

Product Name

Various Zodiac Nature2
Cartridge Sytems

MSDS Number

N-001

Chemical Name

Cartridge comprised of Copper
sulfate pentahydrate, Silver
Metal and Aluminum Oxide
(non-fibrous)

Product Number

421512, 3750026, 421099,
421125, 421135, 421145,
420068, 420066, 420067,
0422010G

Hazard Pictograms



Supplier Info

Zodiac Pool Systems, Inc
2620 Commerce Way
Vista, CA 92081
760-599-9600

Emergency 1-800-424-9300

Signal Word

Warning

**Precautionary
Statements**

Wash Hands, forearms and Exposed areas
thoroughly after handling

Avoid Release to the environment

Wear eye protection, protective clothing, protective
gloves

IF IN EYES: Rinse cautiously with water for several
minutes. Remove Contact lenses, if present and easy to
do. Continue Rinsing

If eye irritation persists: Get Medical Advice/attention

Collect Spillage

Dispose of contents/container according to
local, regional, national, territorial, provincial
See SDS for additional Statements

Hazard Statement

Causes Serious Eye Irritation

Very toxic to aquatic life with long
lasting events

See SDS for additional
Statements

Supplemental Information

N-001

Nature²® M Cartridge, Nature²® Express Cartridge, Nature²® Express, Nature²® VC Cartridge, Nature²® G Cartridge, Nature²® CF, Nature²® DuoClear™ Cartridge, Nature²® Fusion inground

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations
Revision Date: 12/02/2015 Date of Issue: 07/25/2014

Version: 2.0

SECTION 1: IDENTIFICATION

1.1. Product Identifier

Product Form: Mixture

Product Name: Nature²® M Cartridge, Nature²® Express Cartridge, Nature²® Express, Nature²® VC Cartridge, Nature²® G Cartridge, Nature²® CF, Nature²® DuoClear™ Cartridge, Nature²® Fusion inground

Other means of identification: EPA Reg. 67712-1, M-25, VC 20, VC 40, G25, G35, G45, Nature²®, Nature²® Limited, Vision®, Aquatech™, Clear Vision®, DuoClear™ Cartridge, Nature²® SP, Nature²® Express IG

1.2. Intended Use of the Product

Use of the substance/mixture: Pool and spa sanitization.

1.3. Name, Address, and Telephone of the Responsible Party

Company

Zodiac Pool Systems, Inc.
2620 Commerce Way
Vista, CA 92081
(760) 599-9600

1.4. Emergency Telephone Number

Emergency Number : (CHEMTREC US) 800-424-9300 (CHEMTREC International) 703-527-3887

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the Substance or Mixture

Classification (GHS-US)

Eye Irrit. 2A H319
Aquatic Acute 1 H400
Aquatic Chronic 2 H411

2.2. Label Elements

GHS-US Labeling

Hazard Pictograms (GHS-US)



Signal Word (GHS-US)

: Warning

Hazard Statements (GHS-US)

: H319 - Causes serious eye irritation
H400 - Very toxic to aquatic life
H411 - Toxic to aquatic life with long lasting effects

Precautionary Statements (GHS-US)

: P264 - Wash hands, forearms, and exposed areas thoroughly after handling
P273 - Avoid release to the environment
P280 - Wear eye protection, protective clothing, protective gloves
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P337+P313 - If eye irritation persists: Get medical advice/attention
P391 - Collect spillage
P501 - Dispose of contents/container according to local, regional, national, and international regulations

2.3. Other Hazards

Other Hazards: Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions.

2.4. Unknown Acute Toxicity (GHS-US)

No data available

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SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substance

Not applicable

3.2. Mixture

Name	Product identifier	%	Classification (GHS-US)
Aluminum oxide	(CAS No) 1344-28-1	60 - 80	Aquatic Acute 3, H402
Copper (II) sulfate pentahydrate (1:1:5)	(CAS No) 7758-99-8	8.23	Acute Tox. 3 (Oral), H301 Skin Irrit. 2, H315 Eye Irrit. 2A, H319 STOT SE 3, H335 Aquatic Acute 1, H400 Aquatic Chronic 1, H410
Silver	(CAS No) 7440-22-4	3.51	Eye Irrit. 2A, H319 STOT SE 3, H335 Aquatic Acute 1, H400

Full text of H-phrases: see section 16

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 if possible).

First-aid Measures After Inhalation: Remove to fresh air and keep at rest in a position comfortable for breathing. Obtain medical attention if breathing difficulty persists.

First-aid Measures After Skin Contact: Rinse immediately with plenty of water. Obtain medical attention if irritation develops or persists.

First-aid Measures After Eye Contact: Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention.

First-aid Measures After Ingestion: Do NOT induce vomiting. Rinse mouth. Immediately call a POISON CENTER or doctor/physician.

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

Symptoms/Injuries: Causes serious eye irritation.

Symptoms/Injuries After Inhalation: May cause respiratory irritation.

Symptoms/Injuries After Skin Contact: May cause skin irritation.

Symptoms/Injuries After Eye Contact: Causes serious eye irritation.

Symptoms/Injuries After Ingestion: Ingestion is likely to be harmful or have adverse effects.

Chronic Symptoms: None expected under normal conditions of use.

4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If you feel unwell, seek medical advice (show the label where possible).

SECTION 5: FIRE-FIGHTING MEASURES

5.1. Extinguishing Media

Suitable Extinguishing Media: Use extinguishing media appropriate for surrounding fire.

Unsuitable Extinguishing Media: Do not use a heavy water stream. Use of heavy stream of water may spread fire.

5.2. Special Hazards Arising From the Substance or Mixture

Fire Hazard: Not considered flammable but may burn at high temperatures. Anhydrous copper sulfate formed on water loss. Anhydrous salt will ignite Hydroxylamine. Sealed containers may rupture when heated due to release of water. At temperatures above 600°C, copper sulfate will decompose into cupric oxide and sulfur dioxide. Silver metal dust or powder may be flammable or explosive when dispersed in the air at high concentrations and exposed to heat and flame.

Explosion Hazard: Product is not explosive.

Reactivity: Hazardous reactions will not occur under normal conditions.

5.3. Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire.

Firefighting Instructions: Use water spray or fog for cooling exposed containers.

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Protection During Firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.
Other information: Refer to Section 9 for flammability properties.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Avoid all contact with skin, eyes, or clothing. Avoid breathing dust.

6.1.1. For Non-emergency Personnel

Protective Equipment: Use appropriate personal protection equipment (PPE).

Emergency Procedures: Evacuate unnecessary personnel.

6.1.2. For Emergency Responders

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Contain and collect as any solid.

6.2. Environmental Precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and Material for Containment and Cleaning Up

For Containment: Contain any spills to prevent migration and entry into sewers or streams.

Methods for Cleaning Up: Clear up spills immediately and dispose of waste safely. Spills should be contained with mechanical barriers. Transfer spilled material to a suitable container for disposal. Contact competent authorities after a spill.

6.4. Reference to Other Sections

See Heading 8. Exposure controls and personal protection.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for Safe Handling

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

7.2. Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Comply with applicable regulations.

Storage Conditions: Store in a dry, cool and well-ventilated place. Keep container closed when not in use. Keep/Store away from direct sunlight, extremely high or low temperatures and incompatible materials.

Incompatible Products: Strong acids. Strong bases. Strong oxidizers. Copper Sulfate Pentahydrate is incompatible with hydroxylamine, nitromethane, sodium hypobromite, magnesium; Silver is incompatible with Acetylene, Ammonia, Hydrogen Peroxide and Ethylene Imine.

7.3. Specific End Use(s)

Pool and spa sanitization.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control Parameters

Silver (7440-22-4)		
USA ACGIH	ACGIH TWA (mg/m ³)	0.1 mg/m ³
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	0.01 mg/m ³
USA IDLH	US IDLH (mg/m ³)	10 mg/m ³
USA OSHA	OSHA PEL (TWA) (mg/m ³)	0.01 mg/m ³
Copper (II) sulfate pentahydrate (1:1:5) (7758-99-8)		
USA OSHA	OSHA PEL (TWA) (mg/m ³)	1 mg/m ³ (as Cu)
Aluminum oxide (1344-28-1)		
USA OSHA	OSHA PEL (TWA) (mg/m ³)	5 mg/m ³

8.2. Exposure Controls

Appropriate Engineering Controls

: Ensure adequate ventilation, especially in confined areas. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Ensure all national/local regulations are observed.

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Personal Protective Equipment

: Protective goggles. Gloves. Protective clothing.



Materials for Protective Clothing

: Chemically resistant materials and fabrics.

Hand Protection

: Wear chemically resistant protective gloves.

Eye Protection

: Chemical goggles or safety glasses.

Skin and Body Protection

: Wear suitable protective clothing.

Respiratory Protection

: Use a NIOSH-approved respirator or self-contained breathing apparatus whenever exposure may exceed established Occupational Exposure Limits.

Environmental Exposure Controls

: Do not allow the product to be released into the environment.

Consumer Exposure Controls

: Do not eat, drink or smoke during use.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on Basic Physical and Chemical Properties

Physical State	: Solid
Appearance	: Mixture of gray and blue-colored spheres or granules
Odor	: None
Odor Threshold	: No data available
pH	: No data available
Relative Evaporation Rate (butylacetate=1)	: No data available
Melting Point	: 2038 °C (3700 °F) - Aluminum Oxide, 962 °C (1764 °F) - Silver
Freezing Point	: No data available
Boiling Point	: No data available
Flash Point	: No data available
Auto-ignition Temperature	: No data available
Decomposition Temperature	: No data available
Flammability (solid, gas)	: No data available
Vapor Pressure	: No data available
Relative Vapor Density at 20 °C	: No data available
Specific Gravity	: 2.4 (Aluminum Oxide), 10.5 (Silver)
Solubility	: Water: 215 g/l @0°C (Copper Sulfate Pentahydrate)
Partition coefficient: n-octanol/water	: No data available
Viscosity	: No data available

9.2. Other Information No additional information available

SECTION 10: STABILITY AND REACTIVITY

- 10.1 Reactivity: Hazardous reactions will not occur under normal conditions.
- 10.2 Chemical Stability: Stable under recommended handling and storage conditions (see section 7).
- 10.3 Possibility of Hazardous Reactions: Hazardous polymerization will not occur.
- 10.4 Conditions to Avoid: Direct sunlight. Extremely high or low temperatures. Ignition sources. Incompatible materials.
- 10.5 Incompatible Materials: Strong acids. Strong bases. Strong oxidizers. Copper Sulfate Pentahydrate is incompatible with hydroxylamine, nitromethane, sodium hypobromite, magnesium; Silver is incompatible with Acetylene, Ammonia, Hydrogen Peroxide and Ethylene Imine.
- 10.6 Hazardous Decomposition Products: Sulfur dioxide.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information On Toxicological Effects

Acute Toxicity: Not classified

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Silver (7440-22-4)	
LD50 Oral Rat	> 2000 mg/kg
Copper (II) sulfate pentahydrate (1:1:5) (7758-99-8)	
LD50 Oral Rat	300 mg/kg
Aluminum oxide (1344-28-1)	
LD50 Oral Rat	> 15900 mg/kg
LC50 Inhalation Rat	> 2.3 mg/l/4h

Skin Corrosion/Irritation: Not classified

Serious Eye Damage/Irritation: Causes serious eye irritation.

Respiratory or Skin Sensitization: Not classified

Germ Cell Mutagenicity: Not classified

Carcinogenicity: Not classified

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Single Exposure): Not classified

Specific Target Organ Toxicity (Repeated Exposure): Not classified

Aspiration Hazard: Not classified

Symptoms/Injuries After Inhalation: May cause respiratory irritation.

Symptoms/Injuries After Skin Contact: May cause skin irritation.

Symptoms/Injuries After Eye Contact: Causes serious eye irritation.

Symptoms/Injuries After Ingestion: Ingestion is likely to be harmful or have adverse effects.

Chronic Symptoms: None expected under normal conditions of use.

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Ecology - General : Very toxic to aquatic life. Toxic to aquatic life with long lasting effects.

Silver (7440-22-4)	
LC50 Fish 1	0.00155 (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])
LC 50 Fish 2	0.0062 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [flow-through])
Copper (II) sulfate pentahydrate (1:1:5) (7758-99-8)	
LC50 Fish 1	0.66 - 1.15 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [semi-static])
EC50 Daphnia 1	0.147 - 0.227 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])
LC 50 Fish 2	0.05 - 1.0 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [static])
Aluminum oxide (1344-28-1)	
LC50 Fish 1	14.6 mg/l
EC50 Daphnia 1	38.2 mg/l
NOEC (acute)	> 50 mg/l

12.2. Persistence and Degradability No additional information available

12.3. Bioaccumulative Potential No additional information available

12.4. Mobility in Soil No additional information available

12.5. Other Adverse Effects

Other information : Avoid release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Waste Disposal Recommendations: Dispose of waste material in accordance with all local, regional, national, and international regulations.

Ecology - Waste Materials: Avoid release to the environment.

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SECTION 14: TRANSPORT INFORMATION

14.1 In Accordance with DOT

Proper Shipping Name : ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S.(contains Copper Sulfate, Silver)
 Hazard Class : 9
 Identification Number : UN3077
 Label Codes : 9
 Packing Group : III
 ERG Number : 171



14.2 In Accordance with IMDG

Proper Shipping Name : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (contains Copper Sulfate, Silver)
 Hazard Class : 9
 Identification Number : UN3077
 Packing Group : III
 Label Codes : 9
 EmS-No. (Fire) : F-A
 EmS-No. (Spillage) : S-F



14.3 In Accordance with IATA

Proper Shipping Name : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.(contains Copper Sulfate, Silver)
 Packing Group : III
 Identification Number : UN3077
 Hazard Class : 9
 Label Codes : 9
 ERG Code (IATA) : 9L



SECTION 15: REGULATORY INFORMATION

15.1 US Federal Regulations

This chemical is a pesticide product registered by the United States Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets (SDS), and for workplace labels of non-pesticide chemicals. The hazard information required on the pesticide label is reproduced below. The pesticide label also includes other important information, including directions for use.

PRECAUTIONARY STATEMENT

Hazards to Humans and Domestic Animals.

CAUTION

In the unlikely event that a cartridge breaks, mineral media should not be ingested by humans or animals as it may cause gastric distress.

FIRST AID IF INGESTED:

Call poison control center or doctor immediately for treatment advice.

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SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard
Silver (7440-22-4)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Listed on SARA Section 313 (Specific toxic chemical listings)	
SARA Section 313 - Emission Reporting	1.0 %
Aluminum oxide (1344-28-1)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Listed on SARA Section 313 (Specific toxic chemical listings)	
SARA Section 313 - Emission Reporting	1.0 % (fibrous forms)

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15.2 US State Regulations

Silver (7440-22-4)
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
U.S. - Pennsylvania - RTK (Right to Know) List
Aluminum oxide (1344-28-1)
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
U.S. - Pennsylvania - RTK (Right to Know) List

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Revision date : 12/02/2015
 Other Information : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

GHS Full Text Phrases:

Acute Tox. 3 (Oral)	Acute toxicity (oral) Category 3
Aquatic Acute 1	Hazardous to the aquatic environment - Acute Hazard Category 1
Aquatic Acute 3	Hazardous to the aquatic environment - Acute Hazard Category 3
Aquatic Chronic 1	Hazardous to the aquatic environment - Chronic Hazard Category 1
Aquatic Chronic 2	Hazardous to the aquatic environment - Chronic Hazard Category 2
Eye Irrit. 2A	Serious eye damage/eye irritation Category 2A
Skin Irrit. 2	Skin corrosion/irritation Category 2
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
H301	Toxic if swallowed
H315	Causes skin irritation
H319	Causes serious eye irritation
H335	May cause respiratory irritation
H400	Very toxic to aquatic life
H402	Harmful to aquatic life
H410	Very toxic to aquatic life with long lasting effects
H411	Toxic to aquatic life with long lasting effects

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

SDS US (GHS HazCom)