

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	190 °C	
Load	2.16 kg	
Moulding shrinkage, parallel	2.3 %	ISO 294-4, 2577
Moulding shrinkage, normal	1.9 %	ISO 294-4, 2577

Typical mechanical properties

Tensile modulus	2800 MPa	ISO 527-1/-2
Tensile stress at yield, 50mm/min	68 MPa	ISO 527-1/-2
Tensile strain at yield, 50mm/min	16 %	ISO 527-1/-2
Flexural modulus	2750 MPa	ISO 178
Compressive stress at 1% strain	29 MPa	ISO 604
Charpy impact strength, 23°C	280 kJ/m ²	ISO 179/1eU
Charpy impact strength, -30°C	220 kJ/m ²	ISO 179/1eU
Charpy notched impact strength, 23°C	11 kJ/m ²	ISO 179/1eA
Charpy notched impact strength, -30°C	8.5 kJ/m ²	ISO 179/1eA
Izod notched impact strength, 23°C	9.5 kJ/m ²	ISO 180/1A
Hardness, Rockwell, M-scale	84	ISO 2039-2
Poisson's ratio	0.401	

Thermal properties

Melting temperature, 10°C/min	173 °C	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	101 °C	ISO 75-1/-2
Temperature of deflection under load, 0.45 MPa	158 °C	ISO 75-1/-2
Vicat softening temperature, 50°C/h 10N	167 °C	ISO 306
Coefficient of linear thermal expansion (CLTE), parallel	110 E-6/K	ISO 11359-1/-2
Coefficient of linear thermal expansion (CLTE), normal	120 E-6/K	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	1410 kg/m ³	ISO 1183

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Injection

Drying Recommended	no
Drying Temperature	100 °C
Drying Time, Dehumidified Dryer	3 - 4 h
Processing Moisture Content	≤0.2 %
Melt Temperature Optimum	205 °C
Min. melt temperature	205 °C
Max. melt temperature	210 °C
Screw tangential speed	≤0.3 m/s
Mold Temperature Optimum	105 °C
Min. mould temperature	90 °C
Max. mould temperature	120 °C
Hold pressure range	60 - 120 MPa
Back pressure	4 MPa
Ejection temperature	136 °C

Additional information

Injection molding

Preprocessing

Drying is generally not required because Celcon® and Hostaform® acetal copolymer materials are not hygroscopic 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

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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 hygroscopic 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 hygroscopic 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%.

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

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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.

Calendering

Preprocessing

Consult product information services.

Processing

Consult product information services.

Postprocessing

Consult product information services.

Compression molding

Preprocessing

Consult product information services.

Processing

Consult product information services.

Postprocessing

Consult product information services.

Processing Notes

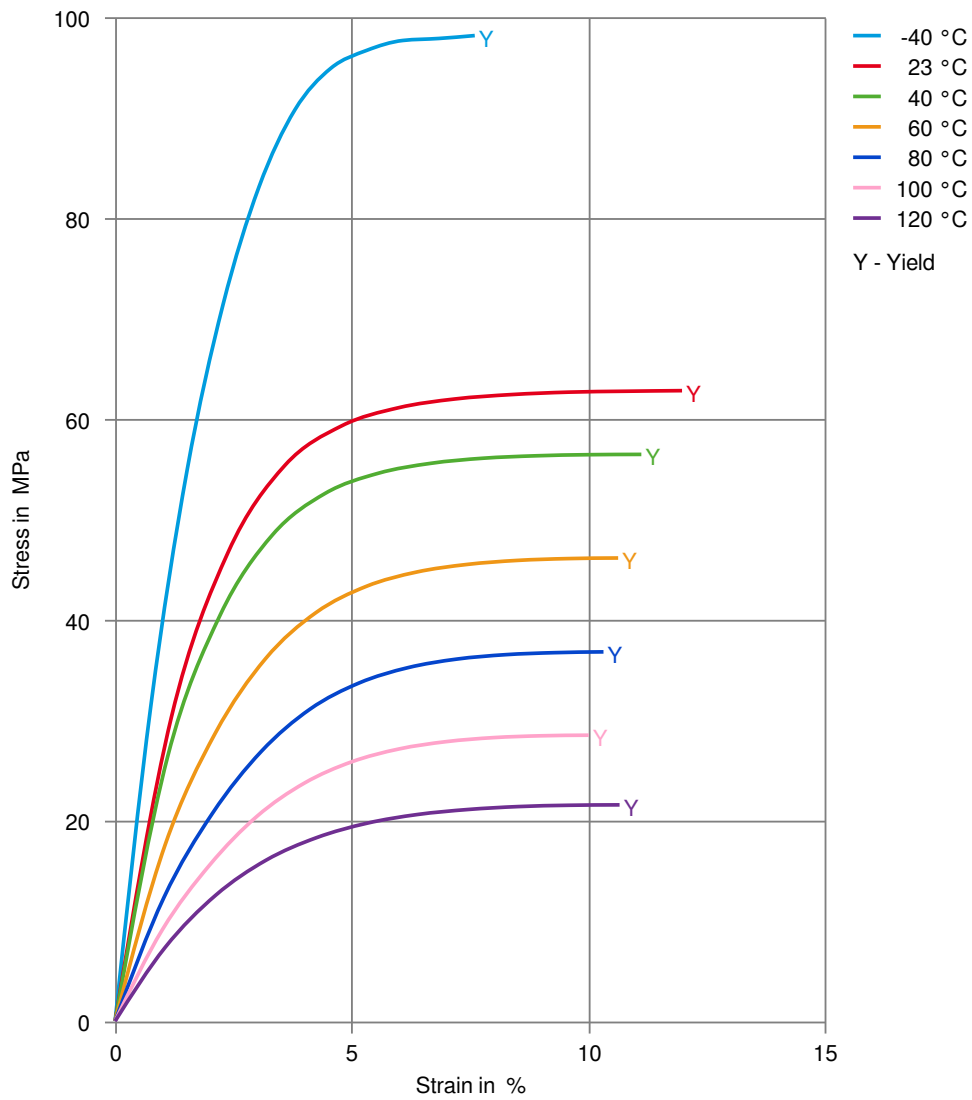
Pre-Drying

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.

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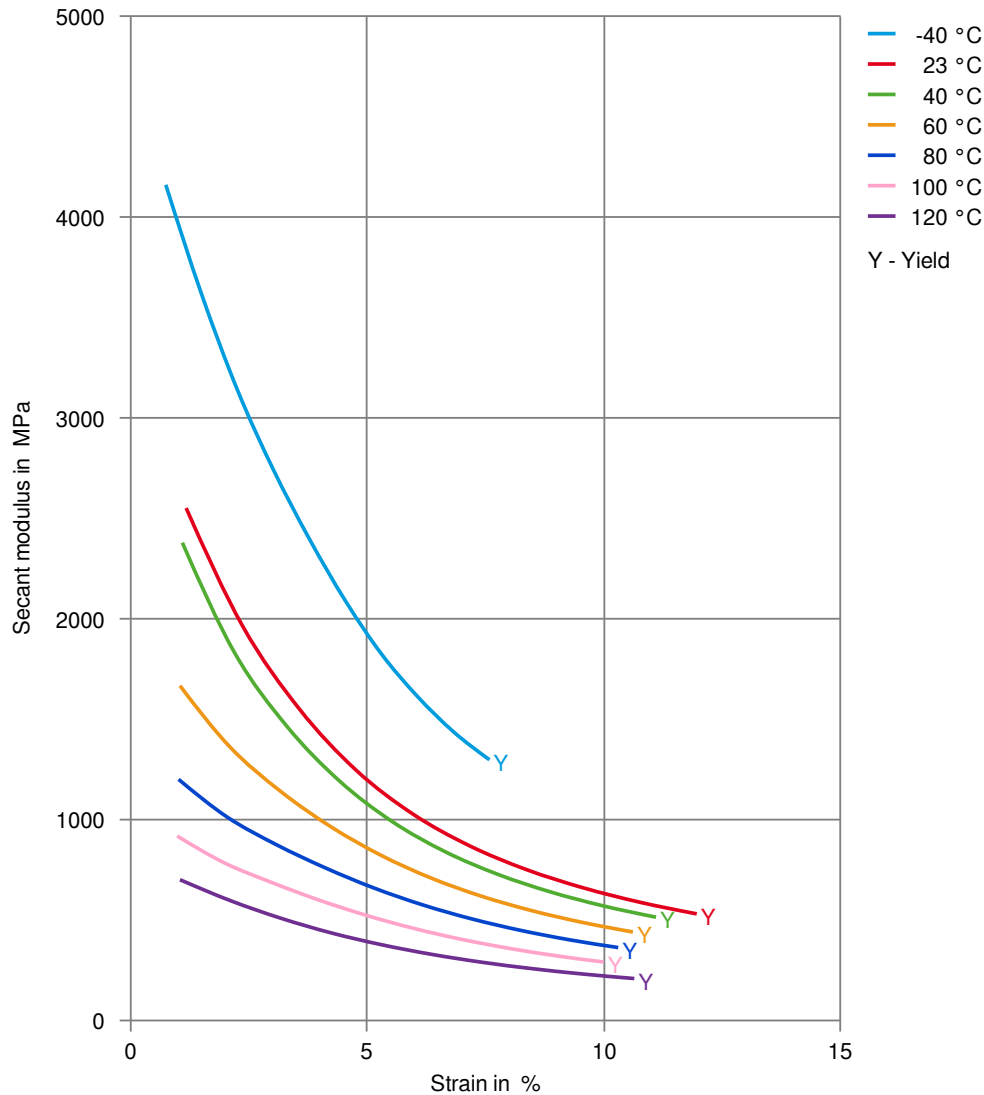
Stress-strain



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Secant modulus-strain



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. Colourants or other additives may cause significant variations in data values. Properties of moulded 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. Other than those products expressly identified as medical grade (including by MT® product designation or otherwise), Celanese's products are not intended for use in medical or dental implants. Regardless of any such product designation, 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, processing technique or material mentioned in this publication should satisfy themselves that they can meet all applicable safety and health standards. We strongly recommend that users seek and adhere to the manufacturer's current instructions for handling each material they use, and entrust the handling of such material to adequately trained personnel only. Please call the telephone numbers listed for additional technical information. Call Customer Services for the appropriate Materials Safety Data Sheets (MSDS) before attempting to process our products.