MATERIAL DATASHEET
ZX-410VMT

ZEDEX®
Tribological Polymer Solutions

Properties	Symbol	Unit		Standard
information				
material code	-	-	internal Standard	106
colour	-	-		Black
density	ρ	kg/dm³	ISO 1183	1,48
mechanical				
compressive modulus	Ec	MPa	DIN EN ISO 604	-
elastic limit	σ_{yel}	MPa	internal Standard	79
compressive stress at yield	σ_{cy}	MPa	DIN EN ISO 604	-
compressive strength	σ_{cm}	MPa	DIN EN ISO 604	108
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	66
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	103
elastic compression limit	ε_{yel}	%	internal Standard	4,35
nominal compressive yield strain	ε_{cy}	%	DIN EN ISO 604	-
nominal compressive strain at compressive strength	ε_{cm}	%	DIN EN ISO 604	23,8
nominal compressive strain at break	ε_{cb}	%	DIN EN ISO 604	25,7
modulus in tension (tensile modulus)	E_t	MPa	DIN EN ISO 527	9900
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	106
tensile stress at break	σ_b	MPa	DIN EN ISO 527	106
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	1,3
tensile elongation at break	ε_b	%	DIN EN ISO 527	1,3
modulus in flexure	E_f	MPa	DIN EN ISO 178	7000
outer fibre stress at 3,5% outer fibre strain	$\sigma_{f3,5\%}$	MPa		-
flexural strength	$\sigma_{f,m}$	MPa		-
flexural stress at break	$\sigma_{f,b}$	MPa		-
elongation at flexural yield stress	$\varepsilon_{f,m}$	%		-
flexural elongation at break	$\varepsilon_{f,b}$	%		-
creep modulus at 1% deformation after 1000h	E	N/mm²	DIN 53444	-
stress at 1% deformation after 1000h	$\sigma_{1\%}$	N/mm²	DIN 53444	-
creep resistance	-	-	relative value	-
ball indentation hardness H358/30 (H132/30) [H49/30]	HB	N/mm²	DIN 2039	180
Shore A hardness	-	Shore	DIN 53505	>103
Shore D hardness	-	Shore		84,2
impact strength Charpy not notched	-	kJ/m²	EN ISO 179/1eU	19
impact strength Charpy notched	-	kJ/m²	EN ISO 179/1eA	4,5
loss tangent (1Hz)	tanδ	1	internal Standard	0,1
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	150
melting temperature (DSC, 10°C/min)	T_m	°C	ISO 11357-1/-3	390
glass transition temperature (DSC, 20°C/min)	T_g	°C	ISO 11357-1/-2	225
coefficient of thermal expansion up to 100°C	α	10^{-5}/K	ISO E 830	4
coefficient of thermal expansion up to 150°C	α	10^{-5}/K	ISO E 831	4,1
heat distortion temperature HDT/A 1,8 MPa	HDT(A)	°C	DIN EN ISO 75	220
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	V-0
limiting oxygen index (LOI)	%	LOI	DIN EN ISO 4589	-

Properties	Symbol		Unit	Standard
electrical				
volume resistivity	R_D	Ω*cm	IEC 93	8500
surface resistance	R_0	Ω	IEC 93	4E03
penetration resistance	E	kV/mm	IEC 243	8
tracking resistance	-	V	IEC 112	-
dielectric constant (110Hz)	-	1	IEC 250	-
dissipation factor (110Hz)	tanδ	1	IEC 112	-
PV values				
max. surface pressure v=1m/min	p_{zul}	N/mm²	"internal test radial bushing "	9,03
max. surface pressure v=10m/min	p_{zul}	N/mm²		4,90
max. surface pressure v=100m/min	p_{zul}	N/mm²		0,20
max. surface pressure v=200m/min	p_{zul}	N/mm²		0,10
evolution of heat with v=1m/min	-	°C		57
evolution of heat with v=10m/min	-	°C		132
evolution of heat with v=100m/min	-	°C		165
evolution of heat with v=200m/min	-	°C		131
friction				
μ static 20° C dry operation	$\mu_{stat.}$	1	internal Standard inclined plane	0,24
μ dynamic 20° C dry operation	$\mu_{dyn.}$	1		0,14
μ dynamic 100° C dry operation	$\mu_{dyn.}$	1		0,16
wear				
wear factor at 20°C	-	mm/100km	"internal test periodic translative movement under load"	0,09
wear factor at 100°C	-	mm/100km		0,02
wear factor at 200°C	-	mm/100km		0,13
wear factor at 240°C	-	mm/100km		-
available as				
tubes (hollow rods) up to øe (de)	-	mm	-	-
sheets up to max. thickness	-	mm	-	-
rods up to øe (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	1,5
water absorption until an equilibrium moisture content	-	%	DIN EN ISO 62	0,5
dimensional stability with temperature variation	-	-	relative value	❶
high precision bushings (negative clearance)	-	-	-	-
alignment adjustment	-	-	relative value	-
envrionmental influences				
suitable for use in water	-	-	-	-
resistance against hot water	-	°C	-	-
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	-	-	-	-
suitable for vacuum	-	-	-	-
rate of desorption	a_{1h}	mbar*l/(s/cm²)	-	-
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	
❶	low
⓾	high
✓	applicable
×	not applicable
(✓)	limited
k.Br.	no break
n.d.	not feasible
-	not determined
n.v.	non-existent

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