

Rapid Electroplating Process, Inc SAFETY DATA SHEET



Conforms to: 29CFR 1900.1200 App D
Complies with Canadian WHMIS MSDS Requirements
Based on CCOHS: A Brief Summary of Canadian Requirements (Apr 2014)
Conforms to Regulation (EC) No.453/2010/EU (REACH)

1. IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY

| | |
|--------------------------|---------------------------------------------------------------------------------------------|
| Product Identification: | Cadmium Plating Materials: Cadmium Coatalyte #312 Cadmium Anode #532, 542, or 552 |
| Product Use: | Selective Electroplating |
| Manufacturer: | Rapid Electroplating Process, Inc. 2901 W. Soffel Ave. Melrose Park, IL 60160 USA |
| Telephone | 00-1-708-344-2504 (9:00 A.M. -4:30 PM, CST/CDT, M-F) |
| Emergency telephone: | In U.S.--CHEMTREC 1-800-424-9300 (24 Hrs) Outside U.S.-- 001-703-527-3887 (call collect) |
| Date of Issue (Version): | Jan 2018 |

CANADIAN SUPPLIER
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2. HAZARDS IDENTIFICATION

Note
Solid metallic anodes are generally classified as “articles” and do not constitute a hazardous material in benign, solid form under the definitions of the OSHA Hazard Communication Standard (29 CFR 1910.1200) or DOT/IATA transportation rules. However, some hazardous elements can be formed as a part of their normal use in selective electroplating. Although not considered a normal end use of our anodes, hazardous conditions can also be created by machining/welding/etc. the anode creating dust/fume or other conditions. The following classification information and warnings are for the hazardous elements which may be released in conjunction with the associated RAPID coatalyte (electrolyte) during normal use in selective electroplating.

Unless noted, hazard information presented here is based on the properties of the full strength constituent chemicals with RAPID product concentrations > 1 wt% (>0.1 wt% if identified as carcinogenic). This product contains diluted forms of the chemicals which should be taken into account when evaluating the hazards of the product as a whole.

| Hazard | Category | Hazard | Category |
|---------------------------------|-----------------------------------|------------------------|----------------------------------------------------------------------------|
| Acute Toxicity | -- | Reproductive Hazard | -- |
| Oral | Not Classified (ATE Product LD50) | Germ Cell Mutagenicity | Muta. Cat. 2 (Cadmium) (EU) |
| Dermal | Unknown | Reproductive Toxicity | Repr. Cat. 2 (Cadmium) (EU) |
| Inhalation Dusts/Mists | Unknown | Lactation | Unknown |
| Skin Corrosion | 1B (pH<2, in vitro test) | Target Organ Toxicity | -- |
| Serious Eye Damage/Irritation | 1 (pH<2, in vitro test) | Single Exposure | Eyes, skin, respiratory system, mucous membranes, kidneys, prostate, blood |
| Carcinogenicity | 1 (Cadmium Compounds-IARC/NTP) | Chronic Exposure | unknown |
| Respiratory/Skin Sensitizations | Unknown | Aspiration Hazard | Unknown |

| Hazard Category | Signal Word | Precautionary Statements: | Hazard Symbol(s) (GHS): |
|-------------------------------|-------------|-----------------------------------------|-------------------------|
| 1 (Skin Corrosion/Irritation) | Danger | Causes severe skin burns and eye damage | |
| 1A (Carcinogenicity) | Danger | May cause cancer | |
| 1 (Hazardous to Environment) | Caution | May impact the environment | |

Hazard Statements (US-GHS):

| ID | Hazard Statement |
|--------|-------------------------------------------------------------------------------------------|
| EUH210 | Safety data sheet available on request. |
| EUH401 | To avoid risks to human health and the environment, comply with the instructions for use. |
| H301 | Toxic if swallowed |
| H302 | Harmful if swallowed |
| H315 | Causes skin irritation |
| H320 | Causes eye irritation |
| H331 | Toxic if inhaled |
| H332 | Harmful if inhaled |
| H340 | May cause genetic defects |

| ID | Hazard Statement |
|------|------------------------------------------|
| H350 | May cause cancer |
| H360 | May damage fertility or the unborn child |
| H401 | Toxic to aquatic life |

Precautionary Statements (US-GHS):

| ID | Precautionary Statement |
|--------------|---------------------------------------------------------------------------------------------------------------------------------|
| P102 | Keep out of reach of children |
| P103 | Read label before use |
| P220 | Keep/Store away from clothing/cyanides/combustible materials |
| P233 | Keep container tightly closed |
| P234 | Keep only in original container |
| P235 | Keep cool |
| P261 | Avoid breathing dust/fume/gas/mist/vapours/spray |
| P262 | Do not get in eyes, on skin, or on clothing |
| P264 | Wash exposed skin thoroughly after handling |
| P270 | Do not eat, drink or smoke when using this product |
| P271 | Use only outdoors or in a well-ventilated area |
| P273 | Avoid release to the environment |
| P280 | Wear protective gloves/protective clothing/eye protection/face protection |
| P302+352 | IF ON SKIN: Wash with soap and water |
| P305+351+338 | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing |
| P307+311 | IF exposed: Call a POISON CENTER or doctor/physician |
| P332+313 | If skin irritation occurs: Get medical advice/attention |
| P337+313 | If eye irritation persists get medical advice/attention |
| P405 | Store locked up |
| P501 | Dispose of contents/waste/container according to national/state/local regulations |

Hazards Not Otherwise Classified

None known.

Ingredients with Unknown Toxicity

None >1%

3. COMPOSITION/INFORMATION ON INGREDIENTS

Anode (Cadmium Anode #532, 542, or 552):

| Chemical Name | Common Name | CAS-No | Concentration (Wt%) |
|-----------------------|-------------|------------------------|---------------------|
| Cadmium (Metal) | Anode | 7440-43-9 | >99 |
| Stainless Steel, 316 | Backing | Not Applicable (SS316) | Not Applicable |
| Dynel (acrylo), Woven | Sleeve_y1 | Not Applicable (Dynel) | Not Applicable |

Note

The anode backing/stem is intended to provide mechanical stiffness as well as electrical continuity and is not intended to be processed in any way that could create a dust/or fume hazard to the worker. 316 Stainless Steel has a very high corrosion resistance in a variety of chemical environments. Consequently, the backing/stem is not expected to evolve hazardous chemicals during the selective plating process.

The sleeve serves to carry and maintain the plating chemicals between the metallic anode and the workpiece as well as provide electrical contact insulation between the metallic anode and the workpiece. As such, it is not expected to participate in chemical reactions which will evolve hazardous chemicals during the selective plating process.

Coatalyte/Activator (Cadmium Coatalyte #312):

| Chemical Name | Common Name | CAS-No | Concentration (Wt%) |
|-------------------------------------------------------------------------|-------------|----------------------|---------------------|
| Cadmium Sulfate Octahydrate | - | 10124-36-4/7790-84-3 | < 10 |
| Sulfuric Acid | - | 7664-93-9 | < 10 |
| Components not designated as hazardous or <1 wt% or carcinogen <0.1 wt% | Various | Various | > 80 |

Note

Because of manufacturing variances and possible product improvements, the compositions and physical properties listed here should be considered representative. The values listed should not be construed as specifications.

4. FIRST AID MEASURES

| Description of First Aid Measures: | |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General Information: | Move to fresh air; flush affected area with water (especially under eyelids if eyes affected); remove contaminated clothing; treat for shock as necessary. Never give anything by mouth to an unconscious person. |
| Following Inhalation: | Move to fresh air. If breathing stops, give artificial respiration/oxygen as appropriate. Call physician. |
| Following Eye contact: | Rinse with clear water, especially under eyelid. Consult Physician. |
| Following Skin contact: | Wash affected area with soap and water. Consult physician if irritation occurs. |
| Following Ingestion: | Call a poison control center (PCC)/physician/emergency responders immediately and follow instructions. If victim is conscious: Rinse mouth. If directed, administer water or milk and/or oxygen if symptoms develop. Do not administer emetic or induce vomiting. Never give anything by mouth to an unconscious person. If victim has stopped breathing: Call a poison control center (PCC)/physician/emergency responders immediately and follow instructions. |

| | |
|-------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Most Important Symptoms and Effects | -- |
| Acute: | Irritation and in extreme cases, chemical burns. |
| Delayed: | Cadmium is toxic (see Signs and Symptoms of Exposure). Long-term inhalation of cadmium compounds may cause metal fume fever, olfactory damage, irreversible renal tubular injury, and emphysema. Chronic effects of cadmium also include anemia, rhinitis, tooth discoloration, and bone changes. Long exposure to HIGH level of sulfuric acid fumes may cause tooth erosion, bronchial irritation/pneumonia and/or intestinal disturbance. |
| Indication of Immediate Medical Attention and Special Treatment Needed: | Persistent irritation/chemical burns. Consult physician. |
| Note to physicians: | Nothing specific known. |

5. FIRE-FIGHTING MEASURES

| | |
|-----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Extinguishing Media: | As appropriate for surrounding fire. |
| Extinguishing Media Which must not be used for safety reasons: | As appropriate for surrounding fire. |
| Hazardous combustion products: | With extreme heating beyond dryness, decomposition of residue can yield cadmium oxide fumes, sulfur oxides. |
| Special exposure hazards arising from the substance or mixture: | If material is free to mix with water, mixing may result in acidic cadmium water runoff. |
| Conditions of Flammability: | Not flammable (aqueous solution). See Section 9: Physical and Chemical Properties. |
| Advice for fire-fighters: | Wear self-contained breathing apparatus. |
| Additional information: | Collect contaminated fire extinguishing water separately. Do not allow entering drains or surface water. |

6. ACCIDENTAL RELEASE MEASURES

| | |
|----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Personal precautions, protective equipment and emergency procedures: | Control access to spill area. Ensure adequate ventilation and avoid direct contact with material. |
| Environmental precautions: | Comply with all national, regional and local regulations for ultimate disposal of acidic cadmium waste solution. Can be neutralized with calcium oxide (lime) or sodium carbonate (soda ash). |
| Methods for containment: | Use inert, absorbent material. |
| Methods for clean-up | Confine material in appropriately marked container. After pickup, clean affected area with mild alkaline (baking soda, etc.) |
| Additional information: | Dispose of in accordance with local, regional and national regulations. |

7. HANDLING AND STORAGE

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|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Precautions for safe handling: | -- |
| Handling: | DO NOT TAKE INTERNALLY. USE IN WELL-VENTILATED AREA. DO NOT MIX WITH OTHER CHEMICALS. Keep container closed when not in use. Keep away from children. Cadmium Coatalyte #312 may give off some sulfur oxides during use. |
| Usage: | To reduce the possibility of injury by splatter or obstruction of ventilation/air movement, do not crowd workpiece with body or face. Avoid conditions that could allow workpiece to: bend/spring-back and "flick" solution; or drop into puddled solution and splash. |
| Storage: | Store/use in ventilated areas and avoid temperature extremes. Keep away from foodstuff, cyanide compounds, alkalis, oxidizers, organics, and reactive metals and other incompatible materials. Do not store near combustible/flammable materials (in the event of fire and container rupture, there is the potential for acidic cadmium solution runoff from fire-fighting water). |
| Specific end use(s): | Recommendations: Observe instructions for use. |

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limit values:

| Chemical Name | ACGIH TWA | ACGIH STEL | OSHA PEL |
|-----------------------------|------------------------------------------|-------------|---------------------------------------|
| Cadmium (Metal) | .01 mg/m3 - as Cd | Not Listed | Special - as Cd: See CFR 29.1910.1027 |
| Cadmium Compounds, soluble | 0.002 mg/m3 - as Cd; Respirable fraction | Not Listed. | Special - as Cd: See CFR 29.1910.1027 |
| Cadmium Sulfate Octahydrate | 0.002 mg/m3 - as Cd; Respirable fraction | Not Listed. | Special - as Cd: See CFR 29.1910.1027 |
| Sulfuric Acid | 0.2 mg/m3 Thoracic Fractions | Not Listed. | 1 mg/m3 |

Note Under normal conditions of evaporation, only the water phase is expected to evaporate leaving the soluble salts behind. Any TWA is thus believed to be meaningful only for the abnormal case in which the solution as a whole is introduced into the air as an aerosol.

| | |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Exposure controls: | -- |
| Engineering Controls: | Local exhaust. |
| Personal protective equipment: | As appropriate for conditions of use: Chemical aprons/suits, eye wash fountain, safety shower. |
| Respiratory protection: | NIOSH approved dust/mist respirator. |
| Eye protection | Chemical splash goggles/face shield. Avoid use of contact lenses. |
| Hand protection: | Gloves, rubber, e.g., butyl or neoprene. |
| Skin protection | As appropriate for conditions of use: Rubber aprons/suits |
| Environmental exposure controls: | Maintain levels below community environmental protection thresholds. |
| General hygiene considerations: | DO NOT TAKE INTERNALLY. Keep away from eyes and out of open wounds. Practice good industrial/personal hygiene and safety practice; do not smoke/eat/drink in area of use; wash hands after use; wash clothing/materials that may have come in contact with chemicals. |

9. PHYSICAL AND CHEMICAL PROPERTIES

Anode (Cadmium Anode #532, 542, or 552):

| | | | |
|-----------------------------------------------------|-----------------------|-----------------------------------------|----------------|
| Physical state: | Solid | Vapour pressure: | Not Applicable |
| Appearance | Metallic | Vapor density: | Not Applicable |
| Color: | Silvery | Relative Density: | 8.65 |
| Odor: | No identifiable odor. | Solubility (in water): | Not Applicable |
| pH: | Not Applicable | Partition coefficient: n-octanol/water: | Not Applicable |
| Melting point / melting range: | 321° C (610° F) | Auto-ignition temperature: | Not Applicable |
| Boiling point / boiling range: | Not Applicable | Decomposition Temperature: | Not Applicable |
| Flash point: | Not Applicable | Viscosity: | Not Applicable |
| Evaporation rate: | Not Applicable | Oxidizing properties: | Not Applicable |
| Flammability (solid, gas): | Not Flammable | Explosion Data-Mechanical Impact: | Insensitive |
| Upper / Lower Flammability Limit--Explosive Limits: | Not Applicable | Explosion Data-Static Discharge: | Insensitive |

Coatalyte/Activator (Cadmium Coatalyte #312):

| | | | |
|-----------------------------------------------------|-----------------------------------|-----------------------------------------|-------------------------------------|
| Physical state: | Liquid | Vapour pressure: | As Water |
| Appearance | Liquid | Vapor density: | As Water |
| Color: | Blue | Relative Density: | 1.5 |
| Odor: | Pungent odor. | Solubility (in water): | Aqueous solution--soluble in water. |
| pH: | 1.5 | Partition coefficient: n-octanol/water: | As Water |
| Melting point / melting range: | < 0° C (< 32° F) | Auto-ignition temperature: | Not Applicable (aqueous solution) |
| Boiling point / boiling range: | > 100° C (> 212° F) | Decomposition Temperature: | Not Applicable (aqueous solution) |
| Flash point: | Not Applicable (aqueous solution) | Viscosity: | As Water |
| Evaporation rate: | As Water | Oxidizing properties: | Not Applicable |
| Flammability (solid, gas): | Not Flammable | Explosion Data-Mechanical Impact: | Insensitive |
| Upper / Lower Flammability Limit--Explosive Limits: | Not Applicable (aqueous solution) | Explosion Data-Static Discharge: | Insensitive |

10. STABILITY AND REACTIVITY

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|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Reactivity: | None known. |
| Chemical Stability: | Stable |
| Possibility of Hazardous Reactions: | With extreme heating beyond dryness, decomposition of residue can yield cadmium oxide fumes, sulfur oxides. |
| Conditions to avoid: | High heat. Mixing with incompatible materials. |
| Incompatible Materials: | Chlorine, chlorate, nitrate, nitrite, and sulfide compounds; cyanides, alkalis, oxidizers, organics, and highly reactive metals (potential for hydrogen gas generation). |
| Hazardous decomposition products: | With extreme heating beyond dryness, decomposition of residue can yield cadmium oxide fumes, sulfur oxides. |
| Anode Reactivity: | RAPID Cadmium Anodes are generally inert until used in the plating process with RAPID Cadmium Coatalyte #312. During the plating process, the anode slowly dissolves and contributes cadmium ions to the coatalyte replenishing the cadmium plated onto the workpiece. |

11. TOXICOLOGICAL INFORMATION

Toxic Levels:

| Source | Chemical Name | LD50 (mg/kg) | LC50 (mg/M3) | IARC Listed | NTP Listed | OSHA Listed | ACGIH Carcinogenicity Listed |
|---------|----------------------------|---------------|---------------|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|--------------------------|---------------------------------------------------------------------------------------------------|
| Anode | Cadmium (Metal) | Not Available | Not Available | IARC lists Cadmium and Cadmium Compounds (evaluated as a group) as 'carcinogenic to humans'. | NTP lists Cadmium and Cadmium Compounds as 'Known to be Human Carcinogens'. | No | ACGIH lists Cadmium and Cadmium Compounds as 'Suspected Human Carcinogen; Biological monitoring.' |
| Anode | Cadmium Compounds, soluble | Various | Not Available | IARC lists Cadmium and Cadmium Compounds (evaluated as a group) as 'carcinogenic to humans'. | NTP lists Cadmium and Cadmium Compounds as 'Known to be Human Carcinogens'. | 29CFR1910.1027 (Cadmium) | ACGIH lists Cadmium and Cadmium Compounds as 'Suspected Human Carcinogen; Biological monitoring.' |
| Coat312 | Cadmium Compounds, soluble | Various | Not Available | IARC lists Cadmium and Cadmium Compounds (evaluated as a group) as 'carcinogenic to humans'. | NTP lists Cadmium and Cadmium Compounds as 'Known to be Human Carcinogens'. | 29CFR1910.1027 (Cadmium) | ACGIH lists Cadmium and Cadmium Compounds as 'Suspected Human Carcinogen; Biological monitoring.' |

| Source | Chemical Name | LD50 (mg/kg) | LC50 (mg/M3) | IARC Listed | NTP Listed | OSHA Listed | ACGIH Carcinogenicity Listed |
|---------|-----------------------------|--------------|------------------------|-----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|--------------------------|-----------------------------------------------------------------------------------------------------|
| Coat312 | Cadmium Sulfate Octahydrate | 280 OR | Not Available | IARC lists Cadmium and Cadmium Compounds (evaluated as a group) as 'carcinogenic to humans'. | NTP lists Cadmium and Cadmium Compounds as 'Known to be Human Carcinogens'. | 29CFR1910.1027 (Cadmium) | ACGIH lists Cadmium and Cadmium Compounds as 'Suspected Human Carcinogen; Biological monitoring.' |
| Coat312 | Sulfuric Acid | 2140 OR | 510 IR - 2 hr Exposure | IARC lists occupational exposure to Strong-inorganic-acid mists containing sulfuric acid as 'carcinogenic to humans'. | NTP lists Strong Inorganic Acid Mists Containing Sulfuric Acid as 'Known to be Human Carcinogens'. | No | ACGIH lists sulfuric acid contained in strong inorganic acid mists as 'Suspected Human Carcinogen.' |

Estimated Product LD50 (mg/kg) 3030.303

Note When the anode is used for normal selective plating, the backing/stem and sleeve are expected to be inert and not generate hazardous chemical products themselves.

| EFFECTS OF ACUTE EXPOSURE | |
|---------------------------|----------------------------------------------------------------|
| Eye contact: | Potential for irritation or (in extreme cases) chemical burns. |
| Inhalation: | Mist can cause respiratory irritation. |
| Skin contact: | Potential for irritation or (in extreme cases) chemical burns. |
| Ingestion: | Potential for irritation or (in extreme cases) chemical burns. |

| EFFECTS OF CHRONIC EXPOSURE | |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Target organs: | Long-term inhalation of cadmium compounds: Olfactory lobes, kidneys, lungs, skeletal, intestines. |
| Chronic Effects: | Cadmium is toxic (see Signs and Symptoms of Exposure). Long-term inhalation of cadmium compounds may cause metal fume fever, olfactory damage, irreversible renal tubular injury, and emphysema. Chronic effects of cadmium also include anemia, rhinitis, tooth discoloration, and bone changes. Long exposure to HIGH level of sulfuric acid fumes may cause tooth erosion, bronchial irritation/pneumonia and/or intestinal disturbance. |
| Carcinogenicity: | NTP lists Strong Inorganic Acid Mists Containing Sulfuric Acid as 'Known to be Human Carcinogens'. NTP lists Cadmium and Cadmium Compounds as 'Known to be Human Carcinogens'. IARC lists Cadmium and Cadmium Compounds (evaluated as a group) as 'carcinogenic to humans'. IARC lists occupational exposure to Strong-inorganic-acid mists containing sulfuric acid as 'carcinogenic to humans'. OSHA regulates Cadmium Exposure by 29CFR1910.1027. ACGIH lists Cadmium and Cadmium Compounds as 'Suspected Human Carcinogen; Biological monitoring' ACGIH lists sulfuric acid contained in strong inorganic acid mists as 'Suspected Human Carcinogen' EU: Carc. Cat. 2 (Cadmium) EU: R45: May cause cancer (Cadmium). |
| Mutagenicity: | EU: Muta. Cat. 2 (Cadmium) |
| Reproductive Effects: | Repr. Cat. 2 (Cadmium) Muta. Cat. 2 (Cadmium) R46 : May cause heritable genetic damage (Cadmium). R60 : May impair fertility (Cadmium). |
| Developmental Effects: | -- |
| Teratogenicity: | EU: Repr. Cat. 2 (Cadmium) EU: Muta. Cat. 2 (Cadmium) EU: R46 : May cause heritable genetic damage (Cadmium). EU: R60 : May impair fertility (Cadmium). |
| Embryotoxicity: | Unknown |
| Skin Sensitization: | None known. |
| Respiratory Sensitization: | Long-term inhalation of cadmium compounds may cause metal fume fever, olfactory damage, irreversible renal tubular injury, and emphysema. Long exposure to HIGH level of sulfuric acid fumes may cause tooth erosion, bronchial irritation/pneumonia and/or intestinal disturbance. |
| Toxicologically Synergistic Materials | None known. |

12. ECOLOGICAL INFORMATION

Specific Toxicity:

| Chemical Name | Effect dose/concentration | Test duration | Species | Result/Evaluation | Method | Remark |
|-----------------------------|---------------------------|---------------|--------------------------------------|-------------------|---------|---------|
| Cadmium Sulfate Octahydrate | Not Available | - | - | - | - | - |
| Cadmium Sulfate Octahydrate | 0.15 mg/L | 48 Hrs | Daphnia magna (Water flea) | EC50 | Unknown | Unknown |
| Cadmium Sulfate Octahydrate | LC50 0.2 mg/L | 90 Hrs | Pimephales promelas (fathead minnow) | LC50 | Unknown | Unknown |
| Sulfuric Acid | LC50 42 mg/L | 96 Hrs | Gambusia affinis | LC50 | Unknown | - |

| | |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Persistence and degradability: | EU: R50/53 : Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. |
| Bioaccumulative potential: | EU: R50/53 : Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. R48/23/25 : Toxic: danger of serious damage to health by prolonged exposure through inhalation and if swallowed. |
| Mobility in soil: | Components are water soluble. |
| Results of PBT and vPvB Assessment: | None known. |
| Other adverse effects: | None known. |

13. DISPOSAL CONSIDERATIONS

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|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Waste treatment methods: | Comply with all national, regional and local regulations for ultimate disposal of acidic cadmium waste solution. Can be neutralized with calcium oxide (lime) or sodium carbonate (soda ash). |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

14. TRANSPORT INFORMATION

Anode (Cadmium Anode #532, 542, or 552):

| Information List | US DOT | IATA |
|----------------------------|----------------------|------------------------|
| UN Number | N/A | N/A |
| Hazard Class | N/A | N/A |
| Packing Group | N/A | N/A |
| Proper Shipping Name | Not regulated by DOT | Not regulated by IATA. |
| Technical Name (if needed) | | |
| Labels | N/A | N/A |

| | |
|---------------------|--------------------------|
| Marine Pollutant | No |
| Special Precautions | None beyond those above. |
| Transport in Bulk | Not Applicable |

Coatalyte/Activator (Cadmium Coatalyte #312):

| Information List | US DOT | IATA |
|----------------------------|---------------------------------------------|---------------------------------------------|
| UN Number | UN 2796 | UN 2796 |
| Hazard Class | 8 | 8 |
| Packing Group | II | II |
| Proper Shipping Name | Sulfuric acid with not more than 51% acid | Sulphuric Acid Solution |
| Technical Name (if needed) | (Cadmium Sulphate, Sulphuric Acid Solution) | (Cadmium Sulphate, Sulphuric Acid Solution) |
| Labels | Corrosive | Corrosive |

| | |
|---------------------|--------------------------|
| Marine Pollutant | Yes (Cadmium Compounds) |
| Special Precautions | None beyond those above. |
| Transport in Bulk | Not Applicable |

15. REGULATORY INFORMATION

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|----------------------|--------------------------------------------------------------------------------------------------------|
| Spill Notifications: | Notify local Safety Coordinators. If spill quantity warrants, notify appropriate government officials. |
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Safety, health and environmental regulations/legislation specific for the substance or mixture

US Federal:

| Chemical Name | CAS | CERCLA RQ (lbs) | Section 302 EHS TPQ (lbs) | Section 304 EHS RQ (lbs) | Section 313 | RCRA Code |
|------------------------------------|----------------------|----------------------|---------------------------|--------------------------|-------------|------------|
| Cadmium | 7440-43-9 | 10 | Not Listed | Not Listed | 313 | Not Listed |
| Cadmium Compounds | N078 | CERCLA Class (No RQ) | Not Listed | Not Listed | 313 | Not Listed |
| Cadmium Sulfate | 10124-36-4/7790-84-3 | Not Listed | Not Listed | Not Listed | Not Listed | Not Listed |
| Sulfuric acid | 7664-93-9 | 1,000 | 1,000 | 1,000 | Not Listed | Not Listed |
| Sulfuric acid (aerosol forms only) | 7664-93-9 | 1,000 | 1,000 | 1,000 | 313 | Not Listed |

FEDERAL: 'Superfund Amendments and Reauthorization Act (SARA) of 1986': This product contains a toxic chemical subject to Title III SARA, Section 313 and 40 CFR Part 372 toxic chemical release reporting requirements.

Canada:

| Chemical Name | CAS | WHMIS Note | WHMIS Class |
|----------------------------|----------------------|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cadmium (Metal) | 7440-43-9 | Toxic, D1A,D2B, 0.1% | D1A Very Toxic Material Causing Immediate and Serious Toxic Effects 1 Transportation of Dangerous Goods: Class 6.1 Group D2A Very Toxic Material Causing Other Toxic Effects carcinogenicity : IARC Group 1, ACGIH A2; chronic toxic effect : nephrotox |
| Cadmium Compounds, soluble | N078 | Toxic, D1A,D2B, 0.1% | - |
| Cadmium Sulfate | 10124-36-4/7790-84-3 | Toxic,D1A,D2A,0.1% | D1A Very Toxic Material Causing Immediate and Serious Toxic Effects Transportation of Dangerous Goods: Class 6.1 Group II D2A Very Toxic Material Causing Other Toxic Effects carcinogenicity : IARC Group 1, ACGIH A2; chronic toxic effect : nephroto |
| Sulfuric Acid | 7664-93-9 | Very Toxic; D1A; E; 1% | D1A Very Toxic Material Causing Immediate and Serious Toxic Effects 1 Acute lethality : LC50 inhalation/4 hours (mouse) = 160 mg/m ³ E Corrosive Material 2 Transportation of Dangerous Goods: Class 8 |
| Sulfuric Acid | 7664-93-9 | Very Toxic; D1A; E; 1% | D1A Very Toxic Material Causing Immediate and Serious Toxic Effects 1 Acute lethality : LC50 inhalation/4 hours (mouse) = 160 mg/m ³ E Corrosive Material 2 Transportation of Dangerous Goods: Class 8 |

California:

| Chemical Name | CAS | CA Prop 65 Toxicity | CA Acutely Hazardous TQ | CA Hazardous Substance | CA Hazardous Note |
|----------------------------|----------------------|---------------------|-------------------------|------------------------|-------------------|
| Cadmium (Metal) | 7440-43-9 | Not Listed | Not Listed | Not Listed | -- |
| Cadmium (Metal) | 7440-43-9 | developmental, male | Not Listed | Not Listed | -- |
| Cadmium Compounds, soluble | N078 | cancer | Not Listed | Listed | -- |
| Cadmium Sulfate | 10124-36-4/7790-84-3 | Not Listed | Not Listed | Not Listed | -- |
| Sulfuric Acid | 7664-93-9 | Not Listed | Not Listed | Listed | -- |
| Sulfuric Acid | 7664-93-9 | Not Listed | Not Listed | Listed | -- |

CALIFORNIA: 'Safe Drinking Water and Toxic Enforcement Act of 1986' (Proposition 65): WARNING: This product contains a chemical known to the State of California to cause cancer, and/or cause birth defects or other developmental/reproductive harm. Other listed chemicals may be present in the new/used product from trace amounts in the raw materials or by virtue of product use and contact with other materials.

16. OTHER INFORMATION

Key literature references and sources for data:

- Centers for Disease Control and Prevention, NIOSH Pocket Guide to Chemical Hazards (05/18/2016)
- Dudavari, Susan, Editor, The Merk Index (01/01/1989)
- Sax, N. Irving, Dangerous Properties of Industrial Materials (01/01/1979)
- ACGIH, 2013 TLVs and BEIs- (Threshold Limit Values for Chemical Substances in Work Air Adopted by ACGIH) (03/01/2013)
- National Toxicology Program (USHHS/PHS), 14th Report on Carcinogens (11/03/2016)
- IARC, Overall Evaluations of Carcinogenicity to Humans As evaluated in IARC Monographs Volumes 1-120 (05/17/2017)
- EPA, Title III List of Lists: Consolidated List of Chemicals Subject to the Emergency Planning and Community Right-to-Know Act (EPCRA) and Section 112(r) of the Clean Air Act, As Amended (03/01/2015)
- Code of Federal Regulations 29, Labor, Parts 1910.1000, SubPart Z
- Code of Federal Regulations 40, Protection of the Environment
- Code of Federal Regulations 49, Transportation
- California Code of Regulations 22 Division 2, Safe Drinking Water and Toxic Enforcement Act of 1986", "Chemicals known to the State to Cause Cancer and Reproductive Toxicity (12/29/2017)
- Toxicological Index Service, CSST, Classification according to WHMIS 1988 (12/13/2013)
- Toxicological Index Service, CSST, WHMIS Disclosure list (Repealed 2/11/2015) (04/15/2014)
- Canadian Centre for Occupational Health and Safety, Information Elements Required on a WHMIS 2015 Safety Data Sheet (SDS) (02/11/2015)
- IATA, Dangerous Goods Regulations, 59th Edition (01/01/2018)
- Various Chemical Suppliers, MSDS's which did not identify chemicals as hazardous
- Canadian centre for Occupational Health and Safety, First Aid for Chemical Exposures (01/09/2017)
- National Library of Medicine, TOXNET
- National Capital Poison Center, First Aid for Poisons (12/31/2017)
- Canadian Centre for Occupational Health and Safety, The Safety Data Sheet -- A Guide to First Aid Recommendations (01/02/2018)
- SDS for Cadmium Sulfate
- SDS for Sulfuric Acid GR ACS

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