

SECTION 1: Identification

Product identifier used on the label: **Telene 1650BK**

Other means of identification: Not applicable

Recommended use of the chemical: RIM (Reaction Injection Molding) Applications

Restrictions on use: None

Details of the supplier of the safety data sheet

Manufacturer/Supplier Name and Address:	Zeon Chemicals L.P. 4111 Bells Lane Louisville, Kentucky 40211	Customer Service:	1-800-735-3388 (502)-775-2000
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Emergency telephone number

24 hours per day/7 days per week (English only):	CHEMTREC: (800) 424 - 9300 Outside the U.S. Call Collect: 001 (703) 527-3887
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SECTION 2: Hazard(s) identification

Classification of the chemical in accordance with paragraph (d) of §1910.1200: This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

GHS Classification:

- Hazardous to the aquatic environment - Chronic Category 2
- Hazardous to the aquatic environment - Acute Category 3
- Specific Target Organ Systemic Toxicity (STOT) - Single Exposure Category 3
- Skin Sensitization Category 1
- Serious Eye Damage/Eye Irritation Category 2A
- Skin Corrosion/Irritation Category 2
- Acute Toxicity - Oral Category 4
- Acute Toxicity - Inhalation Vapour Category 3
- Flammable Liquid Category 3

GHS Signal Word: Danger

GHS Label Pictogram:



GHS Hazard Statements:

- H411 - Toxic to aquatic life with long lasting effects.
- H402 - Harmful to aquatic life.
- H335 - May cause respiratory irritation.
- H317 - May cause an allergic skin reaction.

	H319 - Causes serious eye irritation.
	H315 - Causes skin irritation.
	H302 - Harmful if swallowed.
	H331 - Toxic if inhaled.
	H226 - Flammable liquid and vapour.
Precautionary Statements (Safety):	P273 - Avoid release to the environment.
	P261 - Avoid breathing dust/fume/gas/mist/vapours/spray.
	P271 - Use only outdoors or in a well-ventilated area.
	P280 - Wear protective gloves/protective clothing/eye protection/face protection.
	P272 - Contaminated work clothing should not be allowed out of the workplace.
	P270 - Do not eat, drink or smoke when using this product.
	P264 - Wash thoroughly after handling.
	P243 - Take precautionary measures against static discharge.
	P242 - Use only non-sparking tools.
	P241 - Use explosion-proof electrical/ventilating/lighting/.../ equipment.
	P240 - Ground/bond container and receiving equipment.
	P233 - Keep container tightly closed.
	P210 - Keep away from heat/sparks/open flames/hot surfaces. – No smoking.
Precautionary Statements (First Aid):	P391 - Collect spillage.
	P304+P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
	P312 - Call a POISON CENTER or doctor/physician if you feel unwell.
	P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
	P337+P313 - If eye irritation persists: Get medical advice/attention.
	P303+P361+P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
	P362 - Take off contaminated clothing and wash before reuse.
	P332+P313 - If skin irritation occurs: Get medical advice/attention.
	P301+P312 - IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
	P330 - Rinse mouth.
	P370+P378 - In case of fire: Use carbon dioxide, dry chemical or water fog for extinction.
Precautionary Statements (Disposal):	P501 - Dispose of contents/container in accordance with local/regional/national/international regulations.
Precautionary Statements (Storage):	P403+P235 - Store in a well-ventilated place. Keep cool.
	P233 - Keep container tightly closed.
Other hazards	Substance can be absorbed through the skin. Unstable at temperatures above 122°F (50°C). May self-react at temperatures above 176°F (80°C) Toxic gases may be formed upon combustion and represent a hazard to firefighters. See Section 10 for information on combustion products.

This mixture consists of ingredient(s) of unknown acute toxicity at the following percentage (%): 9

Hazards Not Otherwise Classified: None

SECTION 3: Composition/information on ingredients

Chemical Name	Amount (wt %)	CAS #	GHS Classification
Dicyclopentadiene (CP Dimer)	80 - 90	77-73-6	Flammable Liquid Category 3 Acute Toxicity - Inhalation Vapour Category 2 Acute Toxicity - Oral Category 4 Skin Corrosion/Irritation Category 2 Serious Eye Damage/Eye Irritation Category 2A Specific Target Organ Systemic Toxicity (STOT) - Single Exposure Category 3 Hazardous to the aquatic environment - Chronic Category 2
Tricyclopentadiene	5 - 10	7158-25-0	None
Non-Hazardous Polymer Modier	3 - 7	Proprietary	None
Antioxidant	1 - 5	Proprietary	Acute Toxicity - Oral Category 4 Hazardous to the aquatic environment - Acute Category 1 Hazardous to the aquatic environment - Chronic Category 1
5-Vinyl-2-norbornene	0.1 - 1	3048-64-4	Acute Toxicity - Inhalation Vapour Category 4 Skin Corrosion/Irritation Category 2 Serious Eye Damage/Eye Irritation Category 2B Skin Sensitization Category 1 Hazardous to the aquatic environment - Chronic Category 2

Section Comments: One or more hazardous ingredient(s) and concentration range(s) are claimed as a trade secret under the OSHA Hazard Communication Standard. The hazards of this (these) ingredient(s) are given on this SDS.

SECTION 4: First-aid measures

Description of first aid measures

Following Inhalation: Remove to fresh air. If breathing is difficult, have a trained individual administer oxygen. If not breathing, give artificial respiration and have a trained individual administer oxygen. Get medical attention immediately.

Following Skin Contact: Wash with soap and water. Remove contaminated clothing and launder. Get medical attention if irritation develops or persists.

Following Eye Contact: Immediately flush eyes with plenty of water for at least 30 minutes. Get immediate medical attention. Hold eyelids apart periodically while flushing.

Following Ingestion: If ingested, call your local Poison Control Center (1-800-222-1222 in the U.S.) or physician. Do not induce vomiting unless directed to do so by medical personnel.

Most important symptoms and effects, both acute and delayed

Eye irritant Causes skin irritation. Substance can be absorbed through the skin. May cause allergic skin reaction. Harmful if swallowed. Ingestion may cause irritation of throat, stomach and gastrointestinal tract. Ingestion of this product may result in central nervous system effects including headache, sleepiness, dizziness, slurred speech and blurred vision. Inhalation of high concentrations may result in central nervous system (CNS) effects such as dizziness, weakness, fatigue, nausea, headache, and lack of coordination.

Indication of any immediate medical attention and special treatment needed

No additional first aid information available

SECTION 5: Fire-fighting measures

Extinguishing media

For small fires, use carbon dioxide, dry chemical, or water spray. For large fires, use aqueous foam or water fog. Water spray may be used to cool containers exposed to fire.

Special hazards arising from the substance or mixture

Flammable. Keep away from sources of ignition Use bonding and grounding when transferring quantities of material. Vapors are heavier than air and can travel to a source of ignition and flash back. Closed containers may rupture due to pressure build up during fire conditions. Toxic gases may be formed upon combustion and represent a hazard to firefighters. See Section 10 for information on combustion products.

Advice for firefighters

As in any fire, wear self-contained breathing apparatus operated in pressure-demand mode (NIOSH approved or equivalent) and full protective gear.

Water runoff can cause environmental damage. Dike and collect water used to fight fire.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Wear suitable protective clothing, gloves and eye/face protection. Avoid breathing material. Respiratory protection may be required. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse.

Environmental precautions

Prevent the spread of any spill to minimize harm to human health and the environment. Do not allow the spilled product to enter public drainage system or open waterways. Do not walk through spilled material. Clean up spills immediately.

Methods and material for containment and cleaning up

Remove sources of ignition. Use spark-proof tools and explosion-proof equipment. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain the discharged material. Recover as much as possible for reuse. Do not flush to sewer. Absorb remainder with an inert material such as sand or clay. Wash spill area with soap and water. Notify appropriate authorities if liquid enters sewers or other public waters.

Reference to other sections Refer to Section 8, Exposure Control/Personal Protection.

SECTION 7: Handling and storage

Precautions for safe handling

P201 - Obtain special instructions before use. P202 - Do not handle until all safety precautions have been read and understood. Use with adequate ventilation. Respiratory protection may be required. P272 - Contaminated work clothing should not be allowed out of the workplace. Launder contaminated clothing before reuse. Do not eat, drink or smoke in processing areas. Wash thoroughly after handling. Take precautionary measures against static discharges. Use bonding and grounding when transferring quantities of material. Empty containers retain product residue (liquid and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose container to heat, flame, sparks, static electricity, or other sources of ignition.

Conditions for safe storage, including any incompatibilities

Follow storage requirements for flammable liquids as described in 29 CFR 1910.106 or equivalent. Store in original shipping container and keep tightly sealed. Store in a cool, dry, well-ventilated area away from incompatible substances (refer to Section 10). Protect from heat, spark and other sources of ignition. Store, transport, load, and unload at atmospheric pressure under inert atmosphere to maintain product quality. Containers exposed to heat or sunlight may build pressure. Conduct regular inspection of storage areas. Open containers slowly. Store between -5°C and +45°C. Dicyclopentadiene begins to solidify at temperatures below -7°C. Store in a metallic container. May form explosive peroxides if exposed to air. Store under nitrogen or other inactive gas. Containers should be hermetically sealed when not in use.

SECTION 8: Exposure controls/personal protection

OSHA permissible exposure limit (PEL), American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV), and any other exposure limit used or recommended:

Chemical Name:	OSHA			ACGIH	
	PEL	AL	STEL	TLV	STEL
Dicyclopentadiene (CP Dimer)	NE	NE	NE	5 ppm (27 mg/m ³) TWA	NE
Tricyclopentadiene	NE	NE	NE	NE	NE
Non-Hazardous Polymer Modier	NE	NE	NE	NE	NE
Antioxidant	NE	NE	NE	2 mg/m ³ TWA (inhalable fraction, vapor and aerosol)	NE
5-Vinyl-2-norbornene	NE	NE	NE	NE	NE

PEL = Permissible Exposure Limit; AL = Action Limit; NE = Not Established; RD = Respirable Dust; STEL = Short Term Exposure Limit; TD = Total Dust; TLV = Threshold Limit Value

Exposure controls

Appropriate Engineering Controls H331 - Toxic if inhaled. Processing operations may liberate 1,3 DCP which is a suspect carcinogen. Local exhaust ventilation is strongly recommended to keep exposures as low as possible.

Individual Protection Measures

Eye/Face Protection: If contact is anticipated, wear chemical splash goggles. Additionally, if splashing is possible,

wear a full face shield.

Skin Protection	Use of proper chemical hygiene practices is recommended. Wear long sleeves and gloves to prevent skin contact. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse.
Respiratory Protection	Respiratory protection may be required to avoid overexposure when handling this product. General or local exhaust ventilation is the preferred means of protection. Use a respirator if general room ventilation is not available or sufficient to eliminate symptoms. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 or equivalent requirements must be followed whenever workplace conditions warrant a respirator's use.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance:	Pale yellow liquid
Odor:	Slight Camphor
Odor Threshold:	From 0.003 to 0.2 ppm
pH:	Not Determined
Melting Point/Freezing Point (°F):	23°F (-5°C)
Initial Boiling Point and Boiling Range:	>170°C
Flash Point:	>114°F (>45.5°C)
Evaporation Rate (water = 1):	>1
Flammability (solid/gas):	Not Applicable
Lower Explosive (Flammable) Limit:	~1%
Upper Explosive (Flammable) Limit:	~7%
Vapor Pressure:	(1.4 mmHg)(20 °C)
Vapor Density (Air=1):	4.50
Relative Density (water = 1):	0.98
Solubility (water):	Dicyclopentadiene/water: 40 mg/L (temperature unknown)
Partition Coefficient: n-octanol/water:	2.89 (Dicyclopentadiene)
Autoignition Temperature (°F):	510°C
Decomposition Temperature:	Not Determined
Viscosity (B-type viscometer @ 60 rpm):	150 – 450 mPa.s

SECTION 10: Stability and reactivity

Reactivity	Telene RIM Resin Component A and Component B are designed to be mixed together under controlled conditions in properly designed and operated reaction injection molding systems to produce a reacted polymer. The molding process releases volatiles such as cyclopentadiene, dicyclopentadiene, trace of antioxidants, trace of 1,3-DCP, nitrogen, and norbornene monomer at temperatures significantly above their flash point. Upon heating, DCPD may convert into the monomer cyclopentadiene. Well ventilated conditions are necessary to eliminate hazard risk. There is risk of runaway reaction at temperatures exceeding 80°C. Never handle at temperatures exceeding 50°C and never condense the promoter. Consult with your technical service representatives for processing information.
Chemical stability	Unstable at temperatures above 122°F (50°C). May self-react at temperatures above 176°F (80°C)

Possibility of hazardous reactions	Distillation to dryness may produce explosive peroxides. Mixing of Telene RIM Resin Component A and Component B in non-molding operations may cause an uncontrolled exothermic reaction generating heat above 200°C and releasing vapors such as ethane (flammable) and nitrogen. Metal chloride salts or heat can catalyze polymerization.
Conditions to avoid	Sparks, open flame, other ignition sources, and elevated temperatures; Overheating; Avoid long-term temperatures above 50 °C to prevent polymerization.; Dicyclopentadiene begins to solidify at temperatures below –7°C. Store in a metallic container. May form explosive peroxides if exposed to air. Store under nitrogen or other inactive gas. Containers should be hermetically sealed when not in use.
Incompatible materials	Oxidizing materials, Strong alkalis, Strong acids, Peroxides, Moisture, Isocyanates, Air, Polyols
Hazardous decomposition products	Hydrocarbons, Carbon dioxide, Carbon monoxide, Nitrogen oxides, Hydrogen Chloride

SECTION 11: Toxicological information

Description toxicological (health) effects and the available data used to identify those effects:

Routes of Entry: Inhalation; Ingestion; Skin contact; Skin absorption; Eye contact

Symptoms related to the physical, chemical and toxicological characteristics:

Eye irritant Causes skin irritation. Substance can be absorbed through the skin. May cause allergic skin reaction. Harmful if swallowed. Ingestion may cause irritation of throat, stomach and gastrointestinal tract. Ingestion of this product may result in central nervous system effects including headache, sleepiness, dizziness, slurred speech and blurred vision. Inhalation of high concentrations may result in central nervous system (CNS) effects such as dizziness, weakness, fatigue, nausea, headache, and lack of coordination.

Delayed and immediate effects and chronic effects from short- and long-term exposure:

Numerical Values of Toxicity

Acute Toxicity Estimates:	ORAL LD ₅₀ (rat)	DERMAL LD ₅₀ (rabbit)	INHALATION LC ₅₀ (rat)
Dicyclopentadiene (CP Dimer)	326 mg/kg	5080 mg/kg	1972 mg/m ³ /4H
Tricyclopentadiene			
Non-Hazardous Polymer Modier	>5000 mg/kg	>2500 mg/kg	>2000 mg/m ³ /4H (est)
Antioxidant	890 mg/kg (rat)	>2000 mg/kg	>2000 mg/m ³ /4H (est)
5-Vinyl-2-norbornene	5239 mg/kg	>16 ml/kg	2866 mg/kg/4H

Calculated ATE(mixture): ATE(Mix) Acute Inhalation Vapor = 2063 mg/m³/4H - 2139 mg/m³/4H

Skin Corrosion/Irritation: Draize test (Dicyclopentadiene), rabbit, 20 mg/24H: Moderate

Serious Eye Damage/Irritation: Dicyclopentadiene 75% was a moderate irritant to the rabbit eye at 1 hour but was practically non-irritating at 24, 48 and 72 hours. (OECD Guideline 405)

(Acute Eye Irritation / Corrosion)). Draize test, rabbit, eye: 500 mg/24H Mild

Respiratory or Skin Sensitization: In a modified (9 induction) Beuhler test in female guinea pigs , there were no skin responses following challenge with undiluted dicyclopentadiene 75%w. Dicyclopentadiene 75% is, therefore, considered to be non-sensitising to guinea pig skin (OECD Guideline 406 (Skin Sensitisation)).

Reproductive Toxicity: Dicyclopentadiene induced systemic toxicity in male and female rats at the 100 mg/kg/day dose level. No compound-related effects were seen on reproduction. Effects on neonates included low viability index, lower birth wt and body wt gain in the 100 mg/kg group but not at lower dose levels OECD Guideline 422 (Combined Repeated Dose Toxicity Study with the Reproduction / Developmental Toxicity Screening Test)).

Germ Cell Mutagenicity: Negative in Bacterial Mutation Assay

STOT – single exposure: Specific target organ/systematic toxicity - single exposure: Effect on respiratory system, kidneys, and liver, as well as paralysis of four limbs (suction exposure for rat); anesthetized state (oral administration to mink).

STOT – repeated exposure: Specific target organ/systematic toxicity - repeated exposure: Effect on kidneys and lung (suction exposure for rat); effect on circulatory organ and liver (oral administration to rat).

Carcinogenicity Listings by IARC, NTP, or OSHA

Carcinogenicity	IARC	NTP
Dicyclopentadiene (CP Dimer)	Not Listed	Not Listed
Tricyclopentadiene	Not Listed	Not Listed
Non-Hazardous Polymer Modier	Group 3	Not Listed
Antioxidant	Group 3	Not Listed
5-Vinyl-2-norbornene	Not Listed	Not Listed

SECTION 12: Ecological information

Toxicity: This product has not been tested as a whole. The data has been taken from available literature on the components.

Aquatic EC50 (96h): 8.93 mg/l (5-vinyl-2-norbornene) (Pseudokirchnerie lla subcapitata) (OECD 201)

Aquatic LC50 (96h): 22.86 - 42.3 mg/L (Rainbow Trout) (Dicyclopentadiene)
7.6 mg/l (5-vinyl-2-norbornene) (Danio rerio) (OECD 203)

Aquatic EC50 (48h): 0.62 mg (dicyclopentadiene)/l (Daphnia)
1.44 mg/L Daphnia pulex (Proprietary Antioxidant); 0.48 mg/L Daphnia magna
7.3 mg/l (5-vinyl-2-norbornene) (Daphnia magna) (OECD 202)

Persistence and Degradability: Aerobic: Persistent (Tested substance: 100 mg/L; activated sludge: 30 mg/L; The extent of degradation calculated from BOD is 0%). Anaerobic: No report.

Mobility in Soil: log Koc (5-vinyl-norbornene) = 2.5 (OECD 121). Conclusion: Adsorption to soil is possible

SECTION 13: Disposal considerations

Waste treatment methods

The waste may be a characteristic hazardous waste. The waste may be ignitable. Perform a waste determination prior to disposal. Dispose of hazardous waste at RCRA permitted facilities. All other wastes should be disposed at permitted facilities that accept industrial waste. Dispose of by incineration following Federal, State, Local, or Provincial regulations. Follow all SDS/label precautions even after container is emptied because it may retain product residues.

SECTION 14: Transport information

U.S. Department of Transportation UN Number:	UN2048		
Proper Shipping Name:	Dicyclopentadiene Mixture		
Transport Hazard Class(es):	Class 3	Packing Group:	III
Canadian Transport of Dangerous Goods (TDG):	UN2048		
Proper Shipping Name:	Dicyclopentadiene Mixture		
Mexican Regulation for the Land Transport of Hazardous Materials and Wastes	UN2048		
Proper Shipping Name:	Dicyclopentadiene Mixture		
International Air Transport Authority (IATA/ICAO) UN Number:	UN2048		
Proper Shipping Name:	Dicyclopentadiene Mixture		
Transport Hazard Class(es):	Class 3	Packing Group:	III
International Maritime Organization (IMO) UN Number:	UN2048		
Proper Shipping Name:	Dicyclopentadiene Mixture		
Transport Hazard Class(es):	Class 3	Packing Group:	III
Marine Pollutant:	Yes		

SECTION 15: Regulatory information

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

Chemical Inventory Status:

Australia (AICS):	Not Listed	Canada (DSL):	Listed on the NDSL
China (IECSC):	Not Listed	Korea (KECL):	Not Listed
Japan (ENCS):	Not Determined		
United States (TSCA):	Present		

United States Regulatory Status

EPCRA Section 311/312 (SARA III) Hazard Categories: Acute; Fire

This product contains the following chemical(s) exceeding the *de minimis* amount subject to reporting under SARA 313: Dicyclopentadiene

California Proposition 65 WARNING: Contains the following chemical(s) known to the State of California to cause cancer or reproductive harm:
None

SECTION 16: Other information

NFPA Ratings*	HMIS Ratings**	Key: 0=least; 1=slight; 2=moderate; 3=high; 4=extreme
Health Hazard: 2		Health Hazard: 2
Fire: 2		Fire: 2
Reactivity: 1		Physical Hazard: 1
Special Hazard: None		PPE: PPE should be determined based on workplace conditions.

*National Fire Protection Association (NFPA) ratings identify hazards during a fire emergency.

**Hazardous Materials Identification System (HMIS) ratings apply to products as packaged

Prepared by: This SDS was prepared by Zeon Chemicals L.P.

Issue Date: 03-15-2016

Revision Summary: This document supersedes SDS dated: 01-18-2016

User's Responsibility: This bulletin cannot cover all possible situations which the user may experience during processing. Each aspect of your operation must be examined to determine if, or where, additional precautions may be necessary. All health and safety information contained in this bulletin must be provided to your employees or customers. It is your responsibility to use this information to develop appropriate work practice guidelines and employee instructional programs for your operation.

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END OF SDS