

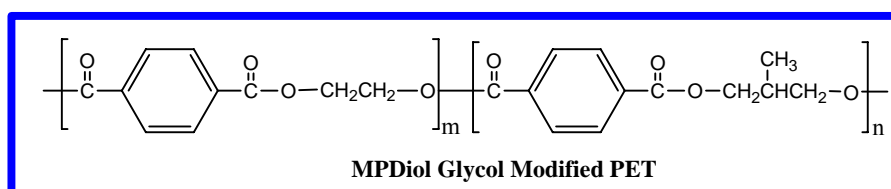
Application Data

MPDiol® Glycol-co-PET

Performance Enhancing Copolyester for Fiber and Film Applications

General

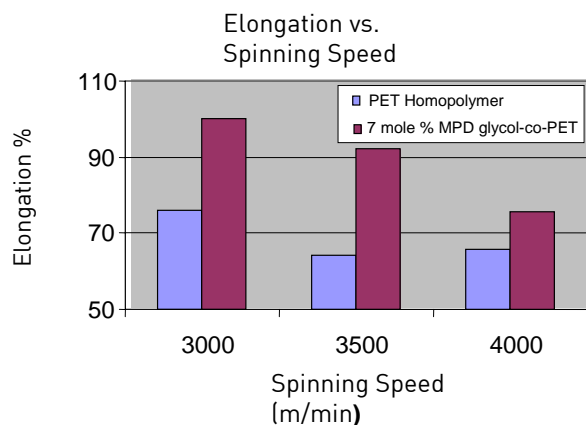
Glycol modification of polyethylene terephthalate (PET) through copolymerization with 2-methyl-1,3-propanediol (MPDiol® Glycol) is an attractive technique to differentiate the properties of PET. Copolymerization leads to PET processing and property enhancements without sacrificing existing PET advantages for film, sheet and fiber applications. Moreover, the lower molecular weight of MPDiol glycol versus other PET modifiers, such as isophthalic acid, may result in MPDiol glycol being a more efficient route to improved processing and performance.



Description

MPDiol glycol is a low-toxicity, high-boiling, low-freezing, low-viscosity liquid that is compatible with conventional melt-phase and solid-state PET polymerization technologies. Incorporating MPDiol glycol into the PET chain lowers the glass transition temperature and melting point and decreases the crystallization rate. These shifts enhance orientation processing, leading to faster elongation rates and higher elongations. MPDiol glycol modification of PET produces low-melt/high-shrink copolymers with soft-hand and improved disperse dyeability.

Properties Vs. PET Homopolymer – Fiber Spinnability



Partially oriented yarns of MPDiol glycol-co-PET spun at higher speeds exhibit properties of unmodified PET produced at lower spinning speeds. This processability advantage is known as “wind-up speed suppression,” and it relates to higher throughput capacity or finer denier filaments.

Benefits

- Compatible with melt-phase and solid-state PET polymerization
- Strong effect on thermal transitions
- High orientation in films, sheet and fiber
- Innovative low-melt/high-shrink fibers
- Carrier-free dyeing at atmospheric boil
- Deep dyeability

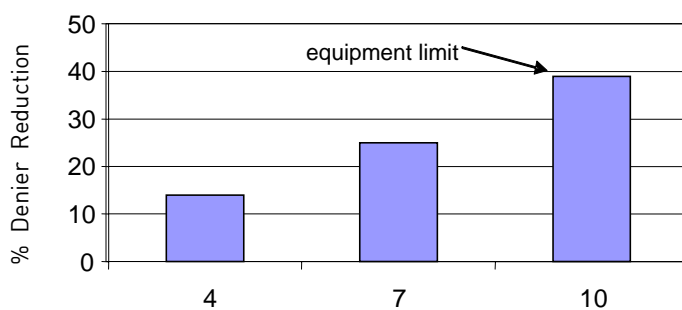
Application Data

MPDiol® Glycol-co-PET

Performance Enhancing Copolyester for Fiber and Film Applications



Denier Reduction vs. MPDiol Glycol Content
(3000 m/min; 72 round hole spinneret)



Mole % MPDiol Glycol Substitution for EG

MPDiol Glycol vs. Isophthalic Acid-Modified PET

Chip Analysis

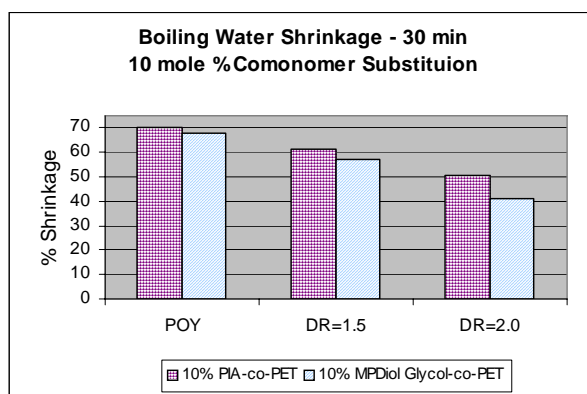
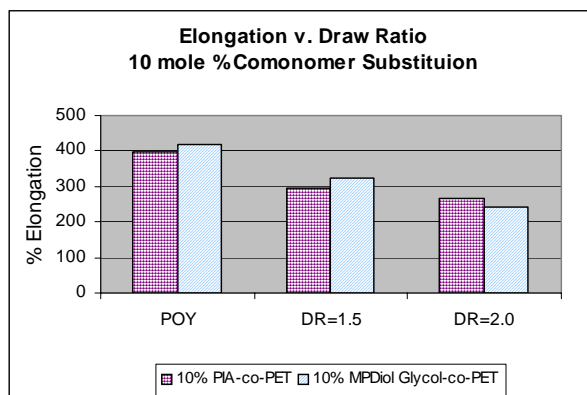
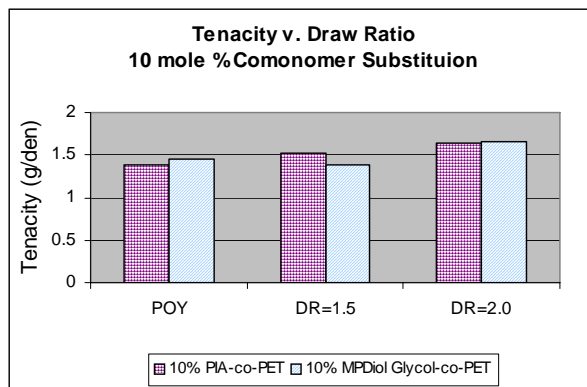
THERMAL ANALYSIS OF ISOPHTHALIC ACID AND MPDIOL GLYCOL-MODIFIED CHIP (as-polymerized)				
	3 mole % PIA	10 mole % PIA	3 mole % MPDiol	10 mole % MPDiol
T _g [° C]	73	72	73	71
T _m [° C]	248	232	248	230
ΔH _m [J/g]	40.7	29.8	40.6	33.4

The sensitivities of thermal transitions MPDiol glycol-co-PET and PIA-co-PET to molar substitution levels are similar. On a weight-equivalent basis, the effect of MPDiol glycol is larger.

Application Data

MPDiol® Glycol-co-PET

Performance Enhancing Copolyester for Fiber and Film Applications



The molar sensitivities of tensile and shrinkage properties of yarns made from MPDiol glycol-co-PET and PIA-co-PET are similar. On a weight basis, MPDiol glycol requirements are less.

This information is believed to be accurate as of the date of publication. It is the sole responsibility of the customer to determine whether the product is appropriate and suitable for the customer's specific use. Specific end uses may require approval by appropriate regulatory agencies. Lyondell Chemical Company makes no warranties, express or implied, regarding the product or information contained therein. The applicable Material Safety Data Sheet should be reviewed by customer before handling the Lyondell Chemical product. Lyondell Chemical Company disclaims any liability for infringement of any patent by reason of customer's use of any Lyondell Chemical Company products in combination with other materials or in any process.

World Headquarters
Lyondell Chemical Company
1221 McKinney
Houston, TX 77010
Tel (713) 652-7200
Toll-free (888) 777-0232
MSDS Hotline: (800) 700-0946

European Headquarters
Lyondell Chemical Europe, Inc.
P. O. Box 2416
3000 CK Rotterdam
The Netherlands
Tel (31) 10 275-5500
Tel (33) 3 44 24 92 05 (tech svc)

Lyondell South America
Av Roque Petroni Jr,
999, cj 123
Sao Paulo, SP 04707-910
Brazil
Tel (55) 11-5185-9300

Asian Headquarters
Lyondell Asia Pacific, Ltd.
41st Floor - The Lee Gardens
33 Hysan Avenue
Causeway Bay, Hong Kong
Tel (852) 28822-668
Tel (33) 3 44 24 92 05 (tech svc)