PLASTIC MATERIALS

# PA 6.6

## DESCRIPTION

Polyamide obtained by the polymerisation of Hexamethylenediamine and adipic acid . It is one of the oldest engineering plastics ,having been created in the USA in 1930. Due to its origin it is widely used in the American and English markets . In comparison to PA6 it is more stiff and tougher but is also more brittle . It is advisable to use PA66 instead of Polyamide 6 when a higher stiffness is required to the detriment of resilence. It casn be easily machined on automatic machine tools.

## FEATURES

- Wear resistance : it is good even in demanding environments.
- Self —lubricating :the friction coefficient is low and generally for sliding application it does not require lubricators.
- Toughness :very high tensile stress and compressive strength , its toughness is higher than that of Polyamide 6
- Machining on automatic machine tools in shown to be easy as the shavings break thanks to its higher toughness
- Ageing resistance, and weatherproof .
- Natural colour

## WEAK POINT

- It is hygroscopic, even if to a lesser extent than PA6.
- It absorbs moisture in time and consequently the mechanical features and final dimensions will change.

## APPLICATION

Mechanical : because it has higher stiffness than PA6 it is used for mechanical applications when this feature is more important than that of shock resistance : suitable for gears ,cams pulleys, anti-wear .
Food contact : in some cases it can be used in contact with food
Electrical : use in the electrical field is to be avoided as the electrical features change with the moisture content.
Chemical: it is resistant to alkali ,inorganic compounds and solvents .

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| PHISICAL PROPERTIES | | | |
|---|---|---|---|
| DESCRIPTION | STANDARDS | U.M | VALUE |
| SPECIFIC GRAVITY | ISO 1183 | g/cm3 | 1.15 |
| WATER ABSORPTION AT SATURATION | ISO 62 | % | 6.5 |
| MOISTURE ABSORPTION AT 23° C-50% RH | ISO 62 | % | 2.2 |
| MECHANICAL PROPERTIS | | | |
| YIELD STRENGTH | ISO 527 | $N/mm^2$ | 90 |
| ELONGATION AT YIELD | ISO 527 | % | >40 |
| TENSILE STRENGTH AT BREAK | ISO 527 | $N/mm^2$ | - |
| ELONGATION AT BREAK | ISO 527 | % | - |
| TENSILE MODULUS | ISO 527 | $N/mm^2$ | 3450 |
| UN-NOTCHED IMPACT STRENGTH | ISO 179 | $KJ/m^2$ | NB |
| NOTCH IMPACT STRENGTH | ISO 179 | $KJ/m^2$ | 4.5 |
| ROCKWELL HARDNESS M | ISO 2039-2 | - | 88 |
| SHORE D HARDNESS | DIN 53505 | SHORE D | - |
| FLEXURAL STRENGTH AL 3.5% | ISO 178 | $N/mm^2$ | - |
| FLEXURAL MODULUS | ISO 178 | $N/mm^2$ | - |
| COMPRESSIVE STRESS (1%-23° C) | ISO 604 | $N/mm^2$ | 25 |
| COMPRESSIVE MODULUS | ISO604 | $N/mm^2$ | - |
| DEFORMATION UNDER LOAD 100 Mpa -24 hr-RT | - | % | - |
| PAISSON' S RATIO | Abs | - | 0.38 |
| TERMAL PROPERTIES | | | |
| MAXIMUM OPERATING TEMPERATURE | - | ° C | 95 |
| MINIMUM OPERATING TEMPERATURE | - | ° C | -30 |
| VICAT SAFTENING TEMPERATURE VST/B/50 | ISO 306 | ° C | - |
| HEAT DEFLECTION TEMPERATURE AT 0.45 Mpa | ISO 75 | ° C | 200/230 |
| HEAT DEFLECTION TEMPERATURE -1.8 MPa | ISO 75 | ° C | 80/100 |
| THERMAL CONDUCTITY | DIN 52612 | W/(K*m) | 0.28 |
| COEF. OF LINEAR THERMAL EXPANSION (23 A 100° C) | ASTM D696 | Pm/(m* ° K) | 80/95 |
| COEF. OF LINEAR THERMAL EXPANSION (23° C) | ASTM D696 | Pm/(m* ° K) | - |
| TIBOLOGICAL PROPERTIES | | | |
| STATIC COEF. OF FRICTION ON POLISHED STEEL | MPC TEST | abs | 0.2 |
| DYNAMIC COEF. OF FRICTION ON POLISHED STEEL | MPC TEST | abs | 0.28 |
| PV LIMITWITHOUT LUBRICATION | MPC TEST V=0.5 m/s | $N/mm^2$ | 0.09 |
| WEAR COEFFICIENT ON HARDENED POLISHED STEEL | MPC TEST PV=0.1 MPa m/s | Pm/s | 8.5 |
| MAXIMUM PRESSURE | MPC TEST | $N/mm^2$ | 25 |
| ELECTRICAL PROPERTIES | | | |
| VOLUME RESISTANCE | IEC 60093 | Ω* m | $>10^{12}$ |
| SURFACE RESISTANCE | IEC 60094 | Ω | $>10^{12}$ |
| DIELECTRIC CONSTANT AT 1 MHz | IEC 60250 | Abs | 3.8 |
| DIELECTRIC LOSS FACTOR- 1 MHz | IEC 60250 | tan | 0.06 |
| DIELECTRIC STREGTH | IEC 60243 | KV/mm | 18 |
| ULTERIORI CARATTERISTICHE | | | |
| BONDABILITY | - | | N |
| FOOD CONTACT SAFETY (FDA COMPILACE) | DM 21/3/73 | | Y |
| FLAMMABILITY | UL 94 | | V2 |
| OXYGEN LIMIT INDEX | ISO 4589 | % | 26 |
| UV RESISTANCE | - | | N*** |