SDS – Cyclic Olefin Copolymers

C Technologies, Inc. does not manufacture Cyclic Olefin Copolymers. Cyclic Olefin Copolymers is manufactured for C Technologies, Inc. by Advanced Polymers. Attached you will find the SDS.
SAFETY DATA SHEET

1. Identification

Product Identifier

Identification of the substance/preparation

Cyclic Olefin Copolymers

Recommended uses and restrictions on use

Use of the Substance / Preparation injection molding articles for optical industry, 3-D Printing, packaging Industry, medical articles.

2. Hazards identification

2.1. Classification of the substance or mixture

OSHA Specified Hazards Not applicable.

2.2. Label elements

Not required according to §1910.1200 (GHS-US labeling).

2.3. Other hazards

None known

3. Composition / Information on ingredients

Chemical characterization contains ethylene-norbornene copolymer (CAS 26007-43-2)

4. First aid measures

Description of first aid measures

General advice
Remove/Take off immediately all contaminated clothing. Wash/Decontaminate removed clothing before reuse.

Inhalation
Aerate with fresh air. When symptoms persist or in all cases of doubt seek medical advice.

Eyes
Resin particles, like other inert materials, are mechanically irritating to eyes. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Obtain medical attention.
Skin
Cool skin rapidly with cold water after contact with molten polymer. If polymer is stuck to skin, do not remove. Allow adhered polymer to come off naturally. Removal of adhered polymer may result in more tissue damages than if polymer is allowed to come off over time. When symptoms persist or in all cases of doubt seek medical advice.

Ingestion
Do not induce vomiting without medical advice. Obtain medical attention.

**Most important symptoms and effects, both acute and delayed**

**Main symptoms**
None known.

**Indication of medical attention/treatment**
This product is essentially inert and non-toxic. Under conditions of thermal decomposition irritant gases may be formed. Exposed patients may need to have their arterial blood gases and carboxyhemoglobin levels checked.

### 5. Firefighting measures

**Extinguishing media**
**Suitable extinguishing media**
Water spray, foam, dry chemical, carbon dioxide (CO2).

**Unsuitable Extinguishing Media**
Do not use a solid water stream as it may scatter and spread fire.

**Special hazards arising from the substance or mixture**
Under conditions giving incomplete combustion, hazardous gases produced may consist of:
- carbon monoxide (CO)
- carbon dioxide (CO2)
Combustion gases of organic materials must in principle be graded as inhalation poisons.

**Protective equipment and precautions for fire fighters**

**Special protective equipment for firefighters**
Fire fighter protection should include a self-contained breathing apparatus (NIOSH-approved or EN 133) and full firefighting turn out gear.

**Precautions for firefighting**
Cool closed containers exposed to fire with water spray. Keep people away from and upwind of fire. Dike and collect water used to fight fire.

### 6. Accidental release measures

**Personal precautions**
Avoid contact with skin and eyes. Do not breathe dust. Keep people away from and upwind of spill/leak.
For emergency responders: Personal protection see section 8.

**Environmental precautions**
Not readily biodegradable. Should not be released into the environment. Do not flush into surface water or sanitary sewer system.

**Methods for containment**
Stop the flow of material, if possible without risk.
Methods for cleaning up
Sweep up and shovel into suitable containers for disposal. Like most thermoplastic plastics the product can be recycled. Dispose of in accordance with local regulations.

7. Handling and storage

Precautions for safe handling

Advice on safe handling
Do not handle hot or molten material without appropriate protective equipment. Do not exceed recommended process temperatures to minimize release of decomposition products.

Hygiene measures
Wash hands before breaks and immediately after handling the product. Take off all contaminated clothing immediately.

Advice on the protection of the environment
See Section 8: Environmental exposure controls

Conditions for safe storage

Technical measures/Storage conditions
Keep away from direct sunlight. Keep containers tightly closed in a dry, cool and well-ventilated place.

Advice on protection against fire and explosion
Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge. Dust can form an explosive mixture in air. Risks of ignition followed by flame propagation or secondary explosions shall be prevented by avoiding accumulation of dust, e.g. on floors and ledges.

Incompatible products
No special restrictions on storage with other products

8. Exposure controls / Personal protection

Exposure limits United States of America

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<tr>
<th>Component</th>
<th>TWA (mg/m³)</th>
<th>TWA (ppm)</th>
<th>STEL (mg/m³)</th>
<th>STEL (ppm)</th>
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US OSHA Z-1

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<th>Ceiling (mg/m³)</th>
<th>Ceiling (ppm)</th>
<th>PEL (mg/m³)</th>
<th>PEL (ppm)</th>
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US NIOSH IDHL

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<th>Component</th>
<th>Potential cancer hazard</th>
<th>Concentration (mg/m³)</th>
<th>Concentration (ppm)</th>
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</table>

**Appropriate Engineering controls**
Ensure adequate ventilation. Provide for appropriate exhaust ventilation and dust collection at machinery.

**Personal protective equipment**

**General industrial hygiene practice**
Avoid contact with skin, eyes and clothing. Do not breathe dust or mist. Ensure that eyewash stations and safety showers are close to the workstation location.

**Hygiene measures**
Wash hands before breaks and immediately after handling the product. Take off all contaminated clothing immediately.

**Respiratory protection**
Based on workplace contaminant levels and working limits of the respirator, use a respirator approved by NIOSH

**Hand protection**
Heat resistant gloves.

**Suitable material**
leather gloves

**Eye protection**
Tightly fitting safety goggles.

**Skin and body protection**
Wear face-shield and protective suit for abnormal processing problems.

**Thermal Hazard**
When handling hot material, use heat resistant gloves. Heat only in areas with appropriate exhaust ventilation.

**9. Physical and chemical properties**

**9.1. Information on basic physical and chemical properties**

- **Appearance**: granules
- **Colour**: colourless
- **Odour**: odourless
- **Odour threshold**: No data available
- **pH**: No data available
- **Melting point/range**: approx. 75-185 °C
- **Boiling point/range**: No data available
- **Flash point**: Not applicable
- **Evaporation rate**: No data available
- **Flammability (solid, gas)**: No data available
- **Lower explosion limit**: Not applicable
- **Upper explosion limit**: Not applicable
- **Vapour pressure**: < 0.001 mm Hg @25°C (77 F)
<table>
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<tr>
<th>Property</th>
<th>Value</th>
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<td>Autoignition temperature</td>
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<td>Decomposition temperature</td>
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<td>Viscosity</td>
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<tr>
<td>Oxidizing properties</td>
<td>Does not apply, substance is not oxidising. There are no chemical groups associated with oxidizing properties</td>
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</table>

9.2. Other information

VOC Content(%) < 0.5 % (wt/wt)

10. Stability and reactivity

Reactivity
The reactivity of the product corresponds to the typical reactivity shown by the substance group as described in any textbook on organic chemistry.

Chemical stability
Stable under normal conditions of handling, use and transportation.

Possibility of hazardous reactions
Hazardous polymerisation does not occur.

Conditions to avoid
Avoid temperatures above 350 °C / 662°F. Risk of decomposition.

Incompatible materials
oxidizing agents.

Hazardous decomposition products
Thermal decomposition can lead to release of irritating gases and vapours.

11. Toxicological information

Main symptoms
None known

Note
No toxicology information is available. Handle in accordance with good industrial hygiene and safety practice.

12. Ecological information

Ecotoxicity
No data available
Persistence/Degradability
No data available

Bioaccumulative potential
No data available

Mobility in soil
No data available

Other Adverse Effects
No data available

Note
No information on ecology is available. According to our experience and to the information provided to us, the product does not have any harmful effects if it is used and handled as specified.

13. Disposal considerations

Product Information
Where possible recycling is preferred to disposal or incineration. May be taken to waste disposal site or incineration plant, with household waste. Rules of the local authorities must be observed.

Uncleaned empty packaging
Regulations concerning reuse or disposal of used packaging materials must be observed.

14. Transport information

ICAO/IATA
Not restricted

IMDG
Not restricted

D.O.T. (49CFR)
Not restricted

15. Regulatory information

OSHA Regulatory Status
This material is non-hazardous as defined by the American OSHA Hazard Communication Standard (29CFR 1910.1200).

Federal Regulations
This product complies with U.S. Toxic Substance Control Act (TSCA)
International Inventories

The products covered by this SDS are permitted under the following inventories:

- TSCA (US)
- AICS (AU)
- KECI (KR)
- DSL (CA)
- IECSC (CN)
- EINECS (EU)
- ENCS (JP)
- NZIoC (NZ)
- TCSI (TW)

16. Other information

Manufacturer's Revision Date: 29-Dec-2017
Manufacturer's Issuing Date 02-Apr-2018
Manufacturer's Version/Revision No. 7.02

Training advice
For effective first-aid, special training / education is needed

Hazard Rating Systems

NFPA (National Fire Protection Association)
- Health Hazard 1
- Fire Hazard 1
- Reactivity 0

HMIS (Hazardous Material Information System)
- Health Hazard 0
- Flammability 1
- Physical Hazard 0

Disclaimer
The information contained herein is accurate to the best of our knowledge. We do not suggest or guarantee that any hazards listed herein are the only ones which exist. C Technologies, Inc. makes no warranty of any kind, express or implied, concerning the safe use of this material in your process or in combination with other substances. Effects can be aggravated by other materials and/or this material may aggravate or add to the effects of other materials. User has sole responsibility to determine the suitability of the materials for any use and the manner of use contemplated. User must meet all applicable safety and health standards.