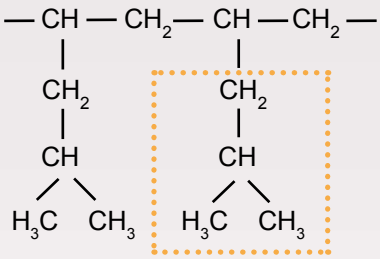
GOODFELLOW & MITSUI & CO. EUROPE PLC

TPX® Polymethylpentene (PMP)

TPX®, a 4-methylpentene-1 based polyolefin manufactured solely by Mitsui Chemicals, Inc., is now available in small order lots from Goodfellow. This lightweight, functional polymer displays a unique combination of physical properties and characteristics due to its distinctive molecular structure. Because of its superb chemical resistance and optical clarity, TPX® is an ideal choice when replacing polycarbonate or acrylic in some chemically demanding environments.

- High heat resistance (melt temperature 236°C)
- Lowest specific gravity of any known polymer (0.833 g/cc)
- Superior steam sterilization capabilities
- Superior transparency to visible light
- Excellent UV transmission characteristics
- Lower refractive index than other transparent resins
- Excellent acoustic properties
- Excellent chemical resistance
- High gas and moisture permeability
- Outstanding dielectric properties



The properties of TPX® make it ideal for extruding items such as film and paper coating, injection molded items and blow molded components. Some of the possible applications are listed below:

- Release film
- Release paper for synthetic leather
- LED molds
- Mandrels and sheaths for hose and cable use
- Cosmetic caps and tubes
- Heat-resistant nonwoven fabric and fibers
- Chemical tubes
- Animal cages
- Sterilization containers

Goodfellow Corporation
305 High Tech Drive, Oakdale, PA 15071-3911, USA
Telephone: 1 800 821 2870 (USA) or 724 695 7060
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Physical properties of TPX®

Physical Properties	Item	Test Condition	Unit	Test Method	Value
Basic Properties	Density		kg/m^3	ASTM-D1505	833
	MFR		g/10 min	ASTM-D1238	9 - 180
	Melting Point	Peak Temperature	°C	JIS-K7121 (DSC method)	236
	Water Absorption		%	ASTM-D570	<0.01
Thermal Properties	Vicat Softening Point		°C	ASTM-D1525	147 – 185
	Heat Distortion Temperature (HDT)	0.43 MPa	°C	ASTM-D648	80 - 132
	Expansion Coefficient		$10^{-6}\ k^{-1}$	ASTM-E831	117
Mechanical Properties @ 23°C	Yield Stress		MPa	ASTM-D638	20 – 32
	Tensile Strength		MPa	ASTM-D638	10 – 25
	Elongation at Break		%	ASTM-D638	10 – 60
	Tensile Modulus		MPa	ASTM-D638	820 - 2050
	Flexural Modulus		MPa	ASTM-D790	630 - 1770
	Flexural Strength		MPa	ASTM-D790	21 – 49
	Izod Impact Strength	With notch	J/m	ASTM-D256	18 – 28
		Without notch	KJ/m^2	ASTM-D256	8 – 129
	Rockwell Hardness	R Scale	-	ASTM-D785	42 – 92
Optical Properties	Haze		%	ASTM-D1003	0.7 – 2.1
	Transmittance		%	ASTM-D1003	92 – 94
	Refractive Index		-	ASTM-D542	1.46
Electrical Properties	Volume Resistivity		Ω . cm	ASTM-D257	$>10^{16}$
	Dielectric Breakdown Voltage		kV/mm	ASTM-D149	65
	Dielectric Constant		-	ASTM-D150	2.1

The above table is an overview of the properties across the full range of TPX® grades. For specific data, please contact tpx@goodfellowusa.com.

All information and technical data are given as a guide only. Although every effort has been made to ensure that the information is correct, no warranty is given as to its completeness or accuracy.

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TPX® Polymethylpentene (PMP) main grades

Grade	Description	Melt Flow Rate (MFR)	Comments
MX002	Injection molding / Extrusion	21 g/10 min	Low rigidity
MX002O	Extrusion for food applications*	21 g/10 min	Low rigidity
MX004	Injection molding / Extrusion	25 g/10 min	Medium rigidity
MX004XB	Injection molding / Extrusion - blue tint	25 g/10 min	Medium rigidity
RT18	Injection molding	26 g/10 min	High rigidity
RT18XB	Injection molding - blue tint	26 g/10 min	High rigidity
RT31	Injection molding - Less odor	21 g/10 min	High rigidity
RT31XB	Injection molding - Less odor - blue tint	21 g/10 min	High rigidity
DX231	Coating	100 g/10 min	High rigidity
DX310	Coating	100 g/10 min	Low rigidity
DX350	Coating	110 g/10 min	High rigidity
DX820	Coating & additive / High flow	180 g/10 min	High rigidity
DX845	Extrusion	9 g/10 min	High rigidity

* Not within EU

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TPX® Polymethylpentene (PMP) - forms

Rod

Diameter: 6.35mm, 9.5mm, 20mm, 25mm, 33mm & 50mm

Film

Thickness: 0.04mm, 0.05mm, 0.09mm, 0.125mm, 0.250mm & 0.5mm

Sheet

Thickness: 2mm, 4.8mm, 6.35mm, 9.53mm, 12.7mm, 19.05mm & 25.4mm.

Granule

Grades: The following grades are currently available in research and small-scale industrial quantities RT18, RT18XB, MX002, MX004 & DX820.

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