TROGAMID®

Technical Information

TROGAMID® *Care*

TROGAMID® *Care* grades represent a range of both amorphous and microcrystalline transparent polyamides for processing via extrusion or injection molding.

Durable

Microcrystalline TROGAMID® *Care* MX is the material of choice for all applications dealing with pharmaceutical formulations, lipids or aggressive disinfectants, since it exhibits an exceptional resistance towards chemicals and stress-cracking. Examples include fluid and drug delivery equipment such as stop-cocks, dialyzer parts, housings, covers or hearing aids.

The high mechanical stability of amorphous TROGAMID® *Care* MT50 predestines the material for applications requiring a high modulus but retaining impact resistance which includes e.g. dentures, parts for monitoring and imaging devices or durable medical equipment. It comprises one of the highest tensile moduli compared to other transparent polyamides.

Functional

The antibacterial TROGAMID® *Care* MX73-A was designed to protect medical devices from surface bacterial colonization, while preserving its outstanding resistance to chemicals and stress-cracking as well as transparency. ISO 22196 tests conducted with *E. coli* and *S. aureus* showed a reduction of the viable cell count of more than 99.99%, each.

TROGAMID® *Care* MX73-L is a transparent specialty grade for applications involving laser welding and laser marking. Though appearing transparent and colorless, it absorbs laser radiation, wherefore the combination of TROGAMID® *Care* MX73 and MX73-L enables the connection of two transparent parts via laser-welding, omitting exposure of the materials to extensive heat treatments or usage of adhesives.

Target areas of application for TROGAMID® *Care* MX compounds include fluid and drug delivery systems, surgical instruments, housings, monitoring and imaging devices and durable medical equipment.

All advantages at a glance

- High transparency
- High chemical resistance
- Very good stress crack resistance
- UV resistance
- High dynamic load-bearing capacity
- Easy processability & colorability
- Free of BPA

Approvals

TROGAMID® *Care* grades were tested on biocompatibility for applications within the body of up to 30 days contact time and comply with USP <88> class VI and ISO 10993 standards.

TROGAMID® *Care* – Amorphous and microcrystalline grades

Properties		Test method int.	Unit	TROGAMID® *Care* MX73	TROGAMID® *Care* MX97	TROGAMID® *Care* MT50
Density	23°C	ISO 1183	g/cm³	1.02	1.02	1.12
Tensile test 23°C	50 mm/min	ISO 527-1 ISO 527-2				
Stress at yield			MPa	60	60	90
Strain at yield			%	8	8	8
Nominal strain at break			%	>50	>50	>50
Tensile modulus		ISO 527-1/-2	MPa	1400	1400	2800
Flexural modulus		ISO 178	MPa	1700	1700	3000
CHARPY impact strength		ISO 179/1eU				
	23°C		kJ/m²	N	N	N
	-30°C		kJ/m²	N	N	N
CHARPY notched impact strength		ISO 179/1eA				
	23°C		kJ/m²	14 C	14 C	12 C
	-30°C		kJ/m²	11C	13 C	7 C
Shore hardness D		ISO 868		81	81	87
Glass transition temperature Tg	10 K/min	ISO 11357	°C	140	140	150
Melting range DSC, 2nd heating		ISO 11357	°C	250	250	–
Temperature of deflection under load		ISO 75-1/-2				
Method A	1.8 MPa		°C	108	108	130
Method B	0.45 MPa		°C	122	122	145
Vicat softening temperature		ISO 306				
Method A	10 N		°C	137	135	130
Method B	50 N		°C	130	130	145
Linear thermal expansion	23°C-55°C	ISO 11359				
longitudinal			10^{-4} K^{-1}	0.9	0.9	0.55
transverse			10^{-4} K^{-1}	0.9	0.9	0.55
Flammability according to UL 94		IEC 60695				
	0.8 mm			HB	HB	1.2*
	1.6 mm			HB	HB	1.2*
Mold shrinkage		determined on 2mm sheets with film gate at rim, mold temp. 80°C ISO 294-4				
in flow direction			%	0.65	0.65	0,5
in transverse direction			%	0.80	0.80	0,5
Water absorption	saturation	ISO 62	%	3.5	3.5	7.5

N = No break, C = Complete break, incl. hinge break, HB =Horizontal burning, *Test specimen 127x12.7x3.2 mm

TROGAMID® *Care* – Functional Grades

Properties	Test method int.	Unit	TROGAMID® *Care* MX73-L	TROGAMID® *Care* MX73-A
Density 23°C	ISO 1183	g/cm³	1.02	
Tensile test 23°C 50 mm/min	ISO 527-1			
Stress at yield	ISO 527-2	MPa	60	59
Strain at yield		%	8	8
Nominal strain at break		%	>50	>50
Tensile modulus	ISO 527-1/-2	MPa	1400	1460
CHARPY impact strength	ISO 179/1eU			
23°C		kJ/m²	N	N
-30°C		kJ/m²	N	
CHARPY notched impact strength	ISO 179/1eA			
23°C		kJ/m²	13 C	10 C
Melting range DSC, 2nd heating	ISO 11357	°C	250	250
Vicat softening temperature	ISO 306			
Method A 10 N		°C	137	
Method B 50 N		°C	131	

N = No break, C = Complete break, incl. hinge break

Evonik Industries AG
Paul-Baumann-Straße 1, 45772 Marl, Germany
Phone +49 2365 49-9227