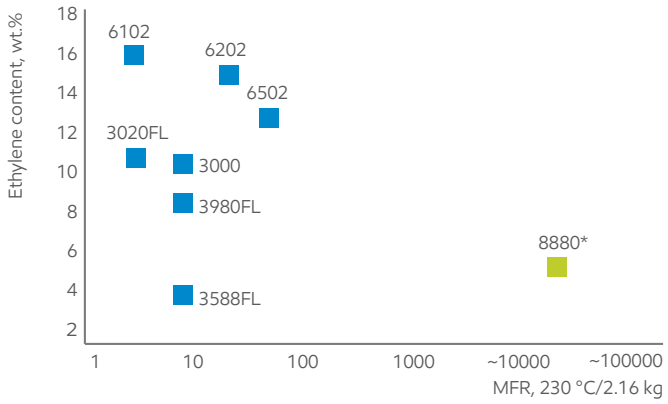
ExxonMobil

Low viscosity Vistamaxx™ 8880 for new possibilities in polymer modification

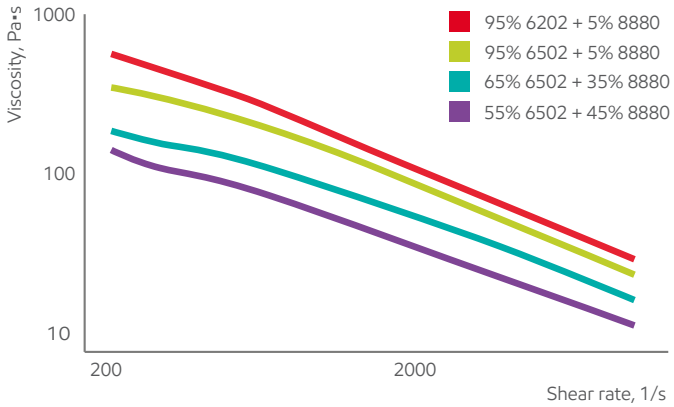
Energy lives here™

Develop innovative solutions that can improve product performance and manufacturing efficiency with Vistamaxx™ performance polymers. Because Vistamaxx 8880 has a much lower viscosity than other grades, it provides opportunities for compounders, converters and OEMs to add value. Using Vistamaxx 8880 as a compound modifier enhances polyolefin blend properties, improves processing efficiency and reduces the dosage of processing aids.

Vistamaxx grades



Viscosity



*MFR of 8880 is from a conversion of viscosity data.

Improved processability

The processing efficiency for compounding and conversion processes can be enhanced due to the low viscosity of Vistamaxx 8880. Its higher melt flow rate can facilitate higher output, leading to cost efficiencies for compounding, injection molding and extrusion processes. The dosage of processing aids can also be reduced with Vistamaxx 8880, which improves compound processability and the surface quality of end-use products.

Melt flow rate of Vistamaxx 8880 compounded with Vistamaxx 6202

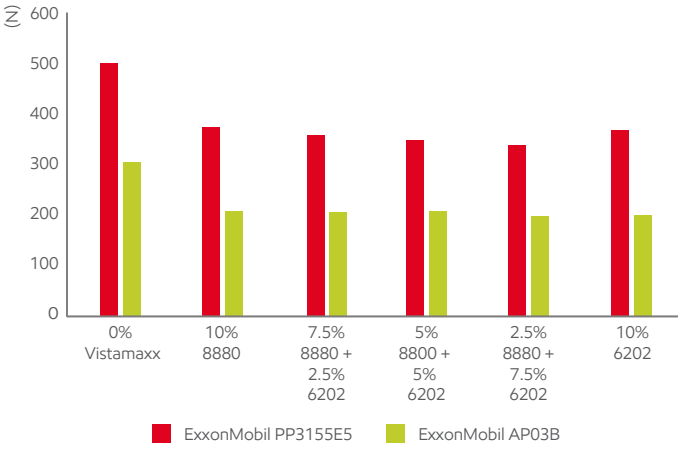
% of Vistamaxx 8880	0%	10%	20%	35%
Melt flow rate (230 °C/2.16 kg)	20	34	45	74

Injection molding for PP modification applications

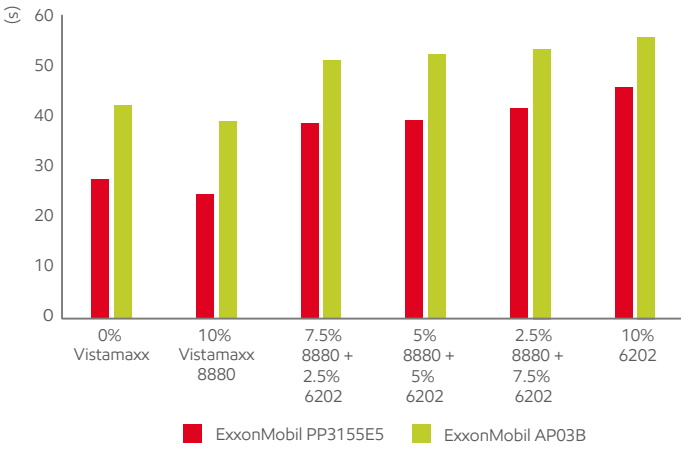
Blended solutions of different Vistamaxx™ performance polymer grades were evaluated to optimize the crystallization speed. DSC results demonstrate that several blends with increased Tc will help resolve processing problems.

Validation has been conducted at the Shanghai Technology Center using a Demag injection molding machine to process a 4*6*0.2cm plaque made with ExxonMobil™ PP3155E5 homopolymer and ExxonMobil AP03B impact copolymer resins. The cycle time is recorded using a thermal imager when the plaque gate temperature is less than 90°C. Minimum clamp force is recorded when there is no flash and a stable part weight.

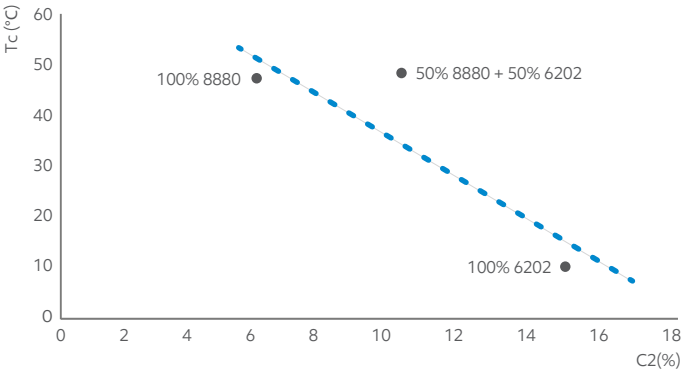
Clamp force



Cycle time



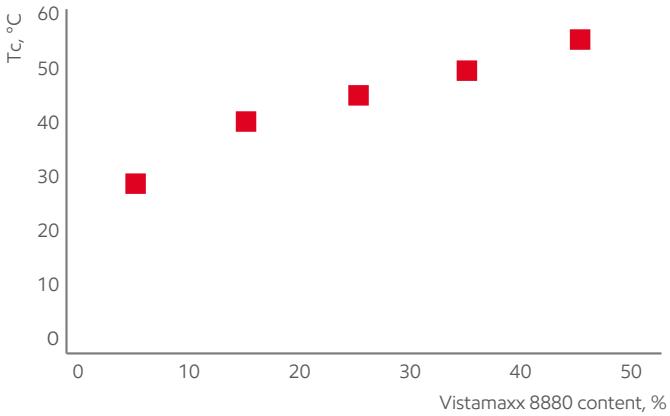
Crystallization temperature



Enhanced injection molding

Cycle time is critical to injection molders as it can influence production efficiency. The benefits of Vistamaxx™ 8880 in injection molding processing are proven when it is added to a Vistamaxx polymer-rich base formulation. Injection pressure can be reduced due to the lower viscosity of Vistamaxx 8880 and cooling efficiency (see crystallization analysis) is improved. With a controlled cooling temperature, Vistamaxx compounds achieve comparable cycle time performance to SEBS compounds for soft thermoplastic elastomer (TPE) applications such as grips and other soft-touch overmolding TPE applications.

Crystallization analysis of Vistamaxx 8880 compounded with Vistamaxx 6202



The addition of Vistamaxx 8880 to Vistamaxx 6202 increases crystallization temperature, facilitating faster injection molding cycle time.

Injection molding process comparison between SEBS compounds and Vistamaxx based compounds

Processing	SEBS compounds	Vistamaxx based compounds	Vistamaxx based compounds with 8880
Melt temperature	■	■	■
Injection pressure	■	■	■
Cycle time	■	■	■ With chilled water

The images above are demonstrative of typical applications for ExxonMobil Chemical products

Typical values

Grades	Physical			Hardness	Mechanical			Thermal	
	Density*	Viscosity* at 190°C (374°F)	Ethylene content*	Durometer hardness (Shore C) Based on ASTM D2240	Tensile stress* at 100%	Tensile strength* at break	Elongation* at break	Glass transition* Tg	Melting temperature* Tm
8880	0.879 g/cm³	1200 mPa•s	6 wt%	53	4.0 MPa	6.2 MPa	1237 %	-22 °C	97 °C

* Based on ExxonMobil method

Data generated by or on behalf of ExxonMobil Chemical, cited from product datasheet version of 09/16/2015, based on ASTM or ExxonMobil method.

Typical values

Grades	MFR 230°C/ 2.16 kg ExxonMobil method g/10 min	Density[1] ASTM D1505 g/cm³	Durometer hardness ASTM D2240 Shore D/A	Tensile strength[1] @break ASTM D638 MPa (psi)	Elongation[1] @break ASTM D638 %	Flex mod[1,2] 1% secant ASTM D790 MPa (psi)	Tear strength[1] Die C ASTM D624 kN/m (lbf/in)	Vicat softening temperature ExxonMobil method °C (°F)
3000	8	0.873	27D	>13.8 (>2000)	>800	62.4 (9050)	63.9 (365)	65.1 (149)
3020FL**	3	0.874	29D	>14.5 (>2100)	>800	65.3 (9470)	65.1 (372)	67.0 (153)
3980FL**	8	0.879	34D	>19.3 (2800)	>800	117 (17000)	83.4 (476)	77.3 (171)
3588FL**	8	0.889	50D	26.0 (3770)	637	402 (58400)	127 (724)	103 (217)
6102/6102FL**	3	0.862	67A	>7.58 (>1100)	>800	14.4 (2090)	33.3 (190)	53.9 (129)
6202/6202FL**	20	0.862	64A	>5.52 (>800)	>800	12.8 (1860)	32.0 (183)	45.2 (113)
6502	45	0.865	71A	>7.58 (>1100)	>800	20.4 (2960)	40.6 (232)	51.4 (125)

** FL grades pass ExxonMobil Chemical's test for film appearance with regard to gels, as needed for performance film applications ('A' rating)

1. All physical properties were measured on specimens cut from compression molded plaques per ASTM D4703, Procedure A, Type I and conditioned at 23°C for a minimum of 40 hours per ASTM D618 prior to testing.
2. 1% secant @ break.

Data generated by or on behalf of ExxonMobil Chemical, cited from product datasheet version of 01/01/2017, based on ASTM or ExxonMobil method.

Contact us for more information:
exxonmobilchemical.com/vistamaxx

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V1118-000E49