SAFETY DATA SHEET

Prepared in accordance with the United States Hazard Communication Standard: 29 CFR 1910.1200 (2012)

Revision date: 25-Feb-16

1. IDENTIF1CATIONOF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product name: Tullanox® HM-250 Silica

CAS-no: 68909-20-6

Synonyms: Reaction products with silicon dioxide, Synthetic Amorphous Silica, Hydrophobic precipitated silica

Recommended use: Various, Rheological control, Flow agent, Thickening agent, Reinforcing agent in Adhesives and/or sealants, Silicone elastomer, Suspension, Paints, Dispersion, other

Restrictions on use: Not Applicable.

Supplier:
Tulco Inc.
9 Bishop Rd.
Ayer MA 01432
United States
Tel: +1 978-772-4412

Emergency Telephone Number:

Tulco Inc. (During work hours) +1 978-772-4412
Tulco Inc. (After work hours) +1 978-877-7987

2. HAZARDS IDENTIFICATION

Classification

OSHA Regulatory Status: This chemical is not considered hazardous by the United States 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200).

Label Elements:

Pictogram: None

Signal Word: None
Hazard statements: None

Precautionary Statements: None

Hazards not otherwise classified (HNOC)

Do not expose to temperatures above 150°C. Hazardous products of combustion can include carbon monoxide, carbon dioxide and nitrogen oxides (NOx).

Potential health effects

Principle Routes of Exposure: Inhalation, Skin Contact, Eye contact

Eye Contact: May cause mechanical irritation. Avoid contact with eyes.

Skin Contact: May cause mechanical irritation and skin drying. Avoid contact with skin. No cases of sensitization in humans have been reported.

Inhalation: Dust may be irritating to respiratory tract. Provide appropriate exhaust ventilation at machinery and at places where dust can be generated. See also Section 8.

Ingestion: Adverse health effects are not expected. See Section 11.

Carcinogenicity: Does not contain any substances greater than 0.1 listed by IARC (International Agency for Research on Cancer), NTP (National Toxicology Program), OSHA (Occupational Safety and Health Administration), ACGIH (American Conference for Governmental Industrial Hygienists) or EU (European Union). See also Section 11.

Target Organ Effects: Lungs, See Section 11

Medical Conditions Aggravated by Exposure: Asthma, Respiratory disorder

Potential Environmental Effects: None known. See Section 12.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms: Silicon Dioxide, Synthetic Amorphous Silica, Precipitated Amorphous Silica.

Chemical name	CAS No	Weight- %	Trade Secret
Silanamine,l,l,l-trimethyl-N-(trimethylsilyl)-, hydrolysis products with silica	68909-20-6	100	*

Other Information:
The hyphen (-) means "not applicable"
This product may contain impurities resulting from our production process < 0.08 Ammonia. Ammonia is not intentionally added in this product but remains adsorbed at the surface of this product. This impurity has been tested as part of our product

4. FIRST AID MEASURES

FIRST AID MEASURES

Skin Contact	Wash thoroughly with soap and water. Seek medical attention if symptoms develop.
Eye contact	Flush eyes immediately with large amounts of water for 15 minutes. Seek medical attention if symptoms develop.
Inhalation	If cough, shortness of breath or other breathing problems occur, move to fresh air. Seek medical attention if symptoms persist. If necessary, restore normal breathing through standard first aid measures.
Ingestion	Do not induce vomiting. If conscious, give several glasses of water. Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed

Symptoms:	The most important known symptoms and effects are described in Section 2 and/or in Section 11.

Indication of any immediate medical attention and special treatment needed

Note to physicians:	Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Carbon dioxide (C02). Foam. Dry chemical. Water.
Unsuitable Extinguishing Media:	None.
Specific hazards arising from the chemical:	None.
Hazardous combustion products:	Carbon monoxide (CO). Carbon dioxide (C02). Nitrogen oxides (NOx).
Protective equipment and precautions for firefighters:	Wear suitable protective equipment. In the event of fire, wear self-contained breathing apparatus.
Risk of Dust Explosion:	Not Applicable: Will not cause dust explosion

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions:	Avoid dust formation. Ensure adequate ventilation. Use personal protective equipment. See also Section 8.
For emergency responders:	Use personal protection recommended in Section 8.

Environmental Precautions:

Environmental Precautions:	Contain spilled product on land, if possible. Local authorities should be advised if significant spillages cannot be contained.

Methods and material for containment and cleaning up

Methods for containment:	Prevent further leakage or spillage if safe to do so.

Methods for cleaning up: Clean up promptly by vacuum. Use of a vacuum with high efficiency particulate air (HEPA) filtration is recommended. Do not create a dust cloud by using a brush or compressed air. Pick up and transfer to properly labeled containers. See Section 13.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling: Avoid contact with skin and eyes. Avoid dust formation. Do not breathe dust. Provide appropriate exhaust ventilation at machinery and at places where dust can be generated. Do not create a dust cloud by using a brush or compressed air.

Take precautionary measures against static discharges. All metal parts of the mixing and processing equipment must be earthed/grounded. Ensure all equipment is electrically earthed/grounded before beginning transfer operations. Fine dust is capable of penetrating electrical equipment and may cause electrical shorts.

General hygiene considerations: Handle in accordance with good industrial hygiene and safety practice

Conditions for safe storage, including any incompatibilities

Storage Conditions: Keep containers tightly closed in a dry and well-ventilated place. Do not store together with volatile chemicals as they may be adsorbed onto product. Store at ambient conditions. Keep in properly labeled containers.

Incompatible materials: None known.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure guidelines: The table below is a summary. Please see the specific legislation for complete information.

Amorphous Silica, The regulatory exposure limits are found under the general silica, CAS RN 7631-86-9:	Australia:	2 mg/m³, TWA, Respirable
	Austria MAK	4 mg/m³, TWA, Inhalable fraction
	Finland:	5 mg/ m³
	Germany TRGS 900:	4 mg/ m³, TWA, Inhalable fraction
	India:	10 mg/ m³, TWA
	Ireland:	2.4 mg/ m³, TWA, Respirable dust
	Norway:	1.5 mg/ m³, TWA, Respirable dust
	Switzerland:	4 mg/m³, TWA
	UK WEL:	6 mg/m³, TWA, Inhalable fraction
		2.4 mg/m³, TWA, Respirable fraction
	US OSHA PEL:	6 mg/ m³ (54 FR2701)

Dust, or Particulates Not Otherwise Specified:	Belgium:	10 mg/ m³, TWA, Inhalable 3 mg/m³ TWA, Respirable
	China:	8 mg/m³, TWA 10 mg/m³, STEL
	France:	10 mg/m³, TWA Inhalable dust 5 mg/m³, TWA Respirable dust
	Italy:	10 mg/m³, TWA, Inhalable 3 mg/m³, TWA, Respirable
	Malaysia:	10 mg/m³, TWA, Inhalable 3 mg/m³, TWA, Respirable
	Spain:	10 mg/m³, VLA, Inhalable 3 rng/m", VLA, Respirable
	US ACGIH - PNOS:	10 mg/m³, TWA, Inhalable 3 mg/m³, TWA, Respirable
	US OSHA - PEL:	15 mg/m³, TWA, Total dust 5 mg/m³, TWA, Respirable

Engineering Controls: Ensure adequate ventilation to maintain exposures below occupational limits. Provide appropriate local exhaust ventilation at machinery and at places where dust can be generated.

Personal protective equipment [PPE]

Respiratory Protection: Approved respirator may be necessary if local exhaust ventilation is not adequate.

Hand Protection: Wear protective gloves to prevent skin drying. Use protective barrier cream before handling the product. Wash hands and other exposed skin with mild soap and water.

Eye/face Protection: Wear eye/face protection. Wear safety glasses with side shields (or goggles).

Skin and Body Protection: Wear suitable protective clothing. Wash clothing daily. Work clothing should not be allowed out of the workplace.

Other: Handle in accordance with good industrial hygiene and safety practice. Emergency eyewash and safety shower should be located nearby.

Environmental exposure controls: In accordance with all local legislation and permit requirements as applicable for dusts.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information given is based on data obtained from similar product.

Physical State:	Solid	**Odor:**	Ammonia.
Appearance:	Powder	**Odor threshold:**	5 ppm
Color:	White		

Property	**Values**	**Remarks • Method**
pH:	8.5	In-house testing
Melting point/freezing point:	1600 - 1700 °C	CRC Handbook of Chemistry and Physics
Boiling point / boiling range:	2230 °C	CRC Handbook of Chemistry and Physics
Evaporation Rate:		Not Applicable
Vapor pressure:		Not Applicable
Vapor Density:		Not Applicable
Density:	2.2-2.3 g/cm3	@ 20°C
Bulk Density:	<8 lbs/ft³	DIN/ISO 787:11
Specific Gravity at 20°C:	2.2 - 2.3	
Water solubility:		No information available
Solubility(ies):		No information available
Partition Coefficient (n-octanol/water):		Not Applicable
Decomposition temperature:		No information available
Viscosity:		Not Applicable
Kinematic viscosity:		Not Applicable
Dynamic viscosity:		Not Applicable
Oxidizing Properties:		No oxidizing properties
Softening point:		Not Applicable
VOC content ():		Not Applicable
Volatile (by Volume):		Not Applicable
Volatile (by Weight):		Not Applicable
Surface Tension:		Not Applicable
Explosive properties:		Non-explosible
Flash Point:		Not combustible
Flammability (solid, gas):		Not flammable. Product resists ignition and does not promote flame spread
Flammability limit in Air:		Not Applicable
Explosion limits in Air - Upper (g/m^3):		Not Applicable
Explosion limits in Air - lower (g/m^3):		Not Applicable
Autoignition Temperature:		Not Applicable
Minimum Ignition Temperature:		No information available
Minimum Ignition Energy:		No information available

Ignition Energy:	
Maximum Absolute Explosion Pressure:	No information available
Maximum Rate of Pressure Rise:	Not Applicable
Burn Velocity:	Not Applicable
KstValue:	No information available
Dust Explosion Classification:	Not Applicable
	Not Applicable

End point is listed "not applicable" due to the inherent properties of the substance
"No information available" indicates testing has not been performed

10. STABILITY AND REACTIVITY

Reactivity: Not reactive.

Stability: Stable under recommended handling and storage conditions.

Possibility of hazardous reactions: None under normal processing.

Hazardous polymerization: Hazardous polymerization does not occur.

Conditions to avoid: Do not expose to temperatures above 150°C. Keep away from heat and sources of ignition. Avoid dust formation.

Incompatible materials: None known.

Explosion data See also Section 9.

Sensitivity to Mechanical Impact: None.

Sensitivity to Static Discharge: This material will not create nor support conditions that would result in a dust explosion or fire. Take precautionary measures against static discharges. Avoid dust formation. All metal parts of the mixing and processing equipment must be earthed/grounded. Ensure all equipment is electrically earthed/grounded before beginning transfer operations.

Hazardous decomposition products: Carbon monoxide (CO). Carbon dioxide (C02). Nitrogen oxides (NOx). Ammonia.

11. TOXICOLOGICAL INFORMATION

Information given is based on data obtained from this substance or from similar substances.

Acute toxicity

OralIDSO: lD50/oral/rat = > 5000 mg/kg. No deaths occurred and no signs of toxicity were seen during the observation periods after single oral administration of the substance. (OECD 423).

Inhalation lCSO: Due to the product's physical characteristics, no suitable testing procedure is available

Dermal IDSO: No data are available on the product itself.

Synthetic Amorphous Silica. LD50/dermal/rabbit = > 2000 mg/kg. Very slight transient erythema in one animal. No signs of systemic or organ toxicity (OECD 402).

Skin corrosion/irritation: Primary irritation index = 0.0 @ 24 hr. Not classified as an irritant (OECD 404)

Serious eye damage/eye irritation: Not classified as an irritant in rabbit studies (OECD 405). High dust concentrations may cause mechanical irritation.

Sensitization: No experimental animal data are available. No cases of sensitization in humans have been reported.

Mutagenicity: Not mutagenic in Ames test. Negative in the chromosome aberration test in Chinese hamster ovary (CHO) cells.

Carcinogenicity: No data are available on the product itself.

Synthetic Amorphous Silica. No evidence of carcinogenicity was observed in multiple animal species following repeated oral or inhalation exposure to amorphous silica. Similarly, epidemiology studies show no evidence of carcinogenicity in workers who manufacture amorphous silica.

Reproductive and Developmental Toxicity: No effects **on** reproductive organs or fetal development have been reported in animal toxicity studies.

STOT - single exposure: Specific target organ toxicity is not expected after single oral, single inhalation, or single dermal exposure.

STOT - repeated exposure: No data are available on the product itself.

Treated Synthetic Amorphous Silica: Repeated dose toxicity: oral (rat), *28-d,* diet, no significant treatment-related adverse effects at the doses tested. Derived No Adverse Effects Level (NOAEL) in the range of 1000 mgjkgjd.

Synthetic Amorphous Silica: Repeated dose toxicity: oral (rat), 2 weeks to 6 months, no significant treatment-related adverse effects at doses of up to 8 silica in the diet.
Repeated dose toxicity: inhalation (rat), 13 weeks, Lowest Observed Effect Level (LOEL) = *1.3* rng/rn> based on mild reversible effects in the lungs.
Repeated dose toxicity: inhalation (rat), 90 days, LOEL = 1 *mgjm*^{3} based on reversible effects in the lungs and effects in the nasal cavity.

Aspiration Hazard: Based on available data, a STOT-RE classification is not warranted.

Based on industrial experience and available data, no aspiration hazard is expected.

12. ECOLOGICAL INFORMATION

Information given is based on data from similar substances.

Aquatic Toxicity: Fish (Brachydanio rerio) LC50 (96 h): > 10,000 rng/l: (Method: OECD 203)
No acute toxicity to Daphnia with EL and ELso ranging from >1000 to 10,000 mg/L (OECD 202)

ENVIRONMENTAL FATE

Persistence and degradability The methods for determining biodegradability are not applicable to inorganic substances

Bioaccumulation	Not expected due to physicochemical properties of the substance.
Mobility:	Not expected to migrate.
Distribution to Environmental Compartments:	No information available.
Other adverse effects:	No information available.

13. DISPOSAL CONSIDERATIONS

Disclaimer: Information in this section pertains to the product as shipped in its intended composition as described in Section 3 of this MSDS. Contamination or processing may change waste characteristics and requirements. Regulations may also apply to empty containers, liners or rinsate. State/provincial and local regulations may be different from federal regulations. The person generating waste must determine its proper classification

RCRA:	Unused product is not a hazardous waste under U.S. RCRA, 40 CFR 261.
Unused and Uncontaminated Product:	Product, as supplied, should be disposed of in accordance with the regulations issued by the appropriate federal, state and local authorities. Same consideration should be given to containers and packaging.

14. TRANSPORTATION INFORMATION

DOT

UN/ID no	Not regulated
Proper Shipping Name	Not regulated
Hazard Class	Not regulated
Packing group	Not regulated

iCAO (air)

UN/ID no	Not regulated
Proper Shipping Name	Not regulated
Hazard Class	Not regulated
Packing group	Not regulated

IATA

UN/ID no	Not regulated
Proper Shipping Name	Not regulated
Hazard Class	Not regulated
Packing group	Not regulated

IMDG

UN/ID no	Not regulated
Proper Shipping Name	Not regulated

Hazard Class	Not regulated
Packing group	Not regulated

RID

UN/IO no	Not regulated
Proper Shipping Name	Not regulated
Hazard Class	Not regulated
Packing group	Not regulated

ADR

UN/IOno	Not regulated
Proper Shipping Name	Not regulated
Hazard Class	Not regulated
Packing group	Not regulated

15. REGULATORY INFORMATION

Hazard Classification

United States - OSHA (29 CFR 1910.1200): Not Hazardous
Mexico - NOM-018-STPS-2000: Not hazardous
Canada - WHMIS Classification (CPR, SOR/88-66): Not controlled
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MjSDS contains all the information required by the Controlled Products Regulations.

International Inventories

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory	Complies
DSL/NOSL - Canadian Domestic Substances List/Non-Domestic Substances List	Complies
EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances	Complies
ENCS - Japan Existing and New Chemical Substances	Complies
IECSC - China Inventory of Existing Chemical Substances	Complies
KECL - Korean Existing and Evaluated Chemical Substances	Complies
PICCS - Philippines Inventory of Chemicals and Chemical Substances	Complies
AICS - Australian Inventory of Chemical Substances	Complies
NZIoC - New Zealand Inventory of Chemicals	Complies
TCSI - Taiwan Chemical Substance Inventory	Complies

US *Federal Regulations*

SARA Section 302 (40 CFR 355) Extremely Hazardous Substances:
No components are listed as extremely hazardous substances under SARA Section 302.

SARA 311/312 Hazard Categories

Acute Health Hazard	NO
Chronic Health Hazard	NO
Fire hazard	NO
Sudden release of pressure hazard	NO
Reactive Hazard	NO

SARA Section 313 (40 CFR 372) Toxics Release Inventory

Does not contain any of the substances identified under Section 313 as toxic chemicals in excess of the de minimis concentrations necessary to be subject to the supplier notification requirements.

Clean Air Act Amendments of 1990 (CAA, Section 112, 40 CFR 82):

This product may contain trace levels of ammonia «1) that is regulated as Toxic Substances under Clean Air Act

CWA (Clean Water Act)

This product may contain trace levels of ammonia «1) that is regulated under Clean Water Act.

CERCLA

This material, as supplied, may contain trace levels one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302). < 1 Ammonia. Ammonia is not intentionally added in this product but remains adsorbed at the surface of this product. This impurity has been tested as part of our product.

Pharmaceutical Information

Not recommended.

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

This product may contain trace levels of substances regulated by state right-to-know regulations: Ammonia.
This product contains a listed component(s) on the Massachusetts Right-to-Know Substances List. New Jersey Right-to-Know List. Pennsylvania Right-to-Know List:. Silica (CAS# 7631-86-9).

16. OTHER INFORMATION

Pharmaceutical Use:

Not permitted

References:

NIOSH Pocket Guide to Chemical Hazards, September 2005. "Silica, amorphous". DHHS (NIOSH) Publication No. 2005-149. National Technical Information Service, Springfield, VA. p. 277

Disclaimer:

The information set forth is based on information that Tulco Inc. believes to be accurate. No warranty, expressed or implied, is intended. The information is provided solely for your information and consideration and Tulco Inc. assumes no legal responsibility for use or reliance thereon. In the event of a discrepancy between the information on the non-English document and its English counterpart, the English version shall supersede.

Prepared by: Tulco Incorporated
Revision date: 25-Feb-16

® and 'TM' indicate trademarks of Tulco Incorporated.

End of Safety Data Sheet