Self-Bonding Liquid Silicone Rubber for Healthcare
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Advances in adhesion technology can help improve the bond between dissimilar materials, reduce assembly steps and successfully meet complex design requirements. The demands of soft-hard design have driven the growth of multi-component processes, that require good adhesion performance between different substrates.

Silicone elastomers and thermoplastics are widely used for soft-hard design via 2K molding or insert molding processes in applications ranging from consumer electronics and health care to packaging, automotive and industrial use. In these applications, unique performance characteristics such as waterproofing, durability and enhanced protection all require good adhesion performance.

Despite advances in adhesion technology, many available substrates still have adhesion challenges. A primer or pre-treatment on the surface of the substrate currently is required to achieve the desired adhesion performance between silicone elastomers and selective thermoplastics. With some plastics, such as polycarbonate (PC), the adhesion requirement is difficult to meet even when primer is applied.

Momentive offers a solution to this ongoing design challenge. Momentive’s Silopren® LSR 47x9 liquid silicone rubber series is a strong self-bonding product portfolio serving the market needs on a wide range of thermoplastics e.g. polycarbonate (PC), polybutylene terephthalate (PBT) and copolymers.

The new Silopren LSR 47x9 series for PC, PBT and copolymers enlarges Momentive’s Self-Bonding LSR portfolio and enables soft-hard design freedom for its customers.

Key Features and Typical Benefits

- Primerless adhesion to various substrates
- Self-bonding properties to thermoplastics including PC, PBT and copolymers
- Typically no primer needed
- Typically no special treatment on substrates’ surface needed
- Typically no adhesion to the mold
- Excellent aging stability and weathering resistance
- Good physical properties
- Low temperature cure possible
- Fast cure for high productivity processes
- Improved productivity in integrated multi-component molding process by eliminating the need for assembling

Potential Applications:

Silopren LSR 47x9 liquid silicone rubber can be considered for manufacturing articles where plastics and elastomers need to be combined in an overmolding or insert-molding process. Parts made by Silopren LSR 47x9 liquid silicone rubber are excellent candidates for use in various applications without post-curing. Examples include:

- Respiratory masks
- Gaskets and valves
- Soft touch grips and handles
- Sealing elements and membranes

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Test of Adhesion Strength

1. Test specimen by insert molding

- Pellets of thermoplastic
- Injection molding of thermoplastic part
- Overmolding of LSR + additives possibly

2. Test of adhesion strength by peeling test

- Cohesive failure strength of LSR < adhesion strength
- Adhesive failure strength of LSR > adhesion strength

Evaluation of Adhesion Strength
Peeling Force N/mm

- No Adhesion
- Separates with demolding
- Stable Adhesion
- Excellent Adhesion
- Cohesive Failure

Adhesion Performance:
Test of Silopren® LSR 47x9 Liquid Silicone Rubber and Selective Substrates

Peeling Force Avg. (N/mm)
24 h at RT (Room Temperature)

- UltraDur® B4520 polybutyleneterephthalate
- Ecozen® T120 copolyester
- Tritan® MX731 copolyester
- Tritan® MX711 copolyester
- Panlite® L225Y polycarbonate
- Makrolon® 2458 polycarbonate
- Makrolon® 2858 polycarbonate
- Makrolon® 2407 polycarbonate
- Lexan® 121 polycarbonate
- Lexan® HFD 1810 polycarbonate
- Apec® 1745 polycarbonate
- Lexan® HP4 polycarbonate

Note: Test data. Actual results may vary. Test specimen molded with injection molding and subjected to an additional storage for 24 h at RT. Molding conditions: 100 sec at 130 °C. In accordance to DIN 53268.

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Adhesion Performance:
Test of Silopren® LSR 47x9 Liquid Silicone Rubber and Selective Substrates

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<td>Lexan® HFD 1810 polycarbonate</td>
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<td>Tritan® MX711 copolyester</td>
<td>Eastman Chemical Company</td>
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<td>BASF AG</td>
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<td>9,7</td>
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Note: Test data. Actual results may vary.
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1 In accordance to DIN 53289.

Customer Service Centers

260 Hudson River Road, Waterford, NY 12188 USA

Email: commercial.services@momentive.com

<table>
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<tr>
<th>Americas</th>
<th>Europe, Middle East, Africa and India</th>
<th>Asia Pacific</th>
<th>Japan</th>
<th>All Other Countries</th>
</tr>
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<tr>
<td>+1 800 295 2392</td>
<td>0800 4321 1000 +40 213 04229</td>
<td>800 820 0202 +86 21 3860 4892</td>
<td>0120 975 400 +81 276 20 6182</td>
<td>+60 3 9206 1543</td>
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