Section 1: Product and Company Identification:

1.1 Product Identifier

Product Form:	Mixture
Identification of Substance:	Aluminum Hydroxide Oxide
Product Name:	NYACOL® AL25SD
Synonym:	Alumina Monohydrate Powder
CAS Number:	1318-23-6
Index Number:	Not available.
EINECS Number:	215-284-3
REACH Registration Number:	Not Registered; see Section 3.
Formula:	$AlHO_2$
Nanoforms:	AlHO2 exists as a nanoform
Unique formula identifier (UFI):	Not required

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

Recommended Use:	Ceramics. Textiles. Papermaking.
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 Classification of the substance or mixture

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

Not classified.

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

Not classified.

2.2 Label Elements

Not labelled.

Signal Word: Not applicable.

Hazard Pictogram: Not applicable.

Hazard Statement(s): Not applicable.

Precautionary Statement(s): Not applicable.

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

3.1 Chemical characterization: Mixtures
Description: Mixture consisting of the following components.

Component Name:	Product Identifiers	GHS Classification	Percent By Weight	SCL, M-factor, ATE
Aluminum Hydroxide Oxide:	CAS: 1318-23-6 EINECS: 215-284-3 Index: Not available	Not classified.	95	
Water:	CAS: 7732-18-5 EINECS: 231-791-2	Not classified	5	
Nitric acid: REACH: 01-2119487297-23-0090	CAS: 7697-37-2 EINECS: 231-714-2 Index: Not available	Ox. Liq. 3 - H272 Met. Corr. 1 - H290 Acute Tox. 3 - H331 Skin Corr. 1A - H314 Eye Dam. 1 - H318 Corrosive to the respiratory tract - EUH071	<1*	Ox. Liq. 3; H272: C ≥ 65 % Skin Corr. 1A; H314: C ≥ 20 % Skin Corr. 1B; H314: 5 % ≤ C < 20 % Inhalation: ATE = 2.65 mg/L (Vapors)
*Does not meet classification criteria as the concentration is below cut-off levels.				

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.

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

Nanoform characteristics:

Name of nanoform: Aluminum Hydroxide Oxide		
		Value
Number based particle size distribution, nm	d10	4 - 60
	d50	5 - 80
	d90	7 - 110
Shape and aspect ratio		Spherical
Surface functionalization		None
Specific surface area, m^2/g		50-200

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: In case of contact, immediately flush skin with plenty of water for several minutes. Remove contaminated clothing. Get medical attention if skin irritation develops or persists.

Inhalation: If inhaled, remove to fresh air; remove person from exposure source. Get medical attention immediately.

Ingestion:	Consult medical professional. Do not induce vomiting unless directed by medical professional. Never give anything by mouth to an unconscious 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

Acute or delayed effects are not anticipated.

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

No further relevant information available.

Section 5: Fire-Fighting Measures

5.1 Extinguishing Media

Suitable Extinguishing Media:	Use fire fighting measures that suit the environment.
Unsuitable extinguishing media:	None known.

5.2 Special hazards arising from the substance or mixture

Flammability of the product:	Material is not flammable. Containers can build pressure if exposed to heat or fire.
Special Hazard Arising from the Chemical:	Combustible products may include nitrogen oxides.
Fire Hazard:	No further relevant information available.
Explosion Hazard	No further relevant information available.
Reactivity:	No further relevant information available.

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. Avoid mist formation. An approved air-purifying respirator should be worn if dust 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 or onto the ground.

6.3 Methods and material for containment and cleaning up

Avoid breathing dust. Avoid creation of dust. Contain spill with inert materials such as sand, vermiculite. Not an RCRA hazardous waste. Ventilate area. Wear appropriate personal protective equipment, including appropriate respiratory protection.

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 dust during use. Use only in well ventilated area. An approved air-purifying respirator should be worn if dust or mist is present. Do not breath dust or mists or aerosols containing the product.

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, ingestion and contact with eyes. 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. Store in a cool dry area. Keep containers tightly sealed.

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

Aluminum Hydroxide Oxide, CAS #1318-23-6

USA OSHA	OSHA PEL Ceiling (mg/M$^{3)}$	2 mg/M^3 TWA

Nitric Acid, CAS #7697-37-2

USA OSHA	OSHA PEL Ceiling (mg/M$^{3)}$	5 mg/M^3 TWA

Water, CAS #7732-18-5

USA OSHA	OSHA PEL Ceiling (mg/M$^{3)}$	None.

8.2 Exposure Controls

Engineering Controls:	Ventilation adequate to meet occupational exposure limits.
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	Powder
Color:	White
Odor:	Odorless
Metling point/freezing point:	Not determined
Boiling point:	Not applicable
Flammability:	Not flammable
Lower and upper explosion limit:	Not applicable
Flash point:	Not applicable
Auto-ignition temperature:	Not applicable
Decomposition temperature:	Not applicable
pH:	Not applicable
Kinematic viscosity, mm^2/s	Not applicable
Solubility:	Disperses in water. Nanoform solubility <1 ppm in water.
Partition coefficient, n-octanol/water (log value)	Not applicable
Vapor pressure	Not determined
Relative density (specific gravity)	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

There are no known reactivity hazards associated with this product.

10.2 Chemical Stability

Stable under normal ambient and anticipated storage and handling conditions.

10.3 Possibility of hazardous reactions

No further relevant information available.

10.4 Conditions to avoid

No further relevant information available.

10.5 Incompatible materials

Strong oxidizing agents.

10.6 Hazardous decomposition products

Oxides of nitrogen.

Section 11: Toxicological Information

11.1 Information on toxicological effects

Acute toxicity:

LD50, Rat, Oral Values for classification:

Aluminum Hydroxide Oxide, CAS# 1318-23-6: >2000 mg/kg

Nitric Acid, CAS# 7697-37-2: >90 mL/kg

Water: None reported.

Skin corrosion/irritation: Avoid contact with skin. Irritation, drying or cracking of skin due to drying effects. Dry skin has been reported.

Eye damage/irritation: Avoid contact with eyes. This material may be irritating.

Inhalation: No further relevant information available.

Sensitization: No sensitizing effect known.

Chronic Effects: No further relevant information available.

Carcinogenicity No data indicating any concern for carcinogenicity.

Section 12: Ecological Information

12.1 Aquatic Toxicity

No further relevant information available.

12.2 Persistence and degradability

There is no data on the degradability of this product.

12.3 Bioaccumulative potential

No further relevant information available.

12.4 Mobility in soil

No further relevant information available.

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: Dispose of solids in a landfill. Dispose in accordance with regional, national and local laws and regulations.

United States: The product is 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.

ADR: Not regulated.

14.5 Environmental hazards:

Not an environmental hazard for transport.

14.6 Special precautions for users:

None.

14.7 Maritime transport in bulk according to IMO instruments

Not applicable.

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

State Right-to-Know Laws:	Section 3 of this SDS lists all components of the product.
California Proposition 65:	No ingredients listed.
SARA Section 311/312 (29 CFR 1910.1200) Hazards:	Not classified according to GHS.
SARA 313, 304 and CERCLA 102 (A):	No ingredients above the de minimus limit.
WHMIS:	Aluminium hydroxide oxide: Not controlled. Nitric acid: Disclose at 1%.

15. 2 Chemical safety assessment:

A Chemical Safety Assessment has not been carried out.

Section 16: Other Information

Full text of Hazard statements:

H272: May intensify fire; oxidizer
H290: May be corrosive to metals
H314: Causes severe skin burns and eye damage
H318: Causes serious eye damage
H331: Toxic if inhaled
EUH071 - Corrosive to the respiratory tract

National Fire Protection Association (U.S.A.) 704	Health-1, Flammability-0, Reactivity-0, Special-None
HMIS® Hazard Rating:	Health-1, Flammability-0, Reactivity-0, Protective Equipment - E; Safety glasses, Gloves, Dust Respirator.
Recommended Use:	The product is recommended for use as in ceramics, textiles and papermaking. 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.
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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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