

# VALOX™ FR RESIN 457

REGION AMERICAS

## DESCRIPTION

6.5% GR PBT, UL94 V-0/5V.

## TYPICAL PROPERTY VALUES

Revision 20170913

| PROPERTIES                                   | TYPICAL VALUES | UNITS              | TEST METHODS   |
|--|----------------|--------------------|----------------|
| <b>MECHANICAL</b>                            |                |                    |                |
| Tensile Stress, brk, Type I, 5 mm/min        | 79             | MPa                | ASTM D 638     |
| Flexural Stress, brk, 1.3 mm/min, 50 mm span | 124            | MPa                | ASTM D 790     |
| Flexural Modulus, 1.3 mm/min, 50 mm span     | 3510           | MPa                | ASTM D 790     |
| Hardness, Rockwell R                         | 121            | -                  | ASTM D 785     |
| <b>IMPACT</b>                                |                |                    |                |
| Izod Impact, unnotched, 23°C                 | 267            | J/m                | ASTM D 4812    |
| Izod Impact, notched, 23°C                   | 32             | J/m                | ASTM D 256     |
| <b>THERMAL</b>                               |                |                    |                |
| HDT, 0.45 MPa, 6.4 mm, unannealed            | 204            | °C                 | ASTM D 648     |
| HDT, 1.82 MPa, 6.4 mm, unannealed            | 151            | °C                 | ASTM D 648     |
| CTE, -40°C to 40°C, flow                     | 6.66E-05       | 1/°C               | ASTM E 831     |
| CTE, 60°C to 138°C, flow                     | 6.66E-05       | 1/°C               | ASTM E 831     |
| Ball Pressure Test, 125°C +/- 2°C            | PASSES         | -                  | IEC 60695-10-2 |
| Relative Temp Index, Elec                    | 120            | °C                 | UL 746B        |
| Relative Temp Index, Mech w/impact           | 120            | °C                 | UL 746B        |
| Relative Temp Index, Mech w/o impact         | 140            | °C                 | UL 746B        |
| <b>PHYSICAL</b>                              |                |                    |                |
| Specific Gravity                             | 1.44           | -                  | ASTM D 792     |
| Specific Volume                              | 0.69           | cm <sup>3</sup> /g | ASTM D 792     |
| Water Absorption, 24 hours                   | 0.06           | %                  | ASTM D 570     |
| Mold Shrinkage, flow, 1.5-3.2 mm (5)         | 0.6 – 0.8      | %                  | SABIC method   |
| Mold Shrinkage, flow, 3.2-4.6 mm (5)         | 0.8 – 1        | %                  | SABIC method   |
| Mold Shrinkage, xflow, 1.5-3.2 mm (5)        | 0.7 – 0.9      | %                  | SABIC method   |
| Mold Shrinkage, xflow, 3.2-4.6 mm (5)        | 0.9 – 1.2      | %                  | SABIC method   |
| <b>ELECTRICAL</b>                            |                |                    |                |
| Volume Resistivity                           | >5.5E+16       | Ohm-cm             | ASTM D 257     |
| Dielectric Strength, in air, 3.2 mm          | 17.7           | kV/mm              | ASTM D 149     |

| PROPERTIES  | TYPICAL VALUES | UNITS    | TEST METHODS   |
|---|----------------|----------|----------------|
| Dielectric Strength, in oil, 1.6 mm                   | 23.6           | kV/mm    | ASTM D 149     |
| Relative Permittivity, 100 Hz                         | 3.5            | -        | ASTM D 150     |
| Relative Permittivity, 1 MHz                          | 3.4            | -        | ASTM D 150     |
| Dissipation Factor, 100 Hz                            | 0.002          | -        | ASTM D 150     |
| Dissipation Factor, 1 MHz                             | 0.02           | -        | ASTM D 150     |
| Arc Resistance, Tungsten {PLC}                        | 7              | PLC Code | ASTM D 495     |
| Hot Wire Ignition {PLC}                               | 3              | PLC Code | UL 746A        |
| High Voltage Arc Track Rate {PLC}                     | 4              | PLC Code | UL 746A        |
| High Ampere Arc Ign, surface {PLC}                    | 3              | PLC Code | UL 746A        |
| Comparative Tracking Index (UL) {PLC}                 | 3              | PLC Code | UL 746A        |
| <b>FLAME CHARACTERISTICS</b>                          |                |          |                |
| UL Recognized, 94V-0 Flame Class Rating (3)           | 0.71           | mm       | UL 94          |
| UL Recognized, 94-5VA Rating (3)                      | 2.99           | mm       | UL 94          |
| Oxygen Index (LOI)                                    | 31.5           | %        | ASTM D 2863    |
| Glow Wire Flammability Index 960°C, passes at         | 1              | mm       | IEC 60695-2-12 |
| Glow Wire Flammability Index 960°C, passes at, by VDE | 3              | mm       | IEC 60695-2-12 |
| Glow Wire Ignitability Temperature, 1.0 mm            | 750            | °C       | IEC 60695-2-13 |
| Glow Wire Ignitability Temperature, 3.0 mm            | 725            | °C       | IEC 60695-2-13 |
| <b>INJECTION MOLDING</b>                              |                |          |                |
| 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       |                |
| 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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