

# GUR® 4112 F

UHMW-PE powder grade for battery separators  
 HMW-PE powder grade for battery separators

## Product information

|                            |             |                     |
|----------------------------|-------------|---------------------|
| Average molecular weight   | 1.7E6 g/mol | Margolies' equation |
| Average particle size, D50 | 115 µm      | laser scattering    |

## Rheological properties

|                                  |            |                     |
|----------------------------------|------------|---------------------|
| Melt mass-flow rate, Temperature | 190 °C     |                     |
| Melt mass-flow rate, Load        | 21.6 kg    |                     |
| Viscosity number                 | 1100 cm³/g | ISO 307, 1157, 1628 |
| Intrinsic viscosity              | 1000       | ISO 307, 1157, 1628 |

## Typical mechanical properties

|                                             |           |                    |
|---------------------------------------------|-----------|--------------------|
| Tensile Modulus                             | 900 MPa   | ISO 527-1/-2       |
| Yield stress, 50mm/min                      | 22 MPa    | ISO 527-1/-2       |
| Yield strain, 50mm/min                      | 9 %       | ISO 527-1/-2       |
| Stress at 50% strain                        | 19 MPa    | ISO 527-1/-2       |
| Stress at break, 50mm/min                   | 42 MPa    | ISO 527-1/-2       |
| Nominal strain at break                     | 550 %     | ISO 527-1/-2       |
| Elongational stress, 150/10                 | 0.04 MPa  | ISO 21304-2        |
| Charpy double notched impact strength, 23°C | 190 kJ/m² | ISO 21304-2        |
| Shore D hardness, 15s                       | 60        | ISO 48-4 / ISO 868 |

## Tribological properties

|                                            |     |          |
|--------------------------------------------|-----|----------|
| Relative Wear                              | 140 | Internal |
| (based on GUR 4120=100), sandslurry method |     |          |

## Thermal properties

|                                          |       |             |
|------------------------------------------|-------|-------------|
| Temp. of deflection under load, 1.8 MPa  | 41 °C | ISO 75-1/-2 |
| Vicat softening temperature, 50°C/h, 50N | 80 °C | ISO 306     |

## Electrical properties

|                     |             |               |
|---------------------|-------------|---------------|
| Volume resistivity  | >1E12 Ohm.m | IEC 62631-3-1 |
| Surface resistivity | >1E12 Ohm   | IEC 62631-3-2 |

## Other properties

|              |           |          |
|--------------|-----------|----------|
| Density      | 940 kg/m³ | ISO 1183 |
| Bulk density | 450 kg/m³ | ISO 60   |



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## Characteristics

Food contact

FDA 21 CFR

