Total Caps & Closures polyolefin product range evolving together with new market requirements.

A complete product range: from low to high fluidity, with improved processing and mechanical properties, allowing cost reductions thanks to lightweighting and processing savings possibilities. For each application, you can find a unique combination of product properties and technology.

- **COST SAVINGS (DOWNGAUGING, PROCESSING)**
- **ENHANCED MECHANICAL PROPERTIES (ADAPTING TO E-COMMERCE NEEDS)**
- **IMPROVED ORGANOLECTICS**
- **AESTHETICS (IMPROVED GLOSS & TRANSPARENCY)**
- **EASY PROCESSING (REDUCED CYCLE TIME & INCREASED MACHINE LIFETIME)**
**CAPS & CLOSURES**

**APPLICATIONS**

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**Total HDPE for still drinks**
- HD 6081
- HD 6082

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**Total LDPE for soft lids, pull-rings and caps**
- 1070 MC 18 C
- 1200 MN 18 C

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**Total Lumatic® HDPE for carbonated drinks**
- Lumatic® M5220
- Lumatic® M5220M
- Lumatic® M5222

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**Total Lumatic® PP for personal care products**
- MR10MX0
- MR30MC2
- MR60MC2

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**Total PP product range**
- PPR 7227
- PPR 9220
- PPR 10232
- PPR 12232
  - For sport caps

- PPC 10712
- PPC 10641
- PPC 7652
- PPC 12712
  - For flip-top caps

- PPH 5060
- PPH 7062
- PPH 9081
- PPH 9020
- PPH 10012
  - For optimized mechanical properties and processability

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**Total Circular compounds® rPP**
- rPPH12GR
- rPPH35GR
- rPPC16GR
- rPPC35GR
  - For non-food contact caps

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Available as Total certified renewable polymers
Unique molecular design and technology expertise to achieve excellent processing behaviour and mechanical properties.

- 5 TO 10% PROCESSING PRESSURE DECREASE
- IMPROVED ESCR (TWICE AS HIGH AS MARKET REFERENCE)
- UP TO 40°C PROCESSING TEMPERATURE REDUCTION POTENTIAL
- CERTIFIED ORGANOLEPTIC PROPERTIES

Available as Total certified renewable polymers
CAPS & CLOSURES HDPE
• HD 6081 and HD 6082 •

<table>
<thead>
<tr>
<th>Grade</th>
<th>Melt Flow Index (2.16 Kg – 190 °C) (g/10min)</th>
<th>Density (g/cm³)</th>
<th>Flexural Modulus (MPa)</th>
<th>Specific features</th>
</tr>
</thead>
<tbody>
<tr>
<td>HD 6081</td>
<td>8</td>
<td>0.960</td>
<td>1300</td>
<td>Organo sensitive still drinks¹</td>
</tr>
<tr>
<td>HD 6082</td>
<td>8</td>
<td>0.960</td>
<td>1300</td>
<td>Organo highly sensitive still drinks¹,²</td>
</tr>
</tbody>
</table>

1. Organooleptic properties are controlled for each production campaign.
2. VOC analysis performed for each batch. Certificates of compliance are available upon request.

Total Polyethylene product range combines flexibility and easy processing for the injection of Caps & Closures.

ESCR performance

Test conditions: 10% Igepal, 0.5 bar, 40 °C, 1.5 Nm
Market reference: Density 0.960 ; Ml2 = 7-8 g/10 min
Total LDPE grades are suitable for soft lids, pull-rings and Caps & Closures.

- Softness and transparency
- Greater ductility
- More complex cap designs
- Better processability

Available as Total certified renewable polymers
## CAPS & CLOSURES LDPE

**LDPE benefits for Caps & Closures**

LDPE portfolio to answer market’s needs.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Density (g/cm³)</th>
<th>Melt Flow Index (2.16 kg – 190 °C) (g/10 min)</th>
<th>Flexural Modulus (MPa)</th>
<th>Specific features</th>
</tr>
</thead>
<tbody>
<tr>
<td>1022 FN 24</td>
<td>0.923</td>
<td>2.3</td>
<td>220</td>
<td>Suitable for soft lids, pull-rings, cosmetics, teats in sport caps</td>
</tr>
<tr>
<td>LD 0304</td>
<td>0.924</td>
<td>4.0</td>
<td>250</td>
<td>Suitable for soft lids, pull-rings, cosmetics, teats in sport caps</td>
</tr>
<tr>
<td>1070 MN 18 C</td>
<td>0.918</td>
<td>7.5</td>
<td>-</td>
<td>Suitable for soft lids, pull-rings, cosmetics, teats in sport caps</td>
</tr>
<tr>
<td>1200 MN 18 C</td>
<td>0.918</td>
<td>22</td>
<td>150</td>
<td></td>
</tr>
<tr>
<td>1700 MN 18 C</td>
<td>0.918</td>
<td>70</td>
<td>140</td>
<td></td>
</tr>
</tbody>
</table>

### ACESO® grades for medical applications

<table>
<thead>
<tr>
<th>Grade</th>
<th>Density (g/cm³)</th>
<th>Melt Flow Index (2.16 Kg – 190 °C) (g/10 min)</th>
<th>Flexural Modulus (MPa)</th>
<th>Specific features</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEM 2420</td>
<td>0.923</td>
<td>2.3</td>
<td>220</td>
<td>Conforms EU and US pharmacopoeia</td>
</tr>
<tr>
<td>PEM 2440</td>
<td>0.924</td>
<td>4.0</td>
<td>250</td>
<td>Conforms EU and US pharmacopoeia</td>
</tr>
<tr>
<td>PEM 1870</td>
<td>0.918</td>
<td>7.5</td>
<td>-</td>
<td>Conforms EU and US pharmacopoeia</td>
</tr>
</tbody>
</table>
A revolutionary product family of bimodal grades allowing significantly improved product performance and important cost savings, and suitable for a wide range of applications: juice, milk, beer and sparkling water.

- 15% LOWER ENERGY CONSUMPTION
- 10% CYCLE TIME REDUCTION
- 20 TO 45° C DECREASE IN PROCESSING TEMPERATURE
- IMPROVED ESCR (TWICE AS HIGH AS MARKET REFERENCE)
- EXCELLENT ORGANOLEPTIC PERFORMANCES

Available as Total certified renewable polymers
### Caps & Closures HDPE

**Polyethylene Lumicene®**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Melt Flow Index (2.16 Kg – 190 °C) (g/10 min)</th>
<th>Density (g/cm³)</th>
<th>Flexural Modulus (MPa)</th>
<th>ESCR (F50, 100% lqepal, ASTM D1693) (h)</th>
<th>Specific features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lumicene® M5220</td>
<td>2.0</td>
<td>0.952</td>
<td>1100</td>
<td>&gt;150</td>
<td>Bimodal, No slip agent, Organo sensitive drinks</td>
</tr>
<tr>
<td>Lumicene® M5220M</td>
<td>2.0</td>
<td>0.952</td>
<td>1100</td>
<td>&gt;150</td>
<td>Bimodal, Slip agent, Organo sensitive drinks</td>
</tr>
<tr>
<td>Lumicene® M5222</td>
<td>2.0</td>
<td>0.952</td>
<td>1100</td>
<td>&gt;150</td>
<td>Bimodal, Alternative to behenamide, Organo-sensitive drinks</td>
</tr>
</tbody>
</table>

Organoleptic properties are controlled for each production campaign.

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### Total Lumicene® M5220 family

Highly performing products associated with significant cost savings.

**The ultimate answer for carbonated drinks:**
- Very good dimensional stability, stress-cracking resistance, rigidity and processability.
- Excellent organoleptic properties.

A reduced carbon footprint: consumption of 1000 t of M5220(M) or M5222 reduced CO₂ emissions by 550 t eq.
Based on proprietary Metallocene technology, Total Refining & Chemicals offers a unique range of polypropylene products. They combine improved properties while allowing significant processing cost reductions.

- **BEST IN CLASS FOR ORGANOLEPTIC PROPERTIES**
- **IMPROVED IMPACT AND STIFFNESS BALANCE, ALLOWING SIGNIFICANT DOWNGAUGING**
- **20 TO 45° C DECREASE IN PROCESSING TEMPERATURES**
- **IMPROVED DIMENSIONAL STABILITY**
- **PROCESSING COSTS SAVINGS POSSIBILITIES**
- **OUTSTANDING GLOSS, TRANSPARENCY AND AESTHETICS**

Available as Total certified renewable polymers.
### Polypropylene Lumicene®

<table>
<thead>
<tr>
<th>Grade</th>
<th>MFI (2.16 kg·190 °C) (g/10 min)</th>
<th>Flexural Modulus (MPa)</th>
<th>Izod Notched at 23 °C (kJ/m²)</th>
<th>Specific features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lumicene® MR10MX0</td>
<td>10</td>
<td>1250</td>
<td>5.0</td>
<td>Outstanding aesthetics, ultra low migration</td>
</tr>
<tr>
<td>Lumicene® MR30MC2</td>
<td>30</td>
<td>1250</td>
<td>5.0</td>
<td>Outstanding aesthetics, ultra low migration</td>
</tr>
<tr>
<td>Lumicene® MR60MC2</td>
<td>60</td>
<td>1250</td>
<td>5.0</td>
<td>Clarified and antistatic</td>
</tr>
</tbody>
</table>

Organoleptic properties are controlled for each production campaign. Lumicene® grades are always phthalate-free.

**Total Lumicene® MR10MX10, the best results on the market for aesthetics**
Total product range is preferred and referenced by most of converters and brand owners looking for differentiation and excellent processing.

We offer a complete product range from low to high fluidity while improving processing, mechanical properties. Total’s solutions allow costs reductions thanks to lightweighting and processing savings possibilities.

Available as Total certified renewable polymers
Total PPR 7227 – an answer to sport drink market

<table>
<thead>
<tr>
<th>Grade</th>
<th>MFI (2.16 kg-190 °C) (g/10 min)</th>
<th>Flexural Modulus (MPa)</th>
<th>Izod Notched at 23 °C (kJ/m²)</th>
<th>Specific features</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPR 7227</td>
<td>10</td>
<td>1200</td>
<td>5.5</td>
<td>Certified organo*, clarified</td>
</tr>
<tr>
<td>PPR 9220</td>
<td>20</td>
<td>900</td>
<td>6.5</td>
<td>Clarified</td>
</tr>
<tr>
<td>PPR 10232</td>
<td>40</td>
<td>1150</td>
<td>5.0</td>
<td>Clarified &amp; antistatic</td>
</tr>
<tr>
<td>PPR 12232</td>
<td>80</td>
<td>1150</td>
<td>5.0</td>
<td></td>
</tr>
</tbody>
</table>

*Organoleptic properties are controlled for each production campaign.

Total PPH 9020 & PPH 10012 – reaching optimized performances

<table>
<thead>
<tr>
<th>Grade</th>
<th>MFI (2.16 kg-190 °C) (g/10 min)</th>
<th>Flexural Modulus (MPa)</th>
<th>Izod Notched at 23 °C (kJ/m²)</th>
<th>Specific features</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPH 5060</td>
<td>6</td>
<td>1400</td>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td>PPH 7062</td>
<td>12</td>
<td>1450</td>
<td>3.5</td>
<td>Antistatic</td>
</tr>
<tr>
<td>PPH 9081</td>
<td>25</td>
<td>1250</td>
<td>3.5</td>
<td></td>
</tr>
<tr>
<td>PPH 9020</td>
<td>25</td>
<td>1600</td>
<td>4.0</td>
<td>Clarified</td>
</tr>
<tr>
<td>PPH 10012</td>
<td>42</td>
<td>1500</td>
<td>3.0</td>
<td>Nucleated &amp; antistatic</td>
</tr>
</tbody>
</table>

Total PPC 12712 – a reference on the market for flip-top caps & e-commerce caps

<table>
<thead>
<tr>
<th>Grade</th>
<th>MFI (2.16 kg-190 °C) (g/10 min)</th>
<th>Flexural Modulus (MPa)</th>
<th>Izod Notched at 23 °C (kJ/m²)</th>
<th>Specific features</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPC 7652</td>
<td>16</td>
<td>1350</td>
<td>9.0</td>
<td>Nucleated, antistatic</td>
</tr>
<tr>
<td>PPC 10712</td>
<td>40</td>
<td>1300</td>
<td>8.0</td>
<td></td>
</tr>
<tr>
<td>PPC 10641</td>
<td>44</td>
<td>1500</td>
<td>7.5</td>
<td>Nucleated, antistatic</td>
</tr>
<tr>
<td>PPC 12712</td>
<td>70</td>
<td>1200</td>
<td>7.0</td>
<td>Nucleated, antistatic</td>
</tr>
</tbody>
</table>
Total Circular compounds®: a unique recipe to provide quality recycled material for Caps & Closures.

Total Circular compounds® have very high post-consumer recycled content.

In addition, specifically designed virgin booster products are incorporated to enhance the performance of the recycled material and ensure the consistency of properties of the final compound.
# CAPS & CLOSURES

• Total Circular compounds® PP •

<table>
<thead>
<tr>
<th>Grade</th>
<th>Melt Flow Index (2.16 kg-190° C) (g/10 min)</th>
<th>Flexural Modulus (MPa)</th>
<th>Charpy Notched +23° C (kJ/m²)</th>
<th>Charpy Notched 0° C (kJ/m²)</th>
<th>Specific features</th>
</tr>
</thead>
<tbody>
<tr>
<td>rPPH12GR</td>
<td>14</td>
<td>1400</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>rPPH35GR</td>
<td>35</td>
<td>1400</td>
<td>4</td>
<td></td>
<td>Ideal for multi-cavity moulds</td>
</tr>
</tbody>
</table>

Properties similar to those of HOMOPOLYMERS

<table>
<thead>
<tr>
<th>Grade</th>
<th>Melt Flow Index (2.16 kg-190° C) (g/10 min)</th>
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<th>Specific features</th>
</tr>
</thead>
<tbody>
<tr>
<td>rPPC16GR</td>
<td>16</td>
<td>1250</td>
<td>8</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>rPPC35GR</td>
<td>35</td>
<td>1400</td>
<td>6</td>
<td>3</td>
<td>Ideal for multi-cavity moulds</td>
</tr>
</tbody>
</table>

Properties similar to those of COPOLYMERS

- Targeted MFI
- Extra odourless available on demand
- Good hinge properties
- Good impact properties

Available with the following certificates:
- REACH certificate (1907/2006/EC)
- SVHC certificate
- RoHS certificate (2011/65/EC)
- Waste Packaging Directive (94/62/EC)
- PAH certificate