

**TOPAS® 9903D-10**

Extrusion grade

Grade with high rigidity and low glass transition temperature. For thermoforming, shrink film and seal layer formulations.

Cyclic Olefin Copolymer (COC)

Property	Value	Unit	Test Standard
<b>Physical Properties</b>			
Density	980	kg/m <sup>3</sup>	ISO 1183
Melt volume rate (MVR) (260°C, 2.16kg)	8.0	cm <sup>3</sup> /10min	ISO 1133
Melt volume rate (MVR) (230°C, 2.16kg)	4.0	cm <sup>3</sup> /10min	ISO 1133
Melt volume rate (MVR) (190°C, 2.16kg)	1.0	cm <sup>3</sup> /10min	ISO 1133
<b>Thermal Properties</b>			
Glass transition temperature (10°C/min)	33	°C	ISO 11357
<b>Mechanical Properties (Tensile bars)</b>			
Tensile modulus	1260	MPa	ISO 527-3
<b>Mechanical Properties (Film)</b>			
Tensile strength @ break (machine direction)	25	MPa	ISO 527-3
Tensile strength @ break (transverse direction)	22	MPa	ISO 527-3
Elongation at break (machine direction)	>150	%	ISO 527-3
Elongation at break (transverse direction)	>100	%	ISO 527-3
<b>Optical Properties (Film)</b>			
Gloss, 60°	>100	%	ISO 2813
Haze	<1	%	ISO 14782
<b>Barrier Properties (Film)</b>			
Water vapor permeability @ 38°C, 90% RH	1.9	g·100µm/(m <sup>2</sup> ·day)	ISO 15106-3
Oxygen Permeability @23°C, 50%RH	400	cm <sup>3</sup> ·100µm/(m <sup>2</sup> ·day·bar)	ASTM D3985
<b>Test Specimen Production (Film)</b>			
Type of extrusion	cast		
Thickness of specimen	0.1	mm	

**Storage**

This grade tends to stick due to its low glass transition temperature. This is also true for parts made thereof. Chilled warehousing is recommended.

**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 extruded articles can be influenced by a wide variety of factors including, but not limited to, material selection, additives, article design, processing conditions and environmental exposure. Any determination of the suitability of a particular material and 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 which 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 to 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 Safety Data Sheets before attempting to process our products. The products mentioned herein are not designed or promoted for use in medical or dental implants.