TOPAS® Cyclic Olefin Copolymers

1: Identification

Product Identifier
Identification of the substance/preparation

TOPAS® Cyclic Olefin Copolymers

Recommended uses and restrictions on use

| Use of the Substance / Preparation | injection molding articles for optical industry, packaging Industry, medical articles. |

Supplier information
Supplier

TOPAS Advanced Polymers, Inc.
7300 Turfway Rd.
Florence, KY 41042
United States

Product Information

+49 (0)1805-1-86727

Emergency telephone number

in USA, call 800 424 9300
outside USA, call 703 527 3887, collect calls accepted
available 24/7***

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)
TOPAS® Cyclic Olefin Copolymers

Remarks
The following specific grades of TOPAS are covered by this MSDS:
5013L-10; 5013S-04; 6013D-61; 6013D-63; 6013M-07; 6013S-04; 6015D-61;
6015S-04; 6017S-04; 8007D-61; 8007S-04; 8007X10

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).

Extinguishing media which must not be used for safety reasons
Do not use a solid water stream as it may scatter and spread fire.

Special hazards arising from the substance or mixture
TOPAS® Cyclic Olefin Copolymers

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 fire-fighting 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
TOPAS® Cyclic Olefin Copolymers

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

<table>
<thead>
<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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<tr>
<th>Component</th>
<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>
<th>Listed w/o limits</th>
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<td>Note D***</td>
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</table>

Engineering measures
Ensure adequate ventilation. Provide for appropriate exhaust ventilation and dust collection at machinery.

Personal protective equipment
TOPAS® Cyclic Olefin Copolymers

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

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
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</thead>
<tbody>
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</table>
TOPAS® Cyclic Olefin Copolymers

Autoignition temperature  No data available
Decomposition temperature No data available
Viscosity No data available

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 text book 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 / 662F. 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***
TOPAS® Cyclic Olefin Copolymers

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)
**SAFETY DATA SHEET**

TOPAS® Cyclic Olefin Copolymers

**16. Other information**

Revision Date: 26-Jun-2015***
Issuing date: 26-Jun-2015

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

**Sources of key data used to compile the datasheet**
Information contained in this safety data sheet is based on TOPAS owned data and public sources deemed valid or acceptable. The absence of data elements required by OSHA, ANSI or Annex II, Regulation 1907/2006/EC indicates, that no data meeting these requirements is available.

**Further information for the safety data sheet**
For more information, consult the Technical Data Sheet (www.topas.com). Changes against the previous version are marked by ***.

**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. TOPAS Advanced Polymers, 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.