CELCON® M15HP

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Celcon® acetal copolymer grade M15HP is a creep resistant, high viscosity polymer providing optimum performance in injection molding. This grade provides overall excellent performance in applications requiring high stiffness. Chemical abbreviation according to ISO 1043-1: POM

Product information

Resin Identification	POM		ISO 1043
Part Marking Code	>POM<		ISO 11469

Rheological properties

Melt volume-flow rate	1.3	cm^3/10min	ISO 1133
Temperature	374	°F	
Load	4.76	lb	
Molding shrinkage, parallel	2.3	%	ISO 294-4, 2577
Molding shrinkage, normal	1.9	%	ISO 294-4, 2577

Typical mechanical properties

Tensile modulus	406000	psi	ISO 527-1/-2
Tensile stress at yield, 50mm/min	9900	psi	ISO 527-1/-2
Tensile strain at yield, 50mm/min	16	%	ISO 527-1/-2
Flexural modulus	399000	psi	ISO 178
Compressive stress at 1% strain	4210	psi	ISO 604
Charpy impact strength, 23°C	133	$ftlb/in^2$	ISO 179/1eU
Charpy impact strength, -30°C	105	$ftlb/in^2$	ISO 179/1eU
Charpy notched impact strength, 23°C	5.23	$ftlb/in^2$	ISO 179/1eA
Charpy notched impact strength, -30°C	4.04	$ftlb/in^2$	ISO 179/1eA
Izod notched impact strength, 23°C	4.52	$ftlb/in^2$	ISO 180/1A
Hardness, Rockwell, M-scale	84		ISO 2039-2
Poisson's ratio	0.401		

Thermal properties

Melting temperature, 10°C/min	343	°F	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	214	°F	ISO 75-1/-2
Temperature of deflection under load, 0.45 MPa	316	°F	ISO 75-1/-2
Vicat softening temperature, 50°C/h 10N	333	°F	ISO 306
Coefficient of linear thermal expansion (CLTE), parallel	0.61	E-4/°F	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal	0.667	E-4/°F	ISO 11359-1/-2

Physical/Other properties

Humidity absorption, 2mm	0.2	%	Sim. to ISO 62
Water absorption, 2mm	0.75	%	Sim. to ISO 62
Density	0.0509	lb/in^3	ISO 1183

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Injection

Drying Recommended	no	
Drying Temperature	212	°F
Drying Time, Dehumidified Dryer	3 - 4	h
Processing Moisture Content	≤0.2	%
Melt Temperature Optimum	401	°F
Min. melt temperature	401	°F
Max. melt temperature	410	°F
Max. screw tangential speed	≤0.3	m/s
Mold Temperature Optimum	221	°F
Min. mold temperature	194	°F
Max. mold temperature	248	°F
Hold pressure range	8700 - 17400	psi
Hold Pressure Time (h is the max. wall thickness of the part in mm)	$2h^2$-3	s
Back pressure	580	psi
Ejection temperature	277	°F

Automotive

OEM	STANDARD	ADDITIONAL INFORMATION
Ford	WSK-M4D635-A1	Natural & Black
Stellantis - Chrysler	MS.50095 / CPN-4155	Natural

Characteristics

Processing	Injection Molding, Film Extrusion, Extrusion, Other Extrusion, Blow Molding, Calendering, Compression molding
Special characteristics	High viscosity, Improved creep

Additional information

Injection molding

Preprocessing

Drying is generally not required because Celcon® and Hostaform® acetal copolymer materials are not hydroscopic nor are they degraded by moisture during processing. Excessive moisture can lead to splay (silver streaking) in molded parts. For better uniformity in molding especially when using regrind or material that has been stored in containers open to the atmosphere, recommended drying conditions are 80 c (180 F) for three hours. Desiccant hopper dryers are not required. Max. water content = 0.35%.

Processing

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 with a 2:1 compression ratio) can result in unmelted particles and poor thermal homogeneity. Using a high back pressure to make up for a low

compression ratio may lead to excessive shear heating and deterioration of the Celcon material.

Melt temperature: Preferred range 205-220 C (400-430 F) Melt temperature should never exceed 230 C (450 F).
Mold surface temperature: preferred range 93-121 C (200-250 F) especially with wall thickness less than 1.5 mm (0.060 in.). Wall thickness greater than 3 mm (1/8 in.) may use a cooler (82 C/180 F) mold surface temperature and wall thickness over 6 mm (1/4 in.) may use a cold mold surface temperature as low as 25 C (80 F). In general, mold surface temperatures lower than 82 C (180 F) may produce a hazy surface or a surface with flow lines, pits and other included defects.

Postprocessing

Postprocessing conditioning and moisturizing not required. It may be necessary to fixture large or complicated parts with varying wall thickness to prevent warpage while cooling to ambient temperature.

Film extrusion

Preprocessing

Drying is generally not required because Celcon materials are not hydroscopic nor are they degraded by moisture during processing. Excessive moisture can cause surface defects on the extruded film. For better uniformity especially when using regrind or material that has been stored in containers open to the atmosphere, recommended drying conditions are 3 Hrs. at 80 C (180 F). Desiccant hopper dryers are not required. Max. moisture content = 0.35%.

Processing

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)

Postprocessing

Postprocessing conditioning or moisturizing is not required.

Profile extrusion

Preprocessing

Drying is generally not required because Celcon materials are not hydroscopic nor are they degraded by moisture during processing. Excessive moisture can cause surface defects on the extrusion. For better uniformity especially when using regrind or material that has been stored in containers open to the atmosphere, recommended drying conditions are 3 Hrs. at 80 C (180 F). Desiccant hopper dryers are not required. Max. moisture content = 0.035%.

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Processing

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).

Postprocessing

Postprocessing or moisturizing is not required. For thick walled extrusions (>3 mm or 1/8 in.), annealing is recommended to reduce internal stresses.

Annealing temperature: 130-140 C (265-285 F)
Annealing time: 10 min/mm thickness

Blow molding

Preprocessing

Consult product information services.

Processing

Consult product information services.

Postprocessing

Consult product information services.

Calandering

Preprocessing

Consult product information services.

Processing

Consult product information services.

Postprocessing

Consult product information services.

Compression molding

Preprocessing

Consult product information services.

Processing

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Postprocessing

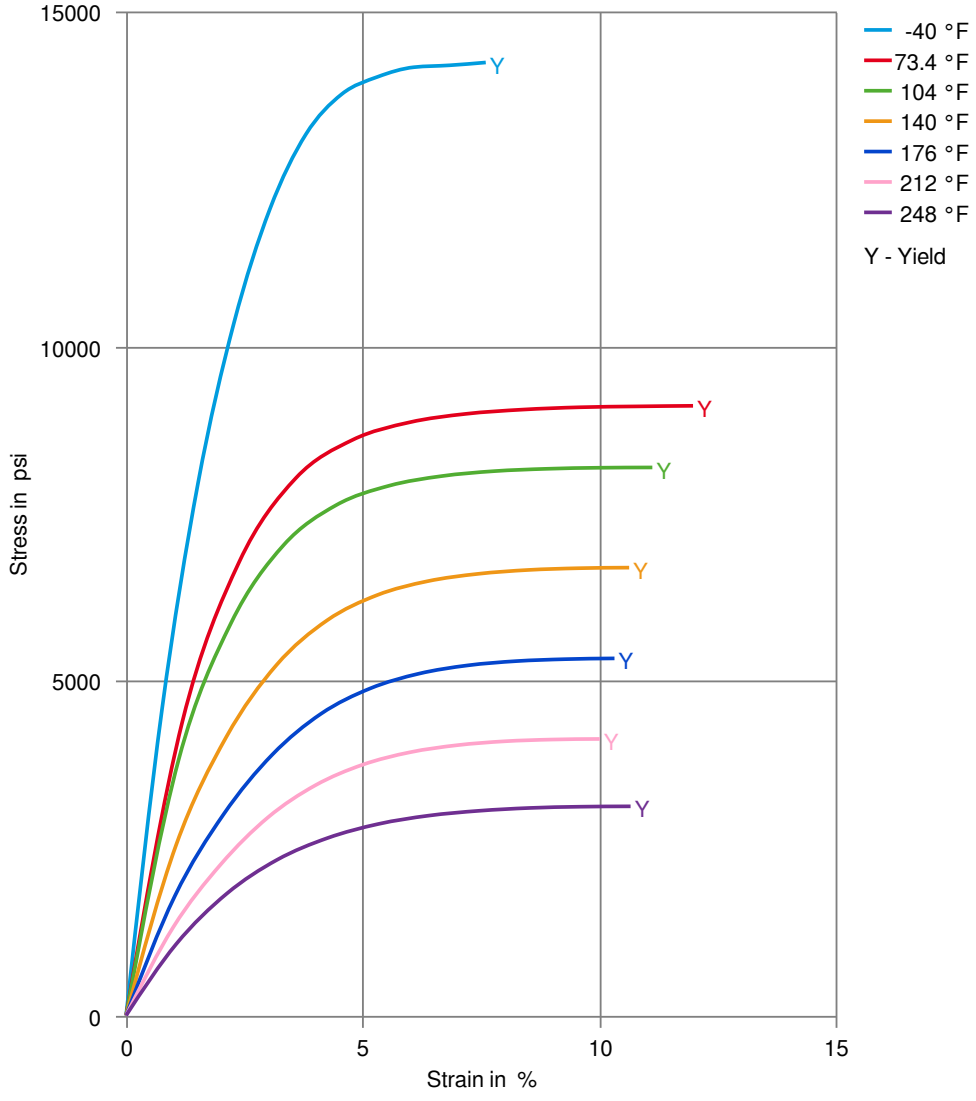
Consult product information services.

Processing Notes

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.

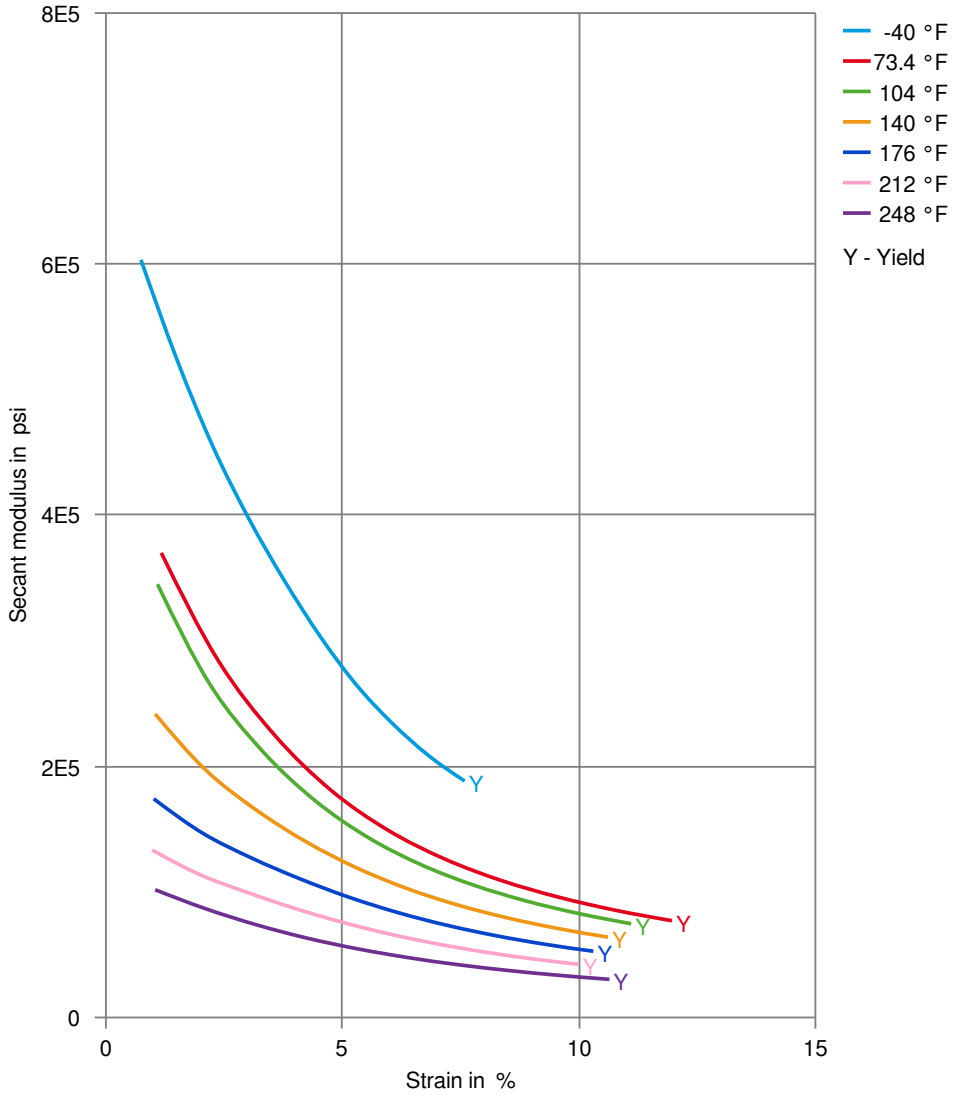
Stress-strain



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Secant modulus-strain



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