

### 1. IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY

**Product Name:** roVa™ Shield Hydrophobic Coating

**Synonyms:** Silica aerogel material

**Use of the Substance/Preparation:** High performance hydrophobic material

**Manufacturer:** roVa Corporation

**Address:** 382, Gangnam-daero, Gangnam-gu, Seoul, Korea - 06232

**Telephone:** +82 2 796 8440

**Fax:** +82 31 221 9822

### 2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient	CAS Number	Percent	EINECS Number
Ethyl Alcohol	64-17-5	80~95	200-578-6
Trimethylsilylated Silica (amorphous silica)	7631-86-9	1~10	262-373-8
Proprietary Additive	NA	1~10	Not assigned

### 3. HAZARDS IDENTIFICATION



#### Emergency Overview

**Caution:**

Flammable liquid and vapor. Causes eye, skin, and respiratory tract irritation. Ingestion may cause gastric disturbances. Can enter lungs and cause damage.

**Appearance:** Turbid  
**Odor:** Alcohol odor

**Primary Routes of Exposure:**

Primary routes of exposure for liquids include skin and eye contact, inhalation, and ingestion.

#### Potential Health Effects

**Skin contact:**

Causes moderate skin irritation. May cause cyanosis of the extremities.

**Eye contact:**

Causes severe eye irritation. May cause painful sensitization to light. May cause chemical conjunctivitis and corneal damage.

**Inhalation:**

Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma.

**Ingestion:**

May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause systemic toxicity with acidosis.

**Target Organ Effects:**

Kidneys, heart, central nervous system, liver, lungs, eyes, skin.

**Medical Condition Aggravated By Exposure:**

Prolonged exposure may cause liver, kidney, and heart damage.

**Potential Health Effects**

None known.

**4. FIRST AID MEASURES****Eye Contact:**

Immediately wash with large amounts of water for at least 15 minutes, occasionally lifting lids. Remove contact lenses if worn and continue to wash with water. If irritation occurs and persists, get medical treatment.

**Skin Contact:**

Remove contaminated clothing and footwear. Immediately wash with large amounts of water for at least 20 minutes. If irritation occurs and persists, get medical treatment. Wash clothing before reuse. Flush skin with plenty of soap and water.

**Ingestion:**

Seek immediate medical attention. Do not induce vomiting. Never give anything by mouth to an unconscious person.

**Inhalation:**

Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation.

**5. FIRE-FIGHTING MEASURES****General Information:**

Containers can build up pressure if exposed to heat and/or fire.

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

Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. Will burn if involved in a fire. Flammable Liquid.

Can release vapors that form explosive mixtures at temperatures above the flashpoint. Use water spray to keep fire-exposed containers cool.

Containers may explode in the heat of a fire.

**Unusual Fire and Explosion Hazards:**

Containers may explode when exposed to extreme heat.

**Extinguishing Media:**

For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. For large fires, use water spray, fog, or alcohol-resistant foam. Use water spray to cool fire-exposed containers. Water may be ineffective. Do NOT use straight streams of water.

**Protective Equipment for Fire-fighting:**

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

**Flash Point:** 16.6 deg C ( 61.88 deg F)  
**Autoignition Temperature:** 363 deg C ( 685.40 deg F)  
**Explosion Limits, Lower:** 3.3 vol %  
**Upper:** 19.0 vol %  
**NFPA Rating:** Health: 2; Flammability: 3; Instability: 0

**6. ACCIDENTAL RELEASE MEASURES****Personal Precautions:**

Use personal protection recommended in Section 8.

**Environmental Precautions:**

A leakage of the material may cause contamination. Prevent flowing into waterways, sewers, basements or confined spaces.

**Methods and Materials for Containment and Cleaning Up:**

Eliminate ignition sources. Soak up with inert absorbent such as sand, earth or vermiculite. Put in closed container for prompt disposal. Remove all sources of ignition. Use a spark-proof tool. Provide ventilation. A vapor suppressing foam may be used to reduce vapors.

**7. HANDLING AND STORAGE****Precautions for Safe Handling:**

Wear personal protective gear (rubber gloves, protection uniform, activated carbon mask, etc.) and avoid contact with eyes, skin, and clothing. Wash thoroughly after handling. Use only in a well-ventilated area. Use spark-proof tools and explosion proof equipment. Practice good industrial hygiene and safety guidelines. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Avoid contact with heat, sparks and flame. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

**Conditions for Safe Storage:**

Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Flammables-area. Do not store near perchlorates, peroxides, chromic acid or nitric acid. Pressurized container: protect from sunlight and do not expose to temperatures exceeding 120°F (50°C).

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Occupational Exposure Limits

ACGIH: 1000 ppm TWA

### Engineering Controls

Use explosion-proof ventilation equipment. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

### Personal Protective Equipment

#### **Respiratory Protection:**

Avoid prolonged and/or deliberate breathing of spray mist.  
Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149.  
Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

#### **Eye Protection:**

Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

#### **Hand Protection:**

Wear appropriate protective gloves to prevent skin exposure.

#### **Clothing:**

Wear appropriate protective clothing to prevent skin exposure.

#### **Hygiene Measures:**

Wash hands and/or face thoroughly between breaks and at the end of the working period.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance:</b>	Colorless
<b>Odor:</b>	Alcohol odor
<b>pH:</b>	Not available
<b>Freezing/Melting Point:</b>	Not applicable
<b>Boiling Point:</b>	approximately 78.5°C (173.3 °F)
<b>Flashing Point:</b>	13°C (55.4 °F)
<b>Evaporation Rate:</b>	Not applicable
<b>Vapor Pressure:</b>	approximately 59.3 mm Hg @ 25 °C
<b>Solubility in Water:</b>	Negligible
<b>Autoignition Temperature:</b>	363°C (685.4 °F)
<b>Viscosity:</b>	5~80 cP @ 20 °C

## 10. STABILITY AND REACTIVITY

### **Chemical Stability:**

Chemically stable under normal handling condition

**Hazardous Reactions:**

None under normal use

**Conditions To Avoid:**

Incompatible materials, ignition sources, excess heat, oxidizers.

**Substances to Avoid:**

Strong oxidizing agents, acids, alkali metals, ammonia, hydrazine, peroxides, sodium, acid anhydrides, calcium hypochlorite, chromyl chloride, nitrosyl perchlorate, bromine pentafluoride, perchloric acid, silver nitrate, mercuric nitrate, potassium-tert-butoxide, magnesium perchlorate, acid chlorides, platinum, uranium hexafluoride, silver oxide, iodine heptafluoride, acetyl bromide, disulfuryl difluoride, tetrachlorosilane + water, acetyl chloride, permanganic acid, ruthenium (VIII) oxide, uranyl perchlorate, potassium dioxide.

**Hazardous Decomposition Products:**

Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

**11. TOXICOLOGICAL INFORMATION****RTECS#:**

CAS# 64-17-5: KQ6300000

CAS# 7732-18-5: ZC0110000

**LD50/LC50:**

CAS# 64-17-5:

Draize test, rabbit, eye: 500 mg Severe;

Draize test, rabbit, eye: 500 mg/24H Mild;

Draize test, rabbit, skin: 20 mg/24H Moderate;

Inhalation, mouse: LC50 = 39 gm/m<sup>3</sup>/4H;

Inhalation, rat: LC50 = 20000 ppm/10H;

Oral, mouse: LD50 = 3450 mg/kg;

Oral, rabbit: LD50 = 6300 mg/kg;

Oral, rat: LD50 = 9000 mg/kg;

Oral, rat: LD50 = 7060 mg/kg;

CAS# 7732-18-5:

Oral, rat: LD50 = >90 mL/kg;

**Carcinogenicity:**

CAS# 64-17-5:

**ACGIH:**

A4 - Not Classifiable as a Human Carcinogen CAS# 7732-18-5: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

**Epidemiology:**

Ethanol has been shown to produce fetotoxicity in the embryo or fetus of laboratory animals. Prenatal exposure to ethanol is associated with a distinct pattern of congenital malformations that have collectively been termed the "fetal alcohol syndrome".

**Teratogenicity:** Oral, Human - woman: TDLo = 41 gm/kg (female 41 week(s) after conception)

Effects on Newborn - Apgar score (human only) and Effects on Newborn - other neonatal measures or effects and Effects on Newborn – drug dependence.

**Reproductive Effects:** Intrauterine, Human - woman: TDLo = 200 mg/kg (female 5 day(s) pre-mating) Fertility – female fertility index (e.g. # females pregnant per # sperm positive females; # females pregnant per # females mated).

**Neurotoxicity:** No information available.

**Mutagenicity:** DNA Inhibition: Human, Lymphocyte = 220 mmol/L.; Cytogenetic Analysis: Human, Lymphocyte = 1160 gm/L.; Cytogenetic Analysis: Human, Fibroblast = 12000 ppm.; Cytogenetic Analysis: Human, Leukocyte = 1 ppm/72H gm/L.; Cytogenetic Analysis: Human, Fibroblast = 12000 ppm.; Cytogenetic Analysis: Human, Leukocyte = 1 ppm/72H (Continuous).; Sister Chromatid Exchange: Human, Lymphocyte = 500 ppm/72H (Continuous).

**Other Studies:** Standard Draize Test(Skin, rabbit) = 20 mg/24H (Moderate) Standard Draize Test: Administration into the eye (rabbit) = 500 mg (Severe).

## 12. ECOLOGICAL INFORMATION

### Ecotoxicity:

Fish:

Rainbow trout: LC50 = 12900-15300 mg/L; 96 Hr; Flow-through @ 24-24.3°C. Rainbow trout: LC50 = 11200 mg/L; 24 Hr; Fingerling (Unspecified) ria: Photobacterium phosphoreum: EC50 = 34900 mg/L; 5-30 min; Microtox test When spilled on land it is apt to volatilize, biodegrade, and leach into the ground water, but no data on the rates of these processes could be found. Its fate in ground water is unknown. When released into water it will volatilize and probably biodegrade. It would not be expected to adsorb to sediment or bioconcentrate in fish.

### Environmental:

When released to the atmosphere it will photodegrade in hours (polluted urban atmosphere) to an estimated range of 4 to 6 days in less polluted areas. Rainout should be significant.

### Physical:

No information available.

### Other:

No information available.

## 13. DISPOSAL CONSIDERATIONS

### Waste Disposal:

Dispose in an approved facility or through a licensed waste disposal contractor. Disposal of this product, solutions, and any byproducts should at all times comply with the requirements of environmental protection and waste disposal legislation. Do not discharge into waterways, drains, and sewers.

### Container Disposal:

Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Follow Waste Disposal guidelines.



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## 14. TRANSPORT INFORMATION

Ethyl alcohol

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	ETHANOL				No information available.
Hazard Class:	3				
UN Number:	UN1170				
Packing Group:	II				

## 15. REGULATORY INFORMATION

### US FEDERAL

#### TSCA

CAS# 64-17-5 is listed on the TSCA inventory.

CAS# 7732-18-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

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None of the chemicals are on the Health & Safety Reporting List.

#### Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

#### Section 12b

None of the chemicals are listed under TSCA Section 12b.

#### TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

#### SARA

##### CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

##### SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

#### SARA Codes

CAS # 64-17-5: acute, chronic, flammable.

#### Section 313

No chemicals are reportable under Section 313.

#### Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depleters. This material does not contain any Class 2 Ozone depleters.

#### Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in



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this product are listed as Toxic Pollutants under the CWA.

**OSHA:**

None of the chemicals in this product are considered highly hazardous by OSHA.

**WARNING:**

This product contains Ethyl alcohol, a chemical known to the state of California to cause birth defects or other reproductive harm. California No Significant Risk Level: None of the chemicals in this product are listed.

**Hazard Symbols:**

F

**Risk Phrases:**

R 11 Highly flammable.

## 16. OTHER INFORMATION

**MSDS Creation Date:** 09/04/2020

**Revision number and date**

Number of Revision : 0  
Revision Date : / /

Date format : mm/dd/yyyy

## DISCLAIMER

The Data set forth in these sheets are based on the information provided by the suppliers of the raw materials and chemicals used in the manufacturing of the aforementioned product. roVa corporation makes no warranty with respect to the accuracy of the information provided by their suppliers, and disclaims all liability of reliance thereon.

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