The LYCRA Company

PRODUCT INFORMATION | FOR GENERAL RELEASE | MARCH 15, 2019

TERATHANE® 3MCPG (co-polyether glycol)

Low-crystalline soft-segment for high performance elastomers

Innovation from The LYCRA Company

TERATHANE® 3MCPG (co-polyether glycol) is an innovative intermediate that is used as a soft-segment building block in high-performance polyurethanes, copolyesters and other polymers.

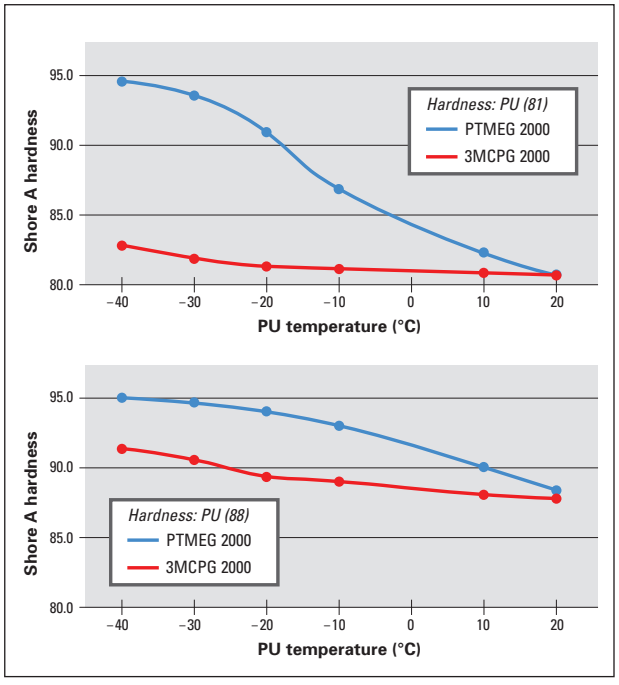
TERATHANE® 3MCPG is available in two molecular weight grades, 1400 and 2000. The dynamic properties and low temperature performance of products made from TERATHANE® 3MCPG surpass those of products based on PTMEG while maintaining excellent mechanical properties, functionality and hydrolytic stability.

Key advantages

TERATHANE® 3MCPG has lower crystallinity than PTMEG. This results in a lower melting point of the soft segments, giving TERATHANE® 3MCPG important advantages:

- **Improved fatigue resistance at low temperatures:** Figure 1 shows that TERATHANE® 3MCPG provides more resistance to stiffening as temperatures fall than PTMEG. It is more stable in terms of flexibility and other physical properties in response to temperature changes.
- **Improved dynamic properties:** The stress/strain curves in Figure 2 show that the low crystalline structure of TERATHANE® 3MCPG contributes to increased recovery power, lower hysteresis (for possible content reduction), and reduced permanent set.
- **Improved processing performance:** Figure 3 shows that TERATHANE® 3MCPG is liquid at room temperature (*i.e.*, 20–25°C), making it easier to handle and process. Because product containers don't require heating before processing at >20°C, TERATHANE® 3MCPG could be considered for use in spray coatings, etc.

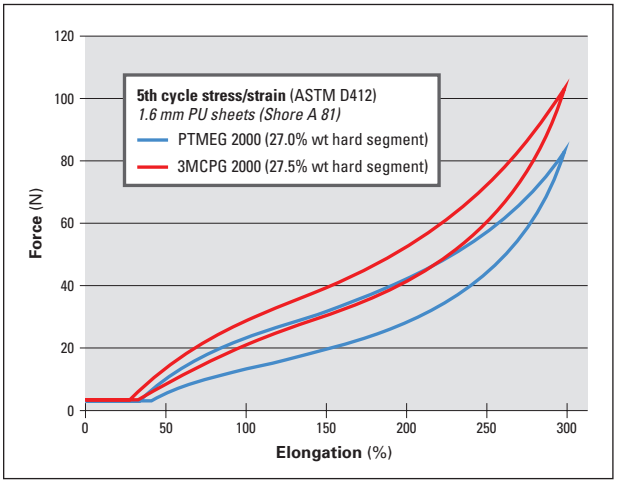
Figure 1. Low temperature performance of 2000 MW TERATHANE® 3MCPG vs. TERATHANE® PTMEG. The 3MCPG resists stiffening better at low temperatures.



Applications

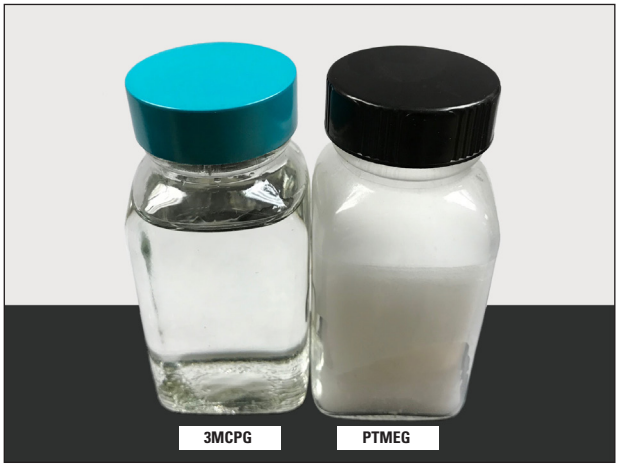
- Sporting goods with enhanced low temperature performance such as skating wheels/rollers (cast part), ski boots (TPU), golf ball covers (coating/film), etc.

Figure 2. Dynamic properties: 2000 MW TERATHANE® 3MCPG vs. TERATHANE® PTMEG. The 3MCPG shows greater recovery (unload) force, lower hysteresis (i.e., energy loss during stretch and recovery cycles), and lower set.



- Synthetic leathers with improved dynamic properties; textiles for cold-weather garments that are more resistant to fatigue at low temperatures.
- Co-polyether esters (COPEs) with better low temperature and dynamic properties for melt-extruded parts, foams and films in such applications as CVJ boots, springs, and more.
- Demanding PU applications where reduced crystallinity is valued such as the microcellular foam in shock absorbers and high performance moving parts.
- Clearer coatings such as for optical fibers.

Figure 3. TERATHANE® 3MCPG (left) is liquid at room temperature (~22°C), whereas TERATHANE® PTMEG (right) is solid.



Specifications

	3MCPG 1400	3MCPG 2000
Moleclular weight daltons	1350 – 1500	1900 – 2100
Hydroxyl number mg KOH/g	74.8 – 83.1	53.4 – 59.1
Water ppm	150 max.	150 max.
Color APHA	60 max.	60 max.
Alkalinity number meq KOH/kg x 30	–2.0 – 1.0	–2.0 – 1.0

Typical properties

	3MCPG 1400	3MCPG 2000
Viscosity at 40°C	500 – 760 cP	1100 – 1570 cP
Melting point	5 – 15°C 41 – 59°F	9 – 19°C 48 – 66°F
Density at 40°C	0.97 m/l 8.1 lb/gal	0.97 m/l 8.1 lb/gal
Refractive index	1.464 n_D^{25}	1.464 n_D^{25}
Flash point (Pensky-Martens closed cup)	310°C 590°F	310°C 590°F
Peroxide content (as H_2O_2)	<5 ppm	<5 ppm
Stabilizer (BHT)	200 – 350 ppm	200 – 350 ppm

TERATHANE®
POLYETHER GLYCOL

The LYCRA Company innovates and produces fiber and technology solutions for the apparel and hygiene industries, as well as specialty chemicals used in the spandex and polyurethane value chains. Headquartered in Wilmington, Delaware, The LYCRA Company is recognized worldwide for its innovative products, technical expertise, and unmatched marketing support. The LYCRA Company owns leading consumer and trade brands: LYCRA®, LYCRA HyFit®, LYCRA® T400®, L by LYCRA®, COOLMAX®, THERMOLITE®, ELASPAN®, SUPPLEX®, TACTEL®, and TERATHANE®. While The LYCRA Company's name is new, its legacy stretches back to 1958 with the invention of the original spandex yarn, LYCRA® fiber. Today, The LYCRA Company is focused on adding value to its customers' products by developing unique innovations designed to meet the consumer's need for comfort and lasting performance. For more information, visit connect.lycra.com and lycra.com.

Contact Information:

Americas
Richard Lemerise
richard.lemerise@LYCRA.com
Phone: + 1-302-683-3071

Asia
Jason Shang
jason.shang@LYCRA.com
Phone: + 86-21-63876666-2228

Europe
Morteza Shirazi
morteza.shirazi@LYCRA.com
Phone: + 34-932-379-282