

MATERIAL SAFETY DATA SHEET**SECTION 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

PRODUCT NAME: ECCOSHIELD® VY

DESCRIPTION: Solvent-based Silicone

INTENDED USE: **Electrically Conductive Caulking Compounds** - Highly conductive, non-hardening, caulking compound & sealer

COMPANY NAME: Emerson & Cuming Microwave Products, Inc.
ADDRESS: 28 York Ave, Randolph, MA 02368

EMERGENCY PHONE NUMBER CHEMTREC USA: 1-800-424-9300
 INTERNATIONAL: 703-527-3887 (COLLECT)

CONTACT (TITLE): Elizabeth Sinkiewicz
 Production Manager
 781-437-1731

DATE OF MSDS REVISION: 09-19-2011

SECTION 2. COMPOSITION AND INFORMATION ON INGREDIENTS

| ELEMENT | CAS NUMBER | WEIGHT (%) | OSHA PEL* (mg/m ³) | |
|---|------------|------------|--------------------------------|----------|
| | | | TWA | STEL |
| Silver and Silver-plated Copper Powders: | | 80-90 | | |
| Silver | 7440-22-4 | | 0.01 | NE |
| Copper | 7440-50-8 | | 1.0 | NE |
| 2-Butanone | 78-93-3 | <1 | 590 | NE [885] |
| Silicone Resins | | <10 | NE | NE |
| Xylene | 1330-20-7 | <10 | 435 [434] | NE [651] |
| Ethylbenzene | 100-41-4 | 1-2 | 435 [434] | NE [543] |

*ACGIH TLVs different from OSHA PELs are shown in brackets. NE = Not Established.

SECTION 3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: **WARNING!** Flammable material-keep away from heat, sparks, or open flame.

POTENTIAL HEALTH EFFECTS: Respiratory tract irritation, skin irritation, eye irritation

INHALATION:

High vapor concentrations may cause respiratory irritation, headaches, nausea, dizziness; may cause anesthetic effects or other temporary central nervous system effects. Severity of effects will be dependent upon vapor concentration and severity of exposure.

INGESTION:

Harmful if swallowed.

SKIN:.

Contains materials which cause moderate skin irritation. Prolonged or repeated exposure to the liquid may exert a defatting or drying action on the skin, possibly resulting in dermatitis. This product may cause skin sensitization/allergic skin reactions which may be severe in certain individuals; symptoms include rash, itching, hives, swelling of the extremities.

EYES:

Contains materials which may cause severe but reversible eye irritation.

CHRONIC HEALTH EFFECTS:

Excessive or prolonged contact with silver or silver compounds has been known to cause argyria, a blue-gray discoloration of the skin. Exposure to the filler material listed in Section 2 is unlikely to occur unless the product is applied in a manner which results in the generation of mists or fumes, or when machining of the cured product results in generation of dust particles.

TARGET ORGANS:

Nasal septum, skin, eyes, liver, kidneys (increased risk with Wilson's disease), central nervous system

CARCINOGENICITY:

Copper: EPA-D
2-Butanone: EPA-D; I
Xylene: EPA-D;I
IARC-3
TLV-A4
Ethylbenzene: EPA-D
IARC-2B
MAK-3A
TLV-A3

CONDITIONS AGGRAVATED BY EXPOSURE:

Exposure may aggravate preexisting skin, eye and/or respiratory disorders.

SECTION 4. EMERGENCY AND FIRST AID MEASURES

INHALATION:

Remove victim to fresh air. Provide oxygen if breathing is difficult. Give artificial respiration if not breathing. Get immediate medical attention.

INGESTION:

DO NOT induce vomiting. If victim is conscious and alert, dilute by giving water to drink; never give anything by mouth to a drowsy, unconscious, or convulsing person. Get immediate medical attention.

SKIN:

Remove any contaminated clothing and flush the affected area of the skin thoroughly

with plenty of water. Follow by washing with soap and water. Get medical attention if irritation persists. Do not reuse contaminated clothing until properly cleaned.

EYES: Immediately flush eyes thoroughly with water for at least 15 minutes while holding eyelids open. Get immediate medical attention.

MEDICAL TREATMENT: Treat symptoms and eliminate overexposure.

SECTION 5. FIRE FIGHTING MEASURES

FLASH POINT (°F): 81, based on Xylene

EXPLOSIVE LIMITS: lel: 1.1% uel: 7.0% (for Xylene)

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical, foam

SPECIAL FIREFIGHTING PROCEDURES: Firefighters/rescue personnel should wear positive pressure self contained breathing apparatus and full protective equipment. Cool exposed containers with water to prevent pressure buildup. If large quantities of material are involved, evacuate area and fight fire from a safe distance.

UNUSUAL FIRE/EXPLOSION HAZARDS: Decomposition and combustion products may be toxic. Closed containers may violently rupture under fire conditions. Vapors may form flammable mixtures with air. Vapors from this product are heavier than air, and may travel a considerable distance to a source of ignition and flash back.

NFPA AND HMIS RATING: Flammability: 3 Health: 2
Reactivity: 0 Special Hazards: none

AUTOIGNITION TEMPERATURE: NA

SECTION 6. ACCIDENTAL RELEASE MEASURES

Spill response operations must be conducted in accordance with the provisions of OSHA 29 CFR 1910.120. Review the entire MSDS before proceeding with spill response.

SMALL SPILLS: Activate all explosion-proof exhaust ventilation in the immediate spill area. Extinguish open flames and eliminate all other sources of ignition. Wipe up, or absorb with vermiculite or other similar material. Wash area with soapy water to remove residue. Collect absorbed material and water rinses in appropriate chemical waste containers. Dispose of as an ignitable waste in accordance with all current Federal, State, and local regulations.

LARGE SPILLS: Evacuate all personnel not directly involved with control/cleanup operations from the immediate spill area. Extinguish open flames and all other sources of ignition. Activate explosion-proof exhaust ventilation in the immediate spill area. Shut off the source of the release if this can be done without risk of injury. Use only spill response equipment approved for use in potential flammable/explosive environments. Dike area to contain the spill and prevent releases to sewers or other waterways. Collect spilled material for salvage/disposal. Apply absorbent material to soak up residue. Wash area with soapy water. Prevent runoff from entering sewers or other water- ways. Collect absorbed material and water rinses in appropriate waste containers. Dispose of as an ignitable waste in accordance with Federal, State, and local regulations.

SECTION 7. HANDLING AND STORAGE

The recommendations described in this section are provided as general guidance for minimizing exposure when handling this product. Because usage conditions will vary depending on customer application, specific safe handling procedures should be developed by a person knowledgeable in the intended usage conditions and equipment. Employees must be properly trained in safe handling of this product prior to use.

PERSONAL PROTECTION: This product can cause severe eye irritation. Prevent eye contact through the use of splash-proof chemical goggles or face shield. This product can cause skin irritation. Wear appropriate protective gloves to minimize skin contact. If necessary, a proper chemical-resistant apron and additional impervious clothing should be used to minimize skin contact and prevent contamination of clothing. Normal work clothing should be washed before re-use. Wash hands and face thoroughly after handling this product and before eating, drinking or smoking. Emergency eye wash facilities and safety shower must be available.

VENTILATION RECOMMENDATIONS AND RESPIRATORY PROTECTION: Provide effective explosion-proof mechanical exhaust ventilation to draw vapors, mists, or fumes generated during processing away from the worker and prevent routine inhalation. Ventilation must be sufficient to maintain airborne concentrations of Section 2 ingredients below their PEL/TLV values. Use an appropriate, properly fitted respirator if exposures exceed PEL/TLV values. The type of respiratory protection selected will depend upon the conditions of use. Observe OSHA regulations for respiratory protection (29 CFR 1910.134).

STORAGE: Store in a cool, dry location with adequate ventilation. Keep container tightly sealed when not in use. Do not store near heat, sparks or open flame. To prevent fire or explosion risk from static electricity accumulation and discharge, effectively ground storage and transfer containers in accordance with NFPA standards. Empty container may contain flammable liquid or vapor residue. Do not cut, weld, solder, drill, grind or expose container to heat, flame or other source of ignition. They may explode and cause injury or death.

SECTION 8. EXPOSURE CONTROLS, PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Ventilation must be sufficient to maintain airborne concentrations of Section 2 ingredients below their PEL/TLV values.

RESPIRATORY PROTECTION: Provide effective explosion-proof mechanical exhaust ventilation to draw vapors, mists, or fumes generated during processing away from the worker and prevent routine inhalation. Use an appropriate, properly fitted respirator if exposures exceed PEL/TLV values. The type of respiratory protection selected will depend upon the conditions of use. Observe OSHA regulations for, respiratory protection (29 CFR 1910.134).

| | |
|------------------------------------|---|
| PROTECTIVE GLOVES: | Wear appropriate protective gloves to minimize skin contact. |
| EYE PROTECTION: | This product can cause severe eye irritation. Prevent eye contact through the use of splash-proof chemical goggles or face shield. |
| OTHER PROTECTIVE EQUIPMENT: | If necessary, a proper chemical-resistant apron and additional impervious clothing should be used to minimize skin contact and prevent contamination of clothing. Normal work clothing should be washed before reuse. |
| OTHER REQUIREMENTS: | Wash hands and face thoroughly after handling this product and before eating, drinking or smoking. Emergency eye wash facilities and safety shower must be available. |

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|-----------------------------|
| APPEARANCE: | Silver-gray paste |
| ODOR: | characteristic solvent odor |
| VOLATILE ORGANIC COMPOUND CONTENT: | <12% by weight |
| PHYSICAL STATE: | semi-solid |
| BOILING POINT (°F): | Not Determined |
| VAPOR PRESSURE @ 25°C: | <3mm Hg |
| EVAPORATION RATE: | NA |
| SPECIFIC GRAVITY (WATER=1): | 3.9-4.3 |
| VAPOR DENSITY: | Heavier than air |
| SOLUBILITY IN WATER: | Insoluble |

SECTION 10. STABILITY AND REACTIVITY

Avoid storage in open containers, exposure to open flame or uncontrolled exposure to heat, uncontrolled mixing with curing agents or exposure to incompatible substances. Product is stable under normal handling and storage conditions. Review reactivity data concerning conditions to avoid and incompatible substances.

INCOMPATIBILITY: Strong oxidizers, acids, and bases.

HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, carbon dioxide, aldehydes, silver and copper compounds, silicates, acids and other organic substances may be formed during combustion. The chemical nature and quantity of decomposition by-products will vary widely depending on the conditions of combustion

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11. TOXICOLOGICAL INFORMATION

Toxicity not established for product as a whole. Silver: LD50 Rat (male) oral >5000 mg/kg, LD50 Rat (male) dermal > 2000 mg/kg. Copper: LD₅₀ (mouse, interperitoneal) 3,500 µg/kg. 2-Butanone: LC50 Rat inhalation

>5000 ppm/6 hr, LD50 Rat oral 3400 mg/kg bw. Xylene: LD50 Rat oral 10 mL/kg, LC50 Rat inhalation 6,350 ppm/4 hr. Ethylbenzene: LD50 Rat oral 3500 mg/kg.

SECTION 12. ECOLOGICAL INFORMATION

Silver: Ranges of element concentrations (in microgram/g) found in fish and invertebrate species Ag < 0.3-5.9. At Ballona Lagoon, elevated levels silver were found in the bivalve *Tagelus californianus* (5.9 ug/g).

Copper: In freshwater, acute toxicity decreases as hardness increases. At a hardness of 100 mg/l, acute National Ambient Water Quality Criterion is 18 µg/l and chronic NAWQ is 12 µg/l. In saltwater, acute sensitivities of aquatic life range from 5.8 µg/l for blue mussel to 600 µg/l for green crab. Freshwater plants have similar sensitivities as freshwater animals. Lowest chronic value for aquatic plants is 1 µg/l. Lowest Observed Effect Concentration (LOEC) for terrestrial plant (little bluestem) is 100 mg/kg. Because many copper compounds and complexes are readily soluble, copper is among the more mobile heavy metals in soil and other surface environments. The major process that limits the environmental mobility of copper is adsorption to organic matter, clays, and other materials. As an essential nutrient, copper is accumulated by plants and animals, although apparently it is not generally biomagnified. Bioconcentration factors in freshwater species range from zero for the bluegill to 2,000 for the alga *Chlorella regularis*. Among saltwater species, the highest bioaccumulation factors are those for the bivalve mollusks. Oysters can bioaccumulate copper up to 28,200 times without any significant mortality.

2-Butanone: If released to air, a vapor pressure of 90.6 mm Hg at 25 deg C indicates methyl ethyl ketone will exist solely as a vapor in the atmosphere. Vapor-phase methyl ethyl ketone will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 14 days. Methyl ethyl ketone is expected to undergo direct photolysis by sunlight with a half-life of about 4 days. If released to soil, methyl ethyl ketone is expected to have very high mobility based upon Koc values of 29 and 34 obtained in silt loams. Volatilization from moist soil surfaces is expected to be an important fate process based upon a Henry's Law constant of 5.69×10^{-5} atm-cu m/mole. Methyl ethyl ketone may volatilize from dry soil surfaces based upon its vapor pressure. The volatilization half-life of methyl ethyl ketone from silt and sandy loams was measured as 4.9 days. This compound is expected to biodegrade under aerobic and anaerobic conditions in soil. If released into water, methyl ethyl ketone is not expected to adsorb to suspended solids and sediment based upon the Koc values. Methyl ethyl ketone was shown to biodegrade 89% in 20 days in fresh water and 69% in 20 days in salt water. Volatilization from water surfaces is expected to be an important fate process based upon this compound's Henry's Law constant. Estimated volatilization half-lives for a model river and model lake are 16 hours and 7.3 days, respectively. An estimated BCF of 3 suggests the potential for bioconcentration in aquatic organisms is low. Hydrolysis is not expected to be an important environmental fate process since this compound lacks functional groups that hydrolyze under environmental conditions.

Xylene: If released to air, vapor pressures ranging from 6.61-8.80 mm Hg at 25 deg C of the individual isomers indicate xylenes will exist solely in the vapor phase in the atmosphere. Vapor-phase xylenes will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-lives for this reaction in air are estimated to be 16-28 hours. Xylenes do not contain chromophores that absorb at wavelengths >290 nm and therefore are not expected to be susceptible to direct photolysis by sunlight. If released to soil, xylenes are expected to have very high to moderate mobility based upon Koc values ranging from 39-365 for the individual isomers. Volatilization from moist soil surfaces is expected to be an important fate process based upon Henry's Law constant values ranging from 5.18×10^{-3} to 7.18×10^{-3} atm-cu m/mole for the individual isomers. Xylenes may volatilize from dry soil surfaces based upon the range of vapor pressure values. Complete degradation of

xylenes in aerobic soil and sediment microcosms has been observed with lifetimes ranging from 5-115 days; however, biodegradation of xylenes may proceed more slowly under anaerobic conditions. If released into water, xylenes are not expected to adsorb to suspended solids and sediment based upon the range of Koc values. In general, it has been found that xylenes are biodegraded in groundwater samples under aerobic conditions and may be degraded under anaerobic denitrifying conditions. Volatilization from water surfaces is expected to be an important fate process based upon the range of Henry's Law constant values. Estimated volatilization half-lives for a model river and model lake are 3 hours and 4 days, respectively. BCF values ranging from 6-23.4 for the individual isomers suggest the potential for bioconcentration in aquatic organisms is low. Hydrolysis is not expected to be an important environmental fate process since these compounds lack functional groups that hydrolyze under environmental conditions.

Ethylbenzene: If released to air, a vapor pressure of 9.6 mm Hg at 25 deg C indicates ethylbenzene will exist solely as a vapor in the ambient atmosphere. Vapor-phase ethylbenzene will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 55 hr. If released to soil, ethylbenzene is expected to have moderate mobility based upon an estimated Koc of 520. Volatilization from moist soil surfaces is expected to be an important fate process based upon a Henry's Law constant of 7.88×10^{-3} atm-cu m/mole. Ethylbenzene may volatilize from dry soil surfaces based upon its vapor pressure. Biodegradation in soil takes place via nitrate-reducing processes. If released into water, ethylbenzene may adsorb to suspended solids and sediment in water based upon the estimated Koc. Biodegradation in a gasoline contaminated aquifer ranged from 10-16 days under aerobic conditions. Ethylbenzene was degraded in 8 days in groundwater and 10 days in seawater as a component of gas oil. Volatilization from water surfaces is expected to be an important fate process based upon this compound's Henry's Law constant. Estimated volatilization half-lives for a model river and model lake are 1.1 and 99 hrs, respectively. Measured BCFs of 0.67 to 15 suggest the potential for bioconcentration in aquatic organisms is low. Hydrolysis is not expected to occur due to the lack of hydrolyzable functional groups.

SECTION 13. DISPOSAL CONSIDERATIONS

Maximize product recovery for reuse or recycling. Waste must be disposed of in accordance with federal, state and local environmental control regulations. If discarded in its purchased form, this product would not be a hazardous waste either by listing or by characteristic. Under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste (40 CFR 261.20-24). Use may also generate liquid wastes with metal concentrations in excess of those permitted through pretreatment or direct discharge NPDES requirements. Appropriate analyses should be conducted to ensure compliance with existing wastewater permits.

SECTION 14. TRANSPORT INFORMATION

DOT HAZARDOUS MATERIAL DESCRIPTION: Not Applicable
PROPER SHIPPING NAME: Not Applicable
DOT HAZARD CLASS: 3
DOT ID: 1175 (Ethylbenzene), 1193 (2-Butanone)
CANADIAN TRANSPORTATION OF DANGEROUS GOODS CLASSIFICATION: 130 (Ethylbenzene), 127 (2-Butanone)

SECTION 15. REGULATORY INFORMATION

TSCA Status: All components of this product are listed in the EPA Toxic Substance Control Act Inventory

SARA Status: The components listed in Section 2 which are substances regulated by the SARA Section 313 amendments to RCRA are as follows: Xylene (1330-20-7), Copper (7440-50-8), Silver (7440-22-4), 2-Butanone (78-93-3), Ethyl Benzene (100-41-4).

SECTION 16. OTHER INFORMATION

DISCLAIMER OF LIABILITY

The information contained herein is based upon data considered true and accurate. However, Emerson & Cuming Microwave Products makes no warranties, express or implied, as to the accuracy or adequacy of the information contained herein or the results to be obtained from the use thereof. This information is offered solely for the user's consideration, investigation and verification. Since the use and conditions of use of this information and the material described herein are not within the control of Emerson & Cuming Microwave Products, Emerson & Cuming Microwave Products assumes no responsibility for injury to the user or third persons. The material described herein is sold only pursuant to Emerson & Cuming Microwave Products' Terms and Conditions of Sale, including those limiting warranties and remedies contained therein. It is the responsibility of the user to determine whether any use of this data and information is in accordance with applicable federal, state or local laws and regulations.