Safety Data Sheet

SDS Number : Z01114

SECTION 1: Identification

Product identifier used on the label: **ZF45#270 Halfwave Retardation Film**

Other means of identification: Not applicable

Recommended use of the chemical: Optical / Medical Device / Electrical 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

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

SECTION 2: Hazard(s) identification

Classification of the chemical in accordance with paragraph (d) of §1910.1200: This product is not considered hazardous in accordance with paragraph (d) of §1910.1200 (Hazard Communication).

GHS Signal Word: None

GHS Hazard Statements: Not classified as hazardous under GHS.

Precautionary Statements (Safety): Not Applicable

Other hazards: As supplied, this product is not expected to cause any adverse health effects. Processing operations may produce vapors or dust that may cause eye, skin, and respiratory tract irritation. Toxic combustion products may be released under fire conditions. Processing and use of this product may cause static charge which may ignite flammable materials. Contact with product at elevated temperatures can result in thermal burns.

Hazards Not Otherwise Classified: None

SECTION 3: Composition/information on ingredients

Chemical Name	Amount (wt %)	CAS #	GHS Classification
Polycycloolefin Resin	>99	Proprietary	None

SECTION 4: First-aid measures

Description of first aid measures

Following Inhalation:	Remove to fresh air. Seek medical attention if cough or other symptoms develop or persist.
Following Skin Contact:	Wash with soap and water. Get medical attention if irritation develops or persists. If molten material contacts skin, cool rapidly with water. Do not attempt to remove material from skin. Seek immediate medical attention for thermal burns.
Following Eye Contact:	Treat as any foreign particulate matter. Do not rub eyes. Flush eyes with running water for several minutes while holding eyelids open. Consult a physician if irritation persists.
Following Ingestion:	Normally not needed. If large quantities are ingested or if you feel unwell, call your local Poison Control Center (1-800-222-1222 in the U.S.) or physician.

Most important symptoms and effects, both acute and delayed

At processing temperatures, the combined ingredients (elastomer and other processing ingredients) may emit fumes and vapors that may cause irritation to the eyes. Contact with product at elevated temperatures can result in thermal burns. Processing operations may create vapors or fumes which may cause respiratory tract irritation.

Indication of any immediate medical attention and special treatment needed

No additional first aid information available

SECTION 5: Fire-fighting measures

Extinguishing media

Use extinguishing media suitable for Class A fires (ordinary combustibles). Carbon dioxide is generally not recommended for use on Class A fires as a lack of cooling capacity may result in reignition.

Special hazards arising from the substance or mixture

Product will burn in a fire. Keep container tightly closed when not in use. Store away from heat, sparks, and other sources of ignition. Processing and use of this product may cause static charge which may ignite flammable materials. Take precautionary measures against static discharges. Special precautions must be taken if this product is ground or otherwise formed into a fine powder or dust since many organic substances in these forms present a dust explosion hazard. Dust in sufficient quantities may be ignited in air. Minimize dust generation and accumulation. Minimize activities which will float or suspend particles in air. Protect from sources of ignition.

Toxic gases may be formed upon combustion and represent a hazard to firefighters. See Section 10 for information on combustion products. Laboratory tests for thermal properties were conducted using OECD Guidelines. The results are indicated below:

93/105/EC Annex VIID 3.10 (Flammability (solids)): Not highly flammable

93/105/EC Annex VIID 3.11 (Explosive properties): Not explosive

93/105/EC Annex VIID 3.12 (Relative self-ignition temperature for solids): Does not self ignite

93/105/EC Annex VIID 3.16 (Thermal stability): Stable at room temperature

According to test method Test method was JIS Z8817-8818:

maximum explosion pressure (Pmax); 7.6 bar

rate of pressure rise (Kst); 133 bar*m/sec

minimum explosion concentration (MEC); 55 ~ 60 g/m3

minimum ignition energy (MIE); 10 ~ 30 mJ (750 g/m3)

minimum ignition temperature (Tc); >400 'C

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.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

No special requirements.

Environmental precautions

As with all industrial chemicals, use of good chemical hygiene and environmental stewardship practices is recommended.

Methods and material for containment and cleaning up

With a shovel or scoop place into appropriate containers for reuse, recycle or disposal.

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

SECTION 7: Handling and storage

Precautions for safe handling

Keep away from sources of ignition Processing and use of this product may cause static charge which may ignite flammable materials. Take precautionary measures against static discharges. Use bonding and grounding when transferring quantities of material. Product will emit fumes and vapors when heated to processing temperatures. Use only with adequate

ventilation. Do not breathe (dust, vapor or fumes). Wash thoroughly after handling. Do not eat, drink or smoke in processing areas.

Clean up following normal processing must be performed with adequate ventilation. Elastomer may be held at process temperatures for a short time without significant thermal degradation. However exposure to elevated temperatures or excessive time will result in decomposition. Equipment should not be shut down for extended time periods with compound in it or decomposition may occur.

Processing fume condensates, which may include toxic contaminants, may be combustible and should be periodically removed from exhaust hoods, ductwork, and other surfaces. Protective clothing and gloves should be worn during cleanup operations to prevent skin contact (Refer to Section 8, Exposure Controls/Personal Protection).

Combustible dust clouds may be created where operations produce dust. Minimize dust generation and accumulation, especially on horizontal surfaces and duct work. Handling and processing operations should be conducted in accordance with NFPA-654 or similar best practices.

Abnormal conditions such as equipment malfunction or using improper equipment or procedures, or hangup or stagnation of material during processing may cause decomposition. Employees involved in removing decomposing material should be provided suitable air-supplied respirators, such as an approved positive pressure self-contained breathing apparatus.

Compounding ingredients added to elastomer products may require special handling. It is the user's responsibility to follow the recommended precautions of the individual additive suppliers.

Post-processing operations involving heat sufficient to result in polymer breakdown emitting smoke and fumes should be conducted in such a manner to avoid inhalation of fumes. Local exhaust ventilation and respiratory protection may be required.

Conditions for safe storage, including any incompatibilities

Store in a cool, dry place away from direct light to maintain quality.

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:

	OSHA			ACGIH	
Chemical Name:	**PEL**	**AL**	**STEL**	**TLV**	**STEL**
Polycycloolefin Resin	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	No exposure limits exist for the constituents of this product. Use local exhaust ventilation or other engineering controls to minimize exposures and maintain operator comfort.

Individual Protection Measures

Eye/Face Protection:	Follow facility guidelines. Additionally, chemical splash goggles and a face shield should be worn when handling heated or molten material to prevent thermal burns to the eyes or face.
Skin Protection	Use of proper chemical hygiene practices is recommended. For molten product, use any type rubber thermal insulating gloves and other clothing as necessary to protect from thermal burns.
Respiratory Protection	Respiratory protection is not typically required during normal use and handling operations where general dilution or local exhaust ventilation is adequate to control exposures. NIOSH

approved respiratory protection may be needed if vapor or dust is generated during processing or if the product is ground into a fine powder. Wear a positive pressure air-supplied respirator in situations where there may be potential for elevated airborne exposure such as during equipment malfunction, or product hangup or stagnation during processing that may result in decomposition.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance:	Colorless Solid
Odor:	None
Odor Threshold:	Not Applicable
pH:	Not Determined
Melting Point/Freezing Point (°F):	Not Determined
Initial Boiling Point and Boiling Range:	Not Applicable
Flash Point:	Not Applicable
Evaporation Rate (water = 1):	Not Applicable
Flammability (solid/gas):	See Section 5
Lower Explosive (Flammable) Limit:	Not Applicable
Upper Explosive (Flammable) Limit:	Not Applicable
Vapor Pressure:	Negligible
Vapor Density (Air=1):	Not Applicable
Relative Density (water = 1):	1.01
Solubility (water):	Insoluble
Partition Coefficient: n-octanol/water:	Not Determined
Autoignition Temperature (°F):	455℃
Decomposition Temperature:	Not Determined
Viscosity (B-type viscometer @ 60 rpm)**:**	Not Applicable

SECTION 10: Stability and reactivity

Reactivity	Hazardous polymerization will not occur.
Chemical stability	This material is stable when properly handled and stored.
Possibility of hazardous reactions	None Known
Conditions to avoid	Overheating
Incompatible materials	As with all organic materials, avoid contact with strong oxidizers and reducing agents.
Hazardous decomposition products	Carbon monoxide, Carbon dioxide, Hydrocarbons

SECTION 11: Toxicological information

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

Routes of Entry: Skin contact; Eye contact; Process Vapor/Dust Inhalation.

Symptoms related to the physical, chemical and toxicological characteristics:

At processing temperatures, the combined ingredients (elastomer and other processing ingredients) may emit fumes and vapors that may cause irritation to the eyes. Contact with product at elevated temperatures can result in thermal burns. Processing operations may create vapors or fumes which may cause respiratory tract irritation.

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)**
Polycycloolefin Resin	>2000 mg/kg	No data available	No data available

Skin Corrosion/Irritation: Does not meet classification criteria.

Serious Eye Damage/Irritation: Does not meet classification criteria.

Respiratory or Skin Sensitization: Not expected to be a sensitizer.

Reproductive Toxicity: Not known or reported to cause reproductive or developmental toxicity.

Germ Cell Mutagenicity: Not known or reported to be mutagenic.

STOT – single exposure: Does not meet classification criteria.

STOT – repeated exposure: Data lacking for classification

	Carcinogenicity Listings by IARC, NTP, or OSHA	
Carcinogenicity	**IARC**	**NTP**
Polycycloolefin Resin	Not Listed	Not Listed

SECTION 12: Ecological information

Toxicity: No information available.

SECTION 13: Disposal considerations

Waste treatment methods

Waste resulting from this product as supplied is not known to be classified as a hazardous waste per the current listings and characteristics contained in 40 CFR Part 261, and its Appendices. It is the generator's responsibility to determine, per the regulation, the applicability of the Resource Conservation and Recovery Act (RCRA), as well as all state, local, or other governmental agency waste disposal regulations, to the particular waste materials prior to treatment or disposal.

SECTION 14: Transport information

U.S. Department of Transportation UN Number:	This product is not defined or designated as a hazardous material by the U.S. Department of Transportation under Title 49 of the Code of Federal Regulations.
Canadian Transport of Dangerous Goods (TDG):	This product is not classified as a dangerous good for transport.
Mexican Regulation for the Land Transport of Hazardous Materials and Wastes	This product is not classified as a dangerous good for transport.
International Air Transport Authority (IATA/ICAO) UN Number:	This product is not classified as a dangerous good for transport.
International Maritime Organization (IMO) UN Number:	This product is not classified as a dangerous good for transport.

SECTION 15: Regulatory information

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

Chemical Inventory Status:

Australia (AICS):	Notified	**Canada (DSL):**	Present
China (IECSC):	Present	**Korea (KECL):**	Present
Japan (ENCS):	Present	**Taiwan (NECSI):**	Present
United States (TSCA):	Present	**Mexico (INSQ)**	Not Listed

United States Regulatory Status

EPCRA Section 311/312 (SARA III) Hazard Categories:	None
This product contains the following chemical(s) exceeding the *de minimis* amount subject to reporting under SARA 313:	None

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:	0
Fire:	1	Fire:	1
Reactivity:	0	Physical Hazard:	0
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.
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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