

MATERIAL DATASHEET

PET TRIBO



In addition to the well-known ZEDEX® families, PET TRIBO is the second representative of our new ZEDEX® new life product family. All products of the new life family base on used or already processed mono-material plastic, which are treated and processed into new products.

The new life family contributes significantly to the reduction of waste, the use of resources and primary energy. In comparison to thermal recycling, a considerable amount of CO2 emissions is avoided.

Various industries are already supporting us in this. Especially for this purpose, we created a very stable and sustainable entire process sequence, in cooperation with Marubeni International.

Properties	Symbol	Unit	Standard
information			
material code	-	-	internal Standard
colour	-	-	black
density	ρ	kg/dm ³	ISO 1183
mechanical			
compressive modulus	E_c	MPa	DIN EN ISO 604
elastic limit	σ_{yel}	MPa	internal Standard
compressive stress at yield	σ_{cy}	MPa	DIN EN ISO 604
compressive strength	σ_{cm}	MPa	DIN EN ISO 604
compressive stress at 1% strain	$\sigma_{1\%}$	MPa	DIN EN ISO 604
compressive stress at 2% strain	$\sigma_{2\%}$	MPa	DIN EN ISO 604
compressive stress at 3,5% strain	$\sigma_{3,5\%}$	MPa	DIN EN ISO 604
compressive strength (0,01 h)	$\sigma_{M0,01}$	MPa	internal Standard
compressive strength (100 h)	σ_{M100}	MPa	internal Standard
compressive strength (10000 h)	σ_{M1000}	MPa	internal Standard
compressive stress at break	σ_{mb}	MPa	DIN EN ISO 604
elastic compression limit	ϵ_{yel}	%	internal Standard
nominal compressive yield strain	ϵ_{cy}	%	DIN EN ISO 604
nominal compressive strain at compressive strength	ϵ_{cm}	%	DIN EN ISO 604
nominal compressive strain at break	ϵ_{cb}	%	DIN EN ISO 604
modulus in tension (tensile modulus)	E_t	MPa	DIN EN ISO 527
elastic limit	σ_{yel}	MPa	internal Standard
tensile stress at yield	σ_y	MPa	DIN EN ISO 527
tensile strength	σ_m	MPa	DIN EN ISO 527
tensile stress at break	σ_b	MPa	DIN EN ISO 527
elastic yield point	ϵ_{yel}	%	internal Standard
yield strain	ϵ_y	%	DIN EN ISO 527
elongation at maximum force	ϵ_m	%	DIN EN ISO 527
tensile elongation at break	ϵ_b	%	DIN EN ISO 527
modulus in flexure	E_f	MPa	-
outer fibre stress at 3,5% outer fibre strain	$\sigma_{f3,5\%}$	MPa	-
flexural strength	σ_{fm}	MPa	DIN EN ISO 178
flexural stress at break	σ_{fb}	MPa	-
elongation at flexural yield stress	ϵ_{fm}	%	-
flexural elongation at break	ϵ_{fb}	%	-
creep modulus at 1% deformation after 1000h	E	N/mm ²	DIN 53444
stress at 1% deformation after 1000h	$\sigma_{1\%}$	N/mm ²	DIN 53444
creep resistance	-	-	relative value
ball indentation hardness H358/30 (H132/30) [H49/30]	HB	N/mm ²	DIN 2039
Shore A hardness	-	Shore	DIN 53505
Shore D hardness	-	Shore	-
impact strength Charpy not notched	-	kJ/m ²	EN ISO 179/1eU
impact strength Charpy notched	-	kJ/m ²	EN ISO 179/1eA
loss tangent (1Hz)	$\tan\delta$	1	internal Standard
fatigue strength at 20°C, 106 stress cycles, 1 Hz	-	MPa	internal Standard
thermal			
continuous operating temperature (long term)	RTi	°C	UL 746B
short term operating temperature (3 h)	-	°C	internal Standard
maximum RTi temperature for bushings when pressed	-	°C	internal Standard
melting temperature (DSC, 10°C/min)	T_m	°C	ISO 11357-1/-3
glass transition temperature (DSC, 20°C/min)	T_g	°C	ISO 11357-1/-2
coefficient of thermal expansion up to 100°C	α	10 ⁻⁶ /K	ISO E 830
coefficient of thermal expansion up to 150°C	α	10 ⁻⁶ /K	ISO E 831
heat distortion temperature HDT/A 1,8 MPa	HDT(A)	°C	DIN EN ISO 75
thermal conductivity	λ	W/(m*K)	DIN 52612
specific heat capacity	c_p	kJ/(kg*K)	DSC
fire behaviour (3,2mm) UL94	-	-	UL 94 HB
limiting oxygen index (LOI)	%	LOI	DIN EN ISO 4589

This enables us to offer you economic advantages and durable alternatives to virgin goods.

The products of the ZEDEX® new life family are subject to the rigorous checks of process values & technical characteristics, which are also applied when processing virgin goods. The high quality standards should encourage our customers to opt for products with a new life cycle.

Only for applications in which high-purity semi-finished products are required, e.g. in the semiconductor industry, products of the ZEDEX® new life family might not be used. Contact us. As usual, our team will help you to find the right material for your challenge.

Properties	Symbol	Unit	Standard
electrical			
volume resistivity	R_v	$\Omega \cdot \text{cm}$	IEC 93
surface resistance	R_s	Ω	IEC 93
penetration resistance	E	kV/mm	IEC 243
tracking resistance	-	V	IEC 112
dielectric constant (110Hz)	-	1	IEC 250
dielectric constant (1MHz)	-	-	IEC 60250
dielectric dissipation factor (1MHz)	$\tan\delta$	-	IEC 60250
dissipation factor (110Hz)	$\tan\delta$	1	IEC 112
PV values			
max. surface pressure v=1m/min	p_{zul}	N/mm ²	33
max. surface pressure v=10m/min	p_{zul}	N/mm ²	2,2
max. surface pressure v=100m/min	p_{zul}	N/mm ²	0,07
max. surface pressure v=200m/min	p_{zul}	N/mm ²	0,04
evolution of heat with v=1m/min	-	°C	49
evolution of heat with v=10m/min	-	°C	62
evolution of heat with v=100m/min	-	°C	36
evolution of heat with v=200m/min	-	°C	66
friction			
μ static 20° C dry operation	μ_{stat}	1	internal Standard
μ dynamic 20° C dry operation	μ_{dyn}	1	inclined plane
μ dynamic 100° C dry operation	μ_{dyn}	1	-
wear			
wear factor at 20°C	-	mm ³ /100km	0,07
wear factor at 100°C	-	mm ³ /100km	0,21
wear factor at 200°C	-	mm ³ /100km	n.d.
wear factor at 240°C	-	mm ³ /100km	n.d.
available as			
tubes (hollow rods) up to ϕ (de)	-	mm	✓
sheets up to max. thickness	-	mm	✓
rods up to ϕ (de)	-	mm	✓
plastic granules	-	-	(✓)
injection moulded parts	-	-	(✓)
machined parts	-	-	✓
precision			
dimensional stability with moisture absorption	-	-	relative value
water absorption 23°C / RMC 93%	-	%	DIN EN ISO 62
water absorption until an equilibrium moisture content	-	%	DIN EN ISO 62
dimensional stability with temperature variation	-	-	relative value
high precision bushings (negative clearance)	-	-	✓
alignment adjustment	-	-	relative value
environmental influences			
suitable for use in water	-	-	✓
resistance against hot water	-	°C	80
resistance against dust, dirt, abrasive substances	-	-	relative value
UV rays resistance	-	-	relative value
suitable for outdoor use	-	-	relative value
resistance to chemicals	-	-	relative value
FDA compliant / EU 10/2011 compliant	-	-	n.v.
suitable for vacuum	-	-	✓
rate of desorption	a_{1h}	mbar/l/(s/cm ²)	1,83e-6 $\alpha = 0,44$
ROHS / WEEE	-	-	✓
free from silicone	-	-	✓
free from PTFE	-	-	✓
sterilization			
resistant against disinfectant	-	-	✓
moist heat sterilization	-	-	relative value
gamma-rays radiation sterilization	-	-	relative value
chemical sterilization	-	-	relative value
UV-sterilization	-	-	relative value

Legend	
①	low
⑩	high
✓	applicable
x	not applicable
(✓)	limited
k.Br.	no break
n.d.	not feasible
-	not determined
n.v.	non-existent

Legal information:
All the tests are been made with a standard conditioning atmosphere of 23°C (at the moment no other temperature is available). The specified values are established from average values of several tests and they correspond to our today's knowledge. They are only to be used as information about our products and as help for the material selection. With these values, we do not ensure specific properties, or the suitability for certain application, therefore we do not assume any legal responsibility for an improper usage. The used test pieces have been machined from extruded semi-finished material. Since the plastics' properties depend on the manufacturing process (extrusion, injection moulding), on

the dimensions of the semi finished material and on the degree of crystallinity, the actual properties of a specific product may slightly deviate from the tested ones. For information about divergent properties do not hesitate to contact us. On request we advise you regarding the most appropriate component design and the definition of material specifications more suitable to your application data. Notwithstanding, the customer bears all the responsibility for the thorough examination of suitability, efficiency, efficacy and safety of the chosen products in pharmaceutical applications, medical devices or other end uses.