

### PETG Technical Data Sheet (TDS)

Polyethylene Terephthalate Glycol-modified (PETG) is a tough and durable materials and it is easy to use. The strength of it allow to be a suitable material for food packaging, the chemical non-reactive characteristic allow it to be the most valuable material in medical field, normally used for orthopedic and prosthetic device.

IEMAI 3D high performance PETG filament is based on FFF/FDM technology, with a commonly used diameter of 1.75 mm, 210-235°C printing temperature, 50-80 °C bed temperature, having excellent interlayer adhesion which greatly improve the strength and shock resistance of the prototype.

PETG is a very waterproof material which make it become an excellent choice for outdoor activity. It also has excellent chemical resistance, which can be well-used in both acidic and alkaline environment, PETG also have strong impact resistance, which make it be the substitute material for PMMA and PC.

| Physical            | Condition | Test Method | Typical Value          |
|---------------------|-----------|-------------|------------------------|
| Density             |           | ASTM D792   | 1.29 g/cm <sup>3</sup> |
| Bulk Density        |           |             | 0.73 g/cm <sup>3</sup> |
| Intrinsic Viscosity |           | ISO 1628-5  | 0.80 dl/g              |
| Water Absorption    |           | ASTM D570   | 0.12%                  |
| Colour              | b*        | ASTM D6290  | ≤ 1                    |
|                     | L*        | ASTM D6290  | ≥64                    |

| Mechanical                      | Condition | Test Method | Typical Value |
|---------------------------------|-----------|-------------|---------------|
| Tensile Modulus                 |           | ISO 527-2   | 3000 MPa      |
| Tensile Yield Stress            |           | ISO 527-2   | 53 MPa        |
| Elongation at Yield             |           | ISO 527-2   | 4%            |
| Tensile Strength                |           | ISO 527-2   | 53 MPa        |
| Elongation at Stress            |           | ISO 527-2   | 4%            |
| Stress at Break                 |           | ISO 527-2   | 19 MPa        |
| Nominal Elongation at Break     |           | ISO 527-2   | 31%           |
| Flexural Modulus                |           | ISO 178     | 2040 MPa      |
| Flexural Stress                 |           | ISO 178     | 171 MPa       |
| Deflection at Flexural Strength |           | ISO 178     | 8.6 mm        |

| Impact                       | Condition     | Test Method | Typical Value        |
|------------------------------|---------------|-------------|----------------------|
| Notched Izod Impact Strength | 23°C, 50 % RH | ISO 180     | 4.5kJ/m <sup>2</sup> |



3D printing solutions for high performance materials

|                                |               |         |          |
|--------------------------------|---------------|---------|----------|
| Unnotched Izod Impact Strength | 23°C, 50 % RH | ISO 180 | No Break |
|--------------------------------|---------------|---------|----------|

| Hardness       | Condition | Test Method | Typical Value |
|----------------|-----------|-------------|---------------|
| Shore Hardness |           | ASTM D2240  | 70            |

| Thermal                      | Condition | Test Method | Typical Value |
|------------------------------|-----------|-------------|---------------|
| Heat Deflection Temperature  |           |             |               |
|                              | 0, 45 MPa | ISO 75-2    | 68°C          |
|                              | 1.8 MPa   | ISO 75-2    | 62°C          |
| Vicat Softening Temperature  |           | ISO 306     | 78°C          |
| Glass Transition Temperature |           | ASTM D3418  | 80°C          |

| Print Recommendation |             |
|----------------------|-------------|
| Nozzle Temperature   | 210 -235 °C |
| Bed Temperature      | 50 -80 °C   |
| Print Speed          | 30-70 mm/s  |
| Chamber Temperature  | 50-70 °C    |
| Cooling Fan          | 0-100%      |