SAFETY DATA SHEET

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

1.1 Product identifier

Product name: **PEMULEN™ TR-1 POLYMER**

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

Identified uses: Not determined.
Uses advised against: Not determined.

1.3 Details of the supplier of the safety data sheet

Supplier

Company Name:	LUBRIZOL LIMITED THE KNOWLE, NETHER LANE
Address:	THE KNOWLE, NETHER LANE HAZELWOOD, DERBYSHIRE, DE56 4AN GB
Telephone:	(44) 01332-842211
E-mail contact:	EUSDS@lubrizol.com (Lubrizol Safety Data Sheets can be obtained at www.mylubrizol.com)

1.4 Emergency telephone number:

FOR TRANSPORT EMERGENCY CALL CHEMTREC (+1) 703 527 3887 (LUBRIZOL)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

The product has been classified according to the legislation in force.

Classification according to Regulation (EC) No 1272/2008 as amended

Chronic hazards to the aquatic environment	Category 3	H412: Harmful to aquatic life with long lasting effects.

Classification according to Directive 67/548/EEC or 1999/45/EC as amended

R52/53

The full text for all R-phrases is displayed in section 16.

2.2 Label elements according to Regulation (EC) No 1272/2008 as amended

2.3 Other hazards: None identified.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Regulation No. 1272/2008.

Chemical name	Concentration	EC No.	REACH Registration No.	M-Factor:	Notes
Cyclohexane	0.1 - 1.0%	203-806-2	Not available.	Chronic: 1	#

This substance has workplace exposure limit(s).
600, 700 and 900 ECHA List Numbers do not have any legal significance; rather they are purely technical identifiers and are displayed for informational purposes only.

Classification Regulation No. 1272/2008.

Chemical name	Classification	Notes
Cyclohexane	Asp. Tox. 1; H304 STOT SE 3; H336 Aquatic Acute 1; H400 Aquatic Chronic 1; H410 Flam. Liq. 2; H225 Skin Irrit. 2; H315	

Directive 67/548/EEC.

Chemical name	Concentration	EC No.	REACH Registration No.	M-Factor:	Notes
Cyclohexane	0.1 - 1.0%	203-806-2	Not available.	Chronic: 1	#

This substance has workplace exposure limit(s).
600, 700 and 900 ECHA List Numbers do not have any legal significance; rather they are purely technical identifiers and are displayed for informational purposes only.

Classification Directive 67/548/EEC.

Chemical name	Classification	Notes
Cyclohexane	F; R11 Xn; R65 R67 N; R50/53 Xi; R38	

The full text for all R-phrases is displayed in section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

Inhalation: Remove exposed person to fresh air if adverse effects are observed. If breathing is labored, administer oxygen. If breathing has stopped, apply artificial respiration. If irritation persists or if toxic symptoms are observed, get medical attention.

Eye contact: Any material that contacts the eye should be washed out immediately with water. If easy to do, remove contact lenses. Water (moisture) swells this product into a gelatinous film which may be difficult to remove from the eye using only water. Immediately flush eyes with plenty of one percent (1%) physiological saline solution for five (5) minutes while holding eyelids open. If no saline is available, flush with plenty of clean water for fifteen (15) minutes. See a physician.

Skin Contact: Wash with soap and water. If skin irritation occurs, get medical attention.

Ingestion: Treat symptomatically. Get medical attention.

4.2 Most important symptoms and effects, both acute and delayed: See section 11.

4.3 Indication of any immediate medical attention and special treatment needed

Hazards: No data available.

Treatment: Treat symptomatically.

SECTION 5: Firefighting measures

General Fire Hazards: Avoid hose stream or any method which will create dust clouds.

5.1 Extinguishing media

Suitable extinguishing media: Use water spray, dry chemical or foam for extinction. CO2 may be ineffective on large fires.

Unsuitable extinguishing media: Not determined.

5.2 Special hazards arising from the substance or mixture: See section 10 for additional information.

5.3 Advice for firefighters

Special fire fighting procedures: This material has been evaluated and is considered to be a risk for dust explosion. It is categorized as Dust Explosion Class ST2. This material has been evaluated and is considered to be a risk for dust explosion. It is categorized as Dust Explosion Class ST1. Material can form an explosive organic dust air mixture. As with all organic dusts, fine particles suspended in air in critical proportions and in the presence of an ignition source may ignite and/or explode. Dust may be sensitive to ignition by electrostatic discharge, electrical arcs, sparks, welding torches, cigarettes, open flame, or other significant heat sources. This product has a high volume resistivity and a propensity to build up static electricity which may be discharged as a spark. A spark can be an ignition source for solvent vapor/air mixtures. As a precaution, implement standard safety measures for handling finely divided organic powders. If you add this product to a solvent, ensure appropriate safe handling practices such as provision for inerting flammable vapors. Take care to minimze airborne dust. Solid does not readily release flammable vapors.

Special protective equipment for fire-fighters: Recommend wearing self-contained breathing apparatus.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures: Personal Protective Equipment must be worn, see Personal Protection Section for PPE recommendations.

6.2 Environmental Precautions: Avoid release to the environment. Prevent further leakage or spillage if safe to do so. Prevent entry into sewers and waterways. Take precautions to avoid release to the environment.

6.3 Methods and material for containment and cleaning up: Pick up free solid for recycle and/or disposal. Sweep up and place in a clearly labeled container for chemical waste. Avoid dust formation. Use wet sweeping compound or water to avoid raising a dust. Collect powder using special dust vacuum cleaner with particle filter or carefully sweep into closed container. Wash spill area with detergent. Material is slippery when wet. Prevent entry into sewers and waterways, dispose of in accordance with all federal, state and local environmental regulation.

6.4 Reference to other sections: See sections 8 and 13 for additional information.

SECTION 7: Handling and storage:

7.1 Precautions for safe handling: Observe good industrial hygiene practices. Provide adequate ventilation. Wear appropriate personal protective equipment. Avoid environmental contamination.
Avoid conditions which create dust. Avoid breathing dust. Avoid contact with eyes and prolonged or repeated contact with skin. Ground container and transfer equipment to eliminate static electric sparks. Keep away from heat, sparks and open flame. Avoid drinking, tasting, swallowing or ingesting this product.

Maximum Handling Temperature: Not determined.

7.2 Conditions for safe storage, including any incompatibilities: Store away from incompatible materials. See section 10 for incompatible materials. Store in a dry, well-ventilated place. Keep containers closed when not in use.

Maximum Storage Temperature: < 80 °C

7.3 Specific end use(s): End uses are listed in an attached exposure scenario when one is required.

SECTION 8: Exposure controls/personal protection

8.1 Control Parameters

Occupational Exposure Limits

Chemical name	Type	Exposure Limit Values		Source
Cyclohexane	TWA	100 ppm	350 mg/m3	UK. EH40 Workplace Exposure Limits (WELs) (12 2011)
Cyclohexane	STEL	300 ppm	1,050 mg/m3	UK. EH40 Workplace Exposure Limits (WELs) (12 2011)
Cyclohexane	TWA	200 ppm	700 mg/m3	EU. Indicative Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU (12 2009)

Other exposure limits

Chemical name	Type	Exposure Limit Values	Source
Modified acrylic polymer	TWA	0.05 mg/m3	

8.2 Exposure controls

Appropriate engineering controls: To prevent dust explosions employ bonding and grounding for operations capable of generating static electricity. Minimize dust generation and accumulation. Provide adequate ventilation.

Individual protection measures, such as personal protective equipment

General information: Use personal protective equipment as required.

Eye/face protection: Use tight fitting goggles if dust is generated. Wear approved chemical safety glasses or goggles where eye exposure is reasonably probable.

Skin protection

Hand Protection: Suitable gloves can be recommended by the glove supplier. Use good industrial hygiene practices to avoid skin contact. If contact with the material may occur wear chemically protective gloves.

Other: Long sleeve shirt is recommended.

Respiratory Protection: Consult with an industrial hygienist to determine the appropriate respiratory protection for your specific use of this material. A respiratory protection program compliant with all applicable regulations must be followed whenever workplace conditions require the use of a respirator. Under normal use conditions, respirator is not usually required. Use appropriate respiratory protection if exposure to dust particles, mist or vapors is likely.

Hygiene measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing to remove contaminants. Discard contaminated footwear that cannot be cleaned. Wash thoroughly after handling.

Environmental Controls:	No data available. See section 6 for details.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance	
Physical State:	Solid
Form:	powder
Color:	White
Odor:	Slight acetic
Odor Threshold:	No data available.
pH:	Approximate 2.5 - 3 (1 % Water)
Melting Point:	No data available.
Boiling Point:	No data available.
Flash Point:	Not applicable.
Evaporation Rate:	No data available.
Flammability (solid, gas):	No data available.
Upper/lower limit on flammability or explosive limits	
Flammability Limit - Upper (%):	No data available.
Flammability Limit - Lower (%):	No data available.
Vapor pressure:	No data available.
Vapor density (air=1):	No data available.
Relative density:	1.4 (20 °C)
Solubility(ies)	
Solubility in Water:	Material will swell in water.
Solubility (other):	No data available.
Partition coefficient (n-octanol/water):	No data available.
Autoignition Temperature:	Approximate 480 °C
Decomposition Temperature:	No data available.
Viscosity:	No data available.
Explosive properties:	No data available.
Oxidizing properties:	No data available.
VOC Content:	No data available.

Other information	
Dust Explosion Limit, Lower:	80 g/cm3
Dust Explosion Description Number Kst:	157 - 193 m.b_/s
Minimum ignition energy:	25 - 50 mJ
Minimum ignition temperature:	Approximate 480 °C
Percent Solid:	98 % (Percent by Weight)
Max. Rate of Pressure Rise:	786 bar/s (500 g/m3)
Max. Pressure of Explosion:	6 bar (500 g/m3)
Volume Resistivity:	1.04x 10+16 ohm-cm
Percent volatile:	2 % (Percent by Weight)

SECTION 10: Stability and reactivity

10.1 Reactivity: No data available.

10.2 Chemical Stability: Material is stable under normal conditions.

10.3 Possibility of Hazardous Reactions: Will not occur.

10.4 Conditions to Avoid: Static discharge. Moisture. Heat.

10.5 Incompatible Materials: Alkalies. Bases. Strong bases.

10.6 Hazardous Decomposition Products: Thermal decomposition or combustion may liberate carbon oxides and other toxic gases or vapors.

SECTION 11: Toxicological information

Information on likely routes of exposure

Inhalation: No data available.

Ingestion: No data available.

Skin Contact: No data available.

Eye contact: No data available.

11.1 Information on toxicological effects

Acute Toxicity

Oral
Product**:** Not classified for acute toxicity based on available data.

Dermal
Product**:** Not classified for acute toxicity based on available data.

Inhalation
Product**:** Avoid inhalation of dust. Animal studies indicate the inhalation of respirable polyacrylate dust may cause inflammatory changes in the lung. Persons with sensitive airways (e.g., asthmatics) may react to vapors. Breathing of dust may cause coughing, mucous production, and shortness of breath.
Not classified for acute toxicity based on available data.

Skin Corrosion/Irritation:
Product**:** Classification: Not irritating (Read across); Rabbit.
Remarks: Pre-existing skin conditions may be aggravated by prolonged or repeated exposure. Contact dermatitis may occur in sensitive individuals under extreme and unusual conditions of prolonged and repeated contact, such as high exposure accompanied by elevated temperature and occlusion by clothing. This effect may be the result of the product's hygroscopic properties, abrasion, or pH.
Not classified as a primary skin irritant.

Serious Eye Damage/Eye Irritation:
Product**:** Classification: Not irritating (Read across); Rabbit.
Remarks: Particles in the eyes may cause irritation and smarting.
Remarks: Not classified as a primary eye irritant.

Respiratory sensitization:
No data available

Skin sensitization:
Product**:** Classification: Not a skin sensitizer. (Read across) Not a skin

sensitizer.

Cyclohexane — Classification: Not a skin sensitizer. (Literature) Not a skin sensitizer.

Specific Target Organ Toxicity - Single Exposure:
Product**:**

Aspiration Hazard:
Cyclohexane — Material can be aspirated into the lungs during the act of swallowing or vomiting. This could result in severe injury to the lungs and death.

Other effects:
Product**:** — This material readily absorbs moisture and may become thick and gelatinous upon contact with mucous membranes of the eye, or upon inhalation into the nasal passages.

Chronic Effects

Carcinogenicity:
No data available

Germ Cell Mutagenicity:
Cyclohexane — This material has not exhibited mutagenic or genotoxic potential in laboratory tests.

Reproductive Toxicity:
No data available

Specific Target Organ Toxicity - Repeated Exposure:
Product**:** — A two-year inhalation study in rats exposed to a respirable, water-absorbent sodium polyacrylate dust resulted in lung effects such as inflammation, hyperplasia, and tumors. There were no observed adverse effects at exposures of 0.05 mg/m3. In addition, long-term medical monitoring of potentially exposed workers has not revealed lung effects such as those observed in the rat. However, the inhalation of respirable dusts should be avoided by implementing respiratory protection measures and observing the recommended permissible exposure limit of 0.05 mg/m3.

SECTION 12: Ecological information

12.1 Ecotoxicity

Fish
Cyclohexane — LC 50 (Fathead Minnow, 4 d): 4.5 mg/l

Aquatic Invertebrates
Cyclohexane — EC 50 (Water flea (Daphnia magna), 2 d): 0.9 mg/l

Toxicity to Aquatic Plants
Cyclohexane — EC 50 (Green algae (Selenastrum capricornutum), 3 d): 9.317 mg/l

Toxicity to soil dwelling organisms
No data available

Sediment Toxicity

No data available

Toxicity to Terrestrial Plants

No data available

Toxicity to Above-Ground Organisms

No data available

Toxicity to microorganisms

No data available

12.2 Persistence and Degradability

Biodegradation

Cyclohexane	Oxygen depletion 77 % (28 d, OECD TG 301 F) Dissolved organic carbon (DOC) 9 % (28 d, Miscellaneous)

BOD/COD Ratio

No data available

12.3 Bioaccumulative Potential

Bioconcentration Factor (BCF)

No data available

Partition Coefficient n-octanol / water (log Kow)

Cyclohexane	Log Kow: 3.44 (Measured)

12.4 Mobility:

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

Disposal methods: Treatment, storage, transportation, and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations. Dispose of packaging or containers in accordance with local, regional, national and international regulations. Empty container contains product residue which may exhibit hazards of product.

Contaminated Packaging: Container packaging may exhibit hazards.

SECTION 14: Transport information

ADR

Not regulated.

IMDG

Not regulated.

IATA

Not regulated.

14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: Not applicable.

For transportation, steps must be taken to prevent load shifting or materials falling, and all relating legal statutes should be obeyed. Review classification requirements before shipping materials at elevated temperatures.

Shipping descriptions may vary based on mode of transport, quantities ,temperature of the material, package size, and/or origin and destination It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material. Review classification requirements before shipping materials at elevated temperatures.

SECTION 15: Regulatory information

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

Inventory Status

Australia (AICS)
All components are in compliance with chemical notification requirements in Australia.

Canada (DSL/NDSL)
All components are in compliance with the Canadian Environmental Protection Act and are present on the Domestic Substances List.

China (IECSC)
All components of this product are listed on the Inventory of Existing Chemical Substances in China.

European Union (REACh)
To obtain information on the REACH compliance status of this product, please visit Lubrizol.com/REACH, or e-mail us at REACH_MSDS_INQUIRIES@Lubrizol.com

Japan (ENCS)
All components are in compliance with the Chemical Substances Control Law of Japan.

Korea (ECL)
All components are in compliance in Korea.

New Zealand (NZIoC)
All components are in compliance with chemical notification requirements in New Zealand.

Philippines (PICCS)
All components are in compliance with the Philippines Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990 (R.A. 6969).

Switzerland (SWISS)
All components are in compliance with the Environmentally Hazardous Substances Ordinance in Switzerland.

Taiwan (TCSCA)
All components of this product are listed on the Taiwan inventory.

United States (TSCA)
All components of this material are on the US TSCA Inventory.

The information that was used to confirm the compliance status of this product may deviate from the chemical information shown in Section 3.

15.2 Chemical safety assessment: No Chemical Safety Assessment has been carried out.

SECTION 16: Other information

Key literature references and sources for data: No data available.

Wording of the R-phrases and H-statements in section 2 and 3

H225	Highly flammable liquid and vapor.
H304	May be fatal if swallowed and enters airways.

H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.
R11	Highly flammable.
R38	Irritating to skin.
R50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R52/53	Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R65	Harmful: may cause lung damage if swallowed.
R67	Vapours may cause drowsiness and dizziness.

Issue Date: 14.10.2014

Disclaimer: As the conditions or methods of use are beyond our control, we do not assume any responsibility and expressly disclaim any liability for any use of this product. Information contained herein is believed to be true and accurate but all statements or suggestions are made without warranty, expressed or implied, regarding accuracy of the information, the hazards connected with the use of the material or the results to be obtained from the use thereof. Compliance with all applicable federal, state, and local regulations remains the responsibility of the user.