Ticona
Performance Driven Solutions™

CELCON® M90™ | POM | Unfilled

Description

Celcon acetal copolymer grade M90™ is a medium viscosity polymer providing optimum performance in general purpose injection molding and extrusion of thin walled tubing and thin gauge film. This grade provides overall excellent performance in many applications.

Chemical abbreviation according to ISO 1043-1: POM

Please also see Hostaform® C 9021.

Physical properties	Value	Unit	Test Standard
Density	**1410**	kg/m³	ISO 1183
Melt volume rate (MVR)	**8**	cm³/10min	ISO 1133
MVR test temperature	**190**	°C	ISO 1133
MVR test load	**2.16**	kg	ISO 1133
Mold shrinkage - parallel	**2**	%	ISO 294-4
Mold shrinkage - normal	**1.9**	%	ISO 294-4
Water absorption (23°C-sat)	**0.75**	%	ISO 62
Humidity absorption (23°C/50%RH)	**0.2**	%	ISO 62

Mechanical properties	Value	Unit	Test Standard
Tensile modulus (1mm/min)	**2760**	MPa	ISO 527-2/1A
Tensile stress at yield (50mm/min)	**66**	MPa	ISO 527-2/1A
Tensile strain at yield (50mm/min)	**10**	%	ISO 527-2/1A
Tensile creep modulus (1h)	**2450**	MPa	ISO 899-1
Tensile creep modulus (1000h)	**1350**	MPa	ISO 899-1
Flexural modulus (23°C)	**2550**	MPa	ISO 178
Charpy impact strength @ 23°C	**188.0**	kJ/m²	ISO 179/1eU
Charpy impact strength @ -30°C	**181.0**	kJ/m²	ISO 179/1eU
Charpy notched impact strength @ 23°C	**6.0**	kJ/m²	ISO 179/1eA
Charpy notched impact strength @ -30°C	**6.0**	kJ/m²	ISO 179/1eA
Notched impact strength (Izod) @ 23°C	**5.7**	kJ/m²	ISO 180/1A

Thermal properties	Value	Unit	Test Standard
Melting temperature (10°C/min)	**165**	°C	ISO 11357-1,-2,-3
DTUL @ 1.8 MPa	**101**	°C	ISO 75-1/-2
DTUL @ 0.45 MPa	**158**	°C	ISO 75-1/-2
Coeff.of linear therm. expansion (parallel)	**1.2**	E-4/°C	ISO 11359-2
Coeff.of linear therm. expansion (normal)	**1.2**	E-4/°C	ISO 11359-2

Electrical properties	Value	Unit	Test Standard
Volume resistivity	**8E12**	Ohm*m	IEC 60093
Surface resistivity	**3E16**	Ohm	IEC 60093

Test specimen production	Value	Unit	Test Standard
Processing conditions acc. ISO	**9988-2**	-	Internal

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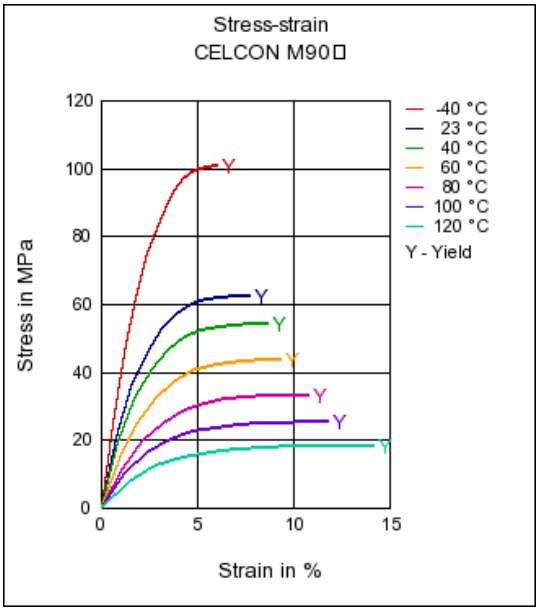
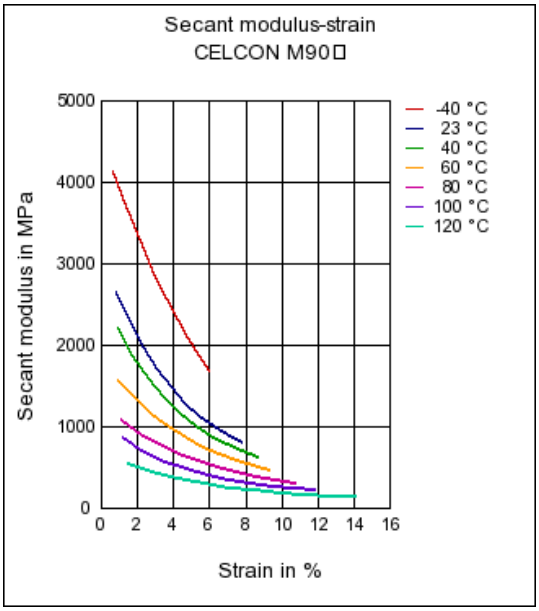
Rheological Calculation properties	Value	Unit	Test Standard
Density of melt	**1200**	kg/m³	Internal
Thermal conductivity of melt	**0.155**	W/(m K)	Internal
Specific heat capacity of melt	**2210**	J/(kg K)	Internal
Eff. thermal diffusivity	**4.85E-8**	m²/s	Internal
Ejection temperature	**165**	°C	Internal

Stress-strain



Secant modulus-strain



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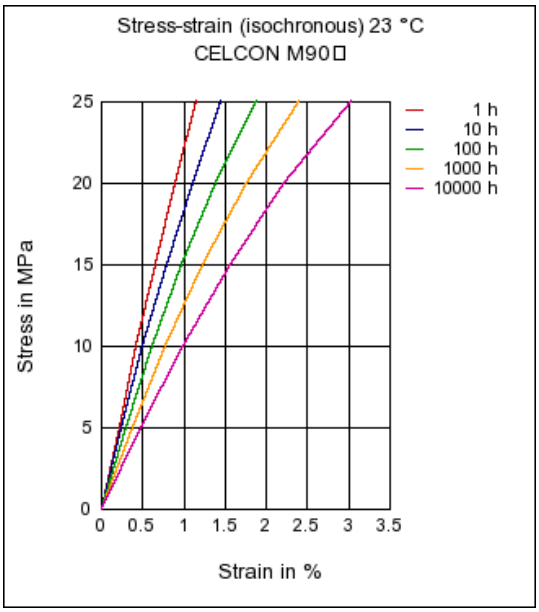
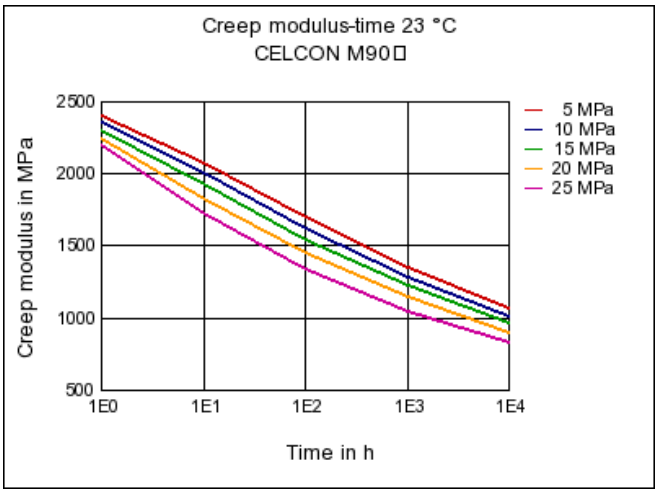
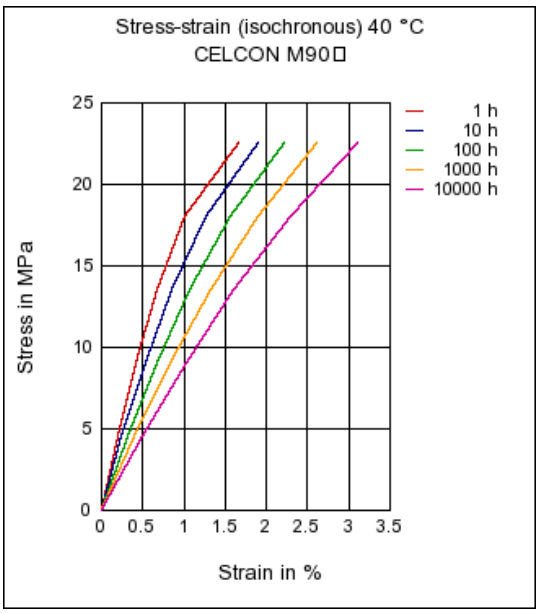
Stress-strain (isochronous)



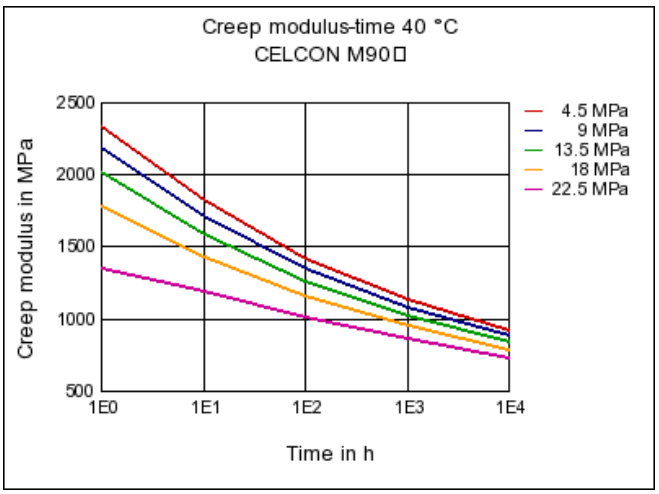
Creep modulus-time



Stress-strain (isochronous)



Creep modulus-time



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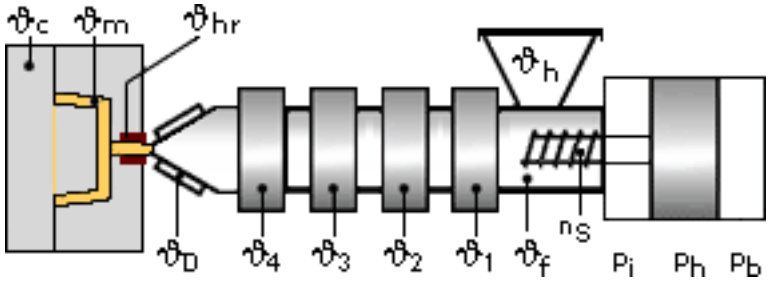
Typical injection moulding processing conditions



Pre Drying:

Drying is not normally required. If material has come in contact with moisture through improper storage or handling or through regrind use, drying may be necessary to prevent splay and odor problems.

Drying time: 3 h

Drying temperature: 80 - 100 °C

Temperature:

	ϑManifold	ϑMold	ϑMelt	ϑNozzle	ϑZone4	ϑZone3	ϑZone2	ϑZone1
min (°C)	180	80	180	190	190	180	180	170
max (°C)	200	120	200	200	200	190	190	180

Pressure:

	Inj press	Hold press	Back pressure
min (bar)	600	600	0
max (bar)	1200	1200	5

Speed:

Injection speed: slow-medium

Injection Molding

Standard reciprocating screw injection molding machines with a high compression screw (minimum 3:1 and preferably 4:1) and low back pressure (0.35 Mpa/50 PSI) are favored. Using a low compression screw (I.E. general purpose 2:1 compression ratio) can result in unmelted particles and poor melt homogeneity. Using a high back pressure to make up for a low compression ratio may lead to excessive shear heating and deterioration of the material.

Melt Temperature: Preferred range 182-199 C (360-390 F). Melt temperature should never exceed 230 C (450 F).

Mold Surface Temperature: Preferred range 82-93 C (180-200 F) especially with wall thickness less than 1.5 mm (0.060 in.). May require mold temperature as high as 120 C (250 F) to reproduce mold surface or to assure minimal molded in stress. Wall thickness greater than 3mm (1/8 in.) may use a cooler (65 C/150 F) mold surface temperature and wall thickness over 6mm (1/4 in.) may use a cold mold surface down to 25 C (80 F). In general, mold surface temperatures lower than 82 C (180 F) may hinder weld line formation and produce a hazy surface or a surface with flow lines, pits and other included defects that can hinder part performance.

Film Extrusion

Standard extruders with a length to diameter ratio of at least 20:1 are recommended. The screw should be a high compression ratio of at least 3:1 and preferably 4:1 to assure good melting and melt homogeneity. The design should be approximately 35% each for feed and metering sections with the remaining 30% as the transition zone.

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Melt temperature: 160-220 C (320-430 F)

Other Extrusion

Standard extruders with a length to diameter ratio of at least 20:1 are recommended. The screw should be a high compression ratio of at least 3:1 and preferably 4:1 to assure good melting and uniform melt homogeneity. The design should be approximately 35% each for the feed and metering sections with the remaining 30% as transition zone.

Melt temperature 180-220 C (355-430F)

Profile Extrusion

Standard extruders with a length to diameter ratio of at least 20:1 are recommended. The screw should be a high compression ratio of at least 3:1 and preferably 4:1 to assure good melting and melt homogeneity. The design should be approximately 35% each for feed and metering sections with the remaining 30% as the transition zone.

Melt temperature: 180-220 C (360-430 F).

Sheet Extrusion

Standard extruders with a length to diameter ratio of at least 20:1 are recommended. The screw should be a high compression ratio (at least 3:1 and preferably 4:1) to assure good melting and uniform melt homogeneity. The screw design should be approximately 35% each for the feed and metering sections with the remaining 30% as the transition zone.

Melt temperature 180-190 C (355-375 F).

Blow Molding

Consult product information services.

Calandering

Consult product information services.

Compression Molding

Consult product information services.

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General Disclaimer

NOTICE TO USERS: Values shown are based on testing of laboratory test specimens and represent data that fall within the standard range of properties for natural material. These values alone do not represent a sufficient basis for any part design and are not intended for use in establishing maximum, minimum, or ranges of values for specification purposes. Colorants or other additives may cause significant variations in data values.
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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