

MATERIAL SAFETY DATA SHEET

This Material Safety Data Sheet complies with the United States Occupational Safety and Health Administration (OSHA) Hazard Communication Standard, 29 CFR 1910.1200.

1. Product and Supplier Identification

Product: Black Patina

Product Use: Wipe on metal plating solution for stained glass crafts.

Supplier: NOVACAN INDUSTRIES LTD.
856 Washington Drive
Port Moody, BC V3H 3K8
Telephone: (888) 931-6422
Transport Emergency Telephone: +1(250) 263.2124

Manufacturer: As above

2. Composition

| Component | % (w/w) | Exposure Limits |
|----------------------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------|
| Nitric Acid (CAS No.7697-37-2) | 9-11 | PEL-TWA 5 mg/m ³ TLV-STEL 10 mg/m ³ |
| Selenium Dioxide (CAS No.7746-08-4) | 1-2 | PEL-TWA 0.2 mg/m ³ as selenium TLV-TWA 0.2 mg/m ³ as selenium Selenium dioxide is a suspected carcinogen |
| Copper Sulphate (CAS No. 7758-98-7) | 5-7 | PEL-TWA 1 mg/m ³ as copper TLV-TWA 1 mg/m ³ as copper |

3. Hazards Identification

Routes of Entry: (under normal conditions of use)

Skin Contact: Moderate Eye Contact: Major Ingestion: Moderate Inhalation: Major

Effects of Short-Term (Acute) Exposure:

Inhalation: Selenium is a severe irritant with immediate or delayed effects: cough, difficult breathing, chills, garlic breath, fever, headache, chemical pneumonia, and bronchial spasms. Nitric acid vapors are corrosive to the nose, throat, and mucous membranes. Prolonged exposure may result in severe irritation and tissue damage.

Skin Contact: Contact with liquid can cause severe irritation, burns. Vapor or mist may cause redness, irritation and burns if contact is prolonged. May lead to dermatitis or sensitization.

Eye Contact: Low concentrations of vapor or mist (10 - 35 ppm) can be immediately irritating and result in redness. Concentrated vapor, mist or splashed liquid can cause severe irritation, burns and permanent blindness.

Hazards Identification, continued

Ingestion: Liquid can cause severe corrosive burns to mouth, throat, esophagus and stomach. Symptoms may include difficulty in swallowing, intense thirst, nausea, vomiting, diarrhea, kidney damage, gastrointestinal disorders, and in severe cases, collapse and death. Small amounts of acid which enter the lungs during ingestion or vomiting (aspiration) can cause serious lung injury and death.

Effects of Long-Term (Chronic) Exposure:

Repeated and prolonged exposure to low concentrations of mist or vapor can cause discolouration and damage to tooth enamel, bleeding of the nose and gums, gastrointestinal symptoms, and chronic bronchitis and gastritis. Repeated exposure to low concentrations of liquid, mist or vapour can cause redness, swelling, sensitization, and pain (dermatitis). Metallic taste and garlic breath are signs of selenium absorption. No evidence of carcinogenicity in human studies. This product does not accumulate in the body.

Medical Conditions Aggravated By Exposure:

Pre-existing respiratory and skin disorders.

4. First Aid Measures

Eye Contact: Flush contaminated eye(s) with lukewarm, gently running water for 30 minutes, holding eyelids open. Seek medical attention if irritation persists.

Skin Contact: Wash affected area immediately with mild soap and water and continue for 15 minutes. If irritation persists, seek immediate medical attention. Remove any contaminated clothing and launder clothing before reuse.

Inhalation: If victim has been exposed to vapors remove to fresh air. If breathing has stopped, a trained person should perform artificial respiration. Get medical attention immediately.

Ingestion: If small amounts have been ingested, **do not induce vomiting**. Dilute contents of stomach with 1-2 glasses of water. If large amounts have been ingested, see a doctor immediately for gastric lavage with a cuffed endotracheal tube. If vomiting occurs naturally have victim lean forward to reduce risk of aspiration. Seek immediate medical attention.

5. Fire Fighting Measures

| | |
|-----------------------------------------|--------------------------------------------------------------------|
| Flash point: | Not Applicable |
| Autoignition temperature: | Not applicable. See information under "Fire Fighting Instructions" |
| Lower Explosive Limit: | Not established |
| Upper Explosion Limit: | Not established |
| Sensitivity to Impact: | Not sensitive. |
| Sensitivity to Static Discharge: | Not sensitive. |

Hazardous Combustion Products: Nitrogen oxides, toxic selenium and hydrogen selenide fumes, and if heated to dryness, copper fume may be produced.

Extinguishing Media: No specific recommendation. Use media to suppress surrounding fire.

Fire Fighting Measures, continued

Fire Fighting Instructions: Do not enter confined fire space without proper personal protection. Use approved positive pressure self-contained breathing apparatus. Do not use water except as a fog. Cool surrounding containers with water spray. Prevent runoff to sewers and waterways. Treat as dilute nitric acid and selenious acid solution. May produce highly toxic selenium fumes and Hydrogen Selenide. Flammable hydrogen gas may be liberated from contact with some metals. Toxic fumes of SO_x may be released above 400°C

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) HAZARD INDEX:

HEALTH: 3 - Very short exposure could cause serious temporary or residual injury requiring immediate attention.

FLAMMABILITY: 0 - Will not burn.

REACTIVITY: 1 - Normally stable but can become unstable at elevated temperatures and pressures, or may react non-violently with water.

SPECIFIC HAZARDS: Corrosive, oxidizing material

6. Accidental Release Measures

Personal Protection: Evacuate unnecessary personnel from spill area. Wear appropriate personal protective equipment. Ventilate area. Do not touch spilled product without proper personal protection. See Section 8 for proper protective equipment to be worn while cleaning an accidental spill.

Environmental Precautions: Implement spill control plan. Stop or reduce leak if safe to do so. Prevent from entering sanitary or storm sewers, waterways, or confined spaces. Use inert materials such as earth or sand to form dike. Keep from contacting aquatic life.

Remedial Measures: Restrict access to area until completion of cleanup. Ensure cleanup is conducted by trained personnel only. Use all appropriate personal protective equipment. For small spills: absorb with neutralizing materials such as soda ash or lime and collect in sealed containers. Flush area with water. For large spills, contain and collect spilled material if possible. Notify government occupational health and safety and environmental authorities as per applicable regulations.

7. Handling and Storage

Handling Procedures: Prevent release of vapor or mist into workplace air. Ensure adequate ventilation. Have emergency equipment readily available. If diluting, slowly add product to the water to avoid boiling or splattering. Keep containers closed when not in use. Wash face and hands thoroughly after handling and before eating, drinking, or using tobacco products.

Storage: Store in a cool, dry, well ventilated area, out of direct sunlight and away from heat sources. Store away from incompatible materials such as oxidizing materials, reducing materials, and strong bases. Keep storage area separate from populated work areas.

8. Exposure Controls, Personal Protection

Engineering Controls: Use general or local exhaust ventilation to maintain exposure below the exposure limits.

Respiratory Protection: If respiratory protection is required, NIOSH recommends for nitric acid vapour or mist in air:

Up to 25 ppm: Chemical cartridge respirator with inorganic acid cartridge(s), powered air-purifying respirator with appropriate cartridge(s), Supplied Air Respirator (SAR), or a full face-piece SCBA.

Exposure Controls, Personal Protection, continued

IDLH Conditions (25 ppm) or Planned Entry in Unknown Concentrations: Positive pressure, full face-piece SCBA, or positive pressure full face-piece SAR with an auxiliary positive pressure SCBA.

Escape: Gas mask with canister, or escape type SCBA.

NOTE: Air purifying respirators do not protect against oxygen deficient atmospheres.

Skin protection: Wear impervious gloves and boots and/or other protective clothing according to circumstances.

Eye and Face Protection: Eye protection is required. Chemical safety goggles are recommended. The wearing of contact lenses is not recommended.

Footwear: As required by worksite rules.

Other: Have a safety shower and eye wash station readily available in the immediate work area.

9. Physical and Chemical Properties

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|------------------------|-----------------------------|-------------------------------|---------------------|
| Appearance: | Clear medium blue liquid | Vapor Density: | Not determined |
| Odor: | Acrid odor | Freezing Point | Not determined |
| Odor Threshold: | Not determined | Boiling Point: | 104 °C |
| pH: | < 1 | Critical Temperature: | Not applicable. |
| Vapor Pressure: | Not determined | Relative Density: | 1.08 (water = 1) |
| Solubility: | Completely soluble in water | Partition Coefficient: | No data |
| | | Evaporation Rate: | Not determined |

10. Stability and Reactivity

Chemical Stability: Stable. Avoid heat – releases toxic gases with heat.

Incompatibility: Very corrosive to most metals, producing flammable hydrogen gas. Reacts violently with bases to produce heat. Reacts with reducing agents to produce heat, fire and flammable hydrogen gas. Reacts with oxidizing agents to produce heat. Reacts with carbides, turpentine, phosphorus hydrogen sulphide, organic materials, and alkalis. Contact with explosives may cause detonation. Reacts with cyanides to produce toxic cyanide gas, and sulphides to produce toxic hydrogen sulphide gas.

Hazardous Decomposition Products: Thermal decomposition liberates toxic corrosive fumes of nitrogen oxides, hydrogen nitrate, copper oxides, hydrogen selenide, and selenium fumes.

Hazardous Polymerization: Will not occur

11. Toxicological Information

Acute Exposure: The theoretical LD₅₀ (rat/oral) for Black Patina is 1913 mg/kg

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|-------------------------------|------------------------------------------------------------|
| Chronic Exposure: | See Section 3. |
| Exposure Limits: | See Section 2. |
| Irritancy: | See Section 3. |
| Sensitization: | See Section 3. |
| Carcinogenicity: | Selenium dioxide is a suspected carcinogen. |
| Teratogenicity: | No reports for ingestion or inhalation of copper compounds |
| Reproductive toxicity: | Not available |
| Mutagenicity: | Inconclusive results |
| Synergistic products: | None reported. |

12. Ecological Information

Environmental toxicity: Copper sulphate is a severe marine pollutant.

Biodegradability: No data available.

13. Disposal Considerations

Place used and contaminated material and packagings into suitable containers and dispose of as controlled waste. Review and follow all local, state, and national regulations.

14. Transport Information

Department of Transport (49 CFR): Corrosive Liquid, Acidic, Inorganic, n.o.s. (contains Nitric Acid), Class 8, UN 3264, P.G. II

International Air Transport Association (IATA): Corrosive Liquid, Acidic, Inorganic, n.o.s. (contains Nitric Acid), Class 8, UN 3264, P.G. II

1 Gallon Containers

International Maritime Organization (IMO): Corrosive Liquid, Acidic, Inorganic, n.o.s. (contains Nitric Acid, Copper Sulphate), Class 8, UN 3264, P.G. II, Marine Pollutant
EmS F-A, S-B, Stowage Category "B", Clear of Living Quarters

8 Ounce Containers

International Maritime Organization (IMO): Corrosive Liquid, Acidic, Inorganic, n.o.s. (contains Nitric Acid, Copper Sulphate), Class 8, UN 3264, P.G. II, Limited Quantity
EmS F-A, S-B, Stowage Category "A", Clear of Living Quarters

15. Regulatory Information

UNITED STATES – FEDERAL REGULATIONS:

TOXIC SUBSTANCES CONTROL ACT (TSCA): All components are listed in the inventory.

OSHA, 29 CFR 1910, Subpart Z: Meets the criteria for a hazardous substance.

Regulatory Information, continued

CERCLA, 40 CFR 302: RQ, Cupric sulphate 4.54 Kg (10 pounds), Nitric acid, 454 Kg (1000 pounds), Selenium dioxide 4.54 Kg (10 pounds)

SARA 302, 40 CFR 355: Nitric Acid listed. Threshold Planning Quantity 454 Kg (1000 pounds)

SARA 313, 40 CFR 372: Nitric Acid is subject to the reporting requirements.

SARA 311/312, 40 CFR 370: Immediate (Acute) Health, Delayed (Chronic) Health.

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| 16. Other Information |
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Original Preparation Date: September 25, 2001

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Comments: This Material Safety Data Sheet was prepared using information provided by Novacan Industries Ltd., and CCINFO. The information in the Material Safety Data Sheet is offered for your consideration and guidance when exposed to this product. Novacan Industries Ltd., expressly disclaims all expressed or implied warranties and assumes no responsibilities for the accuracy or completeness of the data contained herein. The data in this MSDS does not apply to use with any other product or in any other process.

Revisions: Reviewed and Re-issued December 11, 2007