Section 1: Product and Company Identification:

1.1 Product Identifier

Product Form:	Mixture
Identification of Substance:	Zinc Oxide and Water
Product Name:	NYACOL® DP5370
Synonym:	None
CAS Number:	1314-13-2
Index Number:	030-013-00-7
EINECS Number:	215-222-5
REACH Registration Number:	01-2119463881-32-0163
Formula:	ZnO
Nanoforms:	ZnO 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:	UV absorber
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-US Classification

Aquatic Acute 1; H400 Very toxic to aquatic life.
Aquatic Chronic 1; H410 Very toxic to aquatic life with long lasting effects.

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

Aquatic Acute 1; H400 Very toxic to aquatic life.
Aquatic Chronic 1; H410 Very toxic to aquatic life with long lasting effects.

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

Signal Word: Warning

Hazard determining components of labelling:	Zinc Oxide, CAS # 1314-13-2
Hazard Statement(s):	H410 Very toxic to aquatic life with long lasting effects.
Precautionary Statement(s):	P273 - Avoid release to the environment. P391 - Collect spillage. P501 - Dispose of contents/container in accordance with local/regional/national/international regulations.

2.3 Other Hazards

Not applicable.

2.4 Unknown acute toxicity (GHS US)

Not applicable.

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
Zinc Oxide	CAS: 1314-13-2 EINECS: 215-222-5 Index: 030-013-00-7	Aquatic Acute 1, H400; Aquatic Chronic 1, 410	30	
Water	CAS: 7732-18-5 EINECS: 231-791-2	Not classified	66	
Polymer	Trade Secret	Not classified	4	

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: Zinc oxide		
		Value
Number based particle size distribution, nm	d10	20-100
	d50	30-110
	d90	40-170
Shape and aspect ratio		Spherical
Crystallinity		Hexagonal
Surface functionalization		None
Specific surface area, m^2/g		10-30

Section 4: First-Aid Measures

4.1 Description of first aid measures

Eye Contact: Immediately flush eyes with large quantities of water for at least 15 minutes. Hold eyelids apart to ensure rinsing of the entire surface of the eye and lids with water. If irritation occurs get medical attention.

Skin Contact: Wash with soap and plenty of water for at least 15 minutes. Wash contaminated clothing before reuse.

Inhalation: Remove person from exposure source. Consult medical professional if effects occur.

Ingestion: If swallowed rinse out mouth and then drink plenty of water. Seek medical attention if effects occur. Never give anything by mouth to an unconscious person.

First Aid Facilities: Eye wash station. Safety shower.

Advice to Physicians: No further relevant information available.

4.2 Most important symptoms and effects, both acute and delayed

No further relevant information available.

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:	All are acceptable. Cool containers with water spray.
Unsuitable extinguishing media:	None known.

5.2 Special hazards arising from the substance or mixture

Flammability of the product:	Material will not burn in a fire.
Special Hazard Arising from the Chemical:	Formation of toxic gases is possible during heating or in case of fire. Combustible products may include carbon monoxide, carbon dioxide, and 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. An approved air-purifying respirator should be worn if vapor or mist is present.

6.1.1 For non-emergency personnel

Wear protective equipment. Keep unprotected persons away. Avoid inhalation of fumes, contact with skin and eyes.

6.2 Environmental precautions

Do not allow product to reach sewage system or water bodies. Such contamination must be reported to local health authority or other responsible authorities.

6.3 Methods and material for containment and cleaning up

Absorb with liquid binding material (sand, diatomite, acid binders, universal binders, sawdust). Send for recovery or disposal in suitable containers.

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

Prevent formation of mists or aerosols. Ensure good ventilation/ exhaustion at the workplace. Store in cool, dry conditions in well sealed containers.

7.1.1 Protective measures

Use only in well ventilated areas. As a precautionary measure, the wearing of standard work gear is suggested. Do not smoke.

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

Keep from freezing. Store in cool, dry area and keep container tightly sealed. Provide sufficient ventilation at store- and workrooms. Prevent any penetration into the ground.

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

Zinc Oxide, CAS 1314-13-2

Country	Occupational exposure limit	Maximum exposure time	Date	Title	Reference
USA	5 mg/m3	8h TWA	1999	ZnO (respirable fraction)	https://www.osha.gov/dts/chemicalsampling/data/CH_277005.html
UK	Not available				Health and Safety Executive- http://www.hse.gov.uk/pubns/priced/eh40.pdf
Germany	0.1 mg/m3		2014	Zn and its inorganic compounds (respirable fraction)	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
France	10 mg/m3	8h VME	2012	ZnO, dust	Institut National de Recherche et de Sécurité - http://www.inrs.fr/accueil/produits/mediatheque/doc/publications.html?refINRS=ED%20984

8.2 Exposure Controls

8.2.1 Appropriate Engineering Controls

Use exhaust ventilation to keep airborne concentrations below exposure limits. Waste water generated during the production process or cleaning operations should be collected.

8.2.2 Individual protective measures, such as personal protective equipment (PPE)

Hygiene Measures:	Change contaminated clothing. Wash hands after working with substance.
Respiratory:	When respiratory protection is required, or concentrations unknown, use approved air-purifying respirator with a dust cartridge.
Hands:	Wear impervious gloves such as neoprene.
Eyes:	Wear approved safety glasses.
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.

8.2.3 Environmental Exposure Controls

The product should be recycled when possible. Appropriate controls should be put in place to prevent release of the product to the environment, including sewage systems and water bodies.

Section 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Physical State	Liquid
Color:	Beige
Odor:	Odorless
Metling point/freezing point:	Not determined
Boiling point:	100 °C (212 °F)
Flammability:	Not flammable
Lower and upper explosion limit:	Not applicable
Flash point:	Not applicable
Auto-ignition temperature:	Not applicable
Decomposition temperature:	Not applicable
pH:	10
Kinematic viscosity, mm^2/s	<10
Solubility:	Fully miscible with water. Nanoform solubility <10 ppm 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

Reacts with acids.

10.2 Chemical Stability

No decomposition if used according to specifications.

10.3 Possibility of hazardous reactions

None.

10.4 Conditions to avoid

Neutralization by acidic materials.

10.5 Incompatible materials

In case of temperature increase, oxidizing agents may cause reactions.

10.6 Hazardous decomposition products

Oxides of nitrogen and carbon.

Section 11: Toxicological Information

11.1 Information on toxicological effects

Acute toxicity:

LD50, Rat, Oral Values for classification:

Zinc Oxide:	7950 mg/kg
Polymer:	>5000 mg/kg
Water:	None reported.

Skin Contact:	Avoid contact with skin. Zinc Oxide: Irritation: Rabbit 500 mg/24 hours; mild.
Eye Contact:	Avoid contact with eyes. Zinc Oxide: Irritation: Rabbit 500 mg/24 hours; mild.
Inhalation:	Zinc Oxide: LC50 = 2500 mg/kg Mouse.
Sensitization:	No sensitizing effect known.
Chronic Effects:	No further relevant information available.
Carcinogenicity	No data indicating any concern for carcinogenicity.

11.2 Information on other hazards

No further relevant information available.

Section 12: Ecological Information

12.1 Toxicity

Aquatic toxicity: Very toxic for fish.

12.2 Persistence and degradability

No further relevant information available.

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

Not applicable.

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:	Dry to solids. Solids should be disposed of in an incinerator or disposal site.
United States:	The product is not a RCRA regulated waste.

Section 14: Transport Information

US DOT: The product is not restricted for transportation.

14.1 UN Number:

ADR, IMDG, IATA: 3082

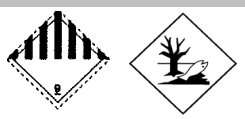
14.2 UN Proper Shipping Name:

ADR: 3082 Environmentally hazardous substance, liquid, N.O.S. (Zinc Oxide)

IMDG, IATA: Environmentally hazardous substance, liquid, N.O.S. (Zinc Oxide)

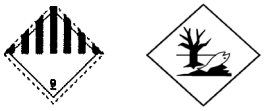
14.3 Transport hazard class(es):

ADR:



Class:	9 (M6) Miscellaneous dangerous substances and articles.
Label:	9

IMDG, IATA:



Class:	9 Miscellaneous dangerous substances and articles.
Label:	9

14.4 Packing Group:

ADR, IMDG, IATA: III

14.5 Environmental hazards:

Special marking (ADR): Symbol (fish and tree)
Special marking (IATA): Symbol (fish and tree)

14.6 Special precautions for users:

Warning: Miscellaneous dangerous substances and articles.
Kemler Number: 90
EMS Number: F-A, S-F

14.7 Maritime transport in bulk according to IMO instruments

Not applicable.

Transport/Additional Information:

ADR:

Limited quantities (LQ):	LQ7
Transport category:	3
Tunnel restriction code:	E
UN "Model Regulation":	UN3082, Environmentally hazardous substance, liquid, N.O.S. (zinc oxide), 9, III

Section 15: Regulatory Information

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

Worldwide Chemical Inventories

EINECS (EU):	All ingredients conform
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

SARA Section 311/312 (29 CFR 1910.1200) Hazards: Not classified as a physical or health hazard according to GHS.

SARA Section 313: This product contains the following toxic chemicals subject to the reporting

Chemical Name:	CAS #:	Percent by Weight:
Zinc Oxide	1314-13-2	30

California Proposition 65:	No ingredients listed.
State Right-to-Know:	Section 3 of this SDS lists all components of the product.
Technical Instructions (air):	Not available.
Water hazard class:	Water hazard class 2: Hazardous for water.
FDA:	DIETARY SUPPLEMENTS: 21 CFR 182.5991 Zinc Oxide is generally recognized as safe when used in accordance with good manufacturing practices. NUTRIENTS: 21 CFR 182.8991 Zinc Oxide is generally recognized as safe when used in accordance with good manufacturing practices.

15. 2 Chemical Safety Assessment:

A Chemical Safety Assessment has not been carried out.

Section 16: Other Information

List of relevant phrases:
H400: Very toxic to aquatic life.
H410: Very toxic to aquatic life with long lasting effects.

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 - B; safety glasses, gloves.
Recommended Use:	The product is recommended for use as an UV absorber. Other uses 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 Guzelian Nyacol Nano Technologies, Incorporated Telephone: +1 508-881-2220
Revision Date:	March 30, 2023
Supersedes:	April 30, 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.