Celanese
The chemistry inside innovation™

# COOLPOLY® D3612 - PA6

## Description

CoolPoly D3612 is a thermally conductive, electrically non-conductive PA6 based flame retardant grade
CoolPoly D series of thermally conductive plastics transfers heat, a characteristic previously unavailable in injection molding grade polymers. CoolPoly is lightweight, net-shape moldable and allows design freedom in applications previously restricted to metals and ceramics. The D series is electrically insulative and provides inherent electrical isolation characteristics.

| Physical properties | Value | Unit | Test Standard |
|---|---|---|---|
| Density | **101** | lb/ft³ | ISO 1183 |
| Molding shrinkage, parallel (flow) | **0.4** | % | ISO 294-4, 2577 |
| Molding shrinkage, transverse normal | **0.4** | % | ISO 294-4, 2577 |

| Mechanical properties | Value | Unit | Test Standard |
|---|---|---|---|
| Tensile modulus | **1.49E6** | psi | ISO 527-1, -2 |
| Tensile stress at break, 5mm/min | **6960** | psi | ISO 527-1, -2 |
| Tensile strain at break, 5mm/min | **0.68** | % | ISO 527-1, -2 |
| Flexural modulus, 23°C | **1.49E6** | psi | ISO 178 |
| Flexural strength, 23°C | **11600** | psi | ISO 178 |
| Charpy impact strength, 23°C | **3.52** | ft-lb/in² | ISO 179/1eU |
| Charpy notched impact strength, 23°C | **0.428** | ft-lb/in² | ISO 179/1eA |

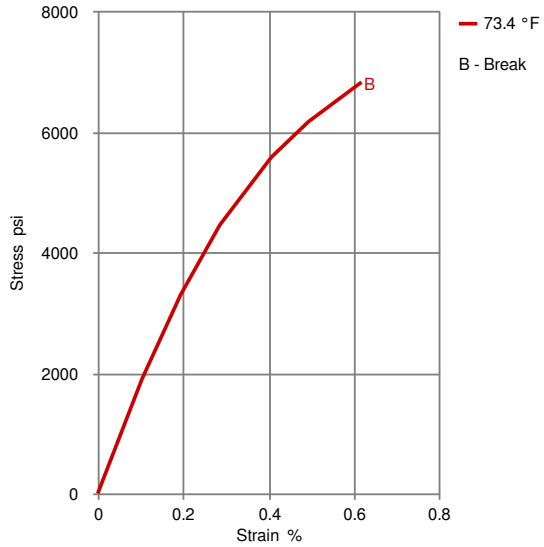
| Thermal properties | Value | Unit | Test Standard |
|---|---|---|---|
| DTUL at 1.8 MPa | **329** | °F | ISO 75-1, -2 |
| DTUL at 0.45 MPa | **401** | °F | ISO 75-1, -2 |
| Flammability at thickness h | **V-0** | class | UL 94 |
| thickness tested (h) | **0.1181** | in | UL 94 |
| Thermal conductivity, flow | **3.8** | W/(m K) | ASTM E1461 |
| Thermal conductivity, crossflow | **3.7** | W/(m K) | ASTM E1461 |
| Thermal conductivity, thruplane | **1.3** | W/(m K) | ASTM E1461 |
| Specific heat | **0.451** | BTU/(lb·F) | ASTM E1461 |

| Electrical properties | Value | Unit | Test Standard |
|---|---|---|---|
| Dielectric constant (Dk), 1MHz | **3.6** | - | IEC 60250 |
| Dissipation factor, 1MHz | **140** | E-4 | IEC 60250 |
| Volume resistivity, 23°C | **>1E13** | Ohm*m | IEC 62631-3-1 |
| Surface resistivity, 23°C | **>1E15** | Ohm | IEC 62631-3-2 |

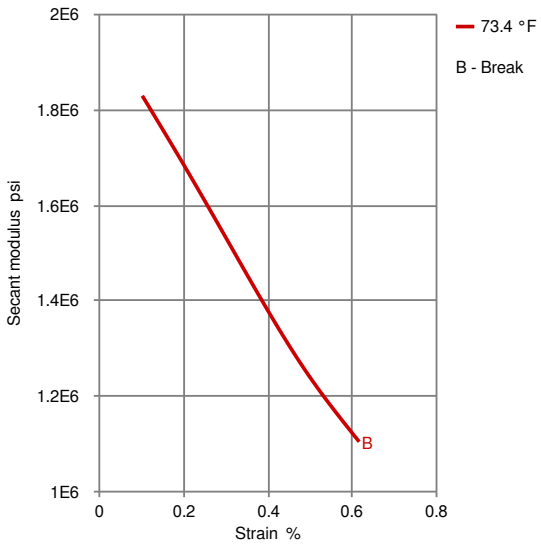
# COOLPOLY® D3612 - PA6

## Diagrams

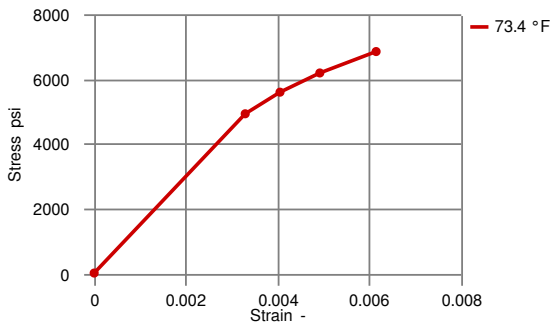
### Stress-strain




### Secant modulus-strain




### True Stress-strain




No yield at 23 °C
Poisson's ratio used is 0.35

## Typical injection moulding processing conditions

| Pre Drying | Value | Unit |
|---|---|---|
| Drying time | **2 - 4** | h |
| Drying temperature | **176** | °F |

| Temperature | Value | Unit |
|---|---|---|
| Zone1 temperature | **419 - 464** | °F |
| Zone2 temperature | **437 - 500** | °F |
| Zone3 temperature | **446 - 527** | °F |
| Zone4 temperature | **455 - 554** | °F |
| Nozzle temperature | **428 - 527** | °F |

## COOLPOLY® D3612 - PA6

| | | |
|---|---|---|
| Melt temperature | **464 - 554** | °F |
| Mold temperature | **176 - 203** | °F |

| Pressure | Value | Unit |
|---|---|---|
| Back pressure max. | **3.5** | bar |

| Speed | Value |
|---|---|
| Injection speed | **medium-fast** |

### Characteristics

| | |
|---|---|
| **Special Characteristics** | Light weighting, Thermally conductive |
| **Processing** | Injection molding |

### General Disclaimer

NOTICE TO USERS: Values shown are based on testing of laboratory test specimens and represent data that fall within the standard range of properties for natural material. These values alone do not represent a sufficient basis for any part design and are not intended for use in establishing maximum, minimum, or ranges of values for specification purposes. Colorants or other additives may cause significant variations in data values. Properties of molded parts can be influenced by a wide variety of factors including, but not limited to, material selection, additives, part design, processing conditions and environmental exposure. Any determination of the suitability of a particular material and part design for any use contemplated by the users and the manner of such use is the sole responsibility of the users, who must assure themselves that the material as subsequently processed meets the needs of their particular product or use.To the best of our knowledge, the information contained in this publication is accurate; however, we do not assume any liability whatsoever for the accuracy and completeness of such information. The information contained in this publication should not be construed as a promise or guarantee of specific properties of our products. It is the sole responsibility of the users to investigate whether any existing patents are infringed by the use of the materials mentioned in this publication.Moreover, there is a need to reduce human exposure to many materials to the lowest practical limits in view of possible adverse effects. To the extent that any hazards may have been mentioned in this publication, we neither suggest nor guarantee that such hazards are the only ones that exist. We recommend that persons intending to rely on any recommendation or to use any equipment, processing technique or material mentioned in this publication should satisfy themselves that they can meet all applicable safety and health standards.We strongly recommend that users seek and adhere to the manufacturer's current instructions for handling each material they use, and entrust the handling of such material to adequately trained personnel only. Please call the telephone numbers listed for additional technical information. Call Customer Services for the appropriate Materials Safety Data Sheets (MSDS) before attempting to process our products. The products mentioned herein are not intended for use in medical or dental implants.

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