

## Tepla® T8100 CF GR

### Material Description:

Tepla® T8100 CF GR is a polyamide-imide(PAI) resin specifically designed to provide exceptionally low wear performance in non-lubricated applications even at high pressure and velocity (PV) conditions. Not only is Tepla® T8100 CF GR particularly suited to applications where lubrication is impossible or undesirable, it provides an additional margin of safety for lubricated systems in the event that lubrication is lost. Specific applications where Tepla® T8100 CF GR may be used are thrust washers, seal rings, sliding vanes, bobbins, bushings, clutch rollers and pistons. The resin can be injection molded into complex shapes.

### General

|                   |                             |                         |
|-------------------|-----------------------------|-------------------------|
| Material Status   | • Commercial: Active        |                         |
| Availability      | • Asia Pacific              | • North America         |
|                   | • Europe                    | • Latin America         |
|                   | • Middle East               | • Africa                |
| Features          | • Chemical Resistant        | • Creep Resistant       |
|                   | • Flame Retardant           | • High Heat Resistance  |
|                   | • High Temperature Strength | • Low Friction          |
|                   | • Self Lubricating          | • Semi Conductive       |
|                   | • Wear Resistant            |                         |
| Uses              | • Aerospace Applications    | • Aircraft Applications |
|                   | • Automotive Applications   | • Bearings              |
|                   | • Bushings                  | • Gears                 |
|                   | • Industrial Applications   | • Industrial Parts      |
|                   | • Machine/Mechanical Parts  | • Metal Replacement     |
|                   | • Rollers                   | • Sealing Devices       |
|                   | • Seals                     | • Thrust Washer         |
|                   | • Transmission Applications | • Washer                |
|                   | • Cams                      |                         |
|                   | Forms                       | • Pellets               |
| RoHS Compliance   | • RoHS Compliant            |                         |
| Processing Method | • Machining                 | • Profile Extrusion     |
|                   | • Injection Molding         |                         |

| Physical Properties      | Typical Value | Unit              | Test Method |
|--------------------------|---------------|-------------------|-------------|
| Density/Specific Gravity | 1.59          | g/cm <sup>3</sup> | ASTM D792   |
| Molding Shrinkage -Flow  | 0.14          | %                 | ASTM D955   |
| Water Absorption (24 hr) | 0.12          | %                 | ASTM D570   |

| Mechanical Properties | Typical Value | Unit | Test Method |
|-----------------------|---------------|------|-------------|
| Tensile Modulus       | 15500         | MPa  | ASTM D638   |
|                       | 11000         | MPa  | ASTM D1708  |
| Tensile Strength      | 97            | MPa  | ASTM D638   |
| Tensile Stress        | 115           | MPa  | ASTM D1708  |
| Tensile Elongation    | 1             | %    | ASTM D638   |
|                       | 6             | %    | ASTM D1708  |
| Flexural Modulus      | 15000         | MPa  | ASTM D790   |
|                       | 10800         | MPa  |             |
| Flexural Strength     | 157           | MPa  | ASTM D790   |
|                       | 92            | MPa  |             |
| Compressive Modulus   | 8800          | MPa  | ASTM D695   |

|   |  |            |
|---|--|------------|
| Compressive Strength                        | 139 MPa  | ASTM D695  |
| Poisson's Ratio                             | 0.42   |            |
| Coefficient of Friction                     |  | ASTM D3702 |
| — <sup>2</sup>                              | 0.29   |            |
| — <sup>3</sup>                              | 0.27   |            |
| Wear Factor                                 |  | ASTM D3702 |
| Dry: 0.25 m/s, 3.4 MPa<br>(50 fpm, 500 psi) | 21 in <sup>3</sup> ·min <sup>-10</sup> /ft·lb·hr |            |
| Dry: 4 m/s, 0.2 MPa<br>(800 fpm, 31.25 psi) | 17 in <sup>3</sup> ·min <sup>-10</sup> /ft·lb·hr |            |

| Impact Properties     | Typical Value | Unit | Test Method |
|-----------------------|---------------|------|-------------|
| Notched Izod Impact   | 45            | J/m  | ASTM D256   |
| Unnotched Izod Impact | 225           | J/m  | ASTM D4812  |

| Thermal Properties  | Typical Value | Unit    | Test Method |
|---------------------|---------------|---------|-------------|
| Surface Resistivity | 6.00E+06      | ohms    | ASTM D257   |
| Volume Resistivity  | 2.00E+07      | Ohms·cm | ASTM D257   |

| Thermal Properties                                      | Typical Value | Unit     | Test Method |
|---|---------------|----------|-------------|
| Deflection Temperature Under Load<br>1.8MPa, Unannealed | 278           | °C       | ASTM D648   |
| Coefficient of Linear Thermal<br>Expansion              | 1.40E-05      | cm/cm/°C | ASTM D696   |
| Thermal Conductivity                                    | 0.81          | W/m/K    | ASTM C177   |

| Processing Information | Typical Value        | Unit |
|------------------------|----------------------|------|
| Mold Temperature       | 199 to 216           | °C   |
| Drying Temperature     | 177                  | °C   |
| Drying Time            | 3                    | hr   |
| Nozzle Temperature     | 371                  | °C   |
| Suggested Max Moisture | 0.05                 | %    |
| Rear Temperature       | 304                  | °C   |
| Screw Speed            | 50 to 100            | rpm  |
| Back Pressure          | 6.89                 | MPa  |
| Screw L/D Ratio        | 18.0:1.0 to 24.0:1.0 |      |

#### Injection Notes

Minimum drying conditions: 3 hours at 350°F, 4 hours at 300°F, or 16 hours at 250°F.

Compression Ratio: 1:1 to 1.5:1

Begin hold pressure at 6000-8000 psi for several seconds, then drop off to 3000-5000 psi for the duration of the hold pressure sequence.

Molded parts must be post cured.

#### NOTES:

<sup>1</sup> ASTM Test Method D1708 has been used to measure the tensile properties of PAI and similar materials because the small test specimen conserved material. Today the most widely used specimen is the Type1 bar of ASTM D638. These D1708 values are included for historical purposes and they should not be compared to the D638 values.

<sup>2</sup> Dry: 0.25 m/s, 3.4 MPa (50 fpm, 500 psi)

<sup>3</sup> Dry: 4 m/s, 0.2 MPa (800 fpm, 31.25 psi)

### CAUTION/警告!

Before using, read the Molding Guide, Material Safety Data Sheets, and Bulletins available from NFD Advanced Composites Sales offices and Distributors supplied to your company. Caution! During drying, purging and molding, small amounts of hazardous gases and/or particulate matter may be released. These may irritate eyes, nose and throat. Use adequate local exhaust ventilation during thermal processing. To prevent resin decomposition, do not contaminate the resin or exceed the recommended melt temperature or hold-up time. Avoid inhalation or skin and eyes contact. Sweep up and dispose of spilled resin to eliminate slipping hazard. 在使用之前, 请阅读NFD公司销售办事处和经销商提供给贵公司的材料成型指南、材料安全数据表和公告。警告! 在干燥、吹扫和成型过程中, 少量有害气体或颗粒物可能会在被释放, 这些可能会刺激眼睛, 鼻子和喉咙。热处理过程中请注意做好排气通风工作。为防止树脂分解, 请勿污染树脂或超过我们为您推荐熔融温度或时间。请避免吸入或与皮肤、眼睛等接触。清扫和处理溢出的树脂, 以消除滑到的危险。

### LEGAL NOTICES/法律声明

The figures indicated here are approximate values. They may be affected by different factors, and the user is not released therefore from the obligation of performing checks and trials of his own. The values indicated here have been compiled on the basis of current tests and findings. Any legally binding guarantee of certain properties, or any suitability for a specific application can not be inferred from the present data. For detailed production regulatory information, contact customer service.

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