Cyclo Olefin Polymer (COP)
High Performance Thermoplastics for Pharmaceutical Packaging

ZEON CORPORATION
**ZEONEX®** Cyclo Olefin Polymer (COP) is a high performance thermoplastic that overcomes limitations of traditional packaging materials with its enhanced barrier, transparency, purity and strength properties. ZEONEX® is ideal for use in the form of Pre-filled Syringes, Vials, Ampoules, IV Bags, Barrier Films, Blister Packs and other pharmaceutical packaging applications.

**High Break Resistance**
Higher impact strength ensures that breakage during handling and transport is minimized. Tensile elongation at cryogenic temperatures make ZEONEX® suitable for Lyophilization.

**Low Protein Adsorption**
ZEONEX®’s low surface energy and hydrophobic nature contribute to very low protein binding, making it the ideal packaging material for protein/peptide based drugs. Low surface energy also ensures low wetting and higher drainability, thus reducing the need for overfills.

**High Transparency**
ZEONEX®’s high “glass-like” light transmittance and low haze enable easy viewing of the contents creating a favorable first impression to the end-user.

**High Moisture Barrier**
Extremely low moisture permeability increases drug shelf life by enabling prolonged storage of moisture sensitive materials.

**Drug Compatibility (Chemical Inertness and Resistance)**
ZEONEX® offers good resistance against acids, alkalis and alcohols. ZEONEX® also has high resistance to organic solvents and a wide range of pH.

**High Purity**
ZEONEX® medical grades are extremely pure resin containing less-than-detectable residual metals and no process aids. Compared to conventional barrier polymers, materials packaged using ZEONEX® have reduced risk to be compromised by off-gassing or extractables.

**No Delamination**
Extended exposure to high pH levels does not cause delamination in ZEONEX® packaging. ZEONEX® is an ideal alternate to glass in applications where delamination is a concern.
**Low-Temperature Heat Sealing**

ZEONEX® is designed to enable low-temperature heat sealing. Due to its lower glass-transition temperature (Tg), ZEONEX® 5000 has a larger processing window for heat sealing.

**Light Weight**

ZEONEX® is up to 2.5 times lighter than glass, easing handling and bringing down transportation cost.

**FDA DMF Nos.**

- ZEONEX® 5000: 27657
- ZEONEX® 690R: 14084
- ZEONEX® 790R: 17236
- ZEONOR® 1020R: 13885

**Non Halogen**

ZEONEX® does not contain halogens. It is easily disposable by incineration and simultaneously reduces the environmental footprint of your product.

**Excellent Molding Properties**

ZEONEX®’s flow and transcription properties make it molding friendly and allows customized designs to meet end user needs. ZEONEX® can be used for molding large size syringes and cartridges.

**Sterilization Compatibility**

ZEONEX® applications can be sterilized using EtO, Gamma, EB and Steam., offering users the flexibility to use ZEONEX® in a wide range of product packaging.

**High Transparency**

ZEONEX®’s high “glass-like” light transmittance and low haze enable easy viewing of the contents creating a favorable first impression to the end-user.

**High Moisture Barrier**

Extremely low moisture permeability increases drug shelf life by enabling prolonged storage of moisture sensitive materials.

**Non Halogen**

ZEONEX® does not contain halogens. It is easily disposable by incineration and simultaneously reduces the environmental footprint of your product.

**Excellent Molding Properties**

ZEONEX®’s flow and transcription properties make it molding friendly and allows customized designs to meet end user needs. ZEONEX® can be used for molding large size syringes and cartridges.

**High Purity**

ZEONEX® medical grades are extremely pure resin containing less-than-detectable residual metals and no process aides. Compared to conventional barrier polymers, materials packaged using ZEONEX® have reduced risk to be compromised by off-gassing or extractables.

**No Delamination**

Extended exposure to high pH levels does not cause delamination in ZEONEX® packaging. ZEONEX® is an ideal alternate to glass in applications where delamination is a concern.

**Cyclo Olefin Polymer (COP)**

is a high performance thermoplastic that overcomes limitations of traditional packaging materials with its enhanced barrier, transparency, purity and strength properties.

**ZEONEX® Medical Grades**

<table>
<thead>
<tr>
<th>Properties</th>
<th>unit</th>
<th>Method</th>
<th>ZEONEX® 5000</th>
<th>ZEONOR® 1020R</th>
<th>ZEONEX® 690R</th>
<th>ZEONEX® 790R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light transmittance (3mmt)</td>
<td>%</td>
<td>Zeon Method</td>
<td>92</td>
<td>91</td>
<td>92</td>
<td>91</td>
</tr>
<tr>
<td>Glass Transition Temperature</td>
<td>°C</td>
<td>Zeon Method</td>
<td>68</td>
<td>102</td>
<td>136</td>
<td>162</td>
</tr>
<tr>
<td>Elongation at break (23°C)</td>
<td>%</td>
<td>ISO 527</td>
<td>120</td>
<td>90</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>WVTR*</td>
<td>g/(m²·24h)</td>
<td>JIS K7129</td>
<td>0.8</td>
<td>1.0</td>
<td>1.0</td>
<td>1.1</td>
</tr>
</tbody>
</table>

*WVTR* - Water vapor transmission rate 40°C, 90%RH (100 μm)

Data represents experimental results and does not guarantee specific performance levels under actual usage.
Cyclo Olefin Polymer (COP)
High Performance Thermoplastics for Pharmaceutical Packaging

For More Information:
Please visit:  www.zeonex.com
Email: zeonex@zeonchemicals.com

A corporate brand “ZEON”, a logotype “ZEONEX”, and “ZEONOR” are the registered trademarks of Zeon Corporation.