

## VALOX™ RESIN 4012G

REGION AMERICAS

### DESCRIPTION

VALOX 4012G is a 10% glass fiber reinforced PBT injection molding resin with excellent mechanical properties. Applications: connectors. This grade is a 4012 with improved cycle time and ductility.

### TYPICAL PROPERTY VALUES

Revision 20190204

| PROPERTIES                                   | TYPICAL VALUES | UNITS | TEST METHODS |
|----------------------------------------------|----------------|-------|--------------|
| <b>MECHANICAL</b>                            |                |       |              |
| Tensile Stress, yld, Type I, 5 mm/min        | 75             | MPa   | ASTM D638    |
| Tensile Stress, brk, Type I, 5 mm/min        | 75             | MPa   | ASTM D638    |
| Tensile Strain, yld, Type I, 5 mm/min        | 3              | %     | ASTM D638    |
| Tensile Strain, brk, Type I, 5 mm/min        | 3              | %     | ASTM D638    |
| Tensile Modulus, 5 mm/min                    | 4600           | MPa   | ASTM D638    |
| Flexural Stress, yld, 1.3 mm/min, 50 mm span | 110            | MPa   | ASTM D790    |
| Flexural Modulus, 1.3 mm/min, 50 mm span     | 3940           | MPa   | ASTM D790    |
| Tensile Stress, yield, 5 mm/min              | 72             | MPa   | ISO 527      |
| Tensile Stress, break, 5 mm/min              | 72             | MPa   | ISO 527      |
| Tensile Strain, yield, 5 mm/min              | 4              | %     | ISO 527      |
| Tensile Strain, break, 5 mm/min              | 4              | %     | ISO 527      |
| Tensile Modulus, 1 mm/min                    | 4500           | MPa   | ISO 527      |
| Flexural Stress, break, 2 mm/min             | 110            | MPa   | ISO 178      |
| Flexural Modulus, 2 mm/min                   | 3500           | MPa   | ISO 178      |
| Ball Indentation Hardness, H358/30           | 117            | MPa   | ISO 2039-1   |
| <b>IMPACT</b>                                |                |       |              |
| Izod Impact, notched, 23°C                   | 74             | J/m   | ASTM D256    |
| Izod Impact, notched, -30°C                  | 74             | J/m   | ASTM D256    |
| Instrumented Dart Impact Total Energy, 23°C  | 4              | J     | ASTM D3763   |
| Izod Impact, unnotched 80°10'4 +23°C         | 37             | kJ/m² | ISO 180/1U   |
| Izod Impact, unnotched 80°10'4 -30°C         | 37             | kJ/m² | ISO 180/1U   |
| Izod Impact, notched 80°10'4 +23°C           | 6              | kJ/m² | ISO 180/1A   |
| Izod Impact, notched 80°10'4 -30°C           | 6              | kJ/m² | ISO 180/1A   |
| Charpy 23°C, V-notch Edgew 80°10'4 sp=62mm   | 7              | kJ/m² | ISO 179/1eA  |
| Charpy -30°C, V-notch Edgew 80°10'4 sp=62mm  | 6              | kJ/m² | ISO 179/1eA  |
| Charpy 23°C, Unnotch Edgew 80°10'4 sp=62mm   | 45             | kJ/m² | ISO 179/1eU  |
| Charpy -30°C, Unnotch Edgew 80°10'4 sp=62mm  | 45             | kJ/m² | ISO 179/1eU  |
| <b>THERMAL</b>                               |                |       |              |
| Vicat Softening Temp, Rate B/50              | 205            | °C    | ASTM D1525   |
| HDT, 1.82 MPa, 3.2mm, unannealed             | 175            | °C    | ASTM D648    |
| CTE, -40°C to 40°C, flow                     | 6.E-05         | 1/°C  | ASTM E831    |
| CTE, -40°C to 40°C, xflow                    | 8.E-05         | 1/°C  | ASTM E831    |
| CTE, 23°C to 80°C, flow                      | 6.E-05         | 1/°C  | ISO 11359-2  |
| CTE, 23°C to 80°C, xflow                     | 8.E-05         | 1/°C  | ISO 11359-2  |

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CHEMISTRY THAT MATTERS™



| PROPERTIES                                    | TYPICAL VALUES | UNITS      | TEST METHODS      |
|-----------------------------------------------|----------------|------------|-------------------|
| CTE, 23°C to 150°C, xflow                     | 8.5E-05        | 1/°C       | ISO 11359-2       |
| Ball Pressure Test, 125°C +/- 2°C             | PASSES         | -          | IEC 60695-10-2    |
| Vicat Softening Temp, Rate B/50               | 205            | °C         | ISO 306           |
| Vicat Softening Temp, Rate B/120              | 208            | °C         | ISO 306           |
| HDT/Be, 0.45MPa Edgew 120*10*4 sp=100mm       | 215            | °C         | ISO 75/Be         |
| HDT/Ae, 1.8 MPa Edgew 120*10*4 sp=100mm       | 170            | °C         | ISO 75/Ae         |
| <b>PHYSICAL</b>                               |                |            |                   |
| Specific Gravity                              | 1.39           | -          | ASTM D792         |
| Mold Shrinkage on Tensile Bar, flow           | 0.6 – 0.9      | %          | SABIC method      |
| Mold Shrinkage, flow, 3.2 mm                  | 0.6 – 1.6      | %          | SABIC method      |
| Mold Shrinkage on Tensile Bar, xflow          | 0.7 – 1        | %          | SABIC method      |
| Melt Flow Rate, 250°C/1.2 kgf                 | 10             | g/10 min   | ASTM D1238        |
| Density                                       | 1.39           | g/cm³      | ISO 1183          |
| Water Absorption, (23°C/saturated)            | 0.2            | %          | ISO 62-1          |
| Moisture Absorption (23°C / 50% RH)           | 0.07           | %          | ISO 62            |
| Melt Volume Rate, MVR at 250°C/1.2 kg         | 9              | cm³/10 min | ISO 1133          |
| <b>ELECTRICAL</b>                             |                |            |                   |
| Volume Resistivity                            | >1.E+15        | Ω.cm       | IEC 60093         |
| Surface Resistivity, ROA                      | >1.E+15        | Ω          | IEC 60093         |
| Dielectric Strength, in oil, 0.8 mm           | 30             | kV/mm      | IEC 60243-1       |
| Dielectric Strength, in oil, 1.6 mm           | 25             | kV/mm      | IEC 60243-1       |
| Dielectric Strength, in oil, 3.2 mm           | 17             | kV/mm      | IEC 60243-1       |
| Relative Permittivity, 1 MHz                  | 3              | -          | IEC 60250         |
| Dissipation Factor, 50/60 Hz                  | 0.001          | -          | IEC 60250         |
| Dissipation Factor, 1 MHz                     | 0.014          | -          | IEC 60250         |
| Comparative Tracking Index                    | 250            | V          | IEC 60112         |
| Comparative Tracking Index, M                 | 150            | V          | IEC 60112         |
| Relative Permittivity, 50/60 Hz               | 3.1            | -          | IEC 60250         |
| <b>FLAME CHARACTERISTICS</b>                  |                |            |                   |
| UL Compliant, 94HB Flame Class Rating         | 1.6            | mm         | UL 94 by SABIC-IP |
| Glow Wire Flammability Index 750°C, passes at | 1              | mm         | IEC 60695-2-12    |
| <b>INJECTION MOLDING</b>                      |                |            |                   |
| Drying Temperature                            | 110 – 120      | °C         |                   |
| Drying Time                                   | 2 – 4          | Hrs        |                   |
| Maximum Moisture Content                      | 0.02           | %          |                   |
| Melt Temperature                              | 250 – 270      | °C         |                   |
| Nozzle Temperature                            | 240 – 260      | °C         |                   |
| Front - Zone 3 Temperature                    | 245 – 265      | °C         |                   |
| Middle - Zone 2 Temperature                   | 240 – 255      | °C         |                   |
| Rear - Zone 1 Temperature                     | 230 – 245      | °C         |                   |
| Hopper Temperature                            | 40 – 60        | °C         |                   |
| Mold Temperature                              | 40 – 100       | °C         |                   |



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