

## VALOX™ RESIN 420HP

REGION AMERICAS

### DESCRIPTION

30% Glass filled PBT resin, FDA Food Contact compliant in limited colors. Effective March 2008 this grade will no longer be supported with biocompatibility information. Alternative grade VALOX HX420HP.

### TYPICAL PROPERTY VALUES

Revision 20190924

| PROPERTIES                                   | TYPICAL VALUES | UNITS | TEST METHODS |
|----------------------------------------------|----------------|-------|--------------|
| <b>MECHANICAL</b>                            |                |       |              |
| Tensile Stress, yld, Type I, 5 mm/min        | 120            | MPa   | ASTM D638    |
| Tensile Stress, brk, Type I, 5 mm/min        | 120            | 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                    | 9300           | MPa   | ASTM D638    |
| Flexural Stress, brk, 1.3 mm/min, 50 mm span | 189            | MPa   | ASTM D790    |
| Flexural Modulus, 1.3 mm/min, 50 mm span     | 7580           | MPa   | ASTM D790    |
| Hardness, Rockwell R                         | 118            | -     | ASTM D785    |
| Tensile Stress, yield, 5 mm/min              | 125            | MPa   | ISO 527      |
| Tensile Stress, break, 5 mm/min              | 125            | MPa   | ISO 527      |
| Tensile Strain, yield, 5 mm/min              | 2              | %     | ISO 527      |
| Tensile Strain, break, 5 mm/min              | 2              | %     | ISO 527      |
| Tensile Modulus, 1 mm/min                    | 9300           | MPa   | ISO 527      |
| Flexural Stress, yield, 2 mm/min             | 195            | MPa   | ISO 178      |
| Flexural Modulus, 2 mm/min                   | 8500           | MPa   | ISO 178      |
| <b>IMPACT</b>                                |                |       |              |
| Izod Impact, unnotched, 23°C                 | 801            | J/m   | ASTM D4812   |
| Izod Impact, notched, 23°C                   | 85             | J/m   | ASTM D256    |
| Izod Impact, notched, -30°C                  | 80             | J/m   | ASTM D256    |
| Instrumented Dart Impact Total Energy, 23°C  | 8              | J     | ASTM D3763   |
| Izod Impact, unnotched 80°10°4 +23°C         | 45             | kJ/m² | ISO 180/1U   |
| Izod Impact, unnotched 80°10°4 -30°C         | 45             | kJ/m² | ISO 180/1U   |
| Izod Impact, notched 80°10°4 +23°C           | 8              | kJ/m² | ISO 180/1A   |
| Izod Impact, notched 80°10°4 -30°C           | 7              | kJ/m² | ISO 180/1A   |
| Charpy 23°C, V-notch Edgew 80°10°4 sp=62mm   | 5              | kJ/m² | ISO 179/1eA  |
| Charpy -30°C, V-notch Edgew 80°10°4 sp=62mm  | 5              | 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              | 215            | °C    | ASTM D1525   |
| HDT, 0.45 MPa, 3.2 mm, unannealed            | 220            | °C    | ASTM D648    |
| HDT, 1.82 MPa, 3.2mm, unannealed             | 203            | °C    | ASTM D648    |
| HDT, 0.45 MPa, 6.4 mm, unannealed            | 215            | °C    | ASTM D648    |
| CTE, -40°C to 40°C, flow                     | 2.52E-05       | 1/°C  | ASTM E831    |

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| PROPERTIES                             | TYPICAL VALUES                 | UNITS      | TEST METHODS |
|----------------------------------------|--------------------------------|------------|--------------|
| CTE, -40°C to 40°C, xflow              | 1.2E-04                        | 1/°C       | ASTM E831    |
| CTE, -40°C to 40°C, flow               | 2.52E-05                       | 1/°C       | ISO 11359-2  |
| CTE, -40°C to 40°C, xflow              | 1.2E-04                        | 1/°C       | ISO 11359-2  |
| Vicat Softening Temp, Rate A/50        | 223                            | °C         | ISO 306      |
| Vicat Softening Temp, Rate B/50        | 215                            | °C         | ISO 306      |
| Vicat Softening Temp, Rate B/120       | 215                            | °C         | ISO 306      |
| HDT/Bf, 0.45 MPa Flatw 80*10*4 sp=64mm | 217                            | °C         | ISO 75/Bf    |
| HDT/Af, 1.8 MPa Flatw 80*10*4 sp=64mm  | 204                            | °C         | ISO 75/Af    |
| PHYSICAL                               |                                |            |              |
| Specific Gravity                       | 1.53                           | -          | ASTM D792    |
| Specific Volume                        | 0.65                           | cm³/g      | ASTM D792    |
| Filler Content                         | 30                             | %          | ASTM D229    |
| Water Absorption, (23°C/24hrs)         | 0.06                           | %          | ASTM D570    |
| Mold Shrinkage on Tensile Bar, flow    | 0.3 – 0.7                      | %          | SABIC method |
| Mold Shrinkage, flow, 3.2 mm           | 0.3 – 0.8                      | %          | SABIC method |
| Mold Shrinkage, flow, 1.5-3.2 mm       | 0.3 – 0.5                      | %          | SABIC method |
| Mold Shrinkage, flow, 3.2-4.6 mm       | 0.5 – 0.8                      | %          | SABIC method |
| Mold Shrinkage on Tensile Bar, xflow   | 0.5 – 1                        | %          | SABIC method |
| Mold Shrinkage, xflow, 3.2 mm          | 0.5 – 1                        | %          | SABIC method |
| Mold Shrinkage, xflow, 1.5-3.2 mm      | 0.4 – 0.6                      | %          | SABIC method |
| Mold Shrinkage, xflow, 3.2-4.6 mm      | 0.6 – 0.9                      | %          | SABIC method |
| Melt Flow Rate, 250°C/2.16 kgf         | 17                             | g/10 min   | ASTM D1238   |
| Density                                | 1.53                           | g/cm³      | ISO 1183     |
| Water Absorption, (23°C/saturated)     | 0.26                           | %          | ISO 62-1     |
| Moisture Absorption (23°C / 50% RH)    | 0.08                           | %          | ISO 62       |
| Melt Volume Rate, MVR at 250°C/2.16 kg | 13                             | cm³/10 min | ISO 1133     |
| ELECTRICAL                             |                                |            |              |
| Volume Resistivity                     | >3.2E+16                       | Ω.cm       | ASTM D257    |
| Dielectric Strength, in air, 3.2 mm    | 18.7                           | kV/mm      | ASTM D149    |
| Dielectric Strength, in oil, 1.6 mm    | 24.8                           | kV/mm      | ASTM D149    |
| Relative Permittivity, 100 Hz          | 3.8                            | -          | ASTM D150    |
| Relative Permittivity, 1 MHz           | 3.7                            | -          | ASTM D150    |
| Dissipation Factor, 100 Hz             | 0.002                          | -          | ASTM D150    |
| Dissipation Factor, 1 MHz              | 0.02                           | -          | ASTM D150    |
| FLAME CHARACTERISTICS                  |                                |            |              |
| UL Yellow Card Link                    | <a href="#">E121562-220792</a> | -          | -            |
| INJECTION MOLDING                      |                                |            |              |
| Drying Temperature                     | 120                            | °C         |              |
| Drying Time                            | 3 – 4                          | Hrs        |              |
| Drying Time (Cumulative)               | 12                             | Hrs        |              |
| Maximum Moisture Content               | 0.02                           | %          |              |
| Melt Temperature                       | 250 – 265                      | °C         |              |
| Nozzle Temperature                     | 245 – 260                      | °C         |              |
| Front - Zone 3 Temperature             | 250 – 265                      | °C         |              |
| Middle - Zone 2 Temperature            | 245 – 260                      | °C         |              |



| PROPERTIES                | TYPICAL VALUES | UNITS | TEST METHODS |
|---------------------------|----------------|-------|--------------|
| Rear - Zone 1 Temperature | 240 – 255      | °C    |              |
| Mold Temperature          | 65 – 90        | °C    |              |
| Back Pressure             | 0.3 – 0.7      | MPa   |              |
| Screw Speed               | 50 – 80        | rpm   |              |
| Shot to Cylinder Size     | 40 – 80        | %     |              |
| Vent Depth                | 0.025 – 0.038  | mm    |              |

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