1. PRODUCT AND COMPANY IDENTIFICATION

Identification of the substance/preparation

TOPAS® Cyclic Olefin Copolymers

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

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

2. HAZARDS IDENTIFICATION

Emergency Overview

Product Description
Physical state granules
Colour colourless
Odour odourless

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

Potential Health Effects

Principle Routes of Exposure Inhalation, Eye contact, Skin contact.

Inhalation No information available. May cause irritation of respiratory tract. Overheating in processing may generate hazardous, irritating vapours.

Eye contact No information available. Hot or molten material has the potential to cause thermal burns. Resin particles, like other inert materials, are mechanically irritating to eyes.

Skin contact No information available. Hot or molten material has the potential to cause thermal burns. Polymer particles may cause mechanical irritation.

Ingestion No information available. Essentially non-toxic based on biological activity of high molecular weight polymers.
Material Safety Data Sheet

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Main symptoms
None known.

Chronic effects
No information available.

3. Composition / Information on ingredients

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

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

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.

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.

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.

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

Main symptoms
None known.

Notes to physician
Treat symptomatically.

5. Firefighting measures

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.
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Special exposure hazards arising from the substance or preparation itself, its combustion products, or released gases
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

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

Precautions for fire-fighting
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

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.

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.

Advice on the protection of the environment
See Section 8: Environmental exposure controls
**TOPAS® Cyclic Olefin Copolymers**

### Storage

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

**Advice on common storage**
No special restrictions on storage with other products

**VCI Storage Class old!**
11: Combustible solids

### 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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<th>Ceiling (mg/m³)</th>
<th>Ceiling (ppm)</th>
<th>PEL (mg/m³)</th>
<th>PEL (ppm)</th>
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#### US OSHA Z-1A Revoked (1993)

<table>
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<th>TWA (mg/m³)</th>
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<th>STEL (mg/m³)</th>
<th>STEL (ppm)</th>
<th>Ceiling (mg/m³)</th>
<th>Ceiling (ppm)</th>
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</tbody>
</table>
TOPAS® Cyclic Olefin Copolymers

**Engineering measures**
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

<table>
<thead>
<tr>
<th>Physical state</th>
<th>granules</th>
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<tbody>
<tr>
<td>Colour</td>
<td>colourless</td>
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<tr>
<td>Odour</td>
<td>odourless</td>
</tr>
<tr>
<td>Softening point</td>
<td>&gt;60 °C/ &gt;140 F</td>
</tr>
<tr>
<td>Bulk density</td>
<td>550 - 600 g/l</td>
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<tr>
<td>Method</td>
<td>DIN 53466</td>
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<td>Vapour pressure</td>
<td>&lt; 0.001 mm Hg @25°C (77 F)</td>
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<tr>
<td>Water solubility</td>
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<tr>
<td>VOC Content(%)</td>
<td>&lt; 0.5 % (wt/wt)</td>
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</table>

### 10. Stability and reactivity

**Stability**
Stable under normal conditions of handling, use and transportation.
Material Safety Data Sheet

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Hazardous reactions
Hazardous polymerisation does not occur.

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

Materials to avoid
oxidizing agents.

11. Toxicological information

Principle Routes of Exposure
Inhalation, Eye contact, Skin contact

Acute toxicity
Subacute, subchronic and prolonged toxicity
Carcinogenicity, Mutagenicity, Reproductive toxicity

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

12. ECOLOGICAL INFORMATION

Acute aquatic toxicity

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
TOPAS® Cyclic Olefin Copolymers

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)

16. Other information

Revison Date 21-May-2012
Issuing date 05-Sep-2013

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 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.