



## NORYL™ Resin FE1630PW

### Europe-Africa-Middle East: COMMERCIAL

NORYL FE1630PW Polyphenylene Oxide (PPO) + Polystyrene (PS) resin is a 30 % Glass Reinforced, injection moldable grade with improved hydrolytic stability; this grade has been developed for fluid engineering applications. NORYL FE1630PW has been certified for potable water applications up to 85C in Europe and North America in limited colours

| TYPICAL PROPERTIES <sup>1</sup>             | TYPICAL VALUE | Unit                | Standard     |
|---------------------------------------------|---------------|---------------------|--------------|
| <b>MECHANICAL</b>                           |               |                     |              |
| Tensile Stress, brk, Type I, 5 mm/min       | 1360          | kgf/cm <sup>2</sup> | ASTM D 638   |
| Tensile Strain, brk, Type I, 5 mm/min       | 2.4           | %                   | ASTM D 638   |
| Tensile Modulus, 5 mm/min                   | 97600         | kgf/cm <sup>2</sup> | ASTM D 638   |
| Flexural Modulus, 1.3 mm/min, 50 mm span    | 79100         | kgf/cm <sup>2</sup> | ASTM D 790   |
| Taber Abrasion, CS-17, 1 kg                 | 65            | mg/1000cy           | SABIC Method |
| Tensile Stress, break, 5 mm/min             | 133           | MPa                 | ISO 527      |
| Tensile Strain, break, 5 mm/min             | 2.5           | %                   | ISO 527      |
| Tensile Modulus, 1 mm/min                   | 9600          | MPa                 | ISO 527      |
| Flexural Stress, break, 2 mm/min            | 192           | MPa                 | ISO 178      |
| Flexural Modulus, 2 mm/min                  | 8120          | MPa                 | ISO 178      |
| Hardness, H358/30                           | 240           | MPa                 | ISO 2039-1   |
| <b>IMPACT</b>                               |               |                     |              |
| Izod Impact, unnotched, 23°C                | 51            | cm-kgf/cm           | ASTM D 4812  |
| Izod Impact, unnotched, -30°C               | 47            | cm-kgf/cm           | ASTM D 4812  |
| Izod Impact, notched, 23°C                  | 8             | cm-kgf/cm           | ASTM D 256   |
| Izod Impact, notched, -30°C                 | 7             | cm-kgf/cm           | ASTM D 256   |
| Izod Impact, unnotched 80*10*4 +23°C        | 30            | kJ/m <sup>2</sup>   | ISO 180/1U   |
| Izod Impact, unnotched 80*10*4 -30°C        | 30            | kJ/m <sup>2</sup>   | ISO 180/1U   |
| Izod Impact, notched 80*10*4 +23°C          | 8             | kJ/m <sup>2</sup>   | ISO 180/1A   |
| Izod Impact, notched 80*10*4 -30°C          | 7             | kJ/m <sup>2</sup>   | ISO 180/1A   |
| Charpy 23°C, V-notch Edgew 80*10*4 sp=62mm  | 10            | kJ/m <sup>2</sup>   | ISO 179/1eA  |
| Charpy -30°C, V-notch Edgew 80*10*4 sp=62mm | 9             | kJ/m <sup>2</sup>   | ISO 179/1eA  |



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| <b>IMPACT</b>                               |               |                         |              |
| Charpy 23°C, Unnotch Edgew 80*10*4 sp=62mm  | 30            | kJ/m <sup>2</sup>       | ISO 179/1eU  |
| Charpy -30°C, Unnotch Edgew 80*10*4 sp=62mm | 30            | kJ/m <sup>2</sup>       | ISO 179/1eU  |
| <b>THERMAL</b>                              |               |                         |              |
| HDT, 1.82 MPa, 3.2mm, unannealed            | 145           | °C                      | ASTM D 648   |
| CTE, -40°C to 40°C, flow                    | 2.5E-05       | 1/°C                    | ASTM E 831   |
| CTE, -40°C to 40°C, xflow                   | 6.E-05        | 1/°C                    | ASTM E 831   |
| CTE, -40°C to 40°C, flow                    | 3.E-05        | 1/°C                    | ISO 11359-2  |
| CTE, -40°C to 40°C, xflow                   | 7.E-05        | 1/°C                    | ISO 11359-2  |
| Vicat Softening Temp, Rate A/50             | 165           | °C                      | ISO 306      |
| Vicat Softening Temp, Rate B/50             | 154           | °C                      | ISO 306      |
| Vicat Softening Temp, Rate B/120            | 158           | °C                      | ISO 306      |
| HDT/Be, 0.45MPa Edgew 120*10*4 sp=100mm     | 150           | °C                      | ISO 75/Be    |
| HDT/Ae, 1.8 MPa Edgew 120*10*4 sp=100mm     | 145           | °C                      | ISO 75/Ae    |
| <b>PHYSICAL</b>                             |               |                         |              |
| Mold Shrinkage, flow, 3.2 mm (5)            | 0.1 - 0.3     | %                       | SABIC Method |
| Mold Shrinkage, xflow, 3.2 mm (5)           | 0.2 - 0.5     | %                       | SABIC Method |
| Melt Flow Rate, 300°C/5.0 kgf               | 9             | g/10 min                | ASTM D 1238  |
| Density                                     | 1.3           | g/cm <sup>3</sup>       | ISO 1183     |
| Water Absorption, (23°C/sat)                | 0.2           | %                       | ISO 62       |
| Moisture Absorption (23°C / 50% RH)         | 0.06          | %                       | ISO 62       |
| Melt Volume Rate, MVR at 300°C/10.0 kg      | 30            | cm <sup>3</sup> /10 min | ISO 1133     |



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| PROCESSING PARAMETERS       | TYPICAL VALUE | Unit |
|-----------------------------|---------------|------|
| <b>Injection Molding</b>    |               |      |
| Drying Temperature          | 100 - 120     | °C   |
| Drying Time                 | 2 - 4         | hrs  |
| Maximum Moisture Content    | 0.02          | %    |
| Melt Temperature            | 280 - 300     | °C   |
| Nozzle Temperature          | 280 - 300     | °C   |
| Front - Zone 3 Temperature  | 290 - 310     | °C   |
| Middle - Zone 2 Temperature | 270 - 290     | °C   |
| Rear - Zone 1 Temperature   | 250 - 270     | °C   |
| Hopper Temperature          | 60 - 80       | °C   |
| Mold Temperature            | 80 - 120      | °C   |