Safety Data Sheet

acc. to 29 CFR 1910.1200 App D

TSE-EZNATE™ 1100

Version number: 0.0 Date of compilation: 2020-05-29

SECTION 1: Identification

1.1 Product identifier

Identification of the substance	**TSE-EZNATE™ 1100**
CAS number	28182-81-2
Alternative number(s)	S-1100

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

Relevant identified uses	Raw material for coatings, adhesives, sealants, or elastomers in industrial applications.

1.3 Details of the supplier of the safety data sheet

5260 113th Avenue North
TSE Industries, Inc.
33760 Clearwater
United States

Telephone: +1 727-573-7676
e-mail: SDSinquiry@tse-industries.com
Website: WWW.TSE-Industries.com

1.4 Emergency telephone number

United States	Infotrac®	+1-800-535-5053 (24/7)

SECTION 2: Hazard(s) identification

2.1 Classification of the substance or mixture

Classification acc. to OSHA "Hazard Communication Standard" (29 CFR 1910.1200)

Section	Hazard class	Category	Hazard class and category	Hazard statement
A.1I	acute toxicity (inhal.)	4	Acute Tox. 4	H332
A.4S	skin sensitization	1	Skin Sens. 1	H317
A.8R	specific target organ toxicity - single exposure (respiratory tract irritation)	3	STOT SE 3	H335

For full text of abbreviations: see SECTION 16.

2.2 Label elements

Labelling acc. to OSHA "Hazard Communication Standard" (29 CFR 1910.1200)

- Signal word warning
- Pictograms

GHS07

- Hazard statements

H317	May cause an allergic skin reaction.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.

- Precautionary statements

P261	Avoid breathing dust/fume/gas/mist/vapors/spray.
P271	Use only outdoors or in a well-ventilated area.
P272	Contaminated work clothing must not be allowed out of the workplace.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P302+P352	If on skin: Wash with plenty of water.
P304+P340	If inhaled: Remove person to fresh air and keep comfortable for breathing.
P312	Call a poison center/doctor if you feel unwell.
P321	Specific treatment (see on this label).
P362+P364	Take off contaminated clothing and wash it before reuse.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/container to industrial combustion plant.

2.3 Other hazards

Hazards not otherwise classified

May be harmful if swallowed (GHS category 5: acutely toxic - oral).
May be harmful in contact with skin (GHS category 5: acutely toxic - dermal).

SECTION 3: Composition/information on ingredients

3.1 Substances

Name of substance TSE-EZNATE™ 1100

Identifiers

CAS No 28182-81-2

Purity ≥99.75 %

Impurities and additives, classification acc. to GHS

Name of substance	Identifier	Wt%	Classification acc. to GHS	Pictograms
Hexamethylene diisocyanate	CAS No 822-06-0	< 1	Acute Tox. 4 / H302 Acute Tox. 1 / H330 Skin Irrit. 2 / H315 Eye Irrit. 2 / H319 Resp. Sens. 1 / H334 Skin Sens. 1 / H317 STOT SE 3 / H335	

For full text of abbreviations: see SECTION 16.

SECTION 4: First-aid measures

4.1 Description of first- aid measures

General notes

Do not leave affected person unattended. Remove victim out of the danger area. Keep affected person warm, still and covered. Take off immediately all contaminated clothing. In all cases of doubt, or when symptoms persist, seek medical advice. In case of unconsciousness place person in the recovery position. Never give anything by mouth.

Following inhalation

Provide fresh air. If breathing is irregular or stopped, immediately seek medical assistance and start first aid actions. In case of respiratory tract irritation, consult a physician.

Following skin contact

Wash with plenty of soap and water. Take off immediately all contaminated clothing and wash it before reuse. If skin irritation or rash occurs: Get medical advice/attention.

Following eye contact

Irrigate copiously with clean, fresh water for at least 15 minutes, holding the eyelids apart. Remove contact lenses, if present and easy to do. Continue rinsing. Irrigate copiously with clean, fresh water for at least 15 minutes, holding the eyelids apart. If eye irritation persists: Get medical advice/attention.

Following ingestion

Do NOT induce vomiting. Rinse mouth with water (only if the person is conscious). Get medical advice/attention.

4.2 Most important symptoms and effects, both acute and delayed

Delayed or immediate effects can be expected after short or long-term exposure. Acute: Isocyanate vapors or mist at concentration above the exposure limits or guidelines can irritate (burning sensation) the mucus membrane in the respiratory tract (nose, throat, lungs) with symptoms of runny nose, sore throat, coughing, chest discomfort, shortness of breath and reduced lung function (breathing difficulty). Persons with a preexisting, nonspecific bronchial hyper reactivity can respond to concentrations below the exposure limits or guidelines with similar symptoms as well as asthma attack or asthma-like symptoms. Exposure well above the exposure limits or guidelines may lead to bronchitis, bronchial spasm and pulmonary edema (fluid in lungs). Chemical or hypersensitivity pneumonitis, with flu-like symptoms (e.g. fever, chills), has also been reported. These symptoms can be delayed up to several hours after exposure. These effects are usually reversible.
May cause skin irritation with symptoms of reddening, itching, and swelling. Can cause sensitization. Persons previously sensitized can experience allergic skin reaction with symptoms of reddening, itching, swelling, and rash. Cured material is difficult to remove.
May cause irritation of the digestive tract. Symptoms may include abdominal pain, nausea, vomiting, and diarrhea.
May cause eye irritation with symptoms of reddening, tearing, stinging and swelling. May cause temporary corneal injury. Vapor or aerosol may cause irritation with symptoms of burning and tearing.
Delayed: Symptoms affecting the respiratory tract can also occur hours after overexposure.

4.3 Indication of any immediate medical attention and special treatment needed

Eyes: Stain for evidence of corneal injury. If cornea is burned, instill antibiotic/steroid preparation as needed. Workplace vapors could produce reversible corneal epithelial edema impairing vision.
Skin: This compound is a skin sensitizer. Treat symptomatically as for contact dermatitis or thermal burn.
Ingestion: Treat symptomatically. There is no antidote. Inducing vomiting is contraindicated because of the irritating nature of the compound.
Inhalation: Treatment is essentially symptomatic. An individual having a dermal or pulmonary sensitization reaction to this material should be removed from further exposure to any diisocyanate.

SECTION 5: Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

Fire extinguishing powder, Carbon dioxide (CO2), Water spray

Unsuitable extinguishing media

Water jet

5.2 Special hazards arising from the substance or mixture

Hazardous combustion products

Nitrogen oxides (NOx), Isocyanate, Hydrogen cyanide (HCN, prussic acid)

5.3 Advice for firefighters

Keep containers cool with water spray. In case of fire and/or explosion do not breathe fumes. Coordinate firefighting measures to the fire surroundings. Do not allow firefighting water to enter drains or water courses. Collect contaminated firefighting water separately. Fight fire with normal precautions from a reasonable distance. Decontaminate equipment and protective clothing prior to reuse. During a fire, isocyanate vaports and other irritating, highly toxic gasses may be generated by thermal decomposition or combustion. Exposure to heated diisocyanate can be extremely dangerous.

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SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Remove persons to safety.

For emergency responders

Put on appropriate personal protective equipment as specified in Section 8 of this SDS. Implement site emergency response plan. Evacuate non-emergency personnel. Isolate the area and prevent access of unauthorized personnel. Do not touch or walk through split material. Ventilate and remove ignition sources.

6.2 Environmental precautions

Keep away from drains, surface and ground water. Retain contaminated washing water and dispose of it.

6.3 Methods and material for containment and cleaning up

Advice on how to contain a spill

Covering of drains, Contain the released material by diking spilled material with absorbent.

Advice on how to clean up a spill

Allow the absorbent to absorb the spilled liquid. Shovel the absorbent material into an approved metal container. Do not fill the container more then 2/3 full to allow for expansion. Do not tighten the lid on container. Move container to an isolated, well-ventilated area to allow release of carbon dioxide. After 72 hours, seal the container and dispose according to instructions in section 13 of this SDS. Decontamination of the spill surface area. Cover contaminated surface area with neutralization solution. Scrub the surface with broom or bush to penetrate into porous surfaces. Wait at least 15 minutes after first application of the neutralization solution. Cover the area with absorbent material and shovel this into metal container. Check for the residual surface contamination using aromatic isocyanate surface test kit and repeat decontamination if necessary. Do not fill the container more then 2/3 full to allow for expansion. Do not tighten the lid on container. Move container to an isolated, well-ventilated area to allow release of carbon dioxide. After 72 hours, seal the container and dispose according to instructions in section 13 of this SDS. Decontaminate surface, tools or equipment that have been in contact with an isocyanate. The following mixtures can be used effectively as a neutralizer: • A mixture of 50-50% monoethanolamine and water. • A mixture of 80% Mineral spirits , 5% detergent and 15% VM&P Naphtha.

6.4 Reference to other sections

Hazardous combustion products: see section 5. Personal protective equipment: see section 8. Incompatible materials: see section 10. Disposal considerations: see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Recommendations

- Measures to prevent fire as well as aerosol and dust generation

Use local and general ventilation. Use only in well-ventilated areas.

Advice on general occupational hygiene

This material can produce asthmatic sensitization upon either single inhalation exposure to a relatively high concentration or upon repeated inhalation exposures to lower concentrations. Individuals with lung or breathing problems or prior allergic reactions to isocyanate must not be exposed to vapor or spray mist. Do not eat, drink and smoke in work areas. Never keep food or drink in the vicinity of chemicals. Avoid contact with skin and eyes. Wash hands after use. Remove contaminated clothing and protective equipment before entering eating areas. Do not breathe gas/fumes/vapor/spray. Handle and store contents under inert gas. Protect from moisture. Wearing of suitable protective equipment (including personal protective equipment referred to under Section 8 of the safety data sheet) to prevent any contamination of skin, eyes and personal clothing. Provide appropriate training of personnel.

7.2 Conditions for safe storage, including any incompatibilities

- Ventilation requirements

Store in a well-ventilated place. Keep container tightly closed. Store in a dry place. Store separately. Never keep food or drink in the vicinity of chemicals.

- Packaging compatibilities

Keep only in original container.

7.3 Specific end use(s)

See section 16 for a general overview.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Use specific OSHA sampling and analytical procedure for monitoring airborne level of diisocyanat to ensure that published exposure limits have not been exceeded.
Peronnel assigned to work with isocyanates should undergo a pre-placement medical evaluation. History of adult asthma and prior isocyanate sensitization are the reasons for medical exclusions from diisocyanate area. Person who has a history of eczema or respiratory allergies such as hay fever a history of adult asthma should be restricted from work with isocyanates. A comprehensive annual medical surveillance program should be instituted for all employees who are potentially exposed to disiocyanates. Once a worked has been diagnosed as a sensitized to any isocyanate, no further exposure can be permitted.
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Occupational exposure limit values (Workplace Exposure Limits)

Country	Name of agent	CAS No	Notation	Identifier	TWA [ppm]	TWA [mg/m³]	STEL [ppm]	STEL [mg/m³]	Ceiling-C [ppm]	Ceiling-C [mg/m³]	Source
US	hexamethylene-diisocyanate	822-06-0		TLV®	0.005						ACGIH® 2017

Notation

Ceiling-C	ceiling value is a limit value above which exposure should not occur
STEL	short-term exposure limit: a limit value above which exposure should not occur and which is related to a 15-minute period (unless otherwise specified)
TWA	time-weighted average (long-term exposure limit): measured or calculated in relation to a reference period of 8 hours time-weighted average (unless otherwise specified

8.2 Exposure controls

Appropriate engineering controls

Exhaust ventilation. Curing ovens must be ventilated to prevent emissions into the workplace. It is possible to be exposed to airborne monomeric HDI if oven off-gasses are released into the work area, .

Individual protection measures (personal protective equipment)

Eye/face protection

Wear suitable face shield. Eye protection (e.g. protective goggles).

Skin protection

- Hand protection

Wear suitable gloves. Nitrile rubber, Butyl Rubber, Neoprene. Check leak-tightness/impermeability prior to use. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves.

- Other protection measures

Wear suitable protective clothing.

Respiratory protection

Isocyanate airborne concentration can exceed PEL when material is sprayed, aerosolized or heated. Use air-purifying or air-supplied respirator complying with OSHA 1910.134 standard if a risk assessment indicates this is necessary. Recommended air-purifying respirator cartridge is an organic vapor with particulate filter (Combination OV/P100) cartridge. For emergency or non-routine, high exposure situation, including confined space entry use full face piece pressure demand self-contained breathing apparatus or full face piece pressure demand supplied-air respirator with escape provisions.

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Physical state	liquid
Color	Colorless to light yellow
Odor	characteristic

Other safety parameters

pH (value)	not determined
Melting point/freezing point	not determined
Initial boiling point and boiling range	not determined
Flash point	158 °C
Evaporation rate	not determined
Flammability (solid, gas)	not relevant, (fluid)
Explosive limits	not determined
Vapor pressure	not determined
Density	1.17 $^{g}/_{cm^3}$ at 20 °C
Vapor density	this information is not available
Solubility(ies)	not determined

Partition coefficient

- n-octanol/water (log KOW)	9.81 (ECHA)
- Soil organic carbon/water (log KOC)	6.266 (ECHA)

Auto-ignition temperature	445 °C
Decomposition temperature	250 °C (ECHA)
Viscosity	not determined
Explosive properties	none
Oxidizing properties	none

9.2 Other information

Surface tension	44.9 $^{mN}/_{m}$ (25 °C) (ECHA)
Temperature class (USA, acc. to NEC 500)	T2 (maximum permissible surface temperature on the equipment: 300°C)

SECTION 10: Stability and reactivity

10.1 Reactivity

Contact with moisture, other materials that react with isocyanates, or temperature above 177°C, may cause polymerization.

10.2 Chemical stability

The material is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

10.3 Possibility of hazardous reactions

Contact with moisture, other materials that react with isocyanates, or temperature above 177°C, may cause polymerization.

10.4 Conditions to avoid

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Water content (moister).

10.5 Incompatible materials

Keep away from water, amines, strong bases, alcohols, copper alloys.

10.6 Hazardous decomposition products

Hazardous combustion products: see section 5.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Classification acc. to OSHA "Hazard Communication Standard" (29 CFR 1910.1200)

Acute toxicity

Harmful if inhaled.

GHS of the United Nations, annex 4: May be harmful if swallowed or in contact with skin.

- Acute toxicity estimate (ATE)

Inhalation: dust/mist 1.5 $^{mg}/_{l}$/4h

Acute toxicity estimate (ATE) of components of the mixture

Name of substance	CAS No	Exposure route	ATE
Hexamethylene diisocyanate	822-06-0	oral	959 $^{mg}/_{kg}$
Hexamethylene diisocyanate	822-06-0	inhalation: vapor	0.124 $^{mg}/_{l}$/4h

Skin corrosion/irritation

Shall not be classified as corrosive/irritant to skin.

Serious eye damage/eye irritation

Shall not be classified as seriously damaging to the eye or eye irritant.

Respiratory or skin sensitization

May cause an allergic skin reaction.

Germ cell mutagenicity

Shall not be classified as germ cell mutagenic.

Carcinogenicity

Shall not be classified as carcinogenic.

Reproductive toxicity

Shall not be classified as a reproductive toxicant.

Specific target organ toxicity - single exposure

May cause respiratory irritation.

Specific target organ toxicity - repeated exposure

Shall not be classified as a specific target organ toxicant (repeated exposure).

Aspiration hazard

Shall not be classified as presenting an aspiration hazard.

SECTION 12: Ecological information

12.1 Toxicity

Shall not be classified as hazardous to the aquatic environment.

Biodegradation

The substance is readily biodegradable. The relevant substances of the mixture are readily biodegradable.

12.2 Persistence and degradability

Data are not available.

12.3 Bioaccumulative potential

Data are not available.

n-octanol/water (log KOW)	9.81 (ECHA)
BCF	141 (ECHA)

12.4 Mobility in soil

Henry's law constant	0 $^{Pa\ m^3}/_{mol}$ at 25 °C
The Organic Carbon normalised adsorption coefficient	6.266 (ECHA)

12.5 Results of PBT and vPvB assessment

Data are not available.

12.6 Other adverse effects

Endocrine disrupting potential

Not listed.

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SECTION 13: Disposal considerations

13.1 Waste treatment methods

Waste treatment-relevant information

Dispose of contents/container to an authorized waste treatment facility. May be disposed according to local, state and federal regulations. Incineration is the preferred method.

Sewage disposal-relevant information

Do not empty into drains. Avoid release to the environment.

Waste treatment of containers/packages

Empty container contains product residue. Do not heat or cur empty container with electric or gas torch because highly toxic vapors and gases are formed. Do not reuse without thorough commercial cleaning and reconditioning. If container is to be disposed, ensure all product residue is removed prior to disposal.

SECTION 14: Transport information

14.1	**UN number**	3082
14.2	**UN proper shipping name**	Other regulated substances, liquid, n.o.s.
14.3	**Transport hazard class(es)**	
	Class	9 (miscellaneous dangerous substances and articles)
14.4	**Packing group**	III (substance presenting low danger)
14.5	**Environmental hazards**	non-environmentally hazardous acc. to the dangerous goods regulations

14.6 Special precautions for user

There is no additional information.

14.7 Transport in bulk according to Annex II of MARPOL and the IBC Code

The cargo is not intended to be carried in bulk.

Information for each of the UN Model Regulations

Transport of dangerous goods by road or rail (49 CFR US DOT)

Index number	3082
Proper shipping name	Other regulated substances, liquid, n.o.s.
- Particulars in the shipper's declaration	UN3082, Other regulated substances, liquid, n.o.s., 9, III
- Reportable quantity (RQ)	39,998 lbs (18,143 kg) (Hexamethylene diisocyanate)
Class	9
Packing group	III
Danger label(s)	9, fish and tree

ERG No	171

International Maritime Dangerous Goods Code (IMDG)

not assigned

International Civil Aviation Organization (ICAO-IATA/DGR)

not assigned

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

National regulations (United States)

Toxic Substance Control Act (TSCA) substance is listed

Superfund Amendment and Reauthorization Act (SARA TITLE III)

- The List of Extremely Hazardous Substances and Their Threshold Planning Quantities (EPCRA Section 302, 304)

not listed

- Specific Toxic Chemical Listings (EPCRA Section 313)

Toxics Release Inventory: Specific Toxic Chemical Listings			
Name acc. to inventory	**CAS No**	**Wt%**	**Effective date**
hexamethylene-1,6-diisocyanate	822-06-0	0.25	1995-01-01

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

- List of Hazardous Substances and Reportable Quantities (CERCLA section 102a) (40 CFR 302.4)

Name of substance	CAS No	Remarks	Statutory code	Final RQ pounds (Kg)
Hexamethylene diisocyanate	822-06-0		3	100 (45,4)

Legend
3 "3" indicates that the source is section 112 of the Clean Air Act

Clean Air Act

not listed

Right to Know Hazardous Substance List

- Hazardous Substance List (NJ-RTK)

Name of substance	CAS No	Remarks	Classifications
Hexamethylene diisocyanate	822-06-0		R1

Legend
R1 Reactive - First Degree

California Environmental Protection Agency (Cal/EPA): Proposition 65 - Safe Drinking Water and Toxic Enforcement Act of 1987

not listed

VOC content

Regulated Volatile Organic Compounds (VOC-EPA): Regulated Volatile Organic Compounds (VOC-Cal ARB):

National inventories

Country	Inventory	Status
EU	REACH Reg.	all ingredients are listed
US	TSCA	all ingredients are listed

Legend
REACH Reg. REACH registered substances
TSCA Toxic Substance Control Act

15.2 Chemical Safety Assessment

No Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information, including date of preparation or last revision

Abbreviations and acronyms

Abbr.	Descriptions of used abbreviations
49 CFR US DOT	49 CFR U.S. Department of Transportation
ACGIH® 2017	From ACGIH®, 2017 TLVs® and BEIs® Book. Copyright 2017. Reprinted with permission. Information on the proper use of the TLVs® and BEIs®: http://www.acgih.org/tlv-bei-guidelines/policies-procedures-presentations/tlv-bei-position-statement
Acute Tox.	Acute toxicity
ATE	Acute Toxicity Estimate
BCF	Bioconcentration factor
Cal ARB	California Air Resources Board
CAS	Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)
Ceiling-C	Ceiling value
DGR	Dangerous Goods Regulations (see IATA/DGR)
EPA	Environmental Protection Agency. An agency of the federal government of the United States charged with protecting human health and the environment
ERG No	Emergency Response Guidebook - Number
Eye Dam.	Seriously damaging to the eye
Eye Irrit.	Irritant to the eye
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations
IATA	International Air Transport Association
IATA/DGR	Dangerous Goods Regulations (DGR) for the air transport (IATA)
ICAO	International Civil Aviation Organization
IMDG	International Maritime Dangerous Goods Code
MARPOL	International Convention for the Prevention of Pollution from Ships (abbr. of "Marine Pollutant")
OSHA	Occupational Safety and Health Administration (United States)
PBT	Persistent, Bioaccumulative and Toxic
ppm	Parts per million

Abbr.	Descriptions of used abbreviations
Resp. Sens.	Respiratory sensitization
Skin Corr.	Corrosive to skin
Skin Irrit.	Irritant to skin
Skin Sens.	Skin sensitization
STEL	Short-term exposure limit
STOT SE	Specific target organ toxicity - single exposure
TLV®	Threshold Limit Values
TWA	Time-weighted average
VOC	Volatile Organic Compounds
vPvB	Very Persistent and very Bioaccumulative

Key literature references and sources for data

OSHA Hazard Communication Standard (HCS), 29 CFR 1910.1200.

Transport of dangerous goods by road or rail (49 CFR US DOT). International Maritime Dangerous Goods Code (IMDG). Dangerous Goods Regulations (DGR) for the air transport (IATA).

List of relevant phrases (code and full text as stated in chapter 2 and 3)

Code	Text
H302	Harmful if swallowed.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H330	Fatal if inhaled.
H332	Harmful if inhaled.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335	May cause respiratory irritation.

Disclaimer

This information is based upon the present state of our knowledge. This SDS has been compiled and is solely intended for this product.