Celanese
The chemistry inside innovation™

CELCON® M90 - POM

Description

General purpose, good optimization of properties
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 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/m²	ISO 179/1eU
Charpy impact strength, -30°C	**181**	kJ/m²	ISO 179/1eU
Charpy notched impact strength, 23°C	**6**	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -30°C	**6**	kJ/m²	ISO 179/1eA
Izod impact notched, 23°C	**5.7**	kJ/m²	ISO 180/1A
Izod impact notched, -30°C	**5.5**	kJ/m²	ISO 180/1A
Compressive stress at 1% strain	**26**	MPa	ISO 604
Compressive stress at 6% strain	**88**	MPa	ISO 604

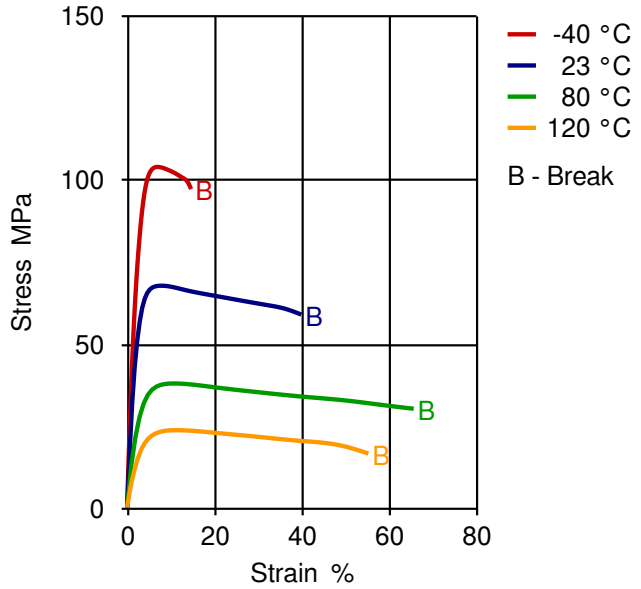
Thermal properties	Value	Unit	Test Standard
Melting temperature, 10°C/min	**166**	°C	ISO 11357-1/-3
DTUL at 1.8 MPa	**101**	°C	ISO 75-1, -2
DTUL at 0.45 MPa	**158**	°C	ISO 75-1, -2
Vicat softening temperature, 50°C/h 50N	**161**	°C	ISO 306
Coeff. of linear therm expansion, parallel	**1.2**	E-4/°C	ISO 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

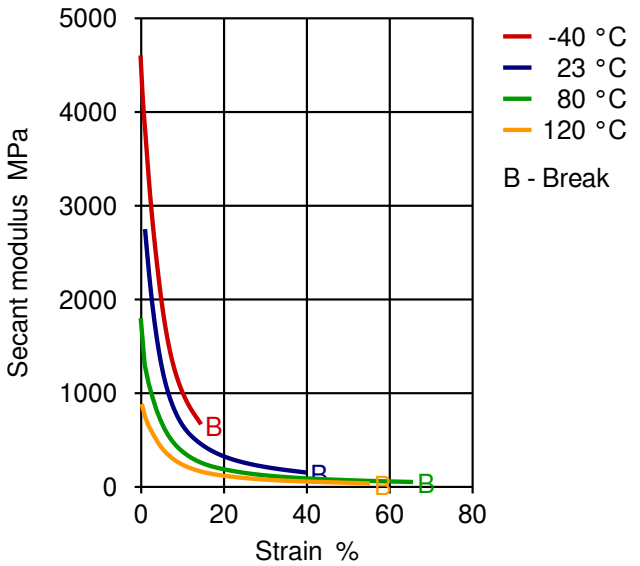
Rheological calculation properties	Value	Unit	Test Standard
Density of melt	**1200**	kg/m³	Internal
Thermal conductivity of melt	**0.155**	W/(m K)	Internal
Spec. heat capacity melt	**2210**	J/(kg K)	Internal
Eff. thermal diffusivity	**4.85E-8**	m²/s	Internal
Ejection temperature	**140**	°C	Internal

Diagrams

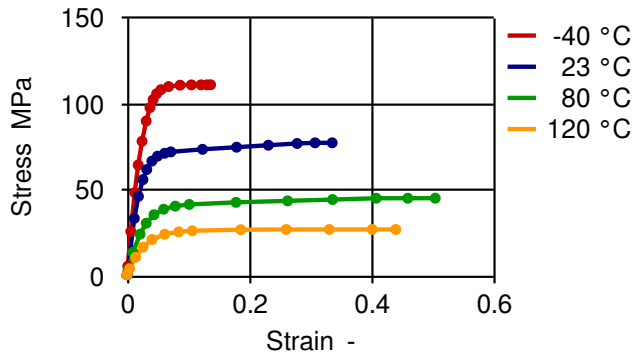
Stress-strain



Secant modulus-strain

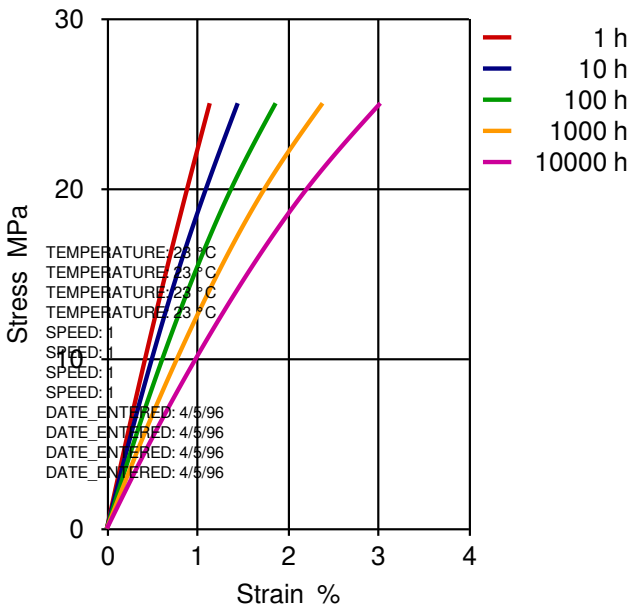


True Stress-strain

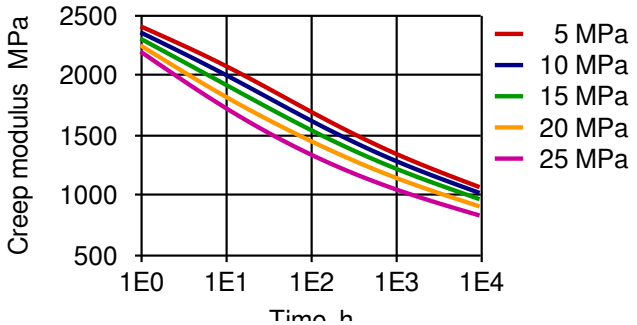


-40 °C yield at 0.06806 strain, 109.249 stress
23 °C yield at 0.07175 strain, 71.324 stress
80 °C yield at 0.10200 strain, 40.814 stress
120 °C yield at 0.10702 strain, 25.530 stress

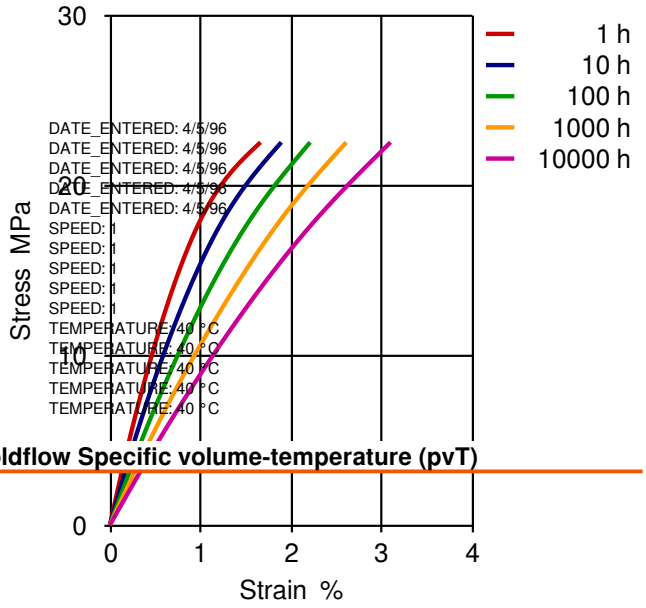
Stress-strain (isochronous) 23 °C



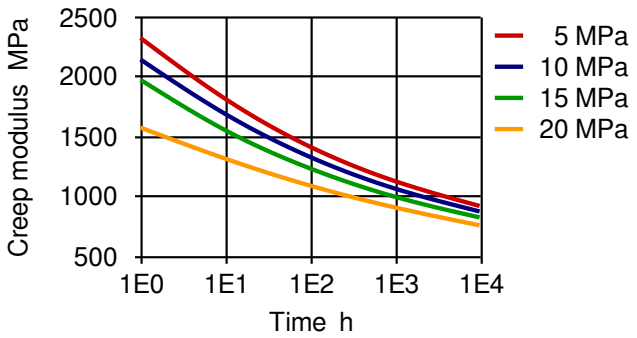
Creep modulus-time 23°C



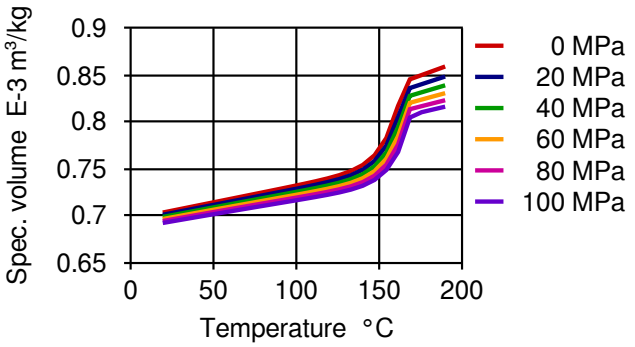
Stress-strain (isochronous) 40°C



Creep modulus-time 40°C



Moldflow Specific volume-temperature (pvT)



Indirect Dilatometry

Typical injection moulding processing conditions

Pre Drying	Value	Unit
Drying time	**3 - 4**	h
Drying temperature	**100 - 120**	°C

Temperature	Value	Unit
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 - 190**	°C
Mold temperature	**80 - 120**	°C
Hot runner temperature	**180 - 200**	°C

Pressure	Value	Unit
Back pressure max.	**40**	bar

Speed	Value
Injection speed	**slow-medium**

Other	Value	Unit	Test Standard
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 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.

Characteristics

Product Categories

Unfilled

Processing

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

Delivery Form

Pellets

Other Approvals

OEM	Specification
BJEV	Q- BJEV 01.59
Bosch	N28 BN22-O034 NAT & BLK
Continental	30.5251-0367.7
Continental	TST N 055 54.07
Chrysler (FCA)	CPN 1532 NAT
Chrysler (FCA)	CPN 1586 BLK (pre-compounded or Salt & Pepper)
Chrysler (FCA)	CPN 3766 CANOD
FORD	WSK-M4D635-A2 NAT & BLK
Geely	Q JLY J7110235B-2018
GM	GMP.POM.005 NATURAL & BLACK
GM	GMW22P-POM-C2
GWM	MP05-01
Hyundai	MS237-09, Type A
Nissan	POM-IC2-1
Renault	IP13g, UB15, UB03f, EP03a
Renault	PMR2020 (EP03-3)
SAIC MOTOR	SMTC-5-310-020
Tesla	TM-1005 BLK
Toyota	TSM 5515G-1B
VW/AUDI	TL52476 NAT & BLK

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