Section 1. Identification

Product Name: ROYALSIL HI-PURITY TEOS
Product Use: TEOS is used to deposit silicic acid by complete hydrolysis. It then can be used to bond with inorganic substrates.

Effective Date: 21 May 2019 **Replaces:** 5 May 2017
Supplier Information:

ROYALSIL, Inc.
25 Lancelot Lane
Mount Laurel, NJ 08054-1912

USA Emergency Phone Number:
CHEMTREC (24-hr/7 days): 1-800-424-9300
Refer to ROYALSIL, Inc. Contract # CCN674872.

Section 2. Hazard(s) Identification

Emergency Overview: Clear liquid. Causes mild skin irritation. Cause serious eye damage. Harmful to aquatic life.

GHS Classification:

Skin Corrosion/Irritation	**Category 2**
Eye Damage/Irritation	**Category 2A**
Flammable Liquid	**Category 3**
Acute toxicity-Inhalation	**Category 4**

GHS Pictograms:
GHS Label: WARNING
POTENTIAL HEALTH EFFECTS:
CODE OF HAZARD STATEMENTS:
Physical Hazards
H226- Flammable Liquid and vapor.
Health Hazards
H226- Flammable Liquid and vapor.
H303- May be harmful if swallowed.
H315- Causes skin irritation.
H317- May cause an allergic skin reaction.
H319- Causes serious eye irritation.
H332- Harmful if inhaled.
H335- May cause respiratory irritation.
Environmental Hazards
H402- Harmful to aquatic life.

CODE OF PRECAUTIONARY STATEMENTS:

General

P101- Keep out of reach of children.
P103- Read label before use.

Prevention Statements

P202- Do not handle until all safety precautions have been read and understood.
P233- Keep container tightly closed.
P240- Ground and bond container and receiving equipment.
P241- Use explosion-proof electrical/ventilating/lighting equipment
P242- Use non-sparking tools.
P243- Take action to prevent static discharges.
P261- Avoid breathing dust/fume/gas/mist/vapor/spray.
P262- Do not get in eyes, on skin or on clothing.
P264- Wash thoroughly after handling using this product.
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.

Response Statements

P302- P352- IF ON SKIN (or hair): wash with plenty water/soap.
P304- P312- P340 - IF INHALED. Remove victim to fresh air and keep at rest in apposition comfortable and breathing. Call a POISON CENTER or doctor/physician you feel unwell.
P305- P310- P338- P351 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POSION CENTER or doctor/physician if you feel unwell.
P333- P313- If skin irritation or rash occurs: Get medical advice/attention.
P363- Wash contaminated clothing before reuse.
P370- P378- In case of fire: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide to extinguish.
P391- Collect spillage.

Storage

P235- P403- Store in well-ventilated place. Keep cool.

Disposal

P501- Dispose of contents/container to an approved waste disposal plant.

ROUTES OF ENTRY: Eye contact, skin adsorption, ingestion and inhalation.
CARCINOGENICITY: None.

Section 3. Composition/Information on Ingredients

Ingredients	CAS No.	EINECS No.	%	Reach No.
Tetraethyl orthosilicate	78-10-4	200-083-8	≥98%	Yes
Ethanol	64-17-5	200-578-6	<2%	Yes

Section 4. First Aid Measures

General Advice: In the case of accident or if you feel unwell, seek medical advice immediately. When symptoms persist or in all cases of doubt seek medical advice.
Eye Contact: Flush eyes with water immediately while holding eyelids open. Remove contacts, if worn, after initial flushing and continue flushing for at least 15 minutes. Seek medical attention if irritation persists.
Skin Contact: Use soap and water to remove from the skin, remove contaminated clothing, clean thoroughly before reuse. If irritation persists, contact a physician.
Inhalation: Move to fresh air. If not breathing, give rescue breathing. If breathing is difficult, give oxygen. Seek medical attention if breathing is still difficult.
Ingestion: If swallowed, get medical attention immediately. DO NOT INDUCE VOMITING. Never give anything by mouth to an unconscious person.
Note to Physician: Treat symptomatically and supportively.

Section 5. Fire Fighting Measures

Flash Point: 143°F (62°C) Flammable liquid
Flammability Limits: LEL: 1.3% UEL: 2.3%
Fire Fighting Media: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Special Fire Fighting Procedures: Eliminate all sources of ignition and ensure adequate ventilation. In case of fire cool endangered containers with water. First responders need to wear full-bunker gear with Self Contained Breathing Apparatus (SCBA), never enter a confined space unless fully protected with proper personal protective equipment (PPE).

Section 6. Accidental Release Measures

Use personal protective equipment, see section 8.
Clean-up Procedures: Stop the source of the release if you are not put at risk. Use inert absorbent material (such as earth, diatomaceous earth, vermiculite) to absorb the spill, use non-sparking shovel to pick up absorbent for disposal. Assure sufficient ventilation.
Spills and Leaks: Dispose in accordance to local, state or Federal regulations.

Section 7. Handling and Storage

Handling: Provide good ventilation. Wear personal protective equipment, see section 8. Do not get into eyes, on skin and on clothing. Do not breathe vapors or mists. Use with adequate ventilation. Wash thoroughly after handling.
Storage: Store in original labeled container. Keep in cool and dry areas.

Section 8. Exposure Controls/Personal Protection

Introductory Remarks: Use local exhaust ventilation or other engineering controls to minimize airborne exposure. A safety shower and eye wash should be readily available.
Tetraethyl silicate permissible exposure limit (PEL) 85 mg/m^3.
Ethanol permissible exposure limit (PEL) is 1,900 mg/m^3.
Personal Protection:
Eyes: Wear safety goggles or face shield to prevent eye contact.
Body: Chemical apron, long sleeve shirts, long pants, socks, and rubber boots.
Hands: Chemical resistant gloves.
Respiratory: Wear an approved respirator that provides protection from this product if the airborne concentrations exceed the recommended exposure limits.

Section 9. Physical and Chemical Properties

Physical State, Color, Odor	Clear liquid with mild odor	**Freezing Point**	-166.8°F (-82.49°C)
Flash Point	143°F (62°C)	**Density(water=1)**	0.93 g/ml @ 68°F (20°C)
Autoignition Temperature	446°F (230°C)	**Boiling Point**	334°F (168ºC)

Section 10. Stability and Reactivity

Chemical Stability: Considered stable under normal ambient temperatures**.**
Hazardous Decomposition: In complete combustion, oxides of carbon and silicate are formed.
Hazardous Polymerization: Will not occur.
Incompatibility- Materials to Avoid: Reacts with strong oxidizing agent, strong acids and water.

Section 11. Toxicological Information

Toxicology: Acute Oral $LD_{50\ (rat)}$ = > 2,500 mg/KG (96 hours)
Acute Dermal $LD_{50\ (rabbit)}$ = > 5,878 mg/l (48 hours)
Acute Inhalation $LC_{50\ (rat)}$ = >10 mg/L

Skin Irritation: Mildly irritating.
Eye Irritation: Serious damage to eyes.
Acute Inhalation Toxicity: Expected to be an irritant to the respiratory system.
Reproductive Toxicity: No evidence of adverse effects on sexual function and fertility or on development, based on animal experiments.
Carcinogenic Effects: None.

Section 12. Ecological Information

Ecotoxicity: $LC_{50(Zebra\ fish)}$ **= > 245 mg/L (96 hour)**
$EC_{50(Green\ algae)}$ **= > 100 mg/L (72 hour)**
$EC_{50(Daphnia)}$ **= > 75 mg/L (48 hour)**
This is toxic to aquatic organisms.
Environmental Fate: Ingredients are readily bio degradable.

Section 13. Disposal Considerations

Waste Disposal Method: Whatever cannot be saved for recovery or recycling should be managed by the local, state or Federal Regulations.
Container Handling and Disposal: All containers should be triple rinsed and disposed of according to local, state and Federal regulations.

Section 14. Transport Information

Shipping Name: ROYALYSIL HI-PURITY TEOS
Proper Shipping Description (Ground):
UN1292, Tetraethyl orthosilicate 3, III

IATA: (Cargo aircraft only)
UN1292, Tetraethyl orthosilicate 3, III
Use P001 and LP01 packing instructions.

IMO (Water):
UN1292, Tetraethyl orthosilicate 3, III

Section 15. Regulatory Information

EPCRA 311/312 Categories:		
	Immediate (Acute) Health Effects:	Yes
	Delayed (Chronic) Health Effects:	No
	Fire Hazard:	Yes
	Sudden Release of Pressure	No
	Reactivity:	No

Right to know classification: Tetraethyl orthosilicate and ethanol are listed in the states of MA, NJ and PA.
TSCA: Tetraethyl orthosilicate and ethanol are listed on TSCA active list.

Reportable Quantity (RQ): Ethanol has an RQ of 100 LBS (45.36 KG) this RQ is not met in present packaging.

Prop. 65: None.

WHMIS:  Flammable and Combustible materials.
Both ingredients are listed in Canada DSL and NDSL lists.

Compounds are listed as chemical inventories of Australia, Canada, China, EU, Japan, Korea, Philippines, United Kingdom and United States of America.

Abbreviations:

CAS #	Chemical Abstract Service Number		
ºC	Celsius Temperature Scale	ºF	Fahrenheit Temperature Scale
EINECS #	European Inventory of Existing Chemical Substances Number		
hPa	hectopascal	LD_{50}	Lethal Dose Oral or Dermal
LC_{50}	Lethal Inhalation	LEL	Lower Explosive Limit
UEL	Upper Explosive Limit	PEL	Permissible Exposure Limit
PPE	Personal Protective Equipment	Prop.	Proprietary
PSI	Pounds Per Square Inch	NA	Not Applicable
ND	Not Determined	STEL	Short Term Exposure Limit
TLV	Threshold Limit Value	TSCA	Toxic Substance Control Act
TWA	Time Weighted Average		

Section 16. Other Information

Hazardous Material Information System **National Fire Protection Association**

HMIS		NFPA	
2	Health	2	Health
4	Fire	4	Fire
1	Reactivity	1	Instability
H	Personal Protection		NA

Health	4 Deadly	3 Extreme Danger	2 Dangerous	1 Slight hazard	0 No hazard
Fire	4 < 73 ºC	3 < 100 ºC	2 < 200 ºC	1 >200 ºC	0 Will not burn
Reactivity/ Instability	4 May detonate	3 Explosive	2 Unstable	1 Normally stable	0 Stable

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This Safety Data Sheet (SDS) meets the requirements of the Federal OSHA Hazard Communication Standard (29 CFR 1910.1200) this product has been classified according to the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all information required by CPR.

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