# tecnhical datasheet

nylon + continuous fibers reinforcement

## Material

Nylon is an engineering thermoplastic, ideal for non-scratching parts or work holding, and printed parts for repeated handling.
It offers improved smoothness, great finish, great strength, and great stiffness.
Nylon exhibits outstanding abrasion resistance with good flexibility to suit a different range of applications.
This engineering thermoplastic that is non-abrasive and can be stiffened with different continuous fiber reinforcements, depending on each application.
It is a versatile material both with and without reinforcing fibers.

| Physical Properties | Typical Value | Test Method | Test Condition |
|---|---|---|---|
| Material Density | 1,1g/cm$^3$ | ISO 1183 | - |

| Mechanical Properties | Typical Value | Test Method | Test Condition |
|---|---|---|---|
| Tensile Stress at Yield | 51 MPa | ISO 527 | - |
| Tensile Modulus | 1,7 GPa | ISO 527 | - |
| Tensile Strain at Yield | 4,5 % | ISO 527 | - |
| Tensile Stress at Break | 36 MPa | ISO 527 | - |
| Tensile Strain at Break | 150 % | ISO 527 | - |
| Flexural Strength | 50 MPa | ISO 178 | - |
| Flexural Modulus | 1,4 GPa | ISO 178 | - |
| IZOD Impact | 1,1 J/m | ISO 180 | Notched |

| Thermal Properties | Typical Value | Test Method | Test Condition |
|---|---|---|---|
| Heat Deflection Temperature | 41 °C | ISO 75 | - |

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| Fiber Reinforcement | Test Method | Carbon | Kevlar® | Fiberglass | HSHT FG |
|---|---|---|---|---|---|
| Tensile Strength | ISO 527 | 800 MPa | 610 MPa | 590 MPa | 600 MPa |
| Tensile Modulus | ISO 527 | 60 GPa | 27 GPa | 21 GPa | 21 GPa |
| Tensile Strain at Break | ISO 527 | 1,5 % | 2,7 % | 3,8 % | 3,9 % |
| Flexural Strength | ISO 178 | 540 MPa | 240 MPa | 200 MPa | 420 MPa |
| Flexural Modulus | ISO 178 | 51 GPa | 26 GPa | 22 GPa | 21 GPa |
| Flexural Strain at Break | ISO 178 | 1,2 % | 2,1 % | 1,1 % | 2,2 % |
| Compressive Strength | ASTM D6641 | 320 MPa | 97 MPa | 140 MPa | 192 MPa |
| Compressive Modulus | ASTM D6641 | 54 GPa | 28 GPa | 21 GPa | 21 GPa |
| Compressive Strain at Break | ASTM D6641 | 0,7 % | 1,5 % | - | - |
| Heat Deflection Temperature | ISO 75 | 105 °C | 105 °C | 105 °C | 150 °C |
| Izod Impact - Notched | ISO 180 | 960 J/m | 2000 J/m | 2600 J/m | 3100 J/m |
| Density | - | 1,4 g/cm3 | 1,2 g/cm3 | 1,5 g/cm3 | 1,5 g/cm3 |

## NOTES

**1)** Tests plaques are uniquely designed to maximize test performance. Fiber test plaques are fully filled with unidirectional fiber and printed without walls. Plastic test plaques are printed with full infill.

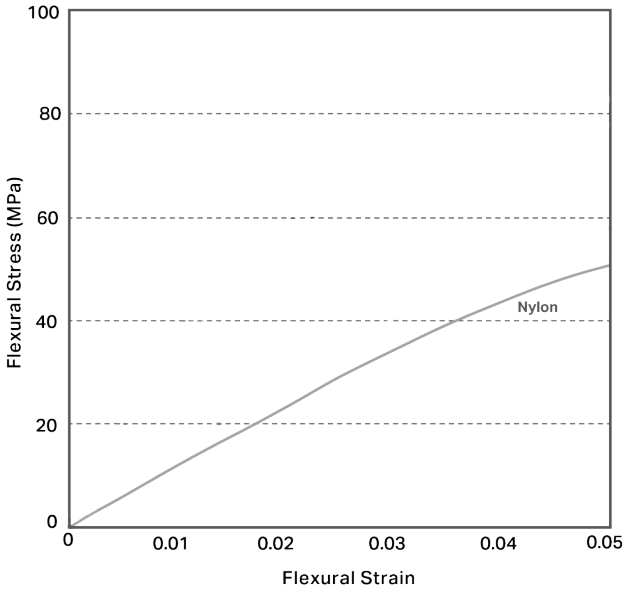
**2)** All customer parts should be tested in accordance with customer's specifications.

**3)** Part and material performance will vary by fiber layout design, part design, specific load conditions, test conditions, build conditions, and the like.

**4)** This representative data was tested, measured, or calculated using standard methods and are subject to change without notice.

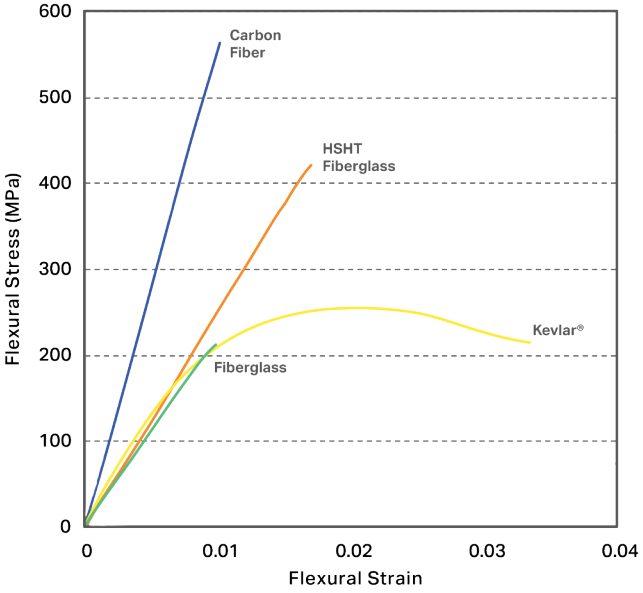
**5)** The data listed here should not be used to establish design, quality control, or specification limits, and are not intended to substitute for your own testing to determine suitability for each application.

## Plastic Matrix




### NYLON
**Flexural Strenght: 50 MPa**

## Fiber Reinforcement




### CARBON FIBER
**Flexural Strenght: 540 MPa**

Carbon Fiber has the highest strength-to-weight ratio of the 4 reinforcing fibers. Carbon Fiber reinforcement is commonly used for parts that replace machine aluminum.

### FIBERGLASS
**Flexural Strenght: 200 MPa**

Fiberglass reinforcement provides high strength and stiffness to a wide variety of applications.

### KEVLAR®
**Flexural Strenght: 240 MPa**

Kevlar® provides excellent durability, making it optimal for parts that are exposed to repeated and sudden loading. It is as stiff as fiberglass but much more durable, so it can be used in a variety of applications.

### HSHT FIBERGLASS
**Flexural Strenght: 420 MPa**

High Strength High Temperature Fiberglass provides aluminum strength and high heat tolerance. Perfect for parts loaded in high operating temperatures.