

## CELCON® M90™ - POM

### 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/m <sup>3</sup>	ISO 1183
Melt volume rate, MVR	8	cm <sup>3</sup> /10min	ISO 1133
MVR temperature	190	°C	ISO 1133
MVR load	2,16	kg	ISO 1133
Molding shrinkage, parallel	2,0	%	ISO 294-4, 2577
Molding shrinkage, normal	1,9	%	ISO 294-4, 2577
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	2760	MPa	ISO 527-2/1A
Tensile stress at yield, 50mm/min	65	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
Flexural stress at 3.5% strain	73	MPa	ISO 178
Charpy impact strength, 23°C	188	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy impact strength, -30°C	181	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy notched impact strength, 23°C	6	kJ/m <sup>2</sup>	ISO 179/1eA
Charpy notched impact strength, -30°C	6	kJ/m <sup>2</sup>	ISO 179/1eA
Izod impact notched, 23°C	5,7	kJ/m <sup>2</sup>	ISO 180/1A
Izod impact notched, -30°C	5,5	kJ/m <sup>2</sup>	ISO 180/1A
Compressive stress at 1% strain	26	MPa	ISO 604
Compressive stress at 6% strain	88	MPa	ISO 604

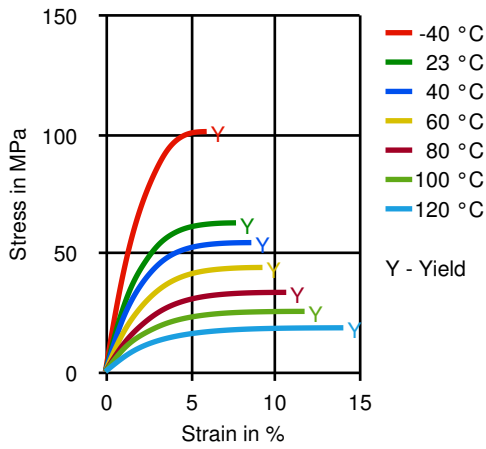
Thermal properties	Value	Unit	Test Standard
Melting temperature, 10°C/min	166	°C	ISO 11357-1/-3
DTUL at 1.8 MPa	101	°C	ISO 75-1, -2
DTUL at 0.45 MPa	158	°C	ISO 75-1, -2
Vicat softening temperature, 50°C/h 50N	161	°C	ISO 306
Coeff. of linear therm expansion, parallel	1,2	E-4/°C	ISO 11359-2
Coeff. of linear 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

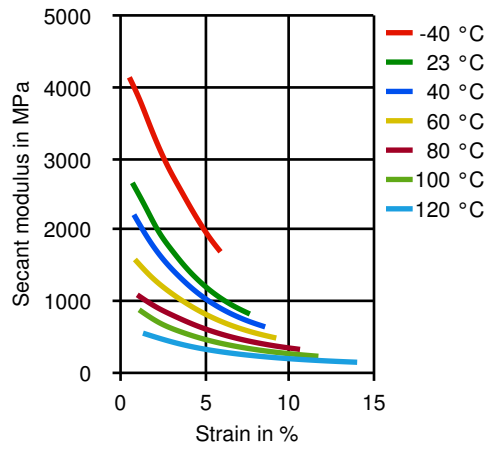
Rheological calculation properties	Value	Unit	Test Standard
Density of melt	1200	kg/m <sup>3</sup>	Internal
Thermal conductivity of melt	0,155	W/(m K)	Internal
Spec. heat capacity melt	2210	J/(kg K)	Internal
Eff. thermal diffusivity	4,85E-8	m <sup>2</sup> /s	Internal
Ejection temperature	140	°C	Internal

**Diagrams**

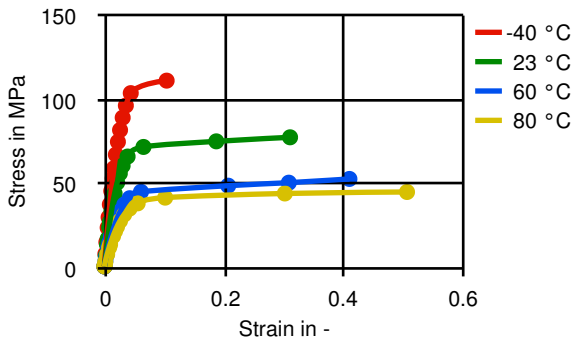
**Stress-strain**



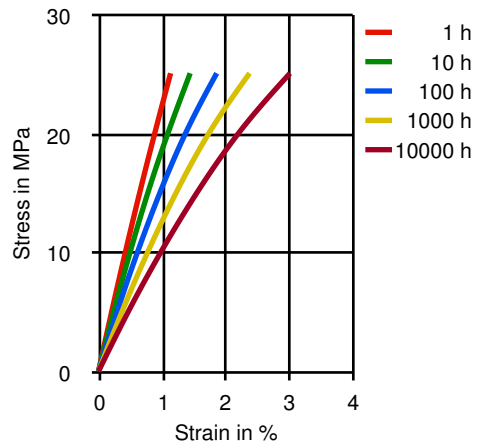
**Secant modulus-strain**



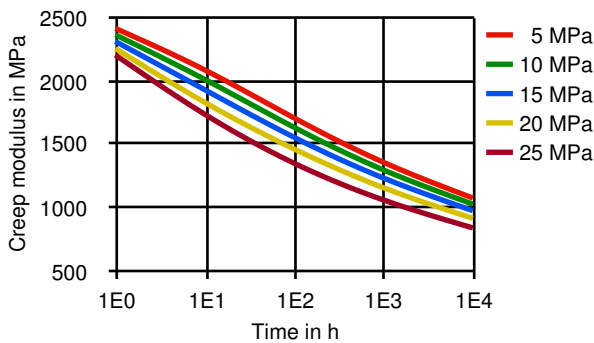
**True Stress-strain**



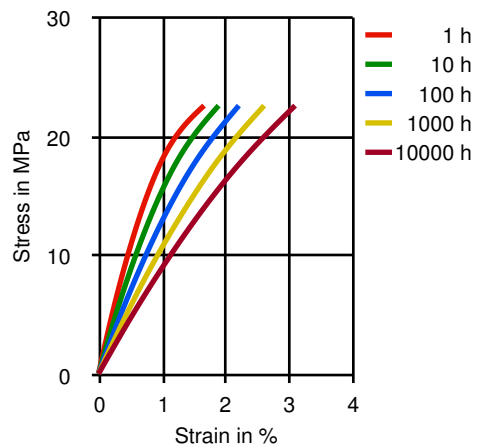
**Stress-strain (isochronous) 23 °C**



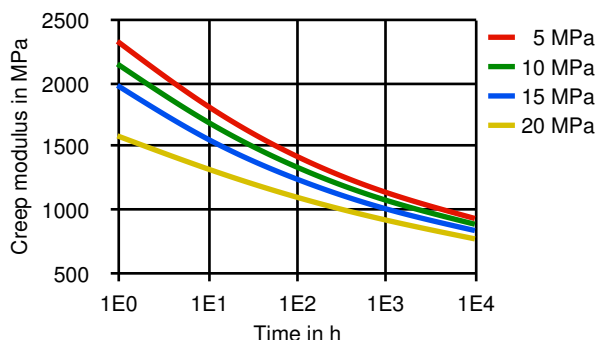
**Creep modulus-time 23 °C**



**Stress-strain (isochronous) 40 °C**



**Creep modulus-time 40° C**



**Typical injection moulding processing conditions**

	Value	Unit	Test Standard
<b>Pre Drying</b>			
Drying time	3 - 4	h	-
Drying temperature	100 - 120	°C	-
<b>Temperature</b>			
Zone1 temperature	170 - 180	°C	-
Zone2 temperature	180 - 190	°C	-
Zone3 temperature	180 - 190	°C	-
Zone4 temperature	190 - 200	°C	-
Nozzle temperature	190 - 200	°C	-
Melt temperature	180 - 200	°C	-
Mold temperature	80 - 120	°C	-
Hot runner temperature	180 - 200	°C	-
<b>Pressure</b>			
Back pressure max.	40	bar	-
<b>Speed</b>			
Injection speed	slow-medium	-	-
<b>Other</b>			
Flow temperature	174	°C	Internal

**Other text information**

**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.

**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.

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

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metering sections with the remaining 30% as transition zone.

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

### Profile extrusion

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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

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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

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Consult product information services.

### Calandering

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Consult product information services.

### Compression molding

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Consult product information services.

## Characteristics

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### Product Categories

Unfilled

### Delivery Form

Pellets

### Processing

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Blow molding, Calandering, Film extrusion, Injection molding, Other extrusion, Sheet extrusion

### Contact Information

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### General Disclaimer

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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. To the best of our knowledge, the information contained in this publication is accurate; however, we do not assume any liability whatsoever for the accuracy and completeness of such information. The information contained in this publication should not be construed as a promise or guarantee of specific properties of our products. It is the sole responsibility of the users to investigate whether any existing patents are infringed by the use of the materials mentioned in this publication. Moreover, there is a need to reduce human exposure to many materials to the lowest practical limits in view of possible adverse effects. To the extent that any hazards may have been mentioned in this publication, we neither suggest nor guarantee that such hazards are the only ones that exist. We recommend that persons intending to rely on any recommendation or to use any equipment,

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