



**VALOX™ Resin 4012G**  
**Americas: COMMERCIAL**

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 PROPERTIES <sup>1</sup>              | TYPICAL VALUE | Unit                | Standard    |
|----------------------------------------------|---------------|---------------------|-------------|
| <b>MECHANICAL</b>                            |               |                     |             |
| Tensile Stress, yld, Type I, 5 mm/min        | 760           | kgf/cm <sup>2</sup> | ASTM D 638  |
| Tensile Stress, brk, Type I, 5 mm/min        | 760           | kgf/cm <sup>2</sup> | ASTM D 638  |
| Tensile Strain, yld, Type I, 5 mm/min        | 3             | %                   | ASTM D 638  |
| Tensile Strain, brk, Type I, 5 mm/min        | 3             | %                   | ASTM D 638  |
| Tensile Modulus, 5 mm/min                    | 46900         | kgf/cm <sup>2</sup> | ASTM D 638  |
| Flexural Stress, yld, 1.3 mm/min, 50 mm span | 1120          | kgf/cm <sup>2</sup> | ASTM D 790  |
| Flexural Modulus, 1.3 mm/min, 50 mm span     | 40100         | kgf/cm <sup>2</sup> | ASTM D 790  |
| 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     |
| Hardness, H358/30                            | 117           | MPa                 | ISO 2039-1  |
| <b>IMPACT</b>                                |               |                     |             |
| Izod Impact, notched, 23°C                   | 7             | cm-kgf/cm           | ASTM D 256  |
| Izod Impact, notched, -30°C                  | 7             | cm-kgf/cm           | ASTM D 256  |
| Instrumented Impact Total Energy, 23°C       | 40            | cm-kgf              | ASTM D 3763 |
| Izod Impact, unnotched 80*10*4 +23°C         | 37            | kJ/m <sup>2</sup>   | ISO 180/1U  |
| Izod Impact, unnotched 80*10*4 -30°C         | 37            | kJ/m <sup>2</sup>   | ISO 180/1U  |
| Izod Impact, notched 80*10*4 +23°C           | 6             | kJ/m <sup>2</sup>   | ISO 180/1A  |



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| <b>IMPACT</b>                                |               |                   |                |
| Izod Impact, notched 80*10*4 -30°C           | 6             | kJ/m <sup>2</sup> | ISO 180/1A     |
| Charpy 23°C, V-notch Edgew 80*10*4 sp=62mm   | 7             | kJ/m <sup>2</sup> | ISO 179/1eA    |
| Charpy -30°C, V-notch Edgew 80*10*4 sp=62mm  | 6             | kJ/m <sup>2</sup> | ISO 179/1eA    |
| Charpy 23°C, Unnotch Edgew 80*10*4 sp=62mm   | 45            | kJ/m <sup>2</sup> | ISO 179/1eU    |
| Charpy -30°C, Unnotch Edgew 80*10*4 sp=62mm  | 45            | kJ/m <sup>2</sup> | ISO 179/1eU    |
| <b>THERMAL</b>                               |               |                   |                |
| Vicat Softening Temp, Rate B/50              | 205           | °C                | ASTM D 1525    |
| HDT, 1.82 MPa, 3.2mm, unannealed             | 175           | °C                | ASTM D 648     |
| CTE, -40°C to 40°C, flow                     | 6.E-05        | 1/°C              | ASTM E 831     |
| CTE, -40°C to 40°C, xflow                    | 8.E-05        | 1/°C              | ASTM E 831     |
| 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    |
| 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 D 792     |
| Mold Shrinkage on Tensile Bar, flow (2) (5)  | 0.6 - 0.9     | %                 | SABIC Method   |
| Mold Shrinkage, flow, 3.2 mm (5)             | 0.6 - 1.6     | %                 | SABIC Method   |
| Mold Shrinkage on Tensile Bar, xflow (2) (5) | 0.7 - 1       | %                 | SABIC Method   |
| Melt Flow Rate, 250°C/1.2 kgf                | 10            | g/10 min          | ASTM D 1238    |
| Density                                      | 1.39          | g/cm <sup>3</sup> | ISO 1183       |



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| <b>PHYSICAL</b>                               |               |                         |                   |
| Water Absorption, (23°C/sat)                  | 0.2           | %                       | ISO 62            |
| Moisture Absorption (23°C / 50% RH)           | 0.07          | %                       | ISO 62            |
| Melt Volume Rate, MVR at 250°C/1.2 kg         | 9             | cm <sup>3</sup> /10 min | ISO 1133          |
| <b>ELECTRICAL</b>                             |               |                         |                   |
| Volume Resistivity                            | >1.E+15       | Ohm-cm                  | IEC 60093         |
| Surface Resistivity, ROA                      | >1.E+15       | Ohm                     | 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 (3)(4)  | 1.6           | mm                      | UL 94 by SABIC-IP |
| Glow Wire Flammability Index 750°C, passes at | 1             | mm                      | IEC 60695-2-12    |



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| PROCESSING PARAMETERS       | TYPICAL VALUE | Unit |
|-----------------------------|---------------|------|
| <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   |