Product Information

TROGAMID® CX9704 NC

TRANSPARENT, AMORPHOUS POLYAMIDE FOR INJECTION MOLDING

TROGAMID® CX9704 is an amorphous and transparent polyamide for the manufacture of parts in the optical industry, like lenses according the injection molding procedure.

TROGAMID® CX9704 is supplied as spherical pellets in moisture-proof packaging.

Pigmentation may affect values.

Key Features

Industrial Sector
Automotive and Mobility, Aircraft and Aerospace, Industry and Engineering, Medical Devices, Optics, Sports and Lifestyle

Processing
Injection molding, Extrusion

Optics
Transparent, High gloss

Resistance to
Heat (thermal stability), Hydrolysis / hot water, UV / light / weathering

Additives
Unfilled

LCA-values	dry	Unit	Test Standard
LCA name of certificate	TROGAMID® CX9704 - Shanghai	-	ISO 14040, 14044
LCA certifier	TÜV Rheinland	-	ISO 14040, 14044
Blue water consumption	**9.2**	kg	ISO 14040, 14044
Global Warming Potential incl. bio. C incl. LUC	**6.4**	kg CO_2 eq./kg	ISO 14040, 14044
Global Warming Potential excl. bio. C incl. LUC	**6.4**	kg CO_2 eq./kg	ISO 14040, 14044

Land use (ReCiPe 2016)	**0**	Annual crop eq. y	ISO 14040, 14044

Mechanical properties ISO	dry / cond	Unit	Test Standard
Tensile modulus	**218000 / -**	psi	ISO 527
Tensile strength	**8700 / -**	psi	ISO 527
Yield stress	**8700 / -**	psi	ISO 527
Yield strain	**8 / -**	%	ISO 527
Stress at 50% strain	**5800 / -**	psi	ISO 527
Stress at break	**7250 / -**	psi	ISO 527
Nominal strain at break, tB	**>50 / -**	%	ISO 527
Charpy impact strength, +23°C	**N / -**	ftlb/in²	ISO 179/1eU
Charpy impact strength, 0°C	**N / -**	ftlb/in²	ISO 179/1eU
Charpy impact strength, -30°C	**N / -**	ftlb/in²	ISO 179/1eU
Charpy notched impact strength, +23°C	**4.76 / 3.71**	ftlb/in²	ISO 179/1eA
Type of failure	**C / C**	-	-
Charpy notched impact strength, 0°C	**5.23 / -**	ftlb/in²	ISO 179/1eA
Type of failure	**C / -**	-	-
Charpy notched impact strength, -30°C	**4.76 / -**	ftlb/in²	ISO 179/1eA
Type of failure	**C / -**	-	-
Flexural modulus, 23°C	**212000 / -**	psi	ISO 178
Flexural stress at conv. deflection, 23°C	**7690 / -**	psi	ISO 178
Flexural strength, 23°C	**11900 / -**	psi	ISO 178
Flexural strain at flexural strength, 23°C	**8 / -**	%	ISO 178
Flexural stress at break, 23°C	**N / -**	psi	ISO 178
Flexural strain at break, 23°C	**N / -**	%	ISO 178
Flexural modulus, var. temp.	**218000 / -**	psi	ISO 178
Flexural stress at conv. deflection, var. temp.	**7250 / ***	psi	ISO 178
Flexural strength, var. temp.	**13100 / ***	psi	ISO 178

Flexural strain at flexural strength, var. temp.	**10 / ***	%	ISO 178
Flexural strain at break, var. temp.	**N / ***	%	ISO 178

Thermal properties	dry / cond	Unit	Test Standard
Glass transition temperature, DSC	**270 / ***	°F	ISO 11357-1/-2
Temp. of deflection under load A, 1.80 MPa	**216 / ***	°F	ISO 75-1/-2
Temp. of deflection under load B, 0.45 MPa	**248 / ***	°F	ISO 75-1/-2
Vicat softening temperature A, 10 N, 50 K/h	**270 / ***	°F	ISO 306
Vicat softening temperature B, 50 N, 50 K/h	**257 / ***	°F	ISO 306
Coeff. of linear therm. expansion, 23°C to 55 °C, parallel	**5.0E-5 / ***	in/in/°F	ISO 11359-1/-2
Coeff. of linear therm. expansion, 23°C to 55 °C, normal	**5.0E-5 / ***	in/in/°F	ISO 11359-1/-2

Physical properties	dry / cond	Unit	Test Standard
Density	**1.02 / -**	g/cm³	ISO 1183
Water absorption	**3.5 / ***	%	Sim. to ISO 62
Humidity absorption	**1.5 / ***	%	Sim. to ISO 62
Shore D hardness	**81**[b] **/ -**	-	ISO 7619-1
Ball indentation hardness	**16000 / -**	psi	ISO 2039-1
Density	**1.02**	g/cm³	ASTM D 792

b: 3 seconds

Burning Behav.	dry / cond	Unit	Test Standard
Burning behav. at 1.5 mm nom. thickn.	**HB / ***	class	IEC 60695-11-10
Thickness tested	**0.0630 / ***	in	-
Burning behav. at thickness h	**HB / ***	class	IEC 60695-11-10
Thickness tested	**0.0315 / ***	in	-
Glow Wire Flammability Index (GWFI)	**1760**	°F	IEC 60695-2-12
GWFI - thickness tested	**0.0394**	in	-
Glow Wire Ignition Temperature (GWIT)	**1520**	°F	IEC 60695-2-13

GWIT - thickness tested	**0.0394**	in	-

Electrical properties	dry / cond	Unit	Test Standard
Volume resistivity, V	**1E13 / -**	Ohm*m	IEC 62631-3-1
Surface resistance, RSD	**1E14 / -**	Ohm	IEC 62631-3-2
Surface resistance, RSA	**1E14 / -**	Ohm	IEC 62631-3-2
Surface resistivity, A	**1E15 / -**	Ohm/sq	IEC 62631-3-2
Relative permittivity, 100Hz	**3.4 / -**	-	IEC 62631-2-1
Relative permittivity, 1MHz	**3.3 / -**	-	IEC 62631-2-1
Dissipation factor, 100Hz	**130 / -**	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	**215 / -**	E-4	IEC 62631-2-1
CTI, test solution A, 50 drops value	**600 / -**	-	IEC 60112
Assessment of the insulation group	**I**	-	DIN EN 60664-1

Optical properties	dry	Unit	Test Standard
Haze	**2**	%	ASTM D 1003
Haze Thickness tested	**0.0787**	in	-
Light Transmittance	**92**	%	ASTM D 1003
Light Transmittance Thickness tested	**0.0787**	in	ASTM D 1003

Rheological properties	dry / cond	Unit	Test Standard
Melt volume-flow rate, MVR	**30 / ***	cm^3/10min	ISO 1133
Temperature	**275 / ***	°C	-
Load	**5 / ***	kg	-
Molding shrinkage, parallel	**0.5 / ***	%	ISO 294-4, 2577
Molding shrinkage, normal	**0.6 / ***	%	ISO 294-4, 2577
Mold temperature	**176 / ***	°F	-
Melt temperature	**536 / ***	°F	-
Flow length, flow spiral	**12.4**	in	Evonik standard

TROGAMID® CX

Flow cross section	**6 x 2**	mm^2	Evonik standard
Mold temperature, flow spiral	**176**	°F	Evonik standard
Melt temperature, flow spiral	**536**	°F	Evonik standard
Injection pressure, flow spiral	**14500**	psi	Evonik standard

Polymer analytics	dry / cond	Unit	Test Standard
Viscosity number	**3600 / ***	in^3/lb	ISO 307, 1157, 1628

Test specimen production	dry	Unit	Test Standard
Injection Molding, melt temperature	**536**	°F	ISO 294
Injection Molding, mold temperature	**176**	°F	ISO 294
Injection Molding, injection velocity	**7.87**	in/s	ISO 294
Injection Molding, pressure at hold	**10200**	psi	ISO 294

Characteristics

Applications
Electrical and Electronical, (Sun-) glasses, Hygiene and cosmetics

Processing
Film extrusion, Profile extrusion

Special Characteristics
Halogen-free, Phosphorus-free, PTFE-free, Amorphous, Low viscosity

Features
Non-corrosive

Color
Natural color

Delivery form
Spherical pellets

Chemical Media Resistance

Alcohols

- ✖ Isopropyl alcohol (23°C)
- ✖ Methanol (23°C)
- ✖ Ethanol (23°C)

Ketones

- ✖ Acetone (23°C)

Salt solutions

- ✔ Sodium Chloride solution (10% by mass) (23°C)
- ✔ Sodium Carbonate solution (20% by mass) (23°C)
- ✔ Sodium Carbonate solution (2% by mass) (23°C)

Other

- ✔ Water (23°C)

Rheological calculation properties	dry	Unit	Test Standard
Density of melt	**56.2**	lb/ft^3	-
Thermal conductivity of melt	**1.73**	BTU in/(hr ft^2 °F)	-
Min. mold temperature	**140**	°F	-
Max. mold temperature	**212**	°F	-
Min. melt temperature	**500**	°F	-
Max. melt temperature	**572**	°F	-