

# CELANEX® 7716

## CELANEX® PBT

Celanex 7716 is a 35% glass/mineral reinforced, non exuding, flame retarded polybutylene terephthalate which has an excellent balance of mechanical properties and processability. Celanex 7716 is well suited for electrical applications where warp resistance or very flat surfaces are required.

### Product information

|                      |                        |           |
|----------------------|------------------------|-----------|
| Resin Identification | PBT-(GF+MD)35 FR(17)   | ISO 1043  |
| Part Marking Code    | >PBT-(GF+MD)35 FR(17)< | ISO 11469 |

### Rheological properties

|                                    |             |                 |
|------------------------------------|-------------|-----------------|
| Melt mass-flow rate                | 6.3 g/10min | ISO 1133        |
| Melt mass-flow rate, Temperature   | 250 °C      |                 |
| Melt mass-flow rate, Load          | 2.16 kg     |                 |
| Moulding shrinkage range, parallel | 0.2 - 0.5 % | ISO 294-4, 2577 |
| Moulding shrinkage range, normal   | 0.6 - 0.8 % | ISO 294-4, 2577 |

### Typical mechanical properties

|                                       |                       |                    |
|---------------------------------------|-----------------------|--------------------|
| Tensile modulus                       | 10800 MPa             | ISO 527-1/-2       |
| Tensile stress at break, 5mm/min      | 83 MPa                | ISO 527-1/-2       |
| Tensile strain at break, 5mm/min      | 1.6 %                 | ISO 527-1/-2       |
| Flexural modulus                      | 11700 MPa             | ISO 178            |
| Flexural strength                     | 140 MPa               | ISO 178            |
| Charpy impact strength, 23°C          | 22 kJ/m <sup>2</sup>  | ISO 179/1eU        |
| Charpy impact strength, -30°C         | 21 kJ/m <sup>2</sup>  | ISO 179/1eU        |
| Charpy notched impact strength, 23°C  | 5 kJ/m <sup>2</sup>   | ISO 179/1eA        |
| Charpy notched impact strength, -30°C | 5 kJ/m <sup>2</sup>   | ISO 179/1eA        |
| Izod notched impact strength, 23°C    | 4.9 kJ/m <sup>2</sup> | ISO 180/1A         |
| Izod notched impact strength, -30°C   | 4.5 kJ/m <sup>2</sup> | ISO 180/1A         |
| Izod impact strength, 23°C            | 19 kJ/m <sup>2</sup>  | ISO 180/1U         |
| Poisson's ratio                       | 0.34 <sup>[C]</sup>   |                    |
| Shore D hardness, 15s                 | 83                    | ISO 48-4 / ISO 868 |

[C]: Calculated

### Thermal properties

|  |          |                |
|--|----------|----------------|
| Melting temperature, 10°C/min                            | 225 °C   | ISO 11357-1/-3 |
| Glass transition temperature, 10°C/min                   | 60 °C    | ISO 11357-1/-3 |
| Temperature of deflection under load, 1.8 MPa            | 194 °C   | ISO 75-1/-2    |
| Temperature of deflection under load, 0.45 MPa           | 222 °C   | ISO 75-1/-2    |
| Coefficient of linear thermal expansion (CLTE), parallel | 31 E-6/K | ISO 11359-1/-2 |
| Coefficient of linear thermal expansion (CLTE), normal   | 46 E-6/K | ISO 11359-1/-2 |

### Flammability

|                               |           |                 |
|-------------------------------|-----------|-----------------|
| Burning Behav. at thickness h | V-0 class | IEC 60695-11-10 |
| Thickness tested              | 0.8 mm    | IEC 60695-11-10 |

# CELANEX® 7716

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### Electrical properties

|                              |            |               |
|------------------------------|------------|---------------|
| Relative permittivity, 100Hz | 4.2        | IEC 62631-2-1 |
| Relative permittivity, 1MHz  | 3.9        | IEC 62631-2-1 |
| Dissipation factor, 1MHz     | 190 E-4    | IEC 62631-2-1 |
| Volume resistivity           | 2E14 Ohm.m | IEC 62631-3-1 |
| Surface resistivity          | 5E16 Ohm   | IEC 62631-3-2 |
| Electric strength            | 24 kV/mm   | IEC 60243-1   |
| Comparative tracking index   | 200        | IEC 60112     |
| Arc Resistance               | 124 s      | UL 746B       |

### Physical/Other properties

|                          |                        |                |
|--------------------------|------------------------|----------------|
| Humidity absorption, 2mm | 0.1 %                  | Sim. to ISO 62 |
| Density                  | 1690 kg/m <sup>3</sup> | ISO 1183       |

### Injection

|                                 |               |
|---------------------------------|---------------|
| Drying Recommended              | yes           |
| Drying Temperature              | 120 °C        |
| Drying Time, Dehumidified Dryer | 4 h           |
| Processing Moisture Content     | ≤0.02 %       |
| Melt Temperature Optimum        | 250 °C        |
| Min. melt temperature           | 240 °C        |
| Max. melt temperature           | 260 °C        |
| Screw tangential speed          | 0.1 - 0.3 m/s |
| Mold Temperature Optimum        | 80 °C         |
| Min. mould temperature          | 60 °C         |
| Max. mould temperature          | 130 °C        |
| Ejection temperature            | 187 °C        |

### Characteristics

|                         |                              |
|-------------------------|------------------------------|
| Processing              | Injection Moulding           |
| Delivery form           | Pellets                      |
| Additives               | Flame retardant              |
| Special characteristics | Flame retardant, Low Warpage |

### Additional information

Injection molding

### Preprocessing

To avoid hydrolytic degradation during processing, CELANEX resins have to be dried to a moisture level equal to or less than 0.02%. Drying should be done in a dehumidifying hopper dryer capable of dewpoints <-30 °F (-34 °C) at 250 °F (121 °C) for 4 hours..

### Processing

Rear Temperature 450-470(230-240) deg F (deg C)  
Center Temperature 460-480(235-250) deg F (deg C)

# CELANEX® 7716

CELANEX® PBT

Front Temperature 470-490(240-255) deg F (deg C)  
Nozzle Temperature 480-490(250-255) deg F (deg C)  
Melt Temperature 460-490(235-255) deg F (deg C)  
Mold Temperature 150-200(65-93) deg F (deg C)  
Back Pressure 0-50 psi  
Screw Speed Medium  
Injection Speed Fast

Injection speed, injection pressure and holding pressure have to be optimized to the individual article geometry. To avoid material degradation during processing low back pressure and minimum screw speed have to be used. Overheating of the material has to be avoided, in particular for flame retardant grades. Up to 50% clean and dry regrind may be used for the '16 series' flame retardant grades.

## Processing Notes

### Pre-Drying

To avoid hydrolytic degradation during processing, CELANEX resins have to be dried to a moisture level equal to or less than 0.02%. Drying should be done in a dehumidifying hopper dryer capable of dewpoints <-40°F (-40°C) at 250°F (121°C) for 4 hours.

### Storage

For subsequent storage of the material in the dryer until processed (<= 60 h) it is necessary to lower the temperature to 100° C.

## Automotive

OEM

General Motors

General Motors

### ADDITIONAL INFORMATION

Black; Special Part Approval, Please See Your CE Account Representative.

Natural; Special Part Approval, Please See Your CE Account Representative.