Section 1: Product and Company Identification:

1.1 Product Identifier

Product Form:	Mixture
Identification of Substance:	Silicon Dioxide and Ethylene Glycol
Product Name:	NYACOL® DP5540
Synonym:	Colloidal Silica Sol
CAS Number:	7631-86-9 and 107-21-1
Index Number:	Not available.
EINECS Number:	231-545-4 and 203-473-3
REACH Registration Number:	01-2119379499-16-0220 and 01-2119456816-28-0202
Formula:	SiO_2
Nanoforms:	SiO2 exists as a nanoform
Unique formula identifier (UFI):	V6S2-A0RR-600S-Y8KY
Formula:	SiO_2

1.2 Relevant identified uses of the substance or mixture and uses advised against

Recommended Use:	Polymers and Ceramics.
Restrictions on Use:	For industrial use only, not for food, drug or home use.

1.3 Details of the supplier of the safety data sheet

Company Identification:	Nyacol Nano Technologies, Incorporated Megunko Road, P.O. Box 349, Ashland, MA 01721 U.S.A. +1 508-881-2220
Email Contact:	info@nyacol.com
Internet:	www.nyacol.com

1.4 Emergency telephone number

In Case of Emergency:	USA/Canada CHEMTREC: +1 (703) 527-3887 International CHEMTREC: +1 (703) 741-5970 24 Hours/Day: 7 Days/Week

Section 2: Hazard(s) Identification

2.1 GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Acute Tox. 4 H302 Harmful if swallowed; STOT, RE 2 H373 May cause damage to organs through prolonged or repeated exposure.

2.1.1 Classification according to Regulation (EC) No. 1272/2008 (CLP)

Acute Tox. 4 H302 Harmful if swallowed; STOT, RE 2 H373 May cause damage to organs through prolonged or repeated exposure.

2.2 Label Elements - Labelling according to Regulation (EC) No. 1272/2008



Signal Word: Warning

Hazard determining components of labelling:	Ethylene Glycol (Ethane-1,2-diol)
Hazard Statement(s):	H302 - Harmful if swallowed. H373 - May cause damage to organs (kidneys) through prolonged or repeated exposure.
Precautionary Statement(s):	P260 - Do not breathe dust/fumes/gas/mist/vapors/ spray. P264 - Wash skin thoroughly after handling. P270 - Do not eat, drink or smoke when using this product. P301+P312+P330 - IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth. P314 - Get medical advice/attention if you feel unwell. P501 - Dispose of contents/container to an approved waste disposal plant.

2.3 Other Hazards

Components do not meet the criteria for a PBT or vPvB substance.

2.4 Unknown acute toxicity (GHS US)

No data available.

Section 3: Composition / Information on Ingredients

Component Name:	Product Identifier	GHS Classification	Percent By Weight	SCL, M-factor, ATE
Ethylene Glycol:	CAS: 107-21-1 EINECS: 203-473-3 Index: 603-027-00-1	Acute Tox. 4, H302 STOT RE 2; H373	70	
Silicon Dioxide:	CAS: 7631-86-9 EINECS: 231-545-4 Index: Not available	Not classified.	30	

Impurities: Present at a level below that to be taken into account for classification.

Stabilizing Additives: None

The supplier currently has no knowledge on additional ingredients that are classified and that contribute to the classification of this substance.

Nanoform characteristics:

Name of nanoform: Synthetic amorphous silicon dioxide		
		Value
Number based particle size distribution, nm	d10 d50 d90	4-56 8-75 12-110
Shape and aspect ratio		Spherical
Crystallinity		Amorphous
Surface functionalization		None
Specific surface area, m2/g		50-600

See Section 16 for a list of hazards if identified above.

Section 4: First-Aid Measures

4.1 Description of first aid measures

Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of the eye and lids with water. Get medical attention.

Skin Contact: Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.

Inhalation: If inhaled, remove to fresh air. If not breathing, clear person's airway and give artificial respiration. If breathing is difficult, qualified medical personnel may administer oxygen. Get medical attention immediately.

Ingestion: If a person is conscious and can swallow, immediately give two glasses of water (16 oz. or 500 ml.) but do not induce vomiting. If vomiting occurs, give fluids again. Have physician determine if condition of person will permit induction of vomiting or evacuation of stomach. Do not give anything by mouth to an unconscious or convulsing person.

First Aid Facilities: Eye wash station.

Advice to Physicians: No further relevant information available.

4.2 Most important symptoms and effects, both acute and delayed

Ethylene glycol poisoning may initially produce behavior changes, drowsiness, vomiting, diarrhea, thirst and convulsions. End-stage signs of poisoning are renal damage/failure with metabolic acidosis. Immediate treatment, supplemented with hemodialysis if indicated, may limit the progression and severity of toxic effects. Contact a POISON CENTER for further treatment information. Aspiration of this product during induced emesis may result in lung injury. If evacuation of stomach is necessary, use method least likely to cause aspiration, such as gastric lavage after endotracheal intubation. Contact a POISON CENTER for additional information.

4.3 Indication of any immediate medical attention and special treatment needed.

Treat symptomatically. Fomepizole and ethanol are antidotes against ethylene glycol toxicity. See http://www.cdc.gov/niosh/ershdb/EmergencyResponseCard_29750031.html for more detailed advice.

Section 5: Fire-Fighting Measures

5.1 Extinguishing Media

Suitable Extinguishing Media:	Use water spray, dry chemical, foam or carbon dioxide to extinguish flames. Use water spray to cool fire-exposed containers. Water or foam may cause frothing.
Unsuitable extinguishing media:	None known.

5.2 Special hazards arising from the substance or mixture

Flammability of the product:	Combustible, material will burn in a fire. Containers can build pressure if exposed to heat or fire.
Special Hazard Arising from the Chemical:	None known.
Fire Hazard:	None known.
Explosion Hazard	None known.
Reactivity:	None known.

5.3 Advice for firefighters

Special Protective Equipment for Fire-fighters:	Wear standard full firefighter turn-out gear (full bunker gear) and respiratory protection (SCBA).

Section 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Eye protection and impervious gloves. An approved air-purifying respirator should be worn if dust or mist is present.

6.1.1 For non-emergency personnel

Wear protective equipment. Keep unprotected persons away.

6.2 Environmental precautions

Prevent entry into sewers and waterways.

6.3 Methods and material for containment and cleaning up

Ventilate area. Avoid breathing vapor. Wear appropriate personal protective equipment, including appropriate respiratory protection. Contain spill if possible. Wipe up or absorb on suitable material and shovel up. Prevent entry into sewers and waterways. Avoid contact with skin, eyes or clothing.

If more than 1 pound of product is spilled, then report spill according to SARA 304 and CERCLA 102(A) requirements.

6.4 Reference to other sections

For more information on exposure controls and personal protection or disposal considerations, check section 8 and 13 of this SDS.

Section 7: Handling and Storage

7.1 Precautions for safe handling

Minimum feasible handling, and temperatures should be maintained. Avoid generating mist or dust during use. Use only in well ventilated area.

7.1.1 Protective measures

Use only in well ventilated areas. As a precautionary measure, the wearing of standard work gear is suggested. Keep ignition sources away. Do not smoke. Protect from heat. Protect against electrostatic charges.

7.1.2 Advice on general occupational hygiene

Avoid inhalation or ingestion. General occupational hygiene measures are required to ensure a safe handling of the substance. These measures involve good personal and housekeeping practices (i.e. regular cleaning with suitable cleaning devices), no eating, drinking and smoking at the workplace and wearing standard working clothes and shoes unless otherwise stated. Wash hands after use. Remove contaminated clothing and protective equipment before entering eating areas. Shower and change clothes at end of work shift. Do not wear contaminated clothing at home.

7.2 Conditions for safe storage, including any incompatibilities

Periods of exposure to high temperatures should be minimized. Water contamination should be avoided. Provide sufficient ventilation in storage and workrooms.

7.3 Specific end use(s)

No additional information available. Refer to Section 1.2 of this SDS.

Section 8: Exposure Controls / Personal Protection

8.1 Control Parameters

8.1.1 National Limit Values

Silicon Dioxide, CAS #7631-86-9

Country	Occupational exposure limit	Reference period	Reference
USA	80 mg/m^3/%SiO2	8 hours	OSHA PEL - http://www.cdc.gov/niosh/idlh/7631869.html
UK	6 mg/m^3 (inhalable)	8 hours	Health and Safety Executive- http://www.hse.gov.uk/pubns/priced/eh40.pdf
Germany	4 mg/m^3 (inhalable)	8 hours	Senate Commission for the Investigation of Health Hazards of Chemical Compounds in the Work Area (MAK Commission): http://www.dfg.de/en/dfg_profile/statutory_bodies/senate/health_hazards/index.html
Belgium	10 mg/m^3	8 hours	Service public fédéral Emploi, Travail et Concentration sociale: http://www.emploi.belgique.be/WorkArea/showcontent.aspx?id=23914
Austria	2 mg/m^3 (inhalable)	8 hours	http://www.arbeitsinspektion.gv.at/NR/rdonlyres/F173280B-D4FB-44D2-8269-8DB2CB1D2078/0/GKV2011.pdf

Ethylene Glycol, CAS #107-2-1

USA OSHA	OSHA PEL Ceiling (mg/m^3)	10 mg/m^3 TWA

8.1.2 DNELs and PNECs

Silicon Dioxide, CAS 7631-86-9

DNEL (Derived No Effect Level)

Route of Exposure/Environmental protection target	DNEL
Inhalation - Long term/systemic effects	4 mg/m^3

PNEC (Predicted No Effect Concentration)

No information available.

Ethylene Glycol (107-21-1)

DNEL (Derived No Effect Level)

Exposure Route	Exposure Pattern	DNEL
Inhalation	Long term systemic	As no long term systemic toxicity hazard has been identified, there is no requirement to derive long term DNELs

	Acute systemic	As no acute toxicity hazard has been identified, there is no requirement to derive acute DNELs
	Long term local	35 mg/m^3 (workers) 7 mg/m^3 (general population)
Dermal	Long term systemic	106 mg/kg bw/day (workers) 53/mg/kg bw/day (general population)
	Acute systemic	As no acute toxicity hazard has been identified, there is no requirement to derive acute DNELs
	Local	As no local toxicity hazard has been identified, there is no requirement to derive local DNELs

PNEC (Predicted No Effect Concentration)

PNEC	Value
Aqua (freshwater)	10 mg/L
Aqua (marine water)	1 mg/L
STP	199.5 mg/L
Sediment (freshwater)	37 mg/kg sediment dw
Sediment (marine water)	3.7 mg/kg sediment dw
Soil	1.53 mg/kg soil dw
Secondary poisoning	No potential for bioaccumulation

8.2 Exposure Controls

Engineering Controls: Ventilation adequate to meet occupational exposure limits. The OSHA ceiling is 50 ppm: ACGIH ceiling is 50 ppm.

Hygiene Measures: Workers should wash exposed skin several times daily with soap and water. Soiled work clothing should be laundered or dry-cleaned.

Respiratory: Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air-supplied respirators should always be worn when airborne concentrations of the contaminant or oxygen content is unknown.

Hands: Wear impervious gloves such as neoprene.

Eyes: Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.

Skin: Wear clean body-covering clothing; impervious gloves such as neoprene. Workers should wash exposed skin several times daily with soap and water. Soiled work clothing should be laundered or dry-cleaned.

Environmental Exposure Controls: Adverse effects of this material on the environment have not been evaluated. Proper disposal techniques to isolate and recover material should be implemented.

Section 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Physical State	Liquid
Color:	Translucent white
Odor:	Slight sweet
Metling point/freezing point:	Not determined
Boiling point:	198° C (388° F) (Ethylene Glycol)
Flammability:	Combustible. Material will burn in a fire.
Lower and upper explosion limit:	Not applicable
Flash point:	118°C (244°F) (Ethylene Glycol)
Auto-ignition temperature:	Not determined
Decomposition temperature:	Not determined
pH (1:1 mixture with water):	3
Kinematic viscosity, mm^2/s	40-80
Solubility:	Fully miscible with water. Nanoform solubility 0.01% in water.
Partition coefficient, n-octanol/water (log value)	Not determined
Vapor pressure	Not determined
Relative density (specific gravity)	1.3
Relative vapor density	Not determined
Particle characteristics	See Section 3 for nanoform characteristics

9.2 Other information

Not applicable.

Section 10: Stability and Reactivity

10.1 Reactivity

Reaction with strong acids and strong oxidizing agents.

10.2 Chemical Stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

Hazardous polymerization will not occur.

10.4 Conditions to avoid

No recommendation.

10.5 Incompatible materials

Not determined.

10.6 Hazardous decomposition products

Toxic levels of carbon monoxide, carbon dioxide, irritating aldehydes and ketones may be formed on burning. Heating in air may produce irritating aldehydes, acids and ketones.

Section 11: Toxicological Information

Silicon dioxide, CAS 7631-86-9

Acute toxicity (oral)	LD50 >5000 mg/kg

Ethylene Glycol, CAS 107-21-1

Acute toxicity, oral (human)	LD50: 1400-1600 mg/kg
Acute toxicity, oral (rat)	LD50: >4000 mg/kg
Acute toxicity, dermal (rabbit)	LD50: >6000 mg/kg
Skin corrosion/irritation	Not irritating
Serious eye	Not irritating
Respiratory or skin sensitization	Not sensitizing
Germ cell mutagenicity	Not considered to be mutagenic (weight of evidence approach)
Carcinogenicity	Not considered to be carcinogenic (weight of evidence approach)
Reproductive toxicity	Not considered to be reproductive or developmental toxicant (weight of evidence approach)

STOT-single exposure	Not considered to induce specific organ toxicity after single exposure
STOT-repeated exposure	NOEL 150 mg/kg bw/day – kidneys found to be the target organ at high doses (oral)
Aspiration hazard	Not considered to cause an aspiration hazard
Inhalation:	Not determined. Use breathing protection when aerosol or mist is formed.
Ingestion:	Systemic toxicity can occur through ethylene glycol ingestion. Symptoms include headache, weakness, confusion, dizziness, staggering, slurred speech, loss of coordination, faintness, nausea and vomiting, increased heart rate, decreased blood pressure, difficulty breathing and seeing, pulmonary edema, unconsciousness, convulsions, collapse, and coma. Symptoms may be delayed. Decreased urine output and kidney failure may also occur. Severe poisoning may cause death.

Section 12: Ecological Information

12.1 Toxicity

Ethylene Glycol, CAS 107-21-1

Toxicological endpoint	**Value**	**Species, Method**
Acute (short-term toxicity):		
Fish	LC50 (96h) > 72860 mg/L	Pimephales promelas, EPA 600/4-90/027
Crustacea	EC50 (48h) > 100 mg/L	Daphnia magna, OECD 202
Algae/aquatic plants	EC10 (96h) > 100 mg/L	Weight of evidence approach
Activated sludge respiration	EC20 > 1995 mg/L	Read across approach from supporting substance, ISO 8192
Chronic (long-term toxicity):		
Fish	NOEC (7d) 15380 mg/L	Weight of evidence approach
Crustacea	NOEC (7d) 8590 mg/L	Weight of evidence approach

12.2 Persistence and degradability

Ethylene glycol in this product is reported to have a moderate rate of biodegradation; greater than or equal to 30% degradation over a test period of 28 days or less.The product is easily biodegradable.

12.3 Bioaccumulative potential

Ethylene Glycol is not considered to be bioaccumulative.

12.4 Mobility in soil

Ethylene Glycol: Based upon a calculated log Koc (=0), adsorption to solid soil phase is not expected.

12.5 Results of PBT and vPvB Assessment

The PBT and vPvB criteria of Annex XIII to the Regulation do not apply to this product.

12.6 Endocrine disrupting properties

No further relevant information available.

12.7 Other adverse effects

No further relevant information available.

Section 13: Disposal Considerations

This information presented only applies to the materials as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. Disposal should be in accordance with applicable regional, national and local laws and regulations.

Disposal Considerations: The product should be recycled or burned in an incinerator or scrubber approved for chemical waste.

United States: Not a RCRA hazardous waste.

Section 14: Transport Information

The product is not restricted for transportation.

Sections 14.1 - 14.4

Regulations

U.S. D.O.T.: Not regulated.

ICAO/IATA: Not regulated.

IMO/IMDG: Not regulated in non-bulk quantities (<5000 lbs.).

ADR: Not regulated.

14.5 Environmental Hazards

Not an environmental hazard for transport.

14.6 Special precautions for user

None.

14.7 Transport bulk according to Annex II of MARPOL73/78 and the IBC Code

Ship Type: 3
Pollution Category: Y

Section 15: Regulatory Information

15. 1 Safety, health and environmental regulations/legislation specific for substance or mixture:

Worldwide Chemical Inventories

EINECS (EU):	All ingredients listed
TSCA (USA):	All ingredients listed
DSL (Canada):	All ingredients listed
AICS (Australia):	All ingredients listed
ENCS (Japan):	All ingredients listed
ECL (Korea):	All ingredients listed
PICCS (Philippines):	All ingredients listed
IECSC (China):	All ingredients listed

Technical Instructions (air): Class: NK Share in %: 70.0

Water hazard class: Water hazard class 1: Slightly hazardous for water

WHMIS: Class D, Division 1, Division 2, material causing other toxic effects and teratogenic effects.

Controlled Products Regulations: This SDS contains all the information items specified in Schedule 1, Column 3 of the Controlled Products Regulations in a 16-heading format.

State Right-to-Know Laws: Section 3 of this SDS lists all components of this product.

SARA 311/312 Hazards: Acute Toxicity. Specific target organ toxicity, repeated exposure.

SARA 313: This product contains the following toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40 CFR 372:

Chemical Name	CAS #	Percent By Weight
Ethylene Glycol	107-21-1	70

If more than one (1) pound of Ethylene Glycol (2.8 pounds of DP5540) is spilled, then report the spill according to SARA 304 CERCLA 102 requirements.

California Proposition 65: Ethylene Glycol

FDA:	21 CFR 175.105 – Silicon Dioxide may be used as a component of adhesives used to prepare articles intended for the use in packaging, transporting or holding food. 21 CFR 177.1200 – Silicon Dioxide may be used as a component of a polymer used as a base sheet or as a coating applied to a base sheet for use in food packaging. 21 CFR 182.90 – Silicon Dioxide is generally recognized as safe (GRAS) as a substance migrating to food from paper and paper board products used in food packaging.

15. 2 Chemical safety assessment:

A Chemical Safety Assessment has not been carried out.

Section 16: Other Information

List of hazard phrases:
H302 – Harmful if swallowed.
H373 – May cause damage to organs (kidneys) through prolonged or repeated exposure.

National Fire Protection Association (U.S.A.) 704	Health-2, Flammability-1, Reactivity-0, Special-None
HMIS® Hazard Rating:	Health-2, Flammability-1, Reactivity-0, Protective Equipment – I; safety glasses, gloves, combination respirator.
Recommended Use:	The product is recommended for use as an additive for polymers and ceramics. Other uses have not been investigated and may have other hazards. For industrial use only, not for food, drug or home use.
Work Alert:	Workers using the product should read and understand this SDS and be trained in the proper use of this material.
Other Special Considerations:	None known.
SDS Prepared By:	Andrew A. Guzelian Technical Services Manager Nyacol Nano Technologies, Incorporated Telephone: +1 508-881-2220
Revision Date:	june 26, 2026
Supersedes:	June 3, 2020

This SDS has been prepared with data from Nyacol Nano Technologies, Inc.'s laboratories, raw material suppliers, and government publications. Information herein is accurate to the best of our knowledge. Suggestions are made without warranty or guarantee of results. Before using, the user should determine the suitability of the products for the intended use, and the user assumes the risk and liability in connection therewith. We do not suggest violation of any existing patents or give permission to practice any patented invention without license.

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