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Sweet bond advances soft-hard designs

Momentive[1] finds the sweet spot for overmolding liquid silicone rubber (LSR) with Eastman Tritan™ copolyesters.

The medical market has a growing demand for innovative soft-hard designs—and a constant need for devices and housings with a combination of chemical resistance and impact strength.

Momentive Performance Materials, a leader in liquid silicone rubber (LSR), recently introduced an innovative self-bonding LSR technology specifically for efficient one-step overmolding of silicone with medical grade Eastman Tritan™ copolyesters. This is the first commercially available process of its kind.

Momentive's Silopren[2] LSR 47×9 liquid silicone rubber series provides strong in-mold adhesion with Tritan without the need for primers. This LSR–polymer combination is ideal for applications that require handling comfort, waterproofing, durability, aging stability, and other properties—including soft-hard design applications such as:

- Respiratory devices
- Sealing elements
- Gaskets for joints in housings and hardware
- Buttons and switches on electronic housings and hardware
- Vibration reduction
- Membranes and lenses for electronic device housings

Specially designed to optimize Tritan

Transparent and opaque grades of Tritan have a lower T_g and require a lower processing temperature than some engineering polymers. The ability of Silopren LSR 47×9 to cure rapidly at relatively low temperatures is the sweet spot for achieving functional performance and efficient processing with Tritan medical grades. The new LSR technology demonstrates excellent adhesion with Tritan. See the table for a comparison of adhesion strength.

This advanced combination adds the best of primerless, self-bonding LSR technology to advantages the industry expects from Tritan:

- Outstanding chemical resistance—compatible with most medical disinfectants and solvents
- Excellent impact strength and durability
- Made without bisphenol A (BPA) and halogens
- Superior noise-damping characteristics relative to other engineering materials
- Excellent clarity and color retention after sterilization by ethylene oxide (EtO), e-beam, and gamma irradiation
- Color match available for qualifying orders of opaque grades
- Design flexibility—curved, thin, lighter-weight devices

All in a single-step, integrated molding process that can shorten cycle times and reduce input costs.

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Eastman **TRITAN**™
copolyester

Adhesion strength of Silopren LSR 4739 and medical grades of Eastman Tritan™ copolyester

The adhesion performance of Momentive's Silopren LSR 4739 liquid silicone rubber was tested with substrates of Eastman Tritan™ copolyester. The results in the table illustrate excellent bonding between Silopren LSR 4739 and various Tritan grades.

Adhesion performance of Silopren LSR 4739 liquid silicone rubber with popular polymers

Engineering thermoplastic	Peeling force (N/mm) 24h/RT	Peeling force (N/mm) 4h/100°C
Eastman Tritan™ MX711 copolyester	6.7	6.8
Eastman Tritan™ MX731 copolyester	6.4	7.1
Eastman Tritan™ MX811 copolyester	6.6	7.2
Eastman Tritan™ MXF121 copolyester	6.0	6.5

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The results of **insight**™

Eastman Chemical Company
Corporate Headquarters
P.O. Box 431
Kingsport, TN 37662-5280 U.S.A.

U.S.A. and Canada, 800-EASTMAN (800-327-8626)
Other Locations, +(1) 423-229-2000

www.eastman.com/locations