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SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier — VORITE* 63

Synonyms: — Not applicable

Chemical Abstracts Registry No: — Mixture

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

Urethane prepolymer

1.3. Details of the supplier of the safety data sheet

Vertellus LLC
201 North Illinois Street, Suite 1800,
Indianapolis, IN 46204
336-292-1781

e-mail Address: sds@vertellus.com

1.4. Emergency telephone number

Vertellus: 1-336-292-1781
CHEMTREC (USA): 1-800-424-9300 (collect calls accepted)
CHEMTREC (International): 1-703-527-3887 (collect calls accepted)
NRCC (China): +86 532 83889090

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

(According to Regulation (EC) No 1272/2008, 29 CFR 1910.1200 & Globally Harmonized System)

Respiratory Sensitization Category 1
Skin Sensitization Category 1
Skin Irritation Category 2
Serious Eye Irritation Category 2
Carcinogenicity Category 2
Acute Toxicity Inhalation Dust / Mist Category 2
EUH204 - Contains isocyanates. May produce an allergic reaction.

2.2. Label elements

Hazard Symbols (Pictogram):

Signal Word: Danger

Hazard Precautions:
H315 - Causes skin irritation.
H317 - May cause an allergic skin reaction.
H319 - Causes serious eye irritation.
H330 - Fatal if inhaled.

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H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H351 - Suspected of causing cancer.
EUH204 - Contains isocyanates. May produce an allergic reaction.

Prevention Precautionary Statements:
P201 - Obtain special instructions before use.
P261 - Avoid breathing dust/fume/gas/mist/vapours/spray.
P280 - Wear protective gloves/protective clothing/eye protection/face protection.
P285 - In case of inadequate ventilation wear respiratory protection.

First Aid Precautionary Statements:
P302+P352 - IF ON SKIN: Wash with plenty of soap and water.
P304+P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313 - IF exposed or concerned: Get medical advice/attention.
P310 - Immediately call a POISON CENTER or doctor/physician.
P333+P313 - If skin irritation or rash occurs: Get medical advice/attention.
P337+P313 - If eye irritation persists: Get medical advice/attention.
P342+P311 - If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.
P362 - Take off contaminated clothing and wash before reuse.
P363 - Wash contaminated clothing before reuse.

Storage Precautionary Statements:
P403+P233 - Store in a well-ventilated place. Keep container tightly closed.

2.3. Other hazards

SECTION 3: Composition/information on ingredients

3.1. Substances or 3.2. Mixtures

Ingredient	CAS Number	Concentration (weight %)	EC Number	CLP Inventory/ Annex VI	EU CLP Classification (1272/2008)
Trade Secret	Trade Secret	Trade Secret	Trade Secret	Not listed.	Skin Irrit. 2; H315 Eye Irrit. 2; H319
2,4-Toluene Diisocyanate	584-84-9	5 - 10	209-544-5	615-006-00-4	Aquatic Chronic 3; H412 Acute Tox. 4; H332 Carc. 2; H351 Eye Irrit. 2; H319 Resp. Sens. 1; H334 Skin Irrit. 2; H315 Skin Sens. 1; H317 STOT SE 3; H335
2,6-Toluene Diisocyanate	91-08-7	1 - 5	202-039-0	615-006-00-4	Aquatic Chronic 3; H412 Acute Tox. 2; H330 Carc. 2; H351 Eye Irrit. 2; H319 Resp. Sens. 1; H334 Skin Irrit. 2; H315 Skin Sens. 1; H317 STOT SE 3; H335

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NOTE: See Section 8 for exposure limit data for these ingredients. See Section 15 for trade secret information (where applicable). See Section 16 for the full text of the R-phrases above.

SECTION 4: First aid measures

4.1. Description of first aid measures

Skin Contact:	Immediately flush with water for 15 minutes. Wash the contaminated skin with soap and water. If irritation develops, call a physician. Remove contaminated clothing and continue flushing with water. Thoroughly wash or discard clothing and shoes before reuse.
Eye Contact:	Rinse eyes immediately with large amounts of water for at least 15 minutes, occasionally lifting the eyelids. Get medical attention if irritation or other symptoms exist.
Inhalation:	Rescuers should put on appropriate protective gear. Remove victim from area of exposure. Remove from exposure. If not breathing, give artificial respiration and call a physician. Give oxygen if respiration is shallow. Keep victim warm. Get medical attention immediately. Short-term inhalation exposure to vapors and mists of isocyanates can cause respiratory and mucous membrane irritation.
Ingestion:	If the material is swallowed, get immediate medical attention or advice -- Do not induce vomiting. Do not give anything by mouth to an unconscious person.

4.2 Most important symptoms and effects, both acute and delayed

Acute:	This product contains diisocyanates. Vapors or mists at excessive levels can irritate the mucous membranes causing respiratory irritation, shortness of breath, discomfort, fever and reduced lung function. Overexposures may lead to bronchitis, bronchial spasm and fluid in the lungs. These symptoms can be delayed up to several hours after exposure. Skin contact with diisocyanates may cause allergic reaction and skin irritation. Eye contact may cause severe irritation, including excess redness and swelling of the conjunctiva. Ingestion may cause abdominal cramps, nausea, vomiting and diarrhea, but is not a likely primary route of exposure. Individuals sensitized from prior contact to diisocyanates may react to levels below the exposure limit, with symptoms similar to those previously listed.
Delayed Effects:	Exposure to isocyanates may cause irritation of the skin, mucous membranes and/or respiratory tract, including asthma attacks or asthma-like symptoms in sensitive individuals. Flu-like symptoms (i.e., fever, chills) have also been reported after exposure to isocyanates. These symptoms can be delayed up to several hours after exposure and are usually reversible.

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

Note to Physician:	No specific indications. Treatment should be based on the judgment of the physician in response to the reactions of the patient.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Appropriate Extinguishing Media:	Carbon dioxide, Dry chemical, foam, water spray

5.2. Special hazards arising from the substance or mixture

Hazardous Products of Combustion:	Toxic vapors may be released during thermal decomposition (i.e., isocyanates, other irritants), but their exact composition has not been determined. Exposure to heated diisocyanate vapors can be extremely dangerous.

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Potential for Dust Explosion: Not applicable.

5.3. Advice for firefighters

Basic Fire Fighting Guidance: As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Evacuate area and fight fire from a safe distance. May release isocyanates upon decomposition. During a fire irritating or toxic gases may be generated by thermal decomposition or combustion. Use water spray/fog for cooling. Hot isocyanates may react vigorously with water. Heat may build pressure and rupture closed containers, spreading fire and increasing risk of burns or injuries. Use water to cool and dilute from as far a distance as possible.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Evacuation Procedures: Isolate the hazard area and deny entry to unnecessary and unprotected personnel. This material is a water pollutant and should be prevented from contaminating soil or from entering sewage and drainage systems and bodies of water Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Wear a self-contained breathing apparatus and appropriate Personal protection. (See Section VIII.)

Special Instructions: See Section 8 for personal protective equipment recommendations. Remove all contaminated clothing to prevent further absorption. Decontaminate affected personnel using the first aid procedures in Section 4. Leather shoes that have been saturated must be discarded.

6.2. Environmental precautions

Prevent releases to soils, drains, sewers and waterways.

6.3. Methods and material for containment and cleaning up

For small spills, use suitable absorbent material and collect for later disposal. Remove all ignition sources. Material can then be collected (eg., suction) for later disposal. For large spills, the area may require diking to contain the spill. Dispose of the material in accordance with standard practice for disposal of potentially hazardous materials as required by applicable federal, state or local laws. Wear protective equipment during clean-up. Ventilate the area of spill or leak. After collection of material, flush area with water.

6.4. Reference to other sections

Refer to section 8 for information on selecting personal protective equipment. Refer to section 13 for information on spilled product, absorbent and clean up material disposal instructions.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for Unique Hazards: Storage temperatures must be maintained between 0˚C and 50˚C to maintain product shelf life.". Contact with moisture may cause polymerization; packages that are suspected to be contaminated should not be resealed.

Practices to Minimize Risk: Wear appropriate protective equipment when performing maintenance on contaminated equipment. Wash hands thoroughly before eating or smoking after handling this material. Do not eat, drink or smoke in work areas. Prevent contact with incompatible materials. Avoid spills and keep away from drains. Handle in a manner to prevent generation of aerosols, vapors or dust clouds.

Special Handling Equipment: Not applicable.

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7.2. Conditions for safe storage, including any incompatibilities

Storage Precautions & Recommendations:	Store away from heat Keep away from heat, sparks, and flame Hot isocyanates may react vigorously with water. Once opened, store container contents in a clean, dry area. Store in a cool dry place. Isolate from incompatible materials.
Dangerous Incompatibility Reactions:	Can react vigorously with oxidizing materials.
Incompatibilities with Materials of Construction:	None known

7.3. Specific end use(s)

If a chemical safety assessment has been completed an exposure scenario is attached as an annex to this Safety Data Sheet. Refer to this annex for the specific exposure scenario control parameters for uses identified in subsection 1.2.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Country	Occupational Exposure Limit
Austria, Belgium, Canada (Ontario), Singapore, S. Korea, Spain	0.005ppm as 8-hour time-weighted average; 0.02ppm as 15-minute short-term limit
Denmark	0.005 ppm as 8-hour time-weighted average; 0.01 ppm as 15-minute short-term limit
United States OSHA PEL	0.02 ppm as 15-minute short-term limit
Sweden	0.002 ppm as 8-hour time-weighted average; 0.005 ppm as 15-minute short-term limit
France	0.01 ppm as 8-hour time-weighted average; 0.02 ppm as 15-minute short-term limit
Germany	0.005ppm as 8-hour time-weighted average; 0.005ppm as 15-minute short-term limit

Air Monitoring Method: Collection media: coated glass fiber filter; Extraction: acetonitrile/DMSO; Analysis: HPLC with UV or fluorescence detector

8.2. Exposure controls

Also see the annex to this SDS (if applicable) for specific exposure scenario controls.

Other Engineering Controls:	All operations should be conducted in well-ventilated conditions. Local exhaust ventilation should be provided. Use process enclosures to control the level of dust in the air. If ventilation is not sufficient to effectively prevent buildup of vapor/mist/fume/dust, appropriate NIOSH/MSHA respiratory protection must be provided. A NIOSH/MSHA approved air purifying respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection. Use impervious gloves. If an exposure limit is exceeded provide respiratory protection.
Personal Protective Equipment:	Chemical goggles should be worn at all times; use face shields as conditions warrant. Use impervious gloves. A NIOSH approved chemical cartridge respirator or supplied-air breathing equipment should be used as conditions necessitate.
Respirator Caution:	Observe OSHA regulations for respirator use (29 CFR 1910.134). Air-purifying respirators must not be used in oxygen-deficient atmospheres.
Thermal Hazards:	Not applicable.
Environmental Exposure Controls:	The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other

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engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance, State & Odor (ambient temperature):	Clear to yellow liquid with a characteristic mild, aromatic odor.		
Molecular Formula:	Mixture	Molecular Weight:	Mixture
Vapor Pressure:	No data available.	Evaporation Rate:	< 1 (Butyl Acetate = 1)
Specific Gravity or Density:	1.703	Vapor Density (air = 1):	Heavier than air.
Boiling Point:	No data available.	Freezing / Melting Point:	35 °F1 °C
Solubility in Water:	Insoluble	Octanol / Water Coefficient:	No data available.
pH:	No data available.	Odor Threshold:	No data available.
Viscosity:	153 stokes	Autoignition Temperature:	No data available.
Flash Point and Method:	310°F (154°C) Closed Cup	Flammable Limits:	No data available.
Flammability (solid, gas):	Not applicable.	Decomposition Temperature:	No data available.
Explosive Properties:	Not explosive	Oxidizing Properties:	Not an oxidizer

SECTION 10: Stability and reactivity

10.1. Reactivity	Not classified as dangerously reactive.
10.2. Chemical stability	Contact with moisture, other materials that react with isocyanates, or temperatures above 350°F (177°C), may cause polymerization.
10.3. Possibility of hazardous reactions	Isocyanates may polymerize if contaminated or subjected to uncontrolled high temperatures. Polymerization can occur if contact with moisture or other materials that react with isocyanates.
10.4. Conditions to avoid	Avoid contact with water, amines, strong bases, alcohols, copper alloys. May cause some corrosion to copper alloys and aluminum.
10.5. Incompatible materials	Can react vigorously with oxidizing materials.
10.6. Hazardous decomposition products	Toxic vapors may be released during thermal decomposition (i.e., isocyanates, other irritants), but their exact composition has not been determined. Exposure to heated diisocyanate vapors can be extremely dangerous.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute Oral LD_{50}:	> 5000 mg/kg (rat)	Vorite 63
Acute Dermal LD_{50}:	> 2000 mg/kg (rabbit)	Vorite 63

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Acute Inhalation LC_{50}:	> 0.04 mg/L 1 hr (rat)	Vorite 63
Skin Irritation:	Moderately irritating to skin.	
Eye Irritation:	Expected to be moderately irritating to eyes.	
Skin Sensitization:	Prolonged or repeated exposure may cause allergic reactions in certain sensitive individuals.	
Mutagenicity:	No data available.	
Reproductive / Developmental Toxicity:	No data available.	
Carcinogenicity:	Contains substances identified as Group 2B carcinogens by IARC.	
Target Organs:	No data available.	
Primary Route(s) of Exposure:	Skin contact and absorption, eye contact, and inhalation. Ingestion is not likely to be a primary route of exposure.	
Most important symptoms and effects, both acute and delayed	This product contains diisocyanates. Vapors or mists at excessive levels can irritate the mucous membranes causing respiratory irritation, shortness of breath, discomfort, fever and reduced lung function. Overexposures may lead to bronchitis, bronchial spasm and fluid in the lungs. These symptoms can be delayed up to several hours after exposure. Skin contact with diisocyanates may cause allergic reaction and skin irritation. Eye contact may cause severe irritation, including excess redness and swelling of the conjunctiva. Ingestion may cause abdominal cramps, nausea, vomiting and diarrhea, but is not a likely primary route of exposure. Individuals sensitized from prior contact to diisocyanates may react to levels below the exposure limit, with symptoms similar to those previously listed. Delayed Effects: Exposure to isocyanates may cause irritation of the skin, mucous membranes and/or respiratory tract, including asthma attacks or asthma-like symptoms in sensitive individuals. Flu-like symptoms (i.e., fever, chills) have also been reported after exposure to isocyanates. These symptoms can be delayed up to several hours after exposure and are usually reversible.	
Additive or Synergistic effects:	None known.	

SECTION 12: Ecological information

12.1. Toxicity	No data available.
12.2. Persistence and degradability	No data available
12.3. Bioaccumulative potential	No data available
12.4. Mobility in soil	No data available
12.5. Results of PBT and vPvB assessment	No data available
12.6. Other adverse effects	No data available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

US EPA Waste Number:	U223
Waste Classification: (per US regulations)	Reactive. Toxic.

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Waste Disposal:	NOTE: Generator is responsible for proper waste characterization. State hazardous waste regulations may differ substantially from federal regulations. Dispose of this material responsibly, and in accordance with standard practice for disposal of potentially hazardous materials as required by applicable international, national, regional, state or local laws, and environmental protection duty of care principles. Do NOT dump into any sewers, on the ground, or into any body of water. For disposal within the EC, the appropriate classification code according to the European Community List of Wastes should be used. Note that disposal regulations may also apply to empty containers and equipment rinsates.

SECTION 14: Transport information

The following information applies to all shipping modes (DOT/IATA/ICAO/IMDG/ADR/RID/ADN), unless otherwise indicated:

14.1. UN number	UN2078	14.2. UN proper shipping name	RQ Toluene diisocyanate mixture
14.3. Transport hazard class(es)	6.1	14.4. Packing group	PG II
14.5. Environmental hazards	Not applicable		
14.6. Special precautions for user	Reportable Quantity of 714kg product (100kg isocyanate)		
NA Emergency Guidebook Numbers:	156	IMDG EMS:	S-A; F-A
14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code			Not applicable.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Chemical Inventory Lists:	Status:		
USA TSCA:	Listed	EINECS:	All components are listed.
Canada(DSL/NDSL):	DSL	Japan:	Listed
Korea:	Listed	Australia:	Listed
China:	Listed	Philippines:	Listed
Taiwan:	Listed	New Zealand:	Listed
German Water Hazard Classification:	Hazard class 2 - hazard to waters		
SARA 313:	Toluene-2,4-diisocyanate and toluene-2,6-diisocyanate = 0.1% de minimis concentration		
Reportable Quantities:	45 kg (99 lb) (isocyanates)		
State Regulations:	This product contains chemicals listed on the New Jersey Department of Health Hazard Right-to-Know Program Hazardous Substance List. (isocyanates) This product contains chemicals listed on the Massachusetts Substance List for Right-to-Know Law. (isocyanates) This product contains chemicals listed on the Pennsylvania Department of Labor and Industry Hazardous Substance List. (isocyanates) This product contains chemicals known to the State of California to cause cancer. (isocyanates)		
New Jersey Trade Secret Information:	54004100000-5085P		

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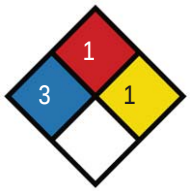
HMIS:

NFPA:



15.2. Chemical safety assessment

Not applicable.

SECTION 16: Other information

Legend of Abbreviations:

ACGIH = American Conference on Governmental Industrial Hygienists.
CAS = Chemical Abstracts Service.
CFR = Code of Federal Regulations.
DSL/NDSL = Domestic Substances List/Non-Domestic Substances List.
EC = European Community.
EINECS = European Inventory of Existing Commercial Chemical Substances.
ELINCS = European List of Notified Chemical Substances.
EU = European Union.
GHS = Globally Harmonized System.
LC = Lethal Concentration.
LD = Lethal Dose.
NFPA = National Fire Protection Association.
NIOSH = National Institute of Occupational Safety and Health.
NTP = National Toxicology Program.
OSHA = Occupational Safety and Health Administration
PEL = Permissible Exposure Limit.
RQ = Reportable Quantity.
SARA = Superfund Amendments and Reauthorization Act of 1986.
TLV = Threshold Limit Value.
WHMIS = Workplace Hazardous Materials Information System.

Important Note: Please note that the information contained herein is furnished without warranty of any kind. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances. The information contained herein may change without prior notice. THIS SAFETY DATA SHEET SUPERSEDES ALL PREVIOUS EDITIONS.

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Issued by:	Regulatory Management Department	Email:	SDS@Vertellus.com
Revision Details:	Revised in all sections to GHS format.		