

CELANEX® 2500 | PBT | Unfilled

Description

Chemical abbreviation according to ISO 1043-1: PBT
Moulding compound ISO 7792- PBT, MGHR, 08-030N

Polybutylene terephthalate, easy flow, nucleated grade

Flammability UL 94 HB Minimum thickness 1.0 mm.

Recognition by Underwriters Laboratories, USA (UL)

Physical properties	Value	Unit	Test Standard
Density	1310	kg/m ³	ISO 1183
Melt volume rate (MVR)	40	cm ³ /10min	ISO 1133
MVR test temperature	250	°C	ISO 1133
MVR test load	2.16	kg	ISO 1133
Mold shrinkage - parallel	1.8 to 2.0	%	ISO 294-4
Humidity absorption (23°C/50%RH)	0.2	%	ISO 62

Mechanical properties	Value	Unit	Test Standard
Tensile modulus (1mm/min)	2700	MPa	ISO 527-2/1A
Tensile stress at yield (50mm/min)	60	MPa	ISO 527-2/1A
Tensile strain at yield (50mm/min)	4	%	ISO 527-2/1A
Nominal strain at break (50mm/min)	15	%	ISO 527-2/1A
Tensile stress at break (50mm/min)	60	MPa	ISO 527-2/1A
Tensile creep modulus (1h)	2400	MPa	ISO 899-1
Tensile creep modulus (1000h)	1600	MPa	ISO 899-1
Flexural strength (23°C)	90	MPa	ISO 178
Charpy impact strength @ 23°C	135	kJ/m ²	ISO 179/1eU
Charpy impact strength @ -30°C	130	kJ/m ²	ISO 179/1eU
Charpy notched impact strength @ 23°C	5	kJ/m ²	ISO 179/1eA
Charpy notched impact strength @ -30°C	4.5	kJ/m ²	ISO 179/1eA

Thermal properties	Value	Unit	Test Standard
Melting temperature (10°C/min)	225	°C	ISO 11357-1,-2,-3
DTUL @ 1.8 MPa	60	°C	ISO 75-1/-2
DTUL @ 0.45 MPa	160	°C	ISO 75-1/-2
Vicat softening temperature B50 (50°C/h 50N)	190	°C	ISO 306
Coeff.of linear therm. expansion (parallel)	1.1	E-4/°C	ISO 11359-2
Limiting oxygen index (LOI)	22	%	ISO 4589
Flammability @1.6mm nom. thickn.	HB	class	UL94
thickness tested (1.6)	1.49	mm	UL94
UL recognition (1.6)	UL	-	UL94
Flammability at thickness h	HB	class	UL94
thickness tested (h)	1	mm	UL94
UL recognition (h)	UL	-	UL94

Electrical properties	Value	Unit	Test Standard
Relative permittivity - 100 Hz	3.9	-	IEC 60250
Relative permittivity - 1 MHz	3.8	-	IEC 60250

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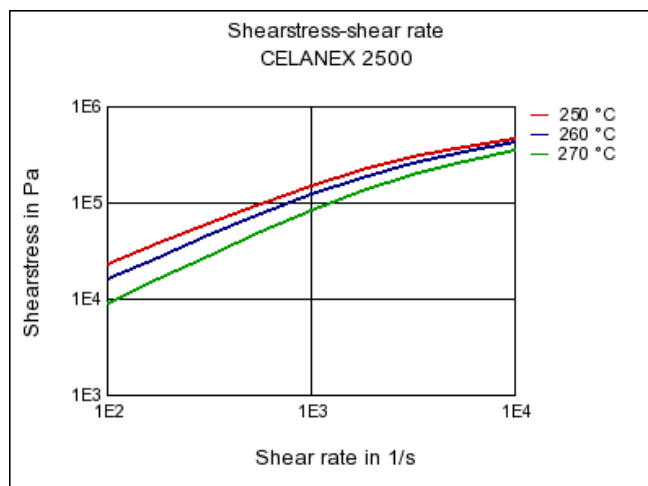
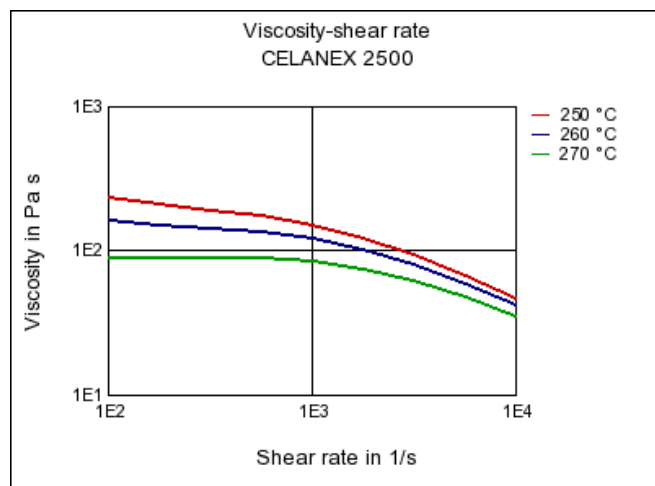
Electrical properties	Value	Unit	Test Standard
Dissipation factor - 100 Hz	13	E-4	IEC 60250
Dissipation factor - 1 MHz	200	E-4	IEC 60250
Volume resistivity	>1E13	Ohm*m	IEC 60093
Surface resistivity	>1E15	Ohm	IEC 60093
Electric strength	23	kV/mm	IEC 60243-1
Comparative tracking index CTI	600	-	IEC 60112

Test specimen production	Value	Unit	Test Standard
Processing conditions acc. ISO	7792	-	Internal
Injection molding melt temperature	265	°C	ISO 294
Injection molding mold temperature	80	°C	ISO 294
Injection molding flow front velocity	200	mm/s	ISO 294
Injection molding hold pressure	70	MPa	ISO 294

Rheological Calculation properties	Value	Unit	Test Standard
Density of melt	1110	kg/m ³	Internal
Thermal conductivity of melt	0.133	W/(m K)	Internal
Specific heat capacity of melt	1920	J/(kg K)	Internal
Ejection temperature	219	°C	Internal

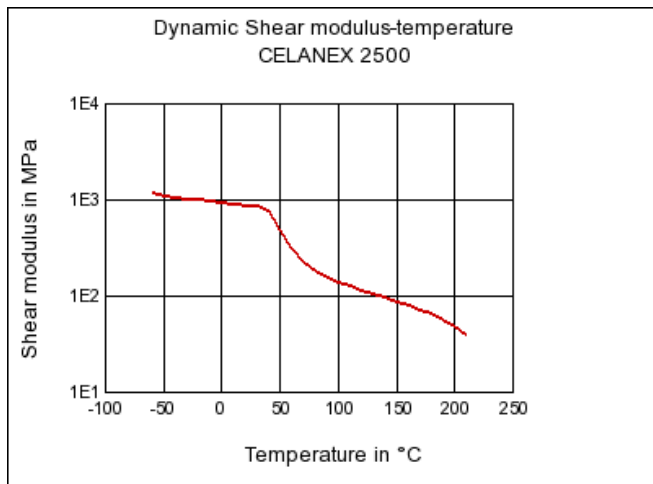
Viscosity-shear rate

Shearstress-shear rate

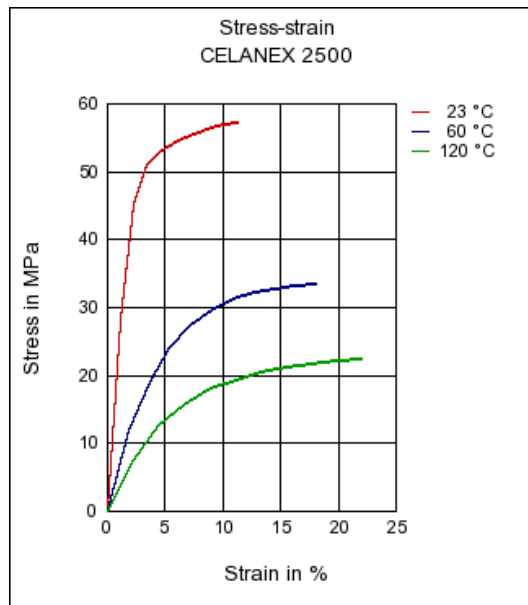


CELANEX® 2500 | PBT | Unfilled

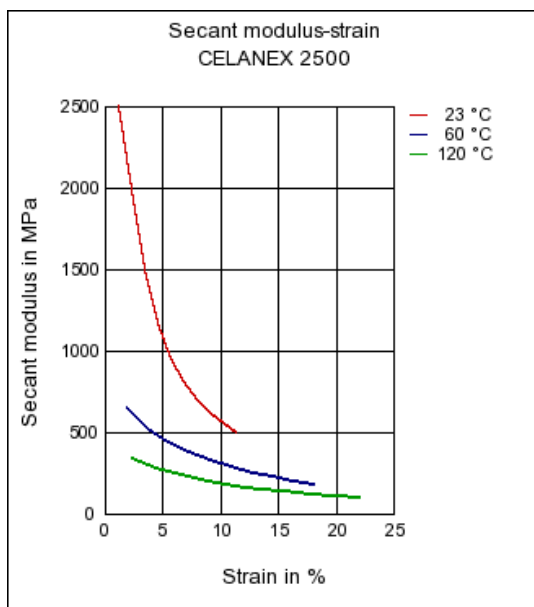
Dynamic Shear modulus-temperature



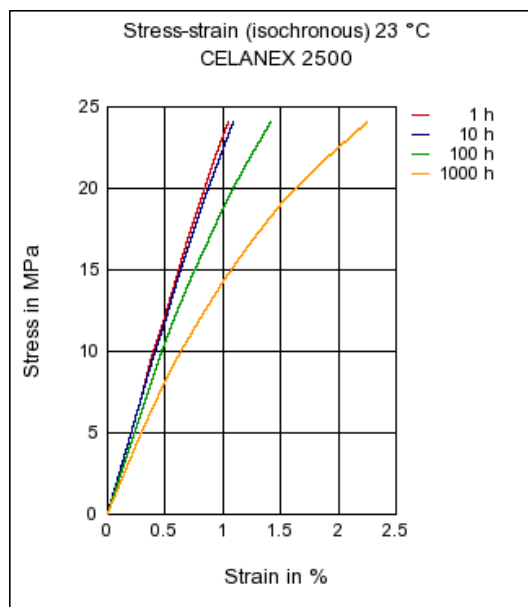
Stress-strain



Secant modulus-strain

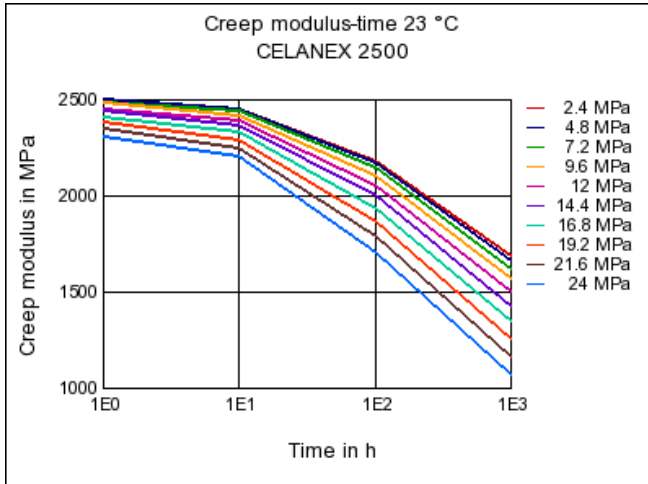


Stress-strain (isochronous)

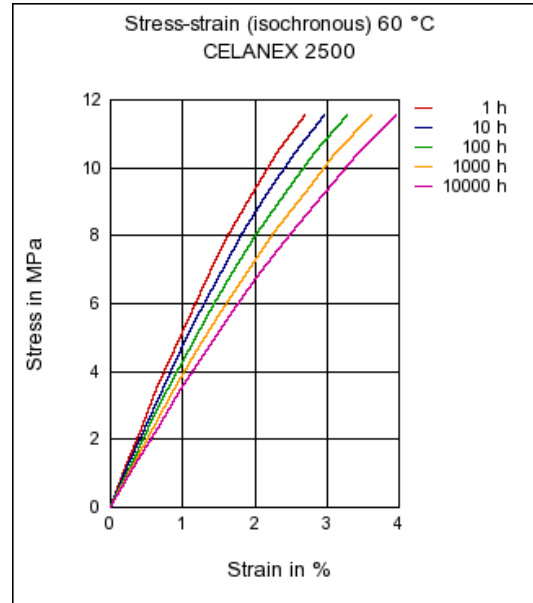


CELANEX® 2500 | PBT | Unfilled

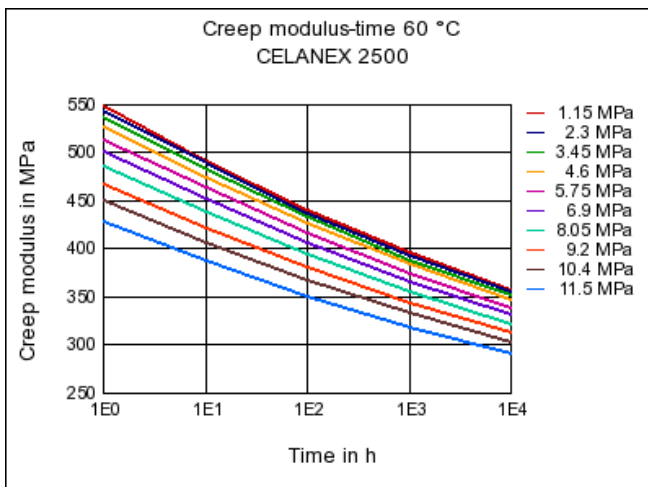
Creep modulus-time



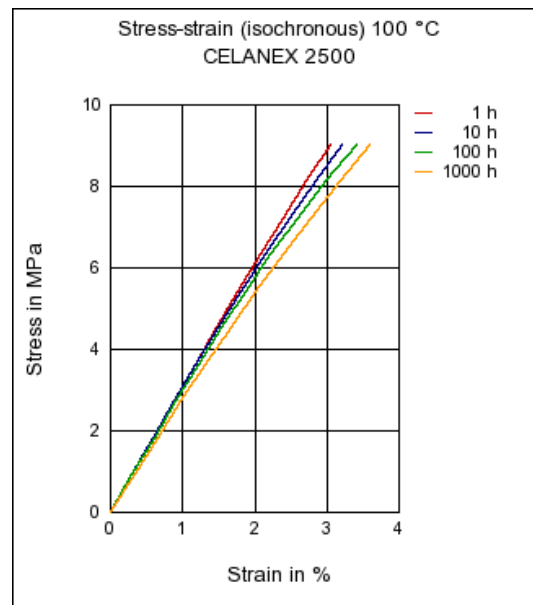
Stress-strain (isochronous)



Creep modulus-time

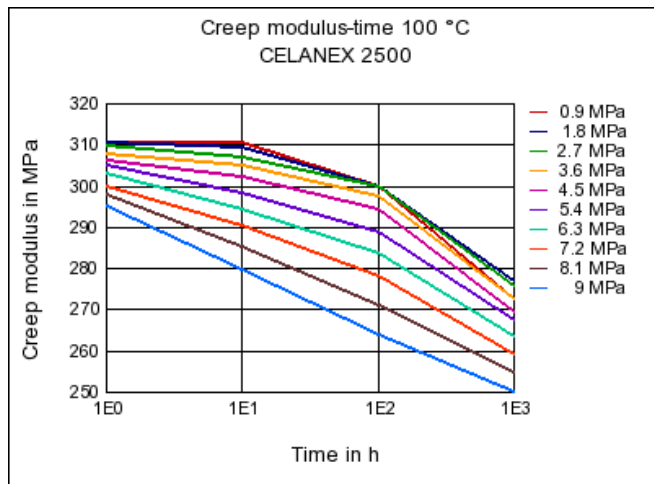


Stress-strain (isochronous)

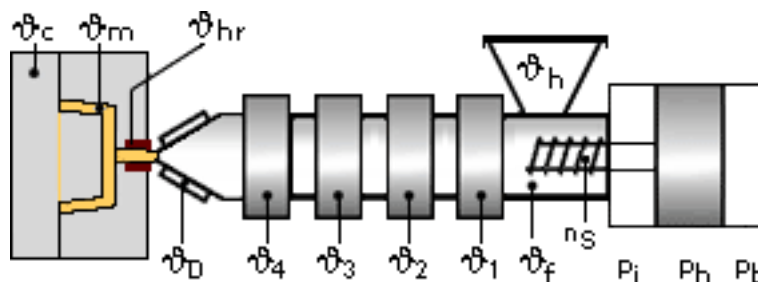


CELANEX® 2500 | PBT | Unfilled

Creep modulus-time



Typical injection moulding processing conditions



Pre Drying:

Necessary low maximum residual moisture content: 0.02%

CELANEX should in principle be predried. Because of the necessary low maximum residual moisture content the use of dry air dryers is recommended. The dew point should be $\leq -30^\circ\text{C}$. The time between drying and processing should be as short as possible.

For subsequent storage of the material in the dryer until processed (≤ 60 h) it is necessary to lower the temperature to 100°C .

Drying time: 2 - 4 h

Drying temperature: 120 - 140 °C

Temperature:

	$\vartheta_{\text{Manifold}}$	ϑ_{Mold}	ϑ_{Melt}	$\vartheta_{\text{Nozzle}}$	ϑ_{Zone4}	ϑ_{Zone3}	ϑ_{Zone2}	ϑ_{Zone1}	ϑ_{Feed}	$\vartheta_{\text{Hopper}}$
min (°C)	250	75	250	250	245	245	240	240	190	20
max (°C)	260	85	260	260	255	255	250	250	200	50

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Speed:

Injection speed: fast

Injection Molding

Mel t Temperature	250-260	° C
Mol d Temperature	75-85	° C
Maxi mum Barrel Residence Time *)	5-10	mi n
I njecti on Speed	fast	
Peri pheral screw speed	max. 0, 3	m/sec
Back Pressure	10-30	bar
I njecti on Pressure	600-1000	bar
Hol ding Pressure	400-800	bar
Nozzl e Desi gn	open desi gn	preferred

Injection speed, injection pressure and holding pressure have to be optimized to the individual article geometry. To avoid material degradation during processing low back pressure and minimum screw speed have to be used. Overheating of the material has to be avoided. For grades containing flame retardants, a maximum temperature of 265 °C should not be exceeded.

Ticona recommends only externally heated hot runner systems.

*) If the cylinder temperatures are higher than the recommended maximum temperatures, the max. residence time in the barrel has to be reduced.

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Properties of molded parts can be influenced by a wide variety of factors including, but not limited to, material selection, additives, part design, processing conditions and environmental exposure. Any determination of the suitability of a particular material and part design for any use contemplated by the users and the manner of such use is the sole responsibility of the users, who must assure themselves that the material as subsequently processed meets the needs of their particular product or use.

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