



# PFI-DEV Silver Flexographic Ink

## Safety Data Sheet

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

Date of issue: 02/06/2019

Revision date: None Version: 1.0

### SECTION 1: Identification of the substance/mixture and of the company/undertaking

#### 1.1. Product identifier

Product form : Mixture  
Trade name : PFI-DEV Silver Flexographic Ink  
Technical name : Silver Flexographic 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](mailto: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: Hazards 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 : Contains silver nanoparticles. 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.

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

1.49 percent of the mixture consists of ingredient(s) of unknown acute toxicity (Inhalation (Dust/Mist))

### SECTION 3: Composition/information on ingredients

#### 3.1. Substance

Not applicable

#### 3.2. Mixture

Name	Product identifier	%	GHS-US classification
Silver	(CAS No) 7440-22-4	56 - 65	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).

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. If skin irritation occurs, get medical advice/attention. Wash contaminated clothing before reuse.

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

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.

# PFI-DEV Silver Flexographic Ink

## Safety Data Sheet

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

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

Symptoms/injuries : Under normal conditions of use, no adverse effects to health have been observed. 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.

### 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 : Cool closed containers exposed to fire with water spray. Incomplete combustion releases dangerous carbon monoxide, carbon dioxide, and other toxic gases.  
Explosion hazard : Prolonged exposure to fire may cause containers to rupture/explode.  
Reactivity : Stable.

### 5.3. Advice for firefighters

Precautionary measures fire : Use water spray or fog for cooling exposed containers. Prolonged exposure to fire may cause containers to rupture/explode. Use self-contained breathing apparatus and chemically protective clothing.  
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 fire fighting 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.  
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 : Eliminate all ignition sources if safe to do so. Stop leak if safe to do so. Ensure adequate air ventilation.

#### 6.1.1. For non-emergency personnel

Emergency procedures : Evacuate unnecessary personnel.

#### 6.1.2. For emergency responders

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 liquid 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 : 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.

### 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.

# PFI-DEV Silver Flexographic Ink

## Safety Data Sheet

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

### SECTION 7: Handling and storage

#### 7.1. Precautions for safe handling

- Precautions for safe handling : Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking, and when leaving work. Provide good ventilation in process area to prevent formation of vapor.
- Hygiene measures : Wash hands thoroughly after handling.

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

- Storage conditions : Keep in a cool, well-ventilated area away from ignition sources. Refrigerate at a temperature between 2 and 9 °C for long-term storage. Keep container closed when not in use.
- Incompatible conditions/materials : Avoid high temperatures and open flame. Avoid oxidizing agents.

#### 7.3. Specific end use(s)

No additional information available

### SECTION 8: Exposure controls/personal protection

#### 8.1. Control parameters

Silver (7440-22-4)		
ACGIH	ACGIH TWA (mg/m <sup>3</sup> )	0.1 mg/m <sup>3</sup> (dust and fume)
OSHA	OSHA PEL (TWA) (mg/m <sup>3</sup> )	0.01 mg/m <sup>3</sup>

#### 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.
- 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.
- Eye protection : Chemical goggles or safety glasses.
- Skin and body protection : Wear suitable protective clothing.
- Respiratory protection : Wear appropriate mask. Avoid breathing dust/fume/gas/mist/vapors/spray.
- 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

- Appearance : Viscous liquid
- Color : Dark gray to black
- Odor : Mildly pungent
- Odor threshold : No data available
- pH : 5.7 - 6.0
- Melting point : No data available
- Freezing point : No data available
- Boiling point : No data available
- Flash point : > 93.3 °C
- Relative evaporation rate (butyl acetate=1) : <= 1
- Flammability (solid, gas) : No data available
- Explosive limits : No data available

# PFI-DEV Silver Flexographic Ink

## Safety Data Sheet

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

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	: 2 - 2.5
Solubility	: Water: Disperses in water with a pH between 5.7 and 6.0
Log Pow	: No data available
Log Kow	: 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

Stable.

### 10.2. Chemical stability

Stable under normal conditions.

### 10.3. Possibility of hazardous reactions

Hazardous polymerization will not occur.

### 10.4. Conditions to avoid

High temperature. Open flame. Sparks.

### 10.5. Incompatible materials

Strong oxidizers. Strong acids.

### 10.6. Hazardous decomposition products

Fume. Carbon monoxide. Carbon dioxide. Nitrogen oxides (NOx).

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

Likely routes of exposure	: Ingestion; Inhalation; Skin and eye contact
Acute toxicity	: Not classified (Based on available data, the classification criteria are not met)

#### Silver (7440-22-4)

LD50 oral rat	> 2000 mg/kg
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 (Based on available data, the classification criteria are not met)

# PFI-DEV Silver Flexographic Ink

## Safety Data Sheet

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

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)
Potential Adverse human health effects and symptoms	: Under normal conditions of use, no adverse effects to health have been observed. 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.

### 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])

#### 12.2. Persistence and degradability

##### PFI-DEV Silver flexo ink

Persistence and degradability : Not established.

#### 12.3. Bioaccumulative potential

##### PFI-DEV Silver flexo ink

Bioaccumulative potential : Not established.

#### 12.4. Mobility in soil

No additional information available

#### 12.5. Other adverse effects

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 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

# PFI-DEV Silver Flexographic Ink

## Safety Data Sheet

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### 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

#### Silver (7440-22-4)

Listed on the United States TSCA (Toxic Substances Control Act) inventory  
Subject to reporting requirements of United States SARA Section 313

RQ (Reportable quantity, section 304 of EPA's List of Lists)	1000 lb
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SARA Section 313 - Emission Reporting	1.0 %
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### 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
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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

#### 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)

### 15.3. US State regulations

No additional information available

## SECTION 16: Other information

Revision date	: 02/06/2019
Other information	: None.

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.*