this product it is assumed that the mixture can be treated in an acclimatized biological waste treatment plant system in limited quantities. However, such treatment should be evaluated and approved for each specific biological system. None of the ingredients in this mixture are classified as Marine Pollutants.

**SECTION 13 - DISPOSAL CONSIDERATIONS**

WASTE DISPOSAL METHOD: Dispose of in accordance with local, state, and federal regulations. Do not flush to sanitary sewer or waterway. Refer to 40 CFR 260 - 299 for complete waste disposal regulations. Consult your local, state, or federal agency before disposing of any chemicals. According to the European Waste Catalogue, waste codes are application specific and should be assigned by the user based on the application for which the product is used.

**SECTION 14 - TRANSPORT INFORMATION**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROPER SHIPPING NAME:</td>
<td>Non - Hazardous for Transport</td>
</tr>
<tr>
<td>DOT HAZARD CLASS / Pack Group</td>
<td>Not regulated</td>
</tr>
<tr>
<td>IATA HAZARD CLASS / Pack Group</td>
<td>Not regulated</td>
</tr>
<tr>
<td>REFERENCE</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>IMDG HAZARD CLASS</td>
<td>Not regulated</td>
</tr>
<tr>
<td>UN / NA IDENTIFICATION NUMBER</td>
<td>None</td>
</tr>
<tr>
<td>RID/ADR Dangerous Goods Code</td>
<td>Not regulated</td>
</tr>
<tr>
<td>LABEL</td>
<td>None Required</td>
</tr>
<tr>
<td>UN TDG Class / Pack Group</td>
<td>Not regulated</td>
</tr>
<tr>
<td>HAZARD Identification Number (HIN)</td>
<td>None</td>
</tr>
</tbody>
</table>

Note: Transportation information provided is for reference only. Customer is urged to consult 49 CFR 100 - 177, IMDG, IATA, EC, United Nations TDG, and WHMIS (Canada) TDG information manuals for detailed regulations and exceptions covering specific container sizes, packaging materials and methods of shipping.
MATERIAL SAFETY DATA SHEET

PRODUCT NAME: Metalon™ HPS-Series High Performance Silver Inks
September 24, 2013

SECTION 15 - REGULATORY INFORMATION

TSCA (Toxic Substance Control Act)
All components of this product are listed on the U.S. Toxic Substances Control Act Chemical Inventory (TSCA Inventory) or are exempted from listing because a Low Volume Exemption has been granted in accordance with 40 CFR 723.50.

SARA TITLE III (Superfund Amendments and Reauthorization Act)
311/312 Hazard Categories
Immediate health

313 Reportable Ingredients:
(a) Indicates a toxic chemical subject to annual reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40 CFR 372.

CERCLA (Comprehensive Response Compensation and Liability Act)
(c) The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) has notification requirements for releases or spills to the environment of the Reportable Quantity (RQ for this mixture = 1200 lbs) or greater amounts, according to 40 CFR 302.

California Prop 65, Safe Drinking Water and Toxic Enforcement Act of 1986
There are no reportable chemicals present known to the state of California to cause cancer or reproductive toxicity.

CPR (Canadian Controlled Products Regulations)
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations. WHMIS Classification: D2B

IDL (Canadian Ingredient Disclosure List)
Components of this product identified by CAS number and listed on the Canadian Ingredient Disclosure List are shown in Section 3.

DSL / NDSL (Canadian Domestic Substances List / Non-Domestic Substances List)
Components of this product identified by CAS number are listed on the DSL or NDSL, or are otherwise in compliance with the New Substances Notification (NSN) regulations. Only ingredients classified as “hazardous” are listed in Section 3 unless otherwise indicated.

EINECS (European Inventory of Existing Commercial Chemical Substances)
Components of this product identified by CAS numbers are on the European Inventory of Existing Commercial Chemical Substances.

SECTION 16 - OTHER INFORMATION

Specific toxicity tests have not been conducted on this product. Our hazard evaluation is based on information from similar products, the ingredients, technical literature, and/or professional experience.

WHG Water Quality Index: 1
VbK Index: Not applicable

Risk Phrases
R36/38 Irritating to eyes and skin.

SYMBOL(S) REQUIRED FOR LABEL
Irritant

S27/28  Use with adequate ventilation. Keep away from heat, sparks, and flames. Use a non-flammable solvent instead of water when cleaning. Safety Data Sheet (SDS) accessible upon request.

S2  Keep out of the reach of children.
S24/25 Avoid contact with skin and eyes.

HGMS HAZARD RATINGS
HEALTH 2  * = Chronic Health Hazard
FLAMMABILITY 1  0 = INSignificant
PHYSICAL HAZARD 0  1 = SLIGHT
PERSONAL PROTECTIVE EQUIPMENT C Safety Glasses, Gloves, Apron

REVISION SUMMARY:
This MSDS has been revised in the following sections:
No changes noted

MSDS Prepared by:
Comprehensive Data Base, Inc.
P.O. Box 686
Seffner, FL 33583 USA
(863) 644 - 3298 www.compdbase.com or www.msds.cc

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.