Section 1: Product and Company Identification:

1.1 Product Identifier

Product Form:	Mixture
Identification of Substance:	Indium Tin Oxide and Water
Product Name:	NYACOL® ITO-W
Synonym:	ITO
CAS Number:	1312-43-2 and 18282-10-5
Index Number:	Not available.
EINECS Number:	215-193-9 and 242-159-0
REACH Registration Number:	Refer to section 3.
Formula:	In2O5Sn

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

Recommended Use:	Polymer additive; transparent conductive coatings.
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. 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)

STOT RE Category 1 H372 Causes damage to lungs through prolonged or repeated exposure by inhalation.
Aquatic Chronic Category 3 H412 Harmful to aquatic life with long lasting effects.

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

STOT RE Category 1 H372 Causes damage to lungs through prolonged or repeated exposure by inhalation.
Aquatic Chronic Category 3 H412 Harmful to aquatic life with long lasting effects.

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

Signal Word: Danger

Hazard determining components of labelling:	Indium trioxide
Hazard Statement(s):	H372: Causes damage to lungs through prolonged or repeated exposure by inhalation. H412: Harmful to aquatic life with long lasting effects.

Precautionary Statement(s):

P260: Do not breathe dust/mist.
P264: Wash hands thoroughly after use.
P270: Do not eat, drink or smoke when using this product.
P273: Avoid release to the environment.
P314: Get medical advice/attention if you feel unwell.
P501: Dispose of contents/container to an authorized waste contractor.

2.3 Other Hazards

No further relevant information available.

2.4 Unknown acute toxicity (GHS US)

No further relevant information available.

Section 3: Composition / Information on Ingredients

Description: Mixture consisting of the following components.

Hazardous Component Name:	Product Identifier	GHS Classification / Directive 1999/45/EC	Percent By Weight
Water	CAS: 7732-18-5 EINECS: 231-791-2 Index: Not available	Not classified	70-80
Indium Oxide:	CAS: 1312-43-2 EINECS: 215-193-9 Index: Not available	STOT RE, 1 - H372 Aquatic Chronic 3 - H412	15 - 20
Tin Oxide: REACH: 05-2117294622-39-0000	CAS: 18282-10-5 EINECS: 242-159-0 Index: Not available	Not classified	2 - 4

Impurities: Present at a level below that to be taken into account for classification.
Stabilizing Additives: Polyacrylic acid, Ammonium Salt (Trade Secret): Non-hazardous 3-5%

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.

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. Remove contaminated clothing. Wash clothing prior to reuse. 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:	Do NOT induce vomiting. If a person is conscious and can swallow, immediately give two glasses of water (16 oz. or 500 ml.); however, stop if person feels sick as vomiting should be avoided. If vomiting occurs, avoid vomit entering the lungs. 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

Causes skin irritation, causes serious eye irritation, may cause respiratory irritation.

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

Treat symptomatically.

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:	Material will not burn in a fire. Containers can build pressure if exposed to heat or fire.
Special Hazard Arising from the Chemical:	No further relevant information available.
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 (PPE) and emergency procedures

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

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.

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

Wear appropriate personal protective equipment (PPE). Minimum feasible handling, and temperatures should be maintained. Avoid generating mist or dust during use. Use only in well ventilated area. Thoroughly wash hands after handling.

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

Keep from freezing. Periods of exposure to high temperatures should be minimized. Provide sufficient ventilation in storage and workrooms. Keep container tightly closed. Store in cool, dry area. Store locked up.

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

Indium oxide, CAS #1312-43-2

Inhalation:	Workplace Exposure Limits	
	0.1 mg/M^3 as In	Long-term exposure limit (8 hour TWA reference period)
	0.3 mg/M^3 as In	Short-term exposure limit (15-minute reference period)

Tin oxide, CAS #18282-10-5

Inhalation:	Workplace Exposure Limits	
	2 mg/M^3 as Sn	Long-term exposure limit (8 hour TWA reference period)
	4 mg/M^3 as Sn	Short-term exposure limit (15-minute reference period)

8.2 Exposure Controls

Engineering Controls: Use local exhaust ventilation or adequate respiratory protective equipment to maintain exposure below workplace exposure limits. Wear protective gloves, protective clothing and eye protection.

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

Appearance (Physical State, Color):	Blue liquid. The product is a water-based material.
Upper/lower flammability or explosive limits:	Not determined.
Volatile by Weight:	80%
Odor:	Odorless
Vapor Pressure:	Not determined.
Odor Threshold:	Not determined.
Density:	1.2 kg/m^3
pH:	Not applicable.
Relative Density:	Not determined.
Melting point/freezing point:	Not determined.
Solubility in Water:	Not determined.
Initial boiling point and boiling range:	100° C (212° F)
Flashpoint:	None.
Evaporation Rate:	Slow.
Flammability (solid, gas):	Not flammable.
Partition Coefficient:	Not determined.
Auto-ignition temperature:	Not determined.
Decomposition temperature:	Not determined.
Viscosity:	<20 cP
Specific Gravity:	1.2
Freezing Point:	0 °C (32° F)
Explosion Limits:	Not determined.
Oxidizing Properties:	Not an oxidizer.

9.2 Other information

Not applicable.

Section 10: Stability and Reactivity

10.1 Reactivity

No further relevant information available.

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 further relevant information available.

10.5 Incompatible materials

No further relevant information available.

10.6 Hazardous decomposition products

Carbon oxides and nitrogen oxides may be formed on burning.

Section 11: Toxicological Information

11.1 Information on toxicological effects

Acute toxicity:

LD50, Rat, Oral Values for classification:

Tin oxide:	>20 gm/kg
Indium oxide:	>10 gm/kg

Skin corrosion/irritation:	Avoid contact with skin. Causes skin irritation.
Eye damage/irritation:	Avoid contact with eyes. Causes serious eye irritation.
Inhalation:	Vapors or mist in excess of permissible concentrations, or in unusually high concentrations generated from spraying, heating the material or from exposure in poorly ventilated areas or confined spaces may cause respiratory irritation. Prolonged over-exposure may result in absorbance of potentially harmful amounts of material.
Ingestion:	No further relevant information available.
Sensitization:	No further relevant information available.
Chronic Effects:	Chronic exposure may cause lung damage. May result in stannosis.
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

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

No further relevant information available.

12.6 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.

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:

No further relevant information available.

14.6 Special precautions for users:

No further relevant information available.

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

Not applicable, the product is not sold in bulk quantities.

Transport/Additional Information:

No further relevant information available.

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
Water hazard class:	Not determined.
EPA TSCA Inventory:	All ingredients listed.
State Right-to-Know Laws:	Section 3 of this SDS lists all components of the product.
SARA Section 311/312 (29 CFR 1910.1200) Hazards:	Specific target organ toxicity, repeated exposure.
SARA 313, 304 and CERCLA 102 (A):	No ingredients listed.
California Proposition 65:	No ingredients listed.

15. 2 Chemical safety assessment:

A Chemical Safety Assessment has not been carried out.

Section 16: Other Information

List of relevant hazard phrases:
H372: Causes damage to lungs through prolonged or repeated exposure by inhalation.
H412: Harmful 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 - I; safety glasses, gloves, combination respirator.
Recommended Use:	The product is recommended for use as a polymer additive and transparent conductive coatings. 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: 508-881-2220 U.S.A.
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