filEX
custom-made polymers

*tribo*PET – filament for 3D printing

***fil*EX *tribo*PET** filament is a tribological optimized PET-based compound. In addition to the outstanding sliding properties this material is characterized by high strength and stiffness. It is therefore the ideal filament for extraordinary applications which require high-quality surfaces. It features excellent thermoplastic qualities due to the embedded GLS lubricant.

print-settings
- printing temperature 230 °C-250 °C
- bed temperature 60 °C

examples for use
- slide bearing
- bearing and sliding elements
- wheels at high strain

characteristics
- low shrinkage and warping
- high wear resistance
- good sliding properties
- low water absorption
- high dimensional stability
- food conformity

material properties

colour	natural white	-
density	1.36 g/cm^3	DIN ISO 1183
heat distortion temperature (HDT)	90 °C	DIN EN ISO 75
friction coefficient	0.13 – 0.23	against steel 1.3505
wear coefficient	1.43 · 10^{-3} mm^3/N·m	against steel 1.3505
humidity absorption (normal conditions)	0.20 %	DIN EN ISO 62
water absorption at 23 °C (saturation)	0.65 %	DIN EN ISO 62

mechanical properties

Comparison of injection molded specimens (IM) to horizontal 3D-printed specimens using an Ultimaker 2 under the following conditions: printing temperature: 240 °C · heated bed temperature: 60 °C · Infill-type: linear ± 45 ° · infill-density-variation: 100 %, 80 %, 60 %, 40 %

tensile test DIN ISO 527	**IM**	**100 % infill**	**80 % infill**	**80 % infill**	**40 % infill**
tensile modulus (MPa)	2955	2464	2038	1696	1496
yield strength (MPa)	62.23	53.20	40.32	36.29	31.42
yield strain (%)	3.61	3.17	3.13	3.14	3.12
3-point bending test DIN ISO 178	**IM**	**100 % infill**	**80 % infill**	**80 % infill**	**40 % infill**
flexural modulus (MPa)	2699	2251	2156	2031	1959
flexural strength (MPa)	102.89	79.99	73.46	68.91	65.55
bending strain (%)	6.25	5.10	4.49	4.47	4.12
charpy impact test DIN ISO 179	**IM**	**100 % infill**	**80 % infill**	**80 % infill**	**40 % infill**
impact strength (kJ/m^2)	37	25	19	18	17

IPT – your partner of engineering, process technology and material testing in the filed of 3D printing

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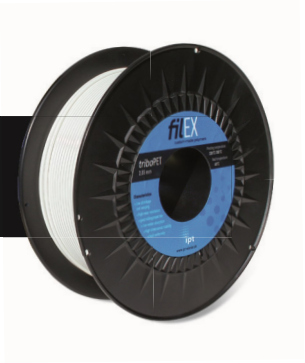
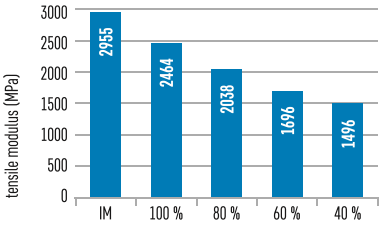
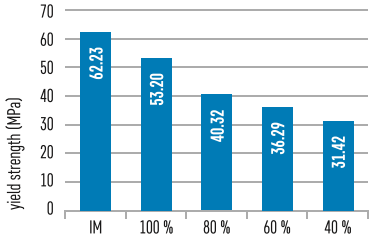


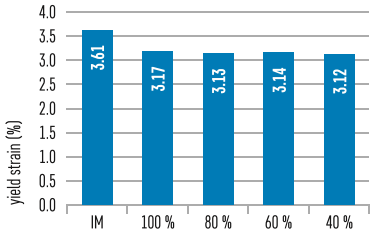
tensile test DIN ISO 527



tensile modulus – a measure of material stiffness when stretched

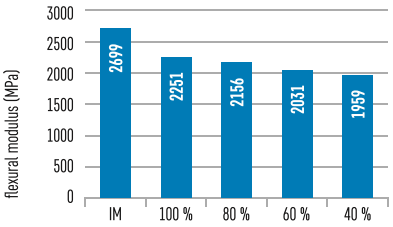


yield strength – defined as the tensile stress point at which the material begins to deform plastically

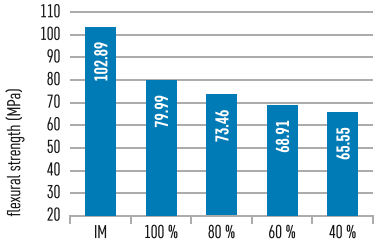


yield strain - a material characteristic which indicates the elongation of the material at the point of plastic deformation

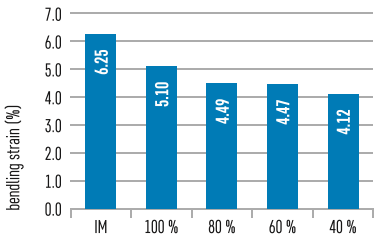
3-point bending test DIN ISO 178



flexural modulus - a measure of material stiffness when bent

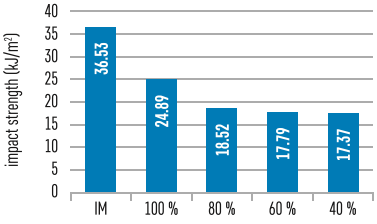


flexural strength - defined as the bending stress point at which the material begins to deform plastically



bending strain - a material characteristic which indicates the deflection of the material at the point of plastic deformation

charpy impact test DIN ISO 179



impact strength - a measure of the ability of the material to absorb impact energy without breaking

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