Pipe & Industrial Sheet: Hostalen HDPE and Petrothene HDPE

<table>
<thead>
<tr>
<th>TYPICAL PROPERTIES</th>
<th>PHYSICAL</th>
<th>MECHANICAL</th>
<th>THERMAL</th>
<th>OTHER</th>
<th>SPECIFIC CHARACTERISTICS</th>
<th>TYPICAL APPLICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MFR 190 ºC/ 5 kg</td>
<td>MFR 190 ºC/ 21.6 kg</td>
<td>Density</td>
<td>Tensile Modulus (sec., at 30/44 ºC)</td>
<td>Tensile Stress at Yield (sec., at 30/44 ºC)</td>
<td>Hardness (shore D)</td>
</tr>
<tr>
<td>Units</td>
<td>g/10 min</td>
<td>g/cm³</td>
<td>MPa</td>
<td>MPa</td>
<td>kJ/m²</td>
<td>ºC</td>
</tr>
</tbody>
</table>

**Product grades – Hostalen**

- **GM 5010 T3 Black** 0.43 9.0 0.957 1050 22 59 24 8 70 30 > 100 PE80-HDPE black colour with high impact and stiffness (RAL 9004); pellets
- **CRP 100 Black** 0.23 6.4 0.959 1100 23 63 26 13 74 30 > 1000 PE100 black colour (RAL 9004); excellent processing, good ESCR; pellets
- **CRP 100 RESIST CR Black** 0.23 6.4 0.958 1100 23 63 26 13 74 30 > 8760 PE100-RC black colour (RAL9004); High ESCR meets PAS1075; pellets
- **CRP100 Black (XL)** 0.23 6.4 0.959 1100 23 63 26 13 74 30 > 1000 PE100 black colour (RAL9004); high melt viscosity, low sag; pellets
- **CRP 100 RD Black** 0.23 6.4 0.959 1100 23 63 26 13 74 30 > 1000 PE100 black colour (RAL9004); good (CC1) resistance to disinfectants; pellets
- **CRP 100 RT Black** 0.45 9.5 0.957 1050 22 59 24 8 70 40 350 PE100 (ISO 12162:2009) black colour (RAL9004), long term hydrostatic strength at raised temperaturas; pellets
- **CRP 100 W Blue** 0.27 7.6 0.950 1050 23 62 26 13 74 30 > 1000 PE100 dark blue colour (similar RAL 5005); good ESCR, pellets
- **CRP 100 RESIST CR W blue** 0.27 7.3 0.950 1050 23 63 26 13 74 30 > 8760 PE100-RC dark blue colour (similar RAL5005); meets PAS1075; pellets
- **CRP 100 Orange** 0.23 6.4 0.951 1050 22 62 29 15 74 30 > 1000 PE100, orange colour (similar RAL1033); good ESCR, pellets
- **CRP 100 RESIST CR Orange** 0.27 7.3 0.950 1050 23 62 29 15 74 30 > 8760 PE100-RC orange colour (similar RAL1033); meets PAS1075; pellets
- **GM 9310 C Black** 4.5 1.000 1250 26 66 5 3 83 20 Semiconductive; HDPE black colour (RAL 9004); pellets

**Product grades – Petrothene**

- **KRS2828E** 1.1 21 0.956 900 23 61 30 40 HDPE, black colour, good weather resistance, good heat ageing resistance; jacketing of wire & cable, pressureless sewage pipes, cable conduits, microducts, extruded sheets, injection molded fittings
- **LRS2800E** 1.1 21 0.950 900 23 61 30 40 HDPE, natural colour, good heat ageing resistance; jacketing of wire & cable, pressureless sewage pipes, cable conduits, microducts, extruded sheets, injection molded fittings

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# Pipe & Industrial Sheet: Crosslinkable HDPE and PE-RT

## Typical Properties

<table>
<thead>
<tr>
<th>Test Method</th>
<th>MFR 190 ºC/2.16 kg</th>
<th>MFR 190 ºC/5 kg</th>
<th>MFR 190 ºC/21.6 kg</th>
<th>Density</th>
<th>Tensile Modulus (sec., v=1mm/min)</th>
<th>Tensile Stress at Yield (v=6mm/min)</th>
<th>Hardness Shore D (3 sec.)</th>
<th>Ball indentation hardness H(32/20)</th>
<th>Vicat Softening Point (9.8 N)</th>
<th>Vicat Softening Point (49 N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units</td>
<td>g/10 min</td>
<td>g/cm³</td>
<td>MPa</td>
<td>MPa</td>
<td>MPa</td>
<td>°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Product grades – Lupolen**

- **4261A Q416**
  - MFR: 0.5 g/10 min
  - Density: 0.946 g/cm³
  - Tensile Modulus: 850 MPa
  - Tensile Stress at Yield: 62 MPa
  - Hardness Shore D: 40 MPa
  - Ball indentation hardness: 125 MPa
  - Vicat Softening Point (9.8 N): 75 ºC
  - Vicat Softening Point (49 N):
  - **Applications**: Heating, plumbing and multilayer pipes (EN ISO 15875 / DIN 16892 / EN ISO 21003)

- **5261Z Q456**
  - MFR: 2.0 g/10 min
  - Density: 0.954 g/cm³
  - Tensile Modulus: 1100 MPa
  - Tensile Stress at Yield: 65 MPa
  - Hardness Shore D: 52 MPa
  - Ball indentation hardness: 132 MPa
  - Vicat Softening Point (9.8 N): 80 ºC
  - Vicat Softening Point (49 N):
  - **Applications**: Heating, plumbing, large bore pipes for gas/water; compression-molded sheets

- **5261Z Q456 B**
  - MFR: 3.0 g/10 min
  - Density: 0.954 g/cm³
  - Tensile Modulus: 1200 MPa
  - Tensile Stress at Yield: 65 MPa
  - Hardness Shore D: 52 MPa
  - Ball indentation hardness: 132 MPa
  - Vicat Softening Point (9.8 N): 80 ºC
  - Vicat Softening Point (49 N):
  - **Applications**: Heating, plumbing and multilayer pipes

- **5461B Q471**
  - MFR: 0.5 g/10 min
  - Density: 0.953 g/cm³
  - Tensile Modulus: 1100 MPa
  - Tensile Stress at Yield: 64 MPa
  - Hardness Shore D: 49 MPa
  - Ball indentation hardness: 130 MPa
  - Vicat Softening Point (9.8 N): 79 ºC
  - Vicat Softening Point (49 N):
  - **Applications**: Heating, plumbing and multilayer pipes

- **5461B Q471 B**
  - MFR: 0.7 g/10 min
  - Density: 0.953 g/cm³
  - Tensile Modulus: 1100 MPa
  - Tensile Stress at Yield: 64 MPa
  - Hardness Shore D: 49 MPa
  - Ball indentation hardness: 130 MPa
  - Vicat Softening Point (9.8 N): 79 ºC
  - Vicat Softening Point (49 N):
  - **Applications**: Heating, plumbing and multilayer pipes

- **UHM 5000**
  - MFR: 0.931 g/10 min
  - Density: 0.931 g/cm³
  - Tensile Modulus: 800 MPa
  - Tensile Stress at Yield: 64 MPa
  - Hardness Shore D: 49 MPa
  - Ball indentation hardness: 130 MPa
  - Vicat Softening Point (9.8 N): 82 ºC
  - **Applications**: Compression moulded sheets and ram extruded products

**Product grades – Hostalen**

- **4721B**
  - MFR: 0.45 g/10 min
  - Density: 0.947 g/cm³
  - Tensile Modulus: 850 MPa
  - Tensile Stress at Yield: 59 MPa
  - Hardness Shore D: 128 MPa
  - Ball indentation hardness: 70 MPa
  - Vicat Softening Point (9.8 N): PE-RT Type II; PE 100; natural colour; pellets; good processability, extremely high resistance to ageing
  - **Applications**: Heating, plumbing; multilayer pipes (ISO 24033 / EN ISO 22391 / DIN 16833 / EN ISO 21003)

- **4121B**
  - MFR: 2.2 g/10 min
  - Density: 0.941 g/cm³
  - Tensile Modulus: 650 MPa
  - Tensile Stress at Yield: 58 MPa
  - Hardness Shore D: 125 MPa
  - Ball indentation hardness: 70 MPa
  - Vicat Softening Point (9.8 N): PE-RT Type II with higher flexibility; natural colour; pellets; good processability, extremely high resistance to ageing
  - **Applications**: Underfloor heating; plumbing; multilayer pipes (ISO 24033 / EN ISO 22391 / DIN 16833 / EN ISO 21003)
### Pipe & Industrial Sheet: Hostalen PP

#### TYPICAL PROPERTIES

<table>
<thead>
<tr>
<th>TYPICAL PROPERTIES</th>
<th>PHYSICAL</th>
<th>MECHANICAL</th>
<th>THERMAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MFR 230 ºC/2.16 kg</td>
<td>MFR 230 ºC/5 kg</td>
<td>Tensile Modulus (sec., v=1mm/min)</td>
</tr>
<tr>
<td>Test Method</td>
<td>ISO 1133-1</td>
<td>ISO 527-2</td>
<td>ISO 179/1eA</td>
</tr>
<tr>
<td>Units</td>
<td>g/10 min</td>
<td>MPa</td>
<td>%</td>
</tr>
</tbody>
</table>

#### Specific Characteristics

<table>
<thead>
<tr>
<th>TYPICAL PROPERTIES</th>
<th>PP-H</th>
<th>PP-B</th>
<th>PP-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE</td>
<td>natural</td>
<td>natural</td>
<td>natural</td>
</tr>
<tr>
<td>COLOUR</td>
<td>grey (RAL 7022)</td>
<td>grey (RAL 7037)</td>
<td>grey (RAL 7032)</td>
</tr>
</tbody>
</table>

#### Typical Applications

<table>
<thead>
<tr>
<th>Product grades – Hostalen PP</th>
</tr>
</thead>
<tbody>
<tr>
<td>H2150 0.3 1.5 1500 36 11 30 4.3 158</td>
</tr>
<tr>
<td>H2150 304850 0.3 1.3 1500 36 10 38 5 156</td>
</tr>
<tr>
<td>H2450 0.3 1.3 1450 36 11 20 5 157</td>
</tr>
<tr>
<td>H2250 36 0.3 1.3 1500 36 12 26 6 157</td>
</tr>
<tr>
<td>H7350/FLS 303064 0.4 2.0 1500 35 11 18 5 158</td>
</tr>
<tr>
<td>EPD60R 0.4 1.1 1600 26 15 54 18 3.5 151</td>
</tr>
<tr>
<td>H2464 0.3 1.3 1350 28 13 55 34 5 155</td>
</tr>
<tr>
<td>H2483 0.3 1.3 1800 32 8 67 20 4.3 159</td>
</tr>
<tr>
<td>H2493 0.25 1.3 2000 38 8 50 4 2.5 -</td>
</tr>
<tr>
<td>H1022 0.3 1.3 1300 30 13 50 15 3 159</td>
</tr>
<tr>
<td>H1022 12 0.3 1.3 1400 31 12 117 21 4 158</td>
</tr>
<tr>
<td>H2222 36 0.3 1.3 1350 30 12 50 13 5.8 158</td>
</tr>
<tr>
<td>H2142 12 0.3 1.4 1500 24 12 54 5 2 150</td>
</tr>
<tr>
<td>H4122 103220 0.3 1.3 1400 30 13 110 20 5.8 159</td>
</tr>
<tr>
<td>N2122 2 - 1750 25 - 20 8 - -</td>
</tr>
<tr>
<td>XN112-I 0.2 1.1 850 26 12 60 8 - -</td>
</tr>
<tr>
<td>XN125-P 0.2 1.1 800 24 12 70 9.5 - -</td>
</tr>
<tr>
<td>H5416 0.3 1.3 850 24 13 89 12 - 132</td>
</tr>
</tbody>
</table>

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[Pipe & Industrial Sheet: Hostalen PP](https://www.lyondellbasell.com)

Mechanical properties tested on injection molded Specimen, molding conditions acc. to ISO 1873-2

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<table>
<thead>
<tr>
<th>Product grades</th>
<th>Test Method</th>
<th>MFR 190 ºC/2.16 kg</th>
<th>Density</th>
<th>Flexural Modulus</th>
<th>Tensile Stress at Yield</th>
<th>Tensile stress at Break</th>
<th>Tensile strain at Break</th>
<th>Melting Temperature</th>
<th>COLOUR</th>
<th>SPECIFIC CHARACTERISTICS</th>
<th>TYPICAL APPLICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Akoafloor PB R509 Brown</td>
<td>ISO 1133-1</td>
<td>0.7</td>
<td>0.93</td>
<td>370</td>
<td>15</td>
<td>35</td>
<td>300</td>
<td>124 - 126</td>
<td>Brown</td>
<td>Random copolymer</td>
<td>Underfloor heating pipe</td>
</tr>
<tr>
<td>Akoafloor PB R509</td>
<td>ISO 1183 A</td>
<td>0.7</td>
<td>0.92</td>
<td>370</td>
<td>15</td>
<td>35</td>
<td>300</td>
<td>124 - 125</td>
<td>Natural</td>
<td>Random copolymer</td>
<td>Underfloor heating pipe</td>
</tr>
<tr>
<td>Akoafloor PB 4235-1 Ivory</td>
<td>ISO 178</td>
<td>0.6</td>
<td>0.93</td>
<td>450</td>
<td>17</td>
<td>30</td>
<td>225</td>
<td>127 - 129</td>
<td>Ivory</td>
<td>Homopolymer</td>
<td>Non-potable heating water pipe for radiator connections or underfloor heating</td>
</tr>
<tr>
<td>Akoaflo R 4237 Grey</td>
<td>ISO 527</td>
<td>0.4</td>
<td>0.938</td>
<td>450</td>
<td>17</td>
<td>30</td>
<td>200</td>
<td>127 - 129</td>
<td>Grey</td>
<td>Homopolymer</td>
<td>High-performance pipe material for potable hot and cold water distribution applications</td>
</tr>
<tr>
<td>Akoaflo R 4238 White</td>
<td>ISO 527</td>
<td>0.4</td>
<td>0.938</td>
<td>450</td>
<td>17</td>
<td>30</td>
<td>200</td>
<td>127 - 129</td>
<td>White</td>
<td>Homopolymer</td>
<td>High-performance pipe material for potable hot and cold water distribution applications</td>
</tr>
<tr>
<td>Akoaflo R 4267 Grey</td>
<td>ISO 527</td>
<td>0.6</td>
<td>0.925</td>
<td>450</td>
<td>17</td>
<td>30</td>
<td>225</td>
<td>127 - 129</td>
<td>Grey</td>
<td>Homopolymer</td>
<td>High-performance pipe material for potable hot and cold water distribution applications where improved organoleptic properties are required</td>
</tr>
<tr>
<td>Akoaflo R 4268 White</td>
<td>ISO 527</td>
<td>0.6</td>
<td>0.925</td>
<td>450</td>
<td>17</td>
<td>30</td>
<td>225</td>
<td>127 - 129</td>
<td>White</td>
<td>Homopolymer</td>
<td>High-performance pipe material for potable hot and cold water distribution applications where improved organoleptic properties are required</td>
</tr>
<tr>
<td>Akoaflo R 4268 K 300</td>
<td>ISO 527</td>
<td>2.0</td>
<td>1.325</td>
<td>6000</td>
<td>75</td>
<td>72</td>
<td>4.5</td>
<td>127 - 129</td>
<td>Natural</td>
<td>Homopolymer</td>
<td>Glass fibre reinforced high flow polybutene-1, typically used for fitting applications such as fitting bodies, support rings, etc. in combination with hot and cold potable water pipe installations</td>
</tr>
</tbody>
</table>

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