

# LEXAN<sup>TM</sup> HEALTHCARE RESIN HPS1R

REGION AMERICAS

## DESCRIPTION

LEXAN HPS1R is a high flow polycarbonate (PC) with an MVR (300°C/1.2kg) of 23. This is a biocompatible (ISO10993 or USP Class VI) grade for medical devices and pharmaceutical applications. It is gamma and e-beam sterilizable, contains a higher amount of mold release than HPS1 and adheres to our healthcare management of change policy.

## TYPICAL PROPERTY VALUES

| PROPERTIES                                   | TYPICAL VALUES | UNITS             | TEST METHODS |
|----------------------------------------------|----------------|-------------------|--------------|
| <b>MECHANICAL</b>                            |                |                   |              |
| Tensile Stress, yld, Type I, 50 mm/min       | 62             | MPa               | ASTM D 638   |
| Tensile Stress, brk, Type I, 50 mm/min       | 65             | MPa               | ASTM D 638   |
| Tensile Strain, yld, Type I, 50 mm/min       | 6              | %                 | ASTM D 638   |
| Tensile Strain, brk, Type I, 50 mm/min       | 120            | %                 | ASTM D 638   |
| Tensile Modulus, 50 mm/min                   | 2370           | MPa               | ASTM D 638   |
| Flexural Stress, yld, 1.3 mm/min, 50 mm span | 93             | MPa               | ASTM D 790   |
| Flexural Modulus, 1.3 mm/min, 50 mm span     | 2300           | MPa               | ASTM D 790   |
| Hardness, Rockwell M                         | 70             | -                 | ASTM D 785   |
| Hardness, Rockwell R                         | 118            | -                 | ASTM D 785   |
| Taber Abrasion, CS-17, 1 kg                  | 10             | mg/1000cy         | ASTM D 1044  |
| Tensile Stress, yield, 50 mm/min             | 63             | MPa               | ISO 527      |
| Tensile Stress, break, 50 mm/min             | 50             | MPa               | ISO 527      |
| Tensile Strain, yield, 50 mm/min             | 6              | %                 | ISO 527      |
| Tensile Strain, break, 50 mm/min             | 70             | %                 | ISO 527      |
| Tensile Modulus, 1 mm/min                    | 2350           | MPa               | ISO 527      |
| Flexural Stress, yield, 2 mm/min             | 90             | MPa               | ISO 178      |
| Flexural Modulus, 2 mm/min                   | 2300           | MPa               | ISO 178      |
| Ball Indentation Hardness, H358/30           | 95             | MPa               | ISO 2039-1   |
| <b>IMPACT</b>                                |                |                   |              |
| Izod Impact, unnotched, 23°C                 | 3204           | J/m               | ASTM D 4812  |
| Izod Impact, notched (natural, tints)        | 640            | J/m               | ASTM D 256   |
| Izod Impact, notched (colors)                | 106.8 – 640.8  | J/m               | ASTM D 256   |
| Tensile Impact Strength, Type S              | 378            | kJ/m <sup>2</sup> | ASTM D 1822  |
| Falling Dart Impact (D 3029), 23°C           | 169            | J                 | ASTM D 3029  |
| Instrumented Impact Energy @ peak, 23°C      | 54             | J                 | ASTM D 3763  |
| Izod Impact, unnotched 80*10*4 +23°C         | NB             | kJ/m <sup>2</sup> | ISO 180/1U   |
| Izod Impact, unnotched 80*10*4 -30°C         | NB             | kJ/m <sup>2</sup> | ISO 180/1U   |
| Izod Impact, notched 80*10*4 +23°C           | 12             | kJ/m <sup>2</sup> | ISO 180/1A   |
| Izod Impact, notched 80*10*4 -30°C           | 10             | kJ/m <sup>2</sup> | ISO 180/1A   |
| Charpy 23°C, V-notch Edgew 80*10*4 sp=62mm   | 12             | kJ/m <sup>2</sup> | ISO 179/1eA  |
| Charpy -30°C, V-notch Edgew 80*10*4 sp=62mm  | 10             | kJ/m <sup>2</sup> | ISO 179/1eA  |
| <b>THERMAL</b>                               |                |                   |              |
| HDT, 0.45 MPa, 6.4 mm, unannealed            | 137            | °C                | ASTM D 648   |

| PROPERTIES                              | TYPICAL VALUES | UNITS      | TEST METHODS   |
|-----------------------------------------|----------------|------------|----------------|
| HDT, 1.82 MPa, 6.4 mm, unannealed       | 126            | °C         | ASTM D 648     |
| CTE, -40°C to 95°C, flow                | 6.84E-05       | 1 / °C     | ASTM E 831     |
| Specific Heat                           | 1.25           | J/g·°C     | ASTM C 351     |
| Thermal Conductivity                    | 0.19           | W/m·°C     | ASTM C 177     |
| Thermal Conductivity                    | 0.2            | W/m·°C     | ISO 8302       |
| CTE, 23°C to 80°C, flow                 | 7.E-05         | 1 / °C     | ISO 11359-2    |
| Ball Pressure Test, 125°C +/- 2°C       | PASSES         | -          | IEC 60695-10-2 |
| Vicat Softening Temp, Rate B/50         | 139            | °C         | ISO 306        |
| Vicat Softening Temp, Rate B/120        | 140            | °C         | ISO 306        |
| HDT/Be, 0.45MPa Edgew 120*10*4 sp=100mm | 133            | °C         | ISO 75/Be      |
| HDT/Ae, 1.8 MPa Edgew 120*10*4 sp=100mm | 121            | °C         | ISO 75/Ae      |
| PHYSICAL                                |                |            |                |
| Specific Gravity                        | 1.2            | -          | ASTM D 792     |
| Specific Volume                         | 0.83           | cm³/g      | ASTM D 792     |
| Density                                 | 1.19           | g/cm³      | ASTM D 792     |
| Water Absorption, 24 hours              | 0.15           | %          | ASTM D 570     |
| Water Absorption, equilibrium, 23C      | 0.35           | %          | ASTM D 570     |
| Water Absorption, equilibrium, 100°C    | 0.58           | %          | ASTM D 570     |
| Mold Shrinkage, flow, 3.2 mm            | 0.5 – 0.7      | %          | SABIC method   |
| Melt Flow Rate, 300°C/1.2 kgf           | 25             | g/10 min   | ASTM D 1238    |
| Density                                 | 1.2            | g/cm³      | ISO 1183       |
| Melt Volume Rate, MVR at 300°C/1.2 kg   | 23             | cm³/10 min | ISO 1133       |
| OPTICAL                                 |                |            |                |
| Light Transmission, 2.54 mm             | 88             | %          | ASTM D 1003    |
| Haze, 2.54 mm                           | 1              | %          | ASTM D 1003    |
| Refractive Index                        | 1.586          | -          | ASTM D542      |
| ELECTRICAL                              |                |            |                |
| Volume Resistivity                      | >1.E+17        | Ohm-cm     | ASTM D 257     |
| Dielectric Strength, in air, 3.2 mm     | 14.9           | kV/mm      | ASTM D 149     |
| Relative Permittivity, 50/60 Hz         | 3.17           | -          | ASTM D 150     |
| Relative Permittivity, 1 MHz            | 2.96           | -          | ASTM D 150     |
| Dissipation Factor, 50/60 Hz            | 0.0009         | -          | ASTM D 150     |
| Dissipation Factor, 1 MHz               | 0.01           | -          | ASTM D 150     |
| Volume Resistivity                      | >1.E+15        | Ohm-cm     | IEC 60093      |
| Surface Resistivity, ROA                | >1.E+15        | Ohm        | IEC 60093      |
| Dielectric Strength, in oil, 3.2 mm     | 17             | kV/mm      | IEC 60243-1    |
| Relative Permittivity, 1 MHz            | 2.7            | -          | IEC 60250      |
| Dissipation Factor, 50/60 Hz            | 0.001          | -          | IEC 60250      |
| Dissipation Factor, 1 MHz               | 0.01           | -          | IEC 60250      |
| Relative Permittivity, 50/60 Hz         | 2.7            | -          | IEC 60250      |
| FLAME CHARACTERISTICS                   |                |            |                |
| Oxygen Index (LOI)                      | 25             | %          | ISO 4589       |
| INJECTION MOLDING                       |                |            |                |
| Drying Temperature                      | 120            | °C         |                |
| Drying Time                             | 3 – 4          | hrs        |                |

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|-----------------------------|----------------|-------|--------------|
| Drying Time (Cumulative)    | 48             | hrs   |              |
| Maximum Moisture Content    | 0.02           | %     |              |
| Melt Temperature            | 270 – 295      | °C    |              |
| Nozzle Temperature          | 265 – 290      | °C    |              |
| Front - Zone 3 Temperature  | 270 – 295      | °C    |              |
| Middle - Zone 2 Temperature | 260 – 280      | °C    |              |
| Rear - Zone 1 Temperature   | 250 – 270      | °C    |              |
| Mold Temperature            | 70 – 95        | °C    |              |
| Back Pressure               | 0.3 – 0.7      | MPa   |              |
| Screw Speed                 | 40 – 70        | rpm   |              |
| Shot to Cylinder Size       | 40 – 60        | %     |              |
| Vent Depth                  | 0.025 – 0.076  | mm    |              |