

## Technical Information



# CALIBRE™ 30xEP-22

## Polycarbonate Resin

### Overview

CALIBRE™ 30xEP-22 MFR Polycarbonate is a high flow injection moulding resin that offers exceptional impact resistance, heat distortion resistance and optical clarity. The high melt flow rate allows complex, thin or long parts to be easily molded. The CALIBRE 300EP-22 series products are available in 2 additive packages: CALIBRE 301EP: Mold release. CALIBRE 303EP: Mold release and UV stabilizer. Material is transparent but can be custom colored.

Govt. and Industry Standards:

- Underwriters Laboratory, Inc. (UL)

Applications:

- Appliances
- Storage media housings
- Electrical & lighting components
- Light diffusers
- Transportation
- Automotive applications
- Houseware
- Recreation
- Packaging applications

| Physical                                 | Nominal Value (English) | Nominal Value (SI)     | Test Method            |
|------------------------------------------|-------------------------|------------------------|------------------------|
| Density                                  | 1.20 g/cm <sup>3</sup>  | 1.20 g/cm <sup>3</sup> | ASTM D792<br>ISO 1183  |
| Melt Mass-Flow Rate (MFR) (300°C/1.2 kg) | 22 g/10 min             | 22 g/10 min            | ASTM D1238<br>ISO 1133 |
| Molding Shrinkage - Flow                 | 5.0E-3 to 7.0E-3 in/in  | 0.50 to 0.70 %         | ISO 294-4              |
| Water Absorption                         |                         |                        | ISO 62                 |
| Saturation, 73°F (23°C)                  | 0.32 %                  | 0.32 %                 |                        |
| Equilibrium, 73°F (23°C), 50% RH         | 0.12 %                  | 0.12 %                 |                        |
| Mechanical                               | Nominal Value (English) | Nominal Value (SI)     | Test Method            |
| Tensile Modulus                          |                         |                        |                        |
| -- <sup>1</sup>                          | 334000 psi              | 2300 MPa               | ASTM D638              |
| --                                       | 334000 psi              | 2300 MPa               | ISO 527-1/1            |
| Tensile Strength                         |                         |                        |                        |
| Yield <sup>2</sup>                       | 8700 psi                | 60.0 MPa               | ASTM D638              |
| Yield                                    | 8700 psi                | 60.0 MPa               | ISO 527-2/50           |
| Break <sup>2</sup>                       | 9500 psi                | 65.5 MPa               | ASTM D638              |
| Break                                    | 9430 psi                | 65.0 MPa               | ISO 527-2/50           |
| Tensile Elongation                       |                         |                        |                        |
| Yield <sup>2</sup>                       | 6.0 %                   | 6.0 %                  | ASTM D638              |
| Yield                                    | 6.0 %                   | 6.0 %                  | ISO 527-2/50           |
| Break <sup>2</sup>                       | 120 %                   | 120 %                  | ASTM D638              |
| Break                                    | 120 %                   | 120 %                  | ISO 527-2/50           |
| Flexural Modulus                         |                         |                        |                        |
| --                                       | 350000 psi              | 2410 MPa               | ASTM D790              |
| -- <sup>3</sup>                          | 348000 psi              | 2400 MPa               | ISO 178                |

| Mechanical                               | Nominal Value (English)   | Nominal Value (SI)    | Test Method                            |
|------------------------------------------|---------------------------|-----------------------|----------------------------------------|
| Flexural Strength                        |                           |                       |                                        |
| --                                       | 14000 psi                 | 96.5 MPa              | ASTM D790                              |
| -- <sup>3</sup>                          | 14100 psi                 | 97.0 MPa              | ISO 178                                |
| Impact                                   | Nominal Value (English)   | Nominal Value (SI)    | Test Method                            |
| Charpy Notched Impact Strength           |                           |                       | ISO 179/1eA                            |
| -22°F (-30°C)                            | 5.2 ft-lb/in <sup>2</sup> | 11 kJ/m <sup>2</sup>  |                                        |
| 73°F (23°C)                              | 9.5 ft-lb/in <sup>2</sup> | 20 kJ/m <sup>2</sup>  |                                        |
| Notched Izod Impact                      |                           |                       |                                        |
| 73°F (23°C)                              | 14 ft-lb/in               | 750 J/m               | ASTM D256                              |
| 73°F (23°C)                              | 35 ft-lb/in <sup>2</sup>  | 74 kJ/m <sup>2</sup>  | ISO 180/1A                             |
| Instrumented Dart Impact <sup>4</sup>    |                           |                       | ASTM D3763                             |
| 73°F (23°C), Total Energy                | 640 in-lb                 | 72.3 J                |                                        |
| Tensile Impact Strength                  | 180 ft-lb/in <sup>2</sup> | 378 kJ/m <sup>2</sup> | ASTM D1822                             |
| Hardness                                 | Nominal Value (English)   | Nominal Value (SI)    | Test Method                            |
| Rockwell Hardness                        |                           |                       | ASTM D785                              |
| M-Scale                                  | 73                        | 73                    |                                        |
| R-Scale                                  | 118                       | 118                   |                                        |
| Thermal                                  | Nominal Value (English)   | Nominal Value (SI)    | Test Method                            |
| Deflection Temperature Under Load        |                           |                       |                                        |
| 66 psi (0.45 MPa), Unannealed            | 280 °F                    | 138 °C                | ASTM D648                              |
| 66 psi (0.45 MPa), Annealed              | 288 °F                    | 142 °C                | ASTM D648<br>ISO 75-2/B                |
| 264 psi (1.8 MPa), Unannealed            | 259 °F                    | 126 °C                | ASTM D648                              |
| 264 psi (1.8 MPa), Unannealed            | 252 °F                    | 122 °C                | ISO 75-2/A                             |
| 264 psi (1.8 MPa), Annealed              | 282 °F                    | 139 °C                | ASTM D648<br>ISO 75-2/A                |
| Vicat Softening Temperature              | 297 °F                    | 147 °C                | ISO 306/B50<br>ASTM D1525 <sup>5</sup> |
| Ball Indentation Temperature             | > 257 °F                  | > 125 °C              | IEC 60335-1                            |
| CLTE - Flow (-40 to 176°F (-40 to 80°C)) | 3.8E-5 in/in/°F           | 6.8E-5 cm/cm/°C       | ISO 11359-2                            |
| Electrical                               | Nominal Value (English)   | Nominal Value (SI)    | Test Method                            |
| Volume Resistivity                       | > 1.0E+15 ohms-cm         | > 1.0E+15 ohms-cm     | IEC 60093                              |
| Dielectric Strength                      |                           |                       |                                        |
| --                                       | 420 V/mil                 | 17 kV/mm              | ASTM D149                              |
| --                                       | 430 V/mil                 | 17 kV/mm              | IEC 60243-1                            |
| Relative Permittivity                    |                           |                       | IEC 60250                              |
| 100 Hz                                   | 3.00                      | 3.00                  |                                        |
| 1 MHz                                    | 3.00                      | 3.00                  |                                        |
| Dissipation Factor                       |                           |                       | ASTM D150                              |
| 50 Hz                                    | 1.0E-3                    | 1.0E-3                |                                        |
| 1 MHz                                    | 2.0E-3                    | 2.0E-3                |                                        |
| Comparative Tracking Index               |                           |                       | IEC 60112                              |
| 0.0787 in (2.00 mm), Solution A          | 250 V                     | 250 V                 |                                        |

| Flammability                                | Nominal Value (English) | Nominal Value (SI) | Test Method    |
|---------------------------------------------|-------------------------|--------------------|----------------|
| Flame Rating <sup>6</sup>                   |                         |                    | UL 94          |
| 0.06 in (1.5 mm)                            | V-2                     | V-2                |                |
| 0.12 in (3.0 mm)                            | V-2                     | V-2                |                |
| Glow Wire Flammability Index <sup>6</sup>   |                         |                    | IEC 60695-2-12 |
| 0.04 in (1.0 mm)                            | 1650 °F                 | 900 °C             |                |
| 0.08 in (2.0 mm)                            | 1610 °F                 | 875 °C             |                |
| 0.12 in (3.0 mm)                            | 1610 °F                 | 875 °C             |                |
| Glow Wire Ignition Temperature <sup>6</sup> |                         |                    | IEC 60695-2-13 |
| 0.04 in (1.0 mm)                            | 1470 °F                 | 800 °C             |                |
| 0.08 in (2.0 mm)                            | 1430 °F                 | 775 °C             |                |
| 0.12 in (3.0 mm)                            | 1430 °F                 | 775 °C             |                |
| Oxygen Index <sup>6</sup>                   | 26 %                    | 26 %               | ISO 4589-2     |
| Optical                                     | Nominal Value (English) | Nominal Value (SI) | Test Method    |
| Refractive Index                            | 1.586                   | 1.586              | ISO 489        |
| Light Transmittance (118.1 mil (3000 µm))   | 87.0 to 91.0 %          | 87.0 to 91.0 %     | ASTM D1003     |
| Haze                                        | < 1.00 %                | < 1.00 %           | ASTM D1003     |
| Injection                                   | Nominal Value (English) | Nominal Value (SI) |                |
| Drying Temperature                          | 248 °F                  | 120 °C             |                |
| Drying Time                                 | 4.0 hr                  | 4.0 hr             |                |

#### Notes

These are typical properties only and are not to be construed as specifications. Users should confirm results by their own tests.

<sup>1</sup> 0.039 in/min (1.0 mm/min)

<sup>2</sup> 2.0 in/min (50 mm/min)

<sup>3</sup> 0.079 in/min (2.0 mm/min)

<sup>4</sup> 10.9 ft/sec (3.33 m/sec)

<sup>5</sup> Rate A (50°C/h), Loading 2 (50 N)

<sup>6</sup> This rating not intended to reflect hazards presented by this or any other material under actual fire conditions.

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