

LIMSTM Liquid Injection Molding System

Self-adhesive Liquid Silicone

allows integral plastic molding without primers

Shin-Etsu Self-adhesive Liquid Silicone offers good adhesion to metals and thermoplastics without primers.

This Silicone bonds well to a variety of metals or plastics.

The short cycle times required for molding this Silicone, coupled with the ease with which the molding processes may be automated, leads to improved quality and productivity.

Major advantages

- Provides integral molding system through co-injection molding or insert molding
- Suitable for use with complicated thermoplastic parts
- Shortened process time through the elimination of primer application
- Provides a safer working environment by eliminating the use of solvent based primers

Major applications

- Automotive parts
- Electrical and electronic components
- Films and other industrial uses

Self-adhesive Liquid Silicone allows the fabricator to shorten while at the same time improving product quality.

The new Shin-Etsu Self-adhesive Liquid Silicone bonds well to a variety of plastics, including the following:

- Polycarbonate (PC)
- Polybutylene-terephthalate (PBT)
- Polyphenylene oxide (PPO)
- Polyamide resins (Nylon 66, Nylon 6)

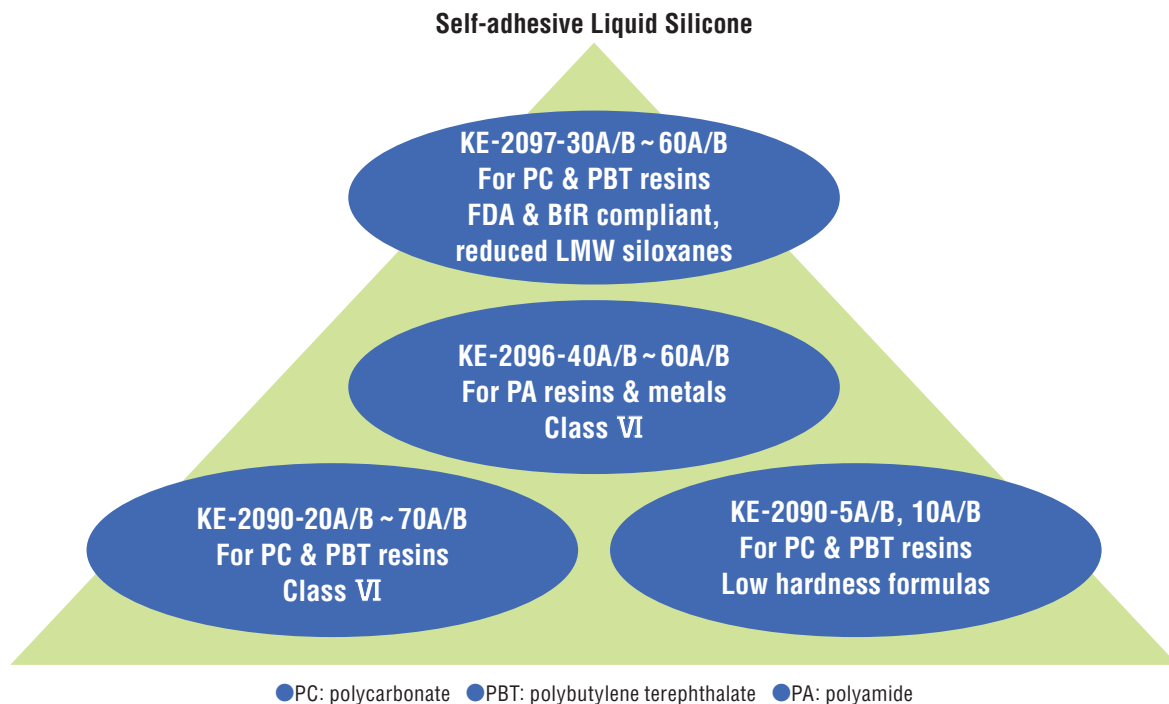
The adhesion obtained with each of these resins has proven resistant to degradation under a wide range of temperatures and humidity.

All provide outstanding, durable adhesion to most resins.

Our offerings also include products that meet FDA, BfR, and Class VI requirements, or contain low levels of low-molecular-weight (LMW) siloxanes.

Self-adhesive Liquid Silicone: Product line

Our line of self-adhesive materials is designed to enable users to develop composite parts that combine silicone rubbers with other types of materials.

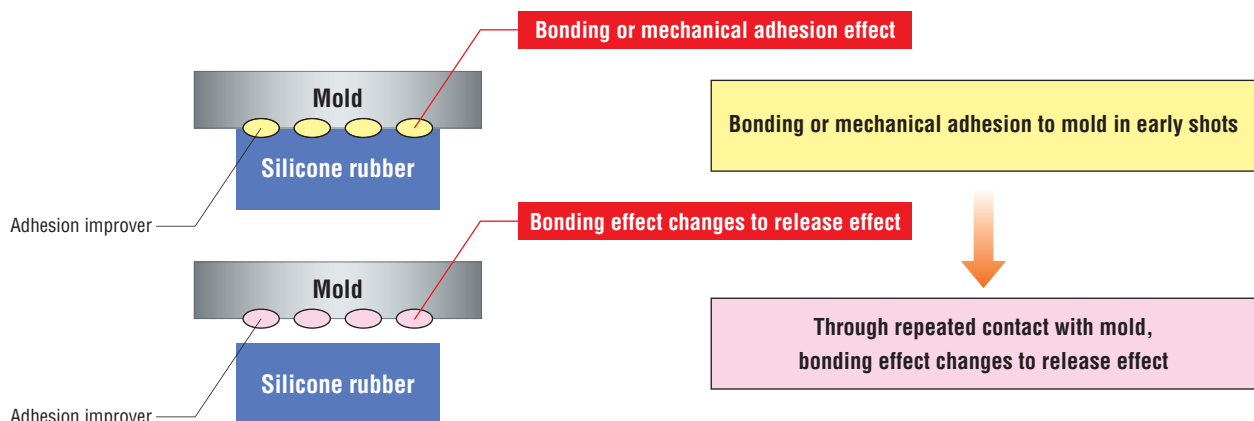


Instructions for use of Self-adhesive Liquid Silicone

1. After several tens of shots with a general purpose LIMS material (e.g. KEG-2000 series), switch to a self-adhesive material.
2. Prepare a dilute surfactant solution (5-10% dishwashing detergent or other) and apply it to the mold surface. Wipe off excess, then apply a fluorine-based release agent ("DAIFREE", made by Daikin Kogyo) for each shot, and reduce the number of applications.

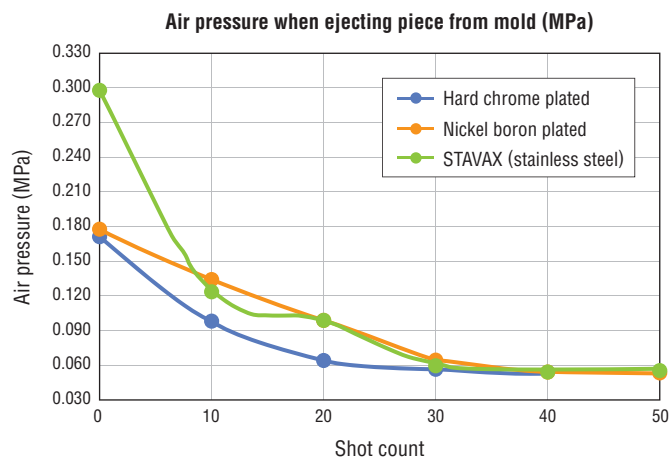
As the release mechanism (presumed) in the figure below shows, there is a high probability that the material will bond or mechanically adhere to the mold during the early shots. But it seems that with repeated molding cycles, a sort of "release layer" forms on the mold surface and the material releases more easily from the mold.

Release mechanism (presumed) of Self-adhesive Liquid Silicone from molds

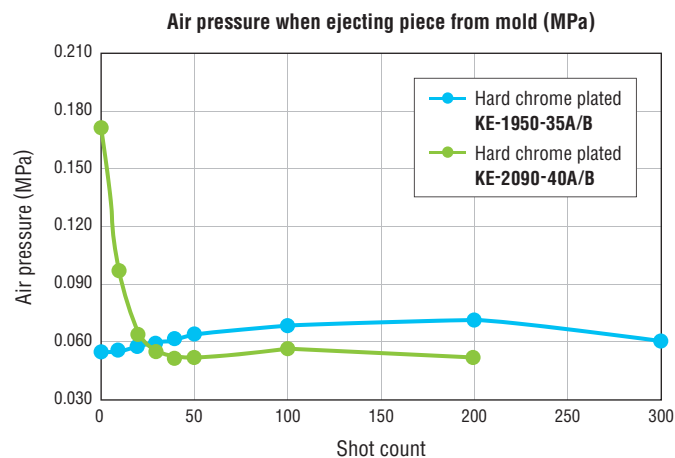


the time required for insert molding processes,

■ Differences in demolding force when using KE-2090-40A/B (influence of mold material)

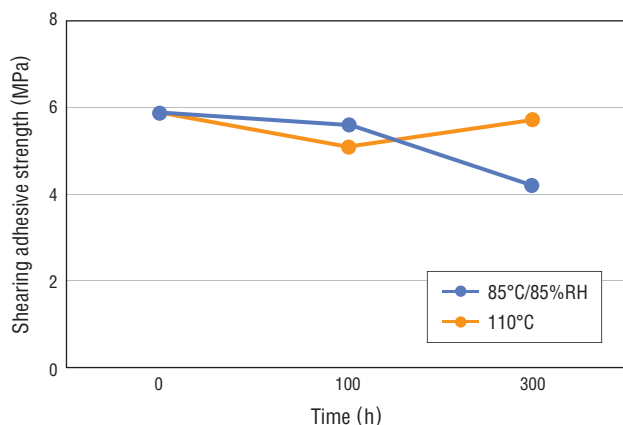


■ Differences in demolding force: KE-2090-40A/B vs. KE-1950-35A/B (general purpose LIMS material)

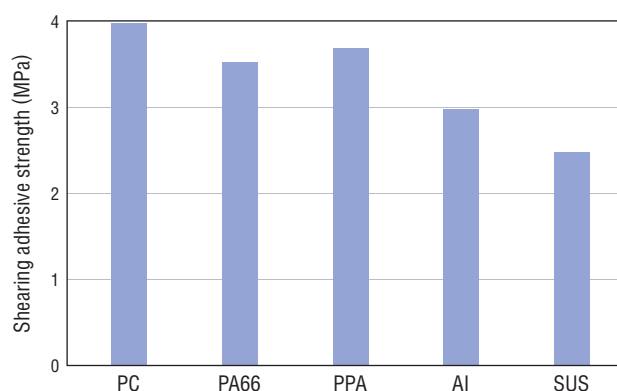


■ Adhesive durability

KE-2090-50A/B and PC resin



■ Shearing adhesive strength on various materials (KE-2096-40A/B)



■ Key features of the KE-2090 series (for PC & PBT resins)

Parameter		Grade	KE-2090-40A/B	KE-2090-50A/B	KE-2090-60A/B	KE-2090-70A/B
Viscosity	Pa·s	Component A	400	340	450	600
		Component B	700	800	700	600
Curing time, T ₁₀ /T ₉₀		sec	82/105	66/102	94/154	69/98
Specific Gravity at 25°C			1.11	1.12	1.12	1.13
Hardness, Durometer A			40	52	60	68
Tensile Strength		MPa	9.0	8.3	7.3	7.7
Elongation at Break		%	630	420	240	230

Curing conditions: 120°C / 5 minutes (press)

Curing property measuring conditions: Rotary rheometer (ODR), 120°C

(Not specified values)

Cautions in using Self-adhesive Liquid Silicone

- Even among the same resin materials, some materials are not suited to addition reactions of silicone rubbers or cannot sufficiently exert adhesion depending on their method of polymerization, degree of refining and types of additive and resin. When designing, check the resin to be used in advance.
- In the situations where the resin surface is dirty, clean the surface with a solvent or similar.
- As for polyamide resin, it is recommended to dry the resin before molding since it has high water absorption properties. Moreover,

attention must be paid to the molding procedure and conditions in the situations where heat treatment and humidity conditioning are performed to acquire dimensional stability.

- The release properties may vary depending on the mold material and condition of the surface (plating), so be sure to test prior to use.
- Be sure to read the Material Safety Data Sheets (MSDS) for these products before use. MSDS are available from the Shin-Etsu Sales Department.

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