

SAFETY DATA SHEET

Issuing date 2014-08-21

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Version 2

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product name: FLEXX 50S/M5CA 406X100

Product code: 1015650

Supplier Carestream Health, Inc., 150 Verona Street, Rochester, New York 14608

Emergency telephone number
CHEMTREC: +1-703-527-3887 (INTERNATIONAL)
1-800-424-9300 (NORTH AMERICA)

For other information contact: 800-328-2910

Product Use: Conductive Film.

2. HAZARDS IDENTIFICATION

Classification

This product is a PET based conductive film with a coating that is comprised of silver nanowires and polymers. The product meets the definition as an article per the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200).

Not classified

Label elements

Emergency Overview

Appearance Film

Physical state Solid

Odor None

Hazards not otherwise classified (HNOC)

- Not applicable

Other Information

The toxicological properties of silver nanowires have not been fully investigated. Some studies suggest that exposure to some engineered nanoparticles can cause adverse health effects in lab animals. Silver nanoparticles may cause pulmonary inflammation and may be a weak skin sensitizer. Take precautions to prevent exposure.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS-No	Weight %	Trade Secret
Polyethylene terephthalate 25038-59-9	25038-59-9	50-100	*
Blend of HDPE and EVA MIXTURE	MIXTURE	15-40	*
Acrylic Polymers PROPRIETARY	PROPRIETARY	1-5	*
Binder PROPRIETARY	PROPRIETARY	<1	*
Silver 7440-22-4	7440-22-4	<0.1	*
Additives, Residuals, and Impurities MIXTURE	MIXTURE	<0.01	*

*The exact percentages (concentrations) have been withheld as trade secrets.

4. FIRST AID MEASURES

First Aid Measures

General advice	This product is not expected to cause any health or safety hazards when used as intended.
Eye contact	Not an expected route of exposure.
Skin contact	Wash hands thoroughly after handling.
Inhalation	Not an expected route of exposure.
Ingestion	Not an expected route of exposure.

Most important symptoms and effects, both acute and delayed

Main Symptoms None known.

Indication of any immediate medical attention and special treatment needed

Notes to physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

Water spray. Dry chemical. Carbon dioxide (CO₂).

Unsuitable Extinguishing Media

Do not use a solid water stream as it may scatter and spread fire.

Specific hazards arising from the chemical

Although the film base is a combustible material, it is not easily flammable. Considerable heating above ambient conditions is required before ignition and combustion can occur. The products of combustion depend on the burning conditions and are likely to include carbon monoxide, oxides of nitrogen and oxides of sulfur.

Hazardous Combustion Products

Carbon oxides. Sulfur oxides. Nitrogen oxides (NO_x).

Explosion Data

Sensitivity to Mechanical Impact None.

Sensitivity to Static Discharge None.

Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions Use personal protective equipment. For personal protection see section 8. During unexpected circumstances and elevated temperatures such as a fire, evacuate personnel to safe areas and use personal protective equipment to prevent exposure to volatiles.

Environmental precautions

Environmental precautions No special environmental precautions required. Do not allow material to contaminate ground water system.

Methods and material for containment and cleaning up

Methods for Containment No special requirements.

Methods for cleaning up Pick up and transfer to properly labeled containers.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities

Technical measures/Storage conditions Keep in a dry, cool and well-ventilated place.

Incompatible products None known.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters**Exposure Guidelines**

Chemical Name	ACGIH TLV	AIHA - Workplace Environmental Exposure Levels (WEELs) - TWAs	OSHA PEL	Advisory OEL
Silver 7440-22-4	TWA: 0.1 mg/m ³		TWA: 0.01 mg/m ³	

Appropriate engineering controls

Engineering Measures Ensure adequate ventilation. Apply technical measures to comply with the occupational exposure limits. Showers. Eyewash stations.

Individual protection measures, such as personal protective equipment

Eye/Face Protection No special protective equipment required.

Skin and body protection Protective gloves.

Respiratory protection None required under normal usage.

Hygiene measures Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL AND CHEMICAL PROPERTIES

Physical state	Solid	Odor	None
Appearance	Film	Odor Threshold	No information available
Color	Clear		

<u>Property</u>	<u>Values</u>	<u>Remarks/ • Method</u>
ph		
Melting point/range:		No information available
Boiling point/boiling range		No information available
Flash Point		No information available.
Evaporation rate		No information available
Flammability (solid, gas)		
upper flammability limit		
lower flammability limit		
Vapor pressure		No information available
Vapor density		No information available
Specific Gravity		No information available
Water Solubility		No information available
Solubility in other solvents		No information available
Partition coefficient: n-octanol/water		No information available
Autoignition temperature		No information available
Decomposition temperature		No information available
Viscosity, kinematic		No information available
Viscosity, dynamic		No information available
Explosive properties		No information available
Oxidizing Properties		Not applicable

<u>Other information</u>		Softening point	No information available
Molecular Weight			No information available
Density VALUE	No information available	Bulk Density VALUE	No information available

10. STABILITY AND REACTIVITY

Reactivity
None under normal use conditions.

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
None under normal processing.

Conditions to Avoid
Heat, flames and sparks.

Incompatible Materials
None known.

Hazardous Decomposition Products

Carbon oxides. Nitrogen oxides (NOx). Sulfur oxides.

11. TOXICOLOGICAL INFORMATION**Information on likely routes of exposure**

Product Information	The toxicological properties of silver nanowires have not been fully investigated. Some studies suggest that exposure to some engineered nanoparticles can cause adverse health effects in lab animals. Silver nanoparticles may cause pulmonary inflammation and may be a weak skin sensitizer. Take precautions to prevent exposure.
Inhalation	Not an expected route of exposure.
Eye contact	Not an expected route of exposure.
Skin contact	Expected to be a low hazard for recommended handling.
Ingestion	Not an expected route of exposure. Do not taste or swallow.

Toxicology data for the components

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Silver 7440-22-4	2000 mg/kg (Rat) Oral LD50 Rat >2000 mg/kg (Source: IUCLID)	-	-

Chemical Name	Other applicable information
Silver	The toxicological properties of silver nanowires have not been fully investigated. Some studies suggest that exposure to some engineered nanoparticles can cause adverse health effects in lab animals. Silver nanoparticles may cause pulmonary inflammation and may be a weak skin sensitizer. Take precautions to prevent exposure.

Information on toxicological effects

Symptoms None known.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Sensitization	No information available.
mutagenic effects	No information available.
Carcinogenicity	Contains no ingredient listed as a carcinogen.
Reproductive toxicity	No information available.
STOT - single exposure	No information available
STOT - repeated exposure	No information available
Chronic toxicity	Excessive absorption of silver compounds from chronic overexposure may result in argyria, a bluish-gray discoloration of the skin, eyes, and mucous membranes.
Aspiration Hazard	No information available.

Numerical measures of toxicity - Product Information**Unknown acute toxicity**

The following values are calculated based on chapter 3.1 of the GHS document Not applicable.

12. ECOLOGICAL INFORMATION**Ecotoxicity**

Contains materials that are very toxic to aquatic organisms. However, the environmental impact of the product in its intended form has not been fully investigated.

Chemical Name	Toxicity to algae	Toxicity to fish	Toxicity to microorganisms	Toxicity to daphnia and other aquatic invertebrates
Silver 7440-22-4		0.00155 - 0.00293: 96 h Pimephales promelas mg/L LC50 static 0.0062: 96 h Oncorhynchus mykiss mg/L LC50 flow-through 0.064: 96 h Lepomis macrochirus mg/L LC50 static		0.00024: 48 h Daphnia magna mg/L EC50 Static

Persistence and degradability

No information available.

Bioaccumulation:

No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste Disposal Methods

This material, as supplied, is not a hazardous waste according to Federal regulations (40 CFR 261). This material could become a hazardous waste if it is mixed with or otherwise comes in contact with a hazardous waste, if chemical additions are made to this material, or if the material is processed or otherwise altered. Consult 40 CFR 261 to determine whether the altered material is a hazardous waste. Consult the appropriate state, regional, or local regulations for additional requirements. Dispose of in accordance with local regulations. Can be landfilled or incinerated, when in compliance with local regulations.

Contaminated packaging

Do not re-use empty containers. Dispose of in accordance with local regulations.

Chemical Name	California Hazardous Waste Status
Silver 7440-22-4	Toxic

14. TRANSPORT INFORMATION

The information given below is provided to assist in documentation. It may supplement the information on the package. The package in your possession may carry a different version of the label depending on the date of manufacture. Depending on inner packaging quantities and packaging instructions, it may be subject to specific regulatory exceptions. Please consult the product packaging for further details.

DOT Not regulated

TDG Not regulated

ICAO/IATA Not regulated

IMDG/IMO Not regulated

For transportation information, go to: <http://ship.carestream.com>

15. REGULATORY INFORMATION

Product is an article. "Complies" indicates that the product, as an article, is not subject to chemical notification requirements.

International Inventories

TSCA	Complies
DSL/NDSL	Complies
EINECS/ELINCS	Complies
ENCS	Complies
IECSC	Complies
KECL	Complies
PICCS	Complies
AICS	Complies
NZIoC	Complies

Legend

EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
AICS - Australian Inventory of Chemical Substances
NZIoC - New Zealand Inventory of Chemicals

U.S. Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

Chemical Name	SARA 313 - Threshold Values %
Silver - 7440-22-4	1.0

SARA 311/312 Hazard Categories

Acute Health Hazard	No
Chronic Health Hazard	No
Fire Hazard	No
Sudden Release of Pressure Hazard	No
Reactive Hazard	No

Clean Water Act

Chemical Name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Silver		X	X	

Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 61)

This product does not contain any substances regulated as hazardous air pollutants (HAPS) under Section 112 of the Clean Air Act Amendments of 1990.

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

Chemical Name	Hazardous Substances RQs	Extremely Hazardous Substances RQs	SARA Product RQ
Silver	1000 lb		

TSCA

This product does not contain any chemicals regulated under TSCA Section 4, Section 5(a), Section 8(a) or Section 8(d).

U.S. State Regulations**California Proposition 65**

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Chemical Name	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Silver	X	X	X		

International Regulations

Mexico - Grade Minimum risk, Grade 0

Chemical Name	Carcinogen Status	Exposure Limits
Silver		Mexico: TWA 0.1 mg/m ³

16. OTHER INFORMATION

NFPA

Health Hazard 0

Flammability 0

Instability 0

HMIS

Health Hazard 0

Flammability 0

Physical Hazard 0

Revision Date

2014-08-21

Revision Note

(M)SDS sections updated

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet