CELANEX® 2401MT® ECO-B 352

CELANEX® PBT

Celanex 2401MT ECO-B 352 is a special grade developed for medical industry applications and complies with:

- CFR 21 (177.1660) of the Food and Drug Administration (FDA), and
- the corresponding EU and national registry regulatory requirements;
- biocompatibility corresponding to USP 23 Class VI/ISO 10993;
- is listed in the Drug Master File (DMF 10047 (US)/10033 (EU)) and the Device Master File (MAF 443 (US)/1078 (EU)),
- and contains no animal products.

Celanex® 2401MT ECO-B 352 incorporates 39% of biobased content derived from waste by weight in the finished product through mass balance allocation. The product is a drop-in replacement to the standard grade with the same performance and processing properties and contributes to the displacement of virgin fossil fuel resources. The biobased source and allocated content in the product are certified according to ISCC PLUS mass balance approach.

Product information

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

Rheological properties

Melt volume-flow rate	20	cm^3/10min	ISO 1133
Temperature	482	°F	
Load	4.76	lb	
Molding shrinkage, parallel	1.6	%	ISO 294-4, 2577
Molding shrinkage range, parallel	1.4 - 1.9	%	ISO 294-4, 2577
Molding shrinkage, normal	1.6	%	ISO 294-4, 2577
Molding shrinkage range, normal	1.4 - 1.9	%	ISO 294-4, 2577

Typical mechanical properties

Tensile modulus	377000	psi	ISO 527-1/-2
Tensile stress at yield, 50mm/min	8700	psi	ISO 527-1/-2
Tensile strain at yield, 50mm/min	4	%	ISO 527-1/-2
Tensile stress at 50% strain	4350	psi	ISO 527-1/-2
Nominal strain at break	>50	%	ISO 527-1/-2
Flexural modulus	363000	psi	ISO 178
Flexural strength	11600	psi	ISO 178
Charpy impact strength, 23°C	N	$ftlb/in^2$	ISO 179/1eU
Charpy impact strength, -30°C	90.4	$ftlb/in^2$	ISO 179/1eU
Charpy notched impact strength, 23°C	2.38	$ftlb/in^2$	ISO 179/1eA
Charpy notched impact strength, -30°C	2.38	$ftlb/in^2$	ISO 179/1eA
Izod notched impact strength, 23°C	2.38	$ftlb/in^2$	ISO 180/1A

Thermal properties

Melting temperature, 10°C/min	437	°F	ISO 11357-1/-3
Glass transition temperature, 10°C/min	140	°F	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	131	°F	ISO 75-1/-2
Temperature of deflection under load, 0.45 MPa	266	°F	ISO 75-1/-2
Temperature of deflection under load, 0.45 MPa, annealed	302	°F	ISO 75-1/-2

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Vicat softening temperature, 50 °C/h 50N	374	°F	ISO 306
Coefficient of linear thermal expansion (CLTE), parallel	0.61	E-4/°F	ISO 11359-1/-2

Electrical properties

Relative permittivity, 100Hz	4		IEC 62631-2-1
Relative permittivity, 1MHz	3.5		IEC 62631-2-1
Dissipation factor, 100Hz	14	E-4	IEC 62631-2-1
Dissipation factor, 1MHz	220	E-4	IEC 62631-2-1
Volume resistivity	1E13	Ohm.m	IEC 62631-3-1
Surface resistivity	1E15	Ohm	IEC 62631-3-2
Electric strength	584	kV/in	IEC 60243-1
Comparative tracking index	600		IEC 60112

Physical/Other properties

Humidity absorption, 2mm	0.2	%	Sim. to ISO 62
Water absorption, 2mm	0.45	%	Sim. to ISO 62
Density	0.0473	lb/in³	ISO 1183

Injection

Drying Recommended	yes	
Drying Temperature	266[1]	°F
Drying Time, Dehumidified Dryer	2 - 4	h
Processing Moisture Content	≤0.01	%
Melt Temperature Optimum	482	°F
Min. melt temperature	464	°F
Max. melt temperature	500	°F
Max. screw tangential speed	0.1 - 0.3	m/s
Mold Temperature Optimum	176	°F
Min. mold temperature	140	°F
Max. mold temperature	266	°F

[1]: Limits: from 120 °C to 140 °C

Characteristics

Processing	Injection Molding
Additives	Release agent
Sustainability	Bio-Content

Additional information

Injection molding

To minimize the volatile content in the final product, dry the resin to <0.02%, preferably ≤0.01% water content. In injection molding, use the lowest possible melt temperature (recommended 240 °C) and shortest feasible residence time (recommended 2-3 minutes). Store the parts in a ventilated, clean area before use. If assistance is needed please contact your Celanese account representative.

These recommendations are based on internal Celanese testing. For drying and injection molding conditions outside the above parameters, customer must test

for and verify suitably low volatiles emissions on molded articles to confirm the final product is suitably pure for its intended use.

Preprocessing

To avoid hydrolytic degradation during processing, CELANEX resins have to be dried to a moisture level equal to or less than 0.02%. The drying should be done in a dry-air dryer (dew point < -30 °C) with a temperature of 120 to 140 °C and a drying time of 4 to min. 2 hours. In case of longer residence times in the dry-air dryer, the temperature should be reduced to below 80 °C.
The time between drying and processing should be kept as short as possible.
The processing machine feed hopper should be closed during the processing operation.

Processing Notes

Pre-Drying

To avoid hydrolytic degradation during processing, CELANEX PBT resins have to be dried to a moisture level to less than 0.02%, preferably equal or less than 0.01%. Drying should be done in a dehumidifying hopper dryer capable of dewpoints <-40 °C (-40 °F) at 120 °C - 140 °C (284 °F) for 4 +/- 2 hours.

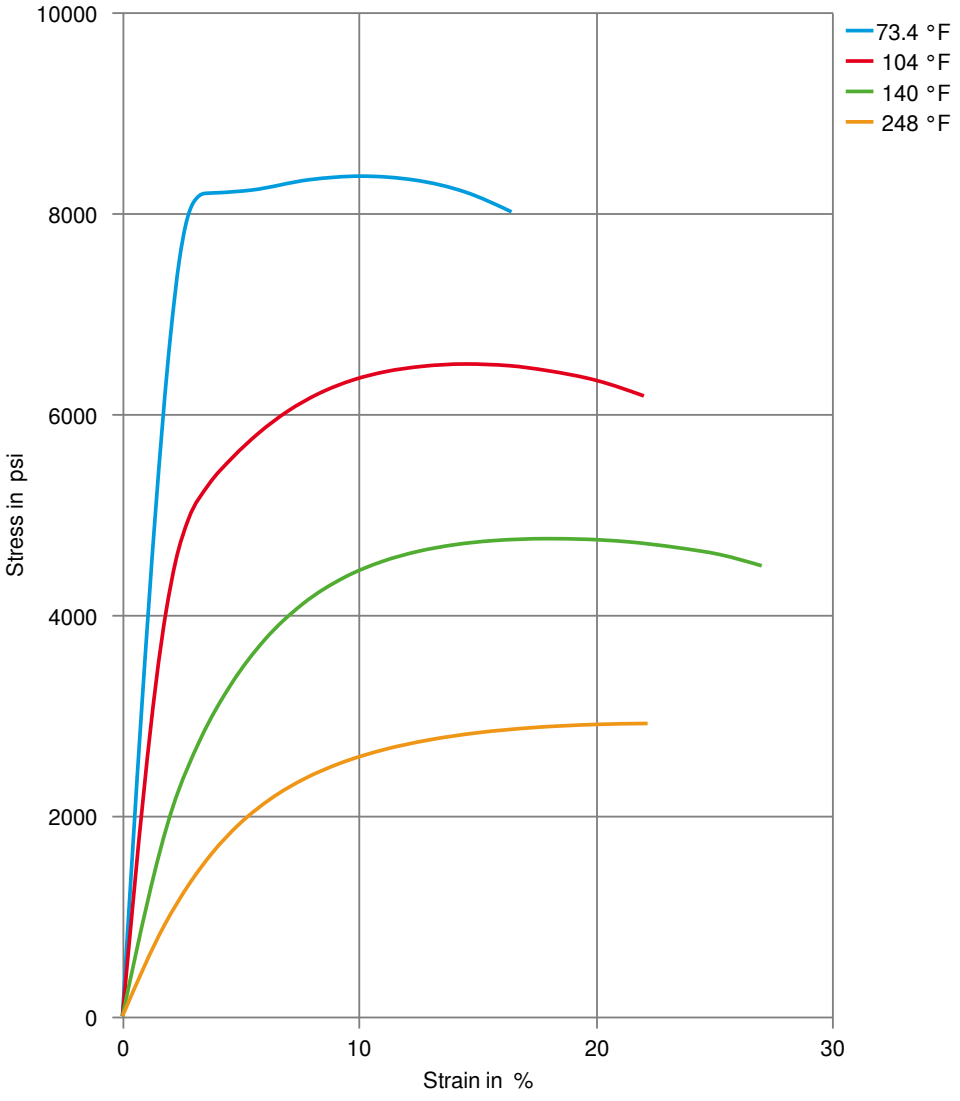
Storage

For subsequent storage of the material in the dryer until processed (<= 60 h) it is necessary to lower the temperature below 80 ° C.

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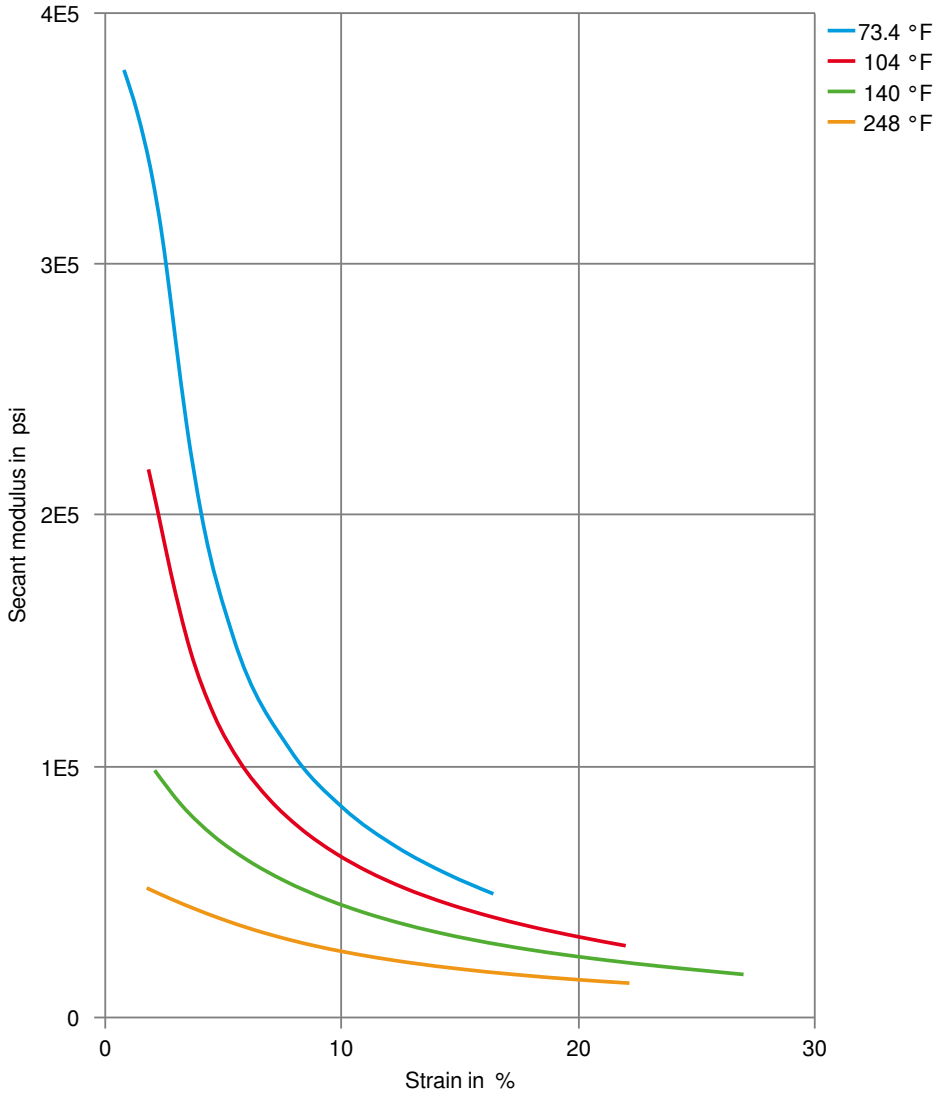
Stress-strain



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Secant modulus-strain



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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. 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.
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