Celanese
The chemistry inside innovation™

CELCON® GC25T ECO-B

25% glass fibers, coupled for improved stiffness, high strength, improved fuel resistance
Celcon® GC25T is a 25% glass fiber coupled acetal copolymer grade. It offers higher strength than the standard Celcon® GC25A. Celcon® GC25T is also exceptionally resistant to fuel. It offers excellent resistance to transportation fuels especially oxygenated fuels. Chemical abbreviation according to ISO 1043-1: POM
ECO-B: Celcon® ECO-B is a POM-Copolymer with the same properties and performance as standard grades but produced with sustainability in mind. Using a mass-balance approach, biogenic feedstocks are used to offset the use of fossil-based raw materials and decrease greenhouse gas emissions. The process is audited and certified according to the ISCC Plus mass balance approach.

Rheological properties

Moulding shrinkage, parallel	0.7	%	ISO 294-4, 2577
Moulding shrinkage, normal	1.5	%	ISO 294-4, 2577

Typical mechanical properties

Tensile Modulus	8700	MPa	ISO 527-1/-2
Stress at break, 5mm/min	125	MPa	ISO 527-1/-2
Strain at break, 5mm/min	2.7	%	ISO 527-1/-2
Flexural Modulus	8500	MPa	ISO 178
Flexural Strength	190	MPa	ISO 178
Compressive stress at 1% strain	67	MPa	ISO 604
Charpy impact strength, 23°C	50	kJ/m²	ISO 179/1eU
Charpy impact strength, -30°C	55	kJ/m²	ISO 179/1eU
Charpy notched impact strength, 23°C	8.7	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -30°C	7.2	kJ/m²	ISO 179/1eA
Izod notched impact strength, 23°C	8	kJ/m²	ISO 180/1A
Poisson's ratio	0.41		

Thermal properties

Melting temperature, 10°C/min	165	°C	ISO 11357-1/-3
Temp. of deflection under load, 1.8 MPa	161	°C	ISO 75-1/-2
Vicat softening temperature, 50°C/h, 50N	161	°C	ISO 306
Coeff. of linear therm. expansion, parallel	27	E-6/K	ISO 11359-1/-2
Coeff. of linear therm. expansion, normal	125	E-6/K	ISO 11359-1/-2

Other properties

Humidity absorption, 2mm	0.2	%	Sim. to ISO 62
Water absorption, 2mm	0.8	%	Sim. to ISO 62
Density	1580	kg/m³	ISO 1183

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Injection

Drying Temperature	100 - 120	°C
Drying Time, Dehumidified Dryer	3 - 4	h
Max. mould temperature	90 - 120	°C
Back pressure	2	MPa
Injection speed	slow	

Characteristics

Additives	Biobased
Food contact	FDA 21 CFR

Additional information

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 Celcon 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 93-121 C (200-250 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 3 mm (1/8 in.) may use a cooler (65 C/150 F) mold surface temperature and wall thickness over 6 mm (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 produce a hazy surface or a surface with flow lines, pits and other included defects.

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)

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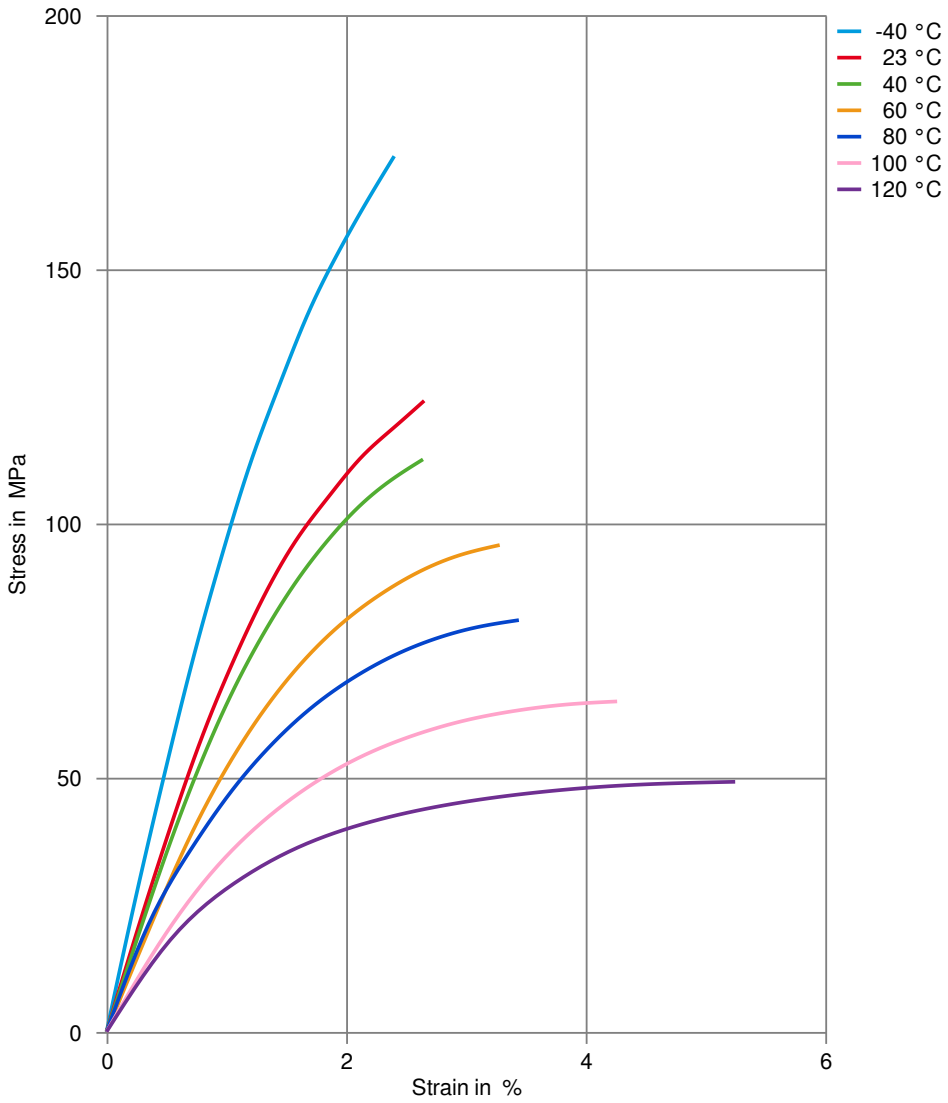
Stress-strain



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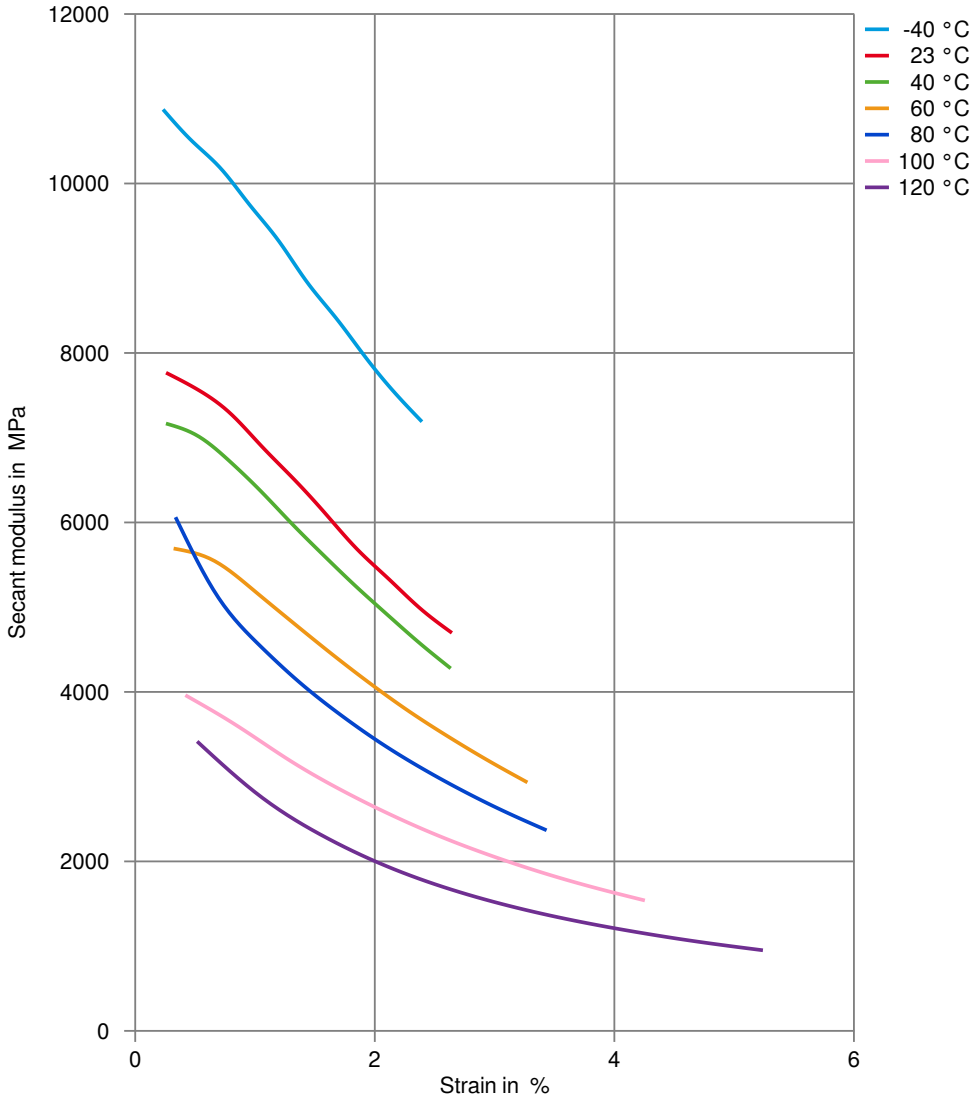
Secant modulus-strain



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Processing Texts

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 Celcon 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 93-121 C (200-250 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 3 mm (1/8 in.) may use a cooler (65 C/150 F) mold surface temperature and wall thickness over 6 mm (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 produce a hazy surface or a surface with flow lines, pits and other included defects.
Injection molding Preprocessing	Drying is generally not required because Celcon 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%.
Injection molding 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.

Chemical Media Resistance

Standard Fuels

- ✔ ISO 1817 Liquid 1 - E5, 60°C
- ✔ ISO 1817 Liquid 2 - M15E4, 60°C
- ✔ ISO 1817 Liquid 3 - M3E7, 60°C
- ✔ ISO 1817 Liquid 4 - M15, 60°C
- ✔ Standard fuel without alcohol (pref. ISO 1817 Liquid C), 23°C
- ✔ Standard fuel with alcohol (pref. ISO 1817 Liquid 4), 23°C

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Symbols used:

✔ possibly resistant
Defined as: Supplier has sufficient indication that contact with chemical can be potentially accepted under the intended use conditions and expected service life. Criteria for assessment have to be indicated (e.g. surface aspect, volume change, property change).

✘ not recommended - see explanation
Defined as: Not recommended for general use. However, short-term exposure under certain restricted conditions could be acceptable (e.g. fast cleaning with thorough rinsing, spills, wiping, vapor exposure).

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