

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

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