

**LOCTITE®**  
**BONDERITE®**  
**TECHNOMELT®**  
**TEROSON®**

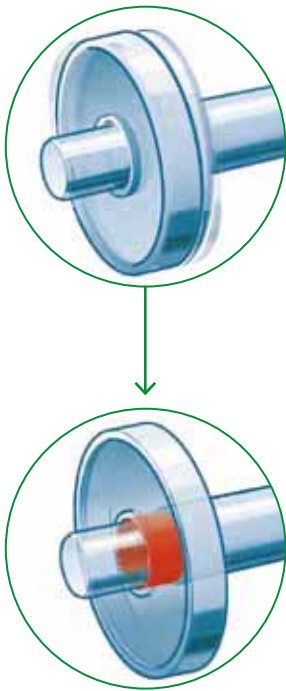
# Product Selector

Industrial Adhesive, Sealant and  
Functional Coating Solutions



# Retaining Compounds

## Cylindrical Assemblies



### Why use a LOCTITE retaining compound?

LOCTITE retaining compounds secure bearings, bushes and cylindrical parts into housings or onto shafts. They achieve maximum load transmission capability and uniform stress distribution and eliminate fretting corrosion. Applied as a liquid, they form a 100% contact between mating metal surfaces, eliminating the need for expensive replacement parts, time consuming machining or the use of mechanical methods. LOCTITE retaining compounds fill the inner space between components and cure to form a strong precision assembly.

### LOCTITE retaining compounds are much superior to conventional assembly methods

- Pins, key/keyway assemblies: Have an uneven distribution of mass and an imbalance that can lead to vibration at high speeds.
- Splines and serrations: They cause high stresses due to the “notch effect” that occurs in the area of a key. High machining costs.
- Clamp rings, press fits, shrink fits, and taper fits: They rely on friction alone to transmit torque, therefore they are limited by material, surfaces and design. Close tolerances are needed to obtain specific load capacities, leading to high production costs. Interference fitting creates stresses in the components that can lead to failure, particularly when combined with operational stresses.
- Welding and soldering: Only compatible metals can be joined, the parts can be distorted by the high temperatures required. Heating of the material can lead to residual stresses and structural degradation. Disassembly can also be difficult or impossible.

### Advantages of LOCTITE retaining compounds as compared to conventional assembly methods

- High-strength products can carry high loads
- Fill all voids to prevent corrosion and fretting
- 100% contact – load and stress is distributed evenly over the joint

### Advantages of LOCTITE retaining compounds in combination with shrink fits or press fits

- Higher load transmission and performance with existing design and geometry solutions
- Equal performance with lower interference/lighter construction

### Advantages of LOCTITE retaining compounds in combination with shrink fits or press fits

#### 1. Gap Size Between Parts

Typically, low viscosity retaining compounds (125 to 2,000 mPa-s) are used for gaps up to 0.15 mm. For gaps greater than 0.15 mm, retaining compounds with higher viscosities (>2,000 mPa-s) should be used.

#### 2. Temperature Resistance

Most LOCTITE retaining compounds are capable of withstanding temperatures up to 150°C. For applications that require resistance to higher temperatures, Henkel has developed a special range of retaining products that can withstand up to 230°C.



## Surface Preparation

Components should be clean and free from contamination such as grease, oil, cutting fluids, protective coatings, etc.

- Degrease, clean and dry surfaces prior to applying the retaining compound – use LOCTITE SF 7063 (See Cleaning on page 110)
- If the retaining compound is applied below 5°C, pre-treatment with Activator LOCTITE SF 7240 or LOCTITE SF 7649 is advised (see Surface Preparation on page 133)
- The cure speed of the retaining compound can be increased by use of Activator LOCTITE SF 7649 or LOCTITE SF 7240 (see Surface Preparation on page 133).



## Dispensing Equipment

### Semi-Automatic Dispensing Equipment

#### LOCTITE 97009 / 97121 / 97201

LOCTITE Semi-Automatic Dispensing Equipment combines a controller and reservoir into a single unit for valve dispensing of many LOCTITE products. It provides digital timing control and an empty and end-of-cycle signal. Pinch Valve are suitable for stationary or hand-held setup mode. The reservoirs are large enough to accept 2kg bottles and units can be equipped with low level sensing.



97009 / 97121 / 97201

### Hand-Held Applicator

#### LOCTITE 98414 Peristaltic Hand Pump, 50ml bottle

#### LOCTITE 97001 Peristaltic Hand Pump, 250ml bottle

These hand-held applicators mount easily on any anaerobic LOCTITE 50ml or 250ml bottle, converting the bottle into a portable dispenser. They are designed to dispense at any angle in drop sizes from 0.01 to 0.04 ml, without leaks or product waste (suitable for viscosities up to 2,500 mPa·s).



97001 / 98414

**For information on semi- or fully automatic dispensing equipment, available valves, spare parts, accessories and dispensing tips, please refer to pages 152 – 163 or the LOCTITE Equipment Sourcebook.**

## 3. Bond Strength

A high strength retaining compound is recommended for applications that require a permanent bond. If parts will need to be taken apart for maintenance, it is better to use a medium strength product because shear strength is lower.

## 4. Cure Speed

Many production applications require retaining compounds with fast cure speed to optimise production rates. On the other hand, some applications call for a slower cure so that adjustments can be made after the parts have been assembled. Our range of LOCTITE retaining compounds offers a wide choice of cure speed options.



# Retaining Compounds

## Product Table

### Is assembly badly worn?

**Yes**

Gaps < 0.5 mm

**Yes**

### Solution

#### LOCTITE 660

(with activator LOCTITE SF 7240 or LOCTITE SF 7649)



#### LOCTITE 641



**Diametrical clearance**

Up to 0.5 mm

Up to 0.1 mm

**Strength required**

High

Medium

**Handling strength after<sup>1</sup>**

15 min.

25 min.

**Service temperature range**

-55°C to +150°C

-55°C to +150°C

**Pack size**

50ml

10ml, 50ml, 250ml

**Equipment<sup>2</sup>**

142240

97001, 98414

#### Handy Hints

- Degrease, clean and dry surfaces prior to applying the retaining compound – use LOCTITE SF 7063 (See Cleaning on page 110)
- If the retaining compound is applied below +5°C, pre-treatment with LOCTITE SF 7240 or LOCTITE SF 7649 is advised (See Surface Preparation on page 133)
- Use in conjunction with existing designs to increase their strength

#### LOCTITE 660

- Ideal for repairing worn coaxial parts without remachining
- Enables re-use of worn bearing seats, keys, splines or tapers
- Suitable for retaining shims

**P1 NSF Reg. No.: 123704**

#### LOCTITE 641

- Ideal for parts that need subsequent dismantling, e.g. retention of bearings onto shafts and into housings

No

Gaps < 0.25 mm

Is disassembly required?

No

What service temperature is required?

Up to 230°C

Up to 180°C

Gap < 0.25 mm

Gap < 0.15 mm

**LOCTITE  
620**



Up to 0.2 mm

High

80 min.

-55°C to +230°C \*

250ml

97001, 98414

**LOCTITE 620**

- High temperature resistance
- Ideal for retaining pins in high temperature assemblies, sleeves in pump housings and bearings in auto transmissions

**DVGW approval (EN 751-1):  
NG-5146AR0622**

**LOCTITE  
638**



Up to 0.25 mm

High

4 min.

-55°C to +180°C

10ml, 50ml, 250ml, 1 ltr, 2 ltr

97001, 97121, 97201, 98414

**LOCTITE 638**

- High temperature resistance
- Bonds through contamination including industrial oils
- High strength on all metals, including passive substrates (e.g. stainless steel)
- Ideal for shafts, gears, pulleys and similar cylindrical parts

**Approvals: P1 NSF Reg. No. 123010, DVGW (EN 751-1):  
NG 5146AR0619, WRAS  
(BS 6920): 0511518**

**LOCTITE  
6300**



Up to 0.15 mm

High

10 min.

-55°C to +180°C

50ml, 250ml

97001, 98414

**LOCTITE 6300**

- Leading in health and safety
- No hazard symbols, risk or safety phrases
- "White" Material Safety Data Sheet (no entries in sections 2, 3, 15 and 16 of MSDS)
- Good thermal resistance

**LOCTITE  
648**



Up to 0.15 mm

High

3 min.

-55°C to +200°C

10ml, 50ml, 250ml, 1 ltr, 2 ltr

97001, 97009, 97121, 97201, 98414

**LOCTITE 648**



- High temperature resistance
- Bonds through contamination including industrial oils
- High strength on all metals, including passive substrates (e.g. stainless steel)
- Ideal for retaining of parts with a clearance or interference fit

**Approvals: P1 NSF Reg. No.: 148350, DVGW (EN 751-1):  
NG 5146C00236, WRAS  
(BS 6920): 0808532**



# Retaining Compounds

## Product List

Product	Chemical basis	Colour	Fluorescence	Service temperature range	Tensile shear strength	Thixotropy	Viscosity
LOCTITE 601	Methacrylate	Green	Yes	-55°C to +150°C	> 15 N/mm <sup>2</sup>	No	100 – 150 mPa·s
LOCTITE 603		Green	Yes	-55°C to +150°C	> 22.5 N/mm <sup>2</sup>	No	100 – 150 mPa·s
LOCTITE 620		Green	No	-55°C to +230°C**	> 24.1 N/mm <sup>2</sup>	Yes	5,000 – 12,000 mPa·s
 LOCTITE 638		Green	Yes	-55°C to +180°C	> 25 N/mm <sup>2</sup>	No	2,000 – 3,000 mPa·s
LOCTITE 640		Green	Yes	-55°C to +175°C	22 N/mm <sup>2</sup>	No	450 – 750 mPa·s
LOCTITE 641		Yellow	No	-55°C to +150°C	> 6.5 N/mm <sup>2</sup>	No	400 – 800 mPa·s
 LOCTITE 648		Green	Yes	-55°C to +180°C	> 25 N/mm <sup>2</sup>	No	400 – 600 mPa·s
LOCTITE 649		Green	Yes	-55°C to +175°C	> 15 N/mm <sup>2</sup>	No	550 – 950 mPa·s
LOCTITE 660		Silver	No	-55°C to +150°C	> 17.2 N/mm <sup>2</sup>	Yes	150,000 – 350,000 mPa·s
LOCTITE 661		Amber	No	-55°C to +175°C	> 15 N/mm <sup>2</sup>	No	400 – 600 mPa·s
LOCTITE 662		Amber	No	-55°C to +150°C	> 25 N/mm <sup>2</sup>	No	1,750 – 3,250 mPa·s
LOCTITE 675		Green	No	-55°C to +150°C	20 N/mm <sup>2</sup>	No	100 – 150 mPa·s
LOCTITE 6300		Green	Yes	-55°C to +180°C	> 15 N/mm <sup>2</sup>	No	250 – 550 mPa·s
LOCTITE 121078		Green	Yes	-55°C to +175°C	> 20 N/mm <sup>2</sup>	Yes	3,000 – 5,000 mPa·s

\* In combination with activator

\*\* After heat cure +180 °C for 30 min.

Fixture time on steel	Maximum diametrical clearance	Pack sizes	Comments
25 min.	0.1 mm	250ml	High strength, low viscosity, small gaps
8 min.	0.1 mm	10ml, 50ml, 250ml, 1 ltr	High strength, oil tolerant
80 min.	0.2 mm	250ml	High strength, high temperature resistance
4 min.	0.25 mm	10ml, 50ml, 250ml, 1 ltr, 2 ltr	High strength, high temperature resistance, oil tolerant
2 hr	0.1 mm	250ml	High strength, good temperature resistance, slow curing
25 min.	0.1 mm	10ml, 50ml, 250ml	Medium strength, if disassembly is required
3 min.	0.15 mm	10ml, 50ml, 250ml, 1 ltr, 2 ltr	High strength, high temperature resistance, oil tolerant
10 min.	0.1 mm	250ml	High strength, no acrylic acid
15 min.	0.5 mm*	50ml	High strength, gap fill for repair
4 min.	0.15 mm	250ml	High strength, low viscosity, also UV-curing
7 min.	0.25 mm	Not available in the U.K.	High strength, medium viscosity, also UV-curing
45 min.	0.1 mm	250ml	High strength, slow curing
10 min.	0.15 mm	50ml, 250ml	High strength, white MSDS, good temperature resistance
3 min.	0.25 mm	250ml, 1 ltr, 2 ltr	High strength, good temperature resistance, high viscosity

