NEW LIQUID SILICONE RUBBER ELIMINATES POST-CURING

In order to fulfill regulatory requirements, articles made from conventional liquid silicone rubber must be post-cured if they are intended for sensitive applications. With ELASTOSIL® LR 5040 series liquid silicone rubber, this expensive, time-consuming and labor-intensive step can be eliminated.

Higher Productivity without Post-curing

To achieve the properties required for sensitive applications, cured materials made from conventional liquid silicone rubber must generally be post-cured (thermal post-treatment) for several hours. This treatment improves the mechanical properties and reduces the volatiles content to the required level. On the one hand, this extra step costs time and energy. On the other, it interrupts the highly automated production process, since the post-curing ovens are generally manually loaded and emptied. Processors would therefore welcome the opportunity to eliminate this complicated and cost-intensive procedure.

Innovative Compound Formulation

It was precisely for this reason that WACKER developed the ELASTOSIL® LR 5040 series of liquid silicone rubber. Even without post-curing, rubber goods manufactured from these new grades show a property profile that already satisfies the requirements for baby-care, food-contact and medical applications.

ELASTOSIL® LR 5040

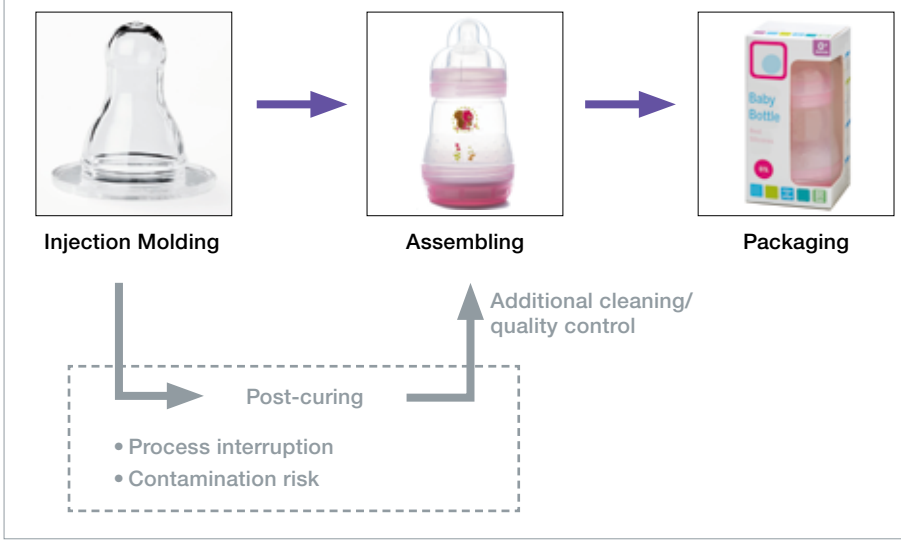
ELASTOSIL® LR 5040 is a series of fast-curing liquid silicone rubber grades. After curing, they have excellent properties even without post-curing:

- Very low volatiles content
- Meet requirements of BfR, FDA, EN 1400 and EN 14350
- Meet USP <88> Class VI testing and key ISO 10993 test requirements
- Excellent tear resistance
- Narrow tolerance of ± 3 Shore A

Advantages of Using ELASTOSIL® LR 5040

- Time and energy saving, since no thermal post-treatment is required
- Higher productivity thanks to fully automated manufacturing chains
- More effective quality assurance, since manual production steps are eliminated

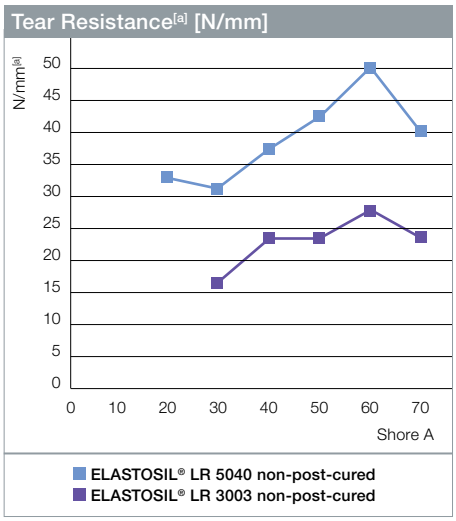
How ELASTOSIL® LR 5040 Helps Simplify the Production Process



The process steps shown in gray are obsolete when ELASTOSIL® LR 5040 is used

WACKER

CREATING TOMORROW'S SOLUTIONS



[a] acc. to ASTM D 624 B

In a non-post-cured state, ELASTOSIL® LR 5040 (blue curve) features significantly higher tear resistance than standard liquid silicone rubber (violet curve).

Improved Mechanical Properties

The ELASTOSIL® LR 5040 product series is currently available in hardness levels between 20 and 70 Shore A, including a 45-Shore A grade best suited for numerous applications in the baby-care sector. These hardness levels are achieved even without post-curing, with a particularly narrow tolerance of ± 3 Shore A points. In addition, the cured rubber products already exhibit tear resistances of up to 50 Newtons per millimeter in their non-post-cured state (measured as per ASTM D 624 B). This is particularly important for manufacturing baby-care articles, such as bottle nipples and pacifiers or teething rings.

Low Volatiles Content

For sensitive applications, the weight loss is often used as a measure of the volatiles content. Typical examples include the European Standard EN 14350-2 for children's drinking equipment and EN 1400 for pacifiers, recommendation "XV. Silicones" of the German Federal Institute for Risk Assessment (BfR), and legal requirements in other European countries. On heat treatment (typically 4 h at 200 °C), the silicone article must show a weight loss of no more than 0.5%. Standard tests show that non-post-cured parts made of ELASTOSIL® LR 5040 mostly lie well below this limit. Depending on the geometry of the finished part and the processing conditions, however, non-conformities may arise – especially in parts with particularly thin walls. Compliance with all relevant standards therefore remains the responsibility of the party placing the part on the market.

Product Table for ELASTOSIL® LR 5040

ELASTOSIL®	LR 5040/20	LR 5040/30	LR 5040/40	LR 5040/45	LR 5040/50	LR 5040/60	LR 5040/70
Product Data							
Appearance	Slightly bluish	Slightly bluish	Slightly bluish	Slightly bluish	Slightly bluish	Slightly bluish	Slightly bluish
Viscosity (D = 1 s^{-1}) [mPa·s]	580,000	900,000	1,000,000	1.000.000	1,100.000	1,300,000	1,800,000
Viscosity (D = 10 s^{-1}) [mPa·s]	260,000	440,000	420,000	450,000	450,000	500,000	630,000
Product Properties in the Crosslinked and Non-Cured State							
Density [g/cm^3]	1.12	1.12	1.13	1.12	1.13	1.13	1.13
Hardness [Shore A]	20	30	40	45	50	60	70
Tensile strength [N/mm^2]	7.9	9.2	9.0	9.0	9.5	9.0	9.5
Elongation at break [%]	890	760	580	580	490	380	370
Tear resistance ASTM D 624 B [N/mm]	33	32	38	38	42	50	36
Tear resistance DIN ISO 34-1 A [N/mm]	11	12	11	11	13	11	12
Weight loss acc. to BfR [%] [1]	≤ 0.4	≤ 0.4	≤ 0.4	≤ 0.4	≤ 0.4	≤ 0.4	≤ 0.4

[1] measured for non-post-cured test plates, 2 mm thick, test conditions based on BfR (Federal Institute for Risk Assessment) XV (4 h / 200 °C)

These figures are intended as a guide and should not be used in preparing specifications.

ELASTOSIL®

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