PA 12 material: polyamide

HP High Reusability PA 12 is a durable thermoplastic from Hewlett-Packard. The material is used for printing prototypes and finished products in manufacturing, industry, automotive, architecture, medicine, and other industries.

Manufacturer:
Hewlett-Packard

The characteristics of the material are superior to those of ABS plastic and photopolymers, as it is biocompatible, non-flammable, and resistant to ultraviolet radiation and chemicals. Fasteners, components, housings, and finished products with IP67 protection are printed using this material.

Components made of HP PA 12 have a gray surface. The layers are sintered tightly, so the finished products do not crack, and they have high abrasive resistance. The material retains its strength under rapid temperature changes and exposure to moisture.

General properties

Powder melting point (by DSC)	187 °C
Particle size	60 μm
Bulk density of powder	0.425 g/cm^3
Density of finished parts	1.01 g/cm^3

Mechanical characteristics

Tensile strength, maximum stress, XY	48 MPa
Tensile strength, maximum stress, Z	48 MPa

Tensile modulus, XY	1700 MPa
Tensile modulus, Z	1800 MPa
Elongation at break, XY	20%
Elongation at break, Z	15%
Flexural strength (at 5%), XY	65 MPa
Flexural strength (at 5%), Z	70 MPa
Flexural modulus, XY	1730 MPa
Flexural modulus, Z	1730 MPa
Notched Izod impact strength (at 3.2 mm, 23 °C), XYZ	3.5 kJ/m^2
Hardness (Shore D)	80
Dielectric constant	3–4
Dielectric strength	20–30 kV/mm

Immunity to fluids

Exposure to alkaline medium	Almost no effect
Exposure to benzene	Almost no effect
Exposure to acetone	Almost no effect
Exposure to methyl alcohol	Almost no effect
Exposure to acetic acid	Almost no effect
Exposure to carbon dioxide	Almost no effect
Exposure to engine oil	Almost no effect
Exposure to UV radiation	Almost no effect

Exposure to IR radiation	Almost no effect
Exposure to bleach	Affecting
Exposure to sulfuric acid	Affecting
Exposure to hydrochloric acid, 20% solution	Affecting
Exposure to phosphoric acid, 10% solution	Affecting

Resistance to heat

Heat distortion temperature (at 0.45 MPa), XY	175 °C
Heat distortion temperature (at 0.45 MPa), Z	175 °C
Heat distortion temperature (at 1.82 MPa), XY	95 °C
Heat distortion temperature (at 1.82 MPa), Z	95 °C

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