LOCTITE®

“Do it Right” User’s Guide

The “When, Where & How” to use
LOCTITE® Maintenance Products

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LOCTITE® MAINTENANCE PRODUCTS

The primary function of this User's Guide is to help you, the maintenance professional, with the proper use of LOCTITE® products. A wide variety of preventative maintenance, as well as repair techniques, are explained in step-by-step detail. Consider this a supplemental service manual for every piece of equipment in your plant. Our goal is to make it easier for you to use our products, to your benefit, for faster repair times, reduced downtime, and extended equipment life. Additional information on these products, as well as others, is available by contacting your local Henkel adhesives and sealants representative at the telephone number listed on the back cover of this guide.

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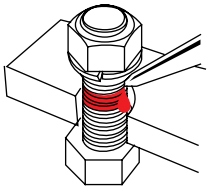
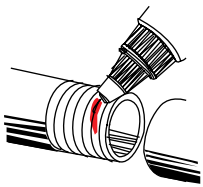
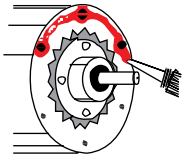
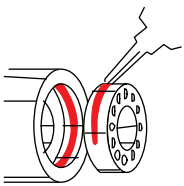
INTRODUCTION

INTRODUCTION TO ANAEROBIC ADHESIVES AND SEALANTS

Anaerobic adhesives and sealants were developed by the founder of LOCTITE® Corporation, now Henkel Corporation, in 1953 and, since then, they have significantly evolved to meet the highest requirements of equipment manufacturers, maintenance and overhaul.

Anaerobic adhesives and sealants are resins that convert from liquid to a tough structural solid in the absence of air and the presence of metal. The primary functions of anaerobic resins are:

Threadlocking	Thread Sealing	Gasketing	Retaining
			

Each one of these functions is based upon control of five major variables: strength, viscosity, adhesion, flexibility, and temperature resistance. These five parameters give anaerobics users considerable latitude in adjusting properties for optimum performance in specific application areas.

Another variable that should be considered is the substrate in which the adhesive will be applied. For certain substrates or other special requirements, the use of primer is recommended.

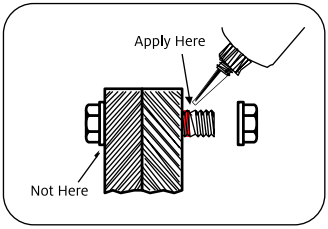
WHY USE A PRIMER?

1. Primers activate inactive surfaces.
2. Primers speed cure times for faster return to service.
3. Primers speed curing through larger gaps and deep threads.
4. Primers substantially speed cure times on cold parts.
5. Primers act as cleaning agents.

Active surfaces (Primer optional): Brass, copper, bronze, iron, soft steel, nickel.
Inactive surfaces (Primer required): Aluminum, stainless steel, magnesium, zinc, black oxide, cadmium, titanium, others.

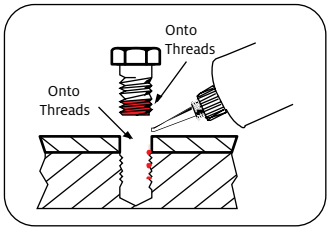
THREADLOCKING

THROUGH HOLES (BOLTS AND NUTS)



1. Clean all threads (bolt and nut) with LOCTITE® SF 7070 ODC-Free Cleaner & Degreaser, if required.
2. If necessary, spray all threads with LOCTITE® SF 7649™ Primer N™. Allow to dry.
3. Select the proper strength LOCTITE® Threadlocker product.
4. Insert bolt into thru hole assembly.
5. Apply several drops of liquid Threadlocker onto bolt at targeted tightened nut engagement area.
6. Assemble and tighten nut as usual.

BLIND HOLES (CAP SCREWS, ETC.)

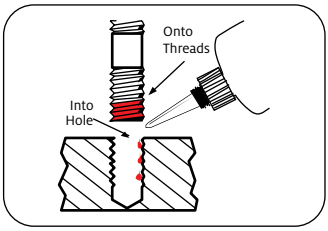


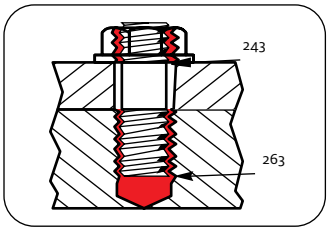
1. Clean all threads (bolt and hole) with LOCTITE® SF 7070 ODC-Free Cleaner & Degreaser, if required.
2. If necessary, spray (bolt and hole) with LOCTITE® SF 7649™ Primer N™. Allow 30 seconds to dry.
3. Select the proper strength Threadlocking product.
4. Squirt several drops down the sides of the female threads.
5. Apply several drops to bolt.
6. Tighten as usual.

   Note: Using LOCTITE® Threadlockers will virtually eliminate stripped threads in aluminum or Magnesium housings caused by galvanic corrosion.

THREADLOCKING

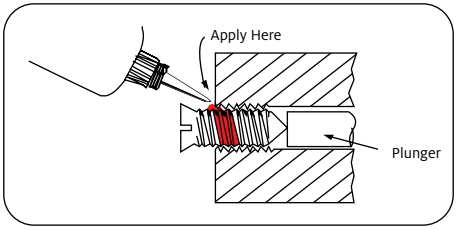
BLIND HOLES (STUDS, ETC.)





1. Clean all threads (bolt and hole) with LOCTITE® SF 7070 ODC-Free Cleaner & Degreaser, if required.
2. If necessary, spray all threads with LOCTITE® SF 7649™ Primer N™. Allow to dry.
3. Squirt several drops of LOCTITE® **263™** Threadlocker down the sides of the female threads.
   Note: Use LOCTITE® 277™ Threadlocker if stud is over 1" diameter.
4. Apply several drops of LOCTITE® **263™** Threadlocker onto stud threads.
5. Install studs.
6. Position cover, head, etc.
7. Apply drops of LOCTITE® **243™** Threadlocker onto exposed threads.
8. Tighten nuts as required.

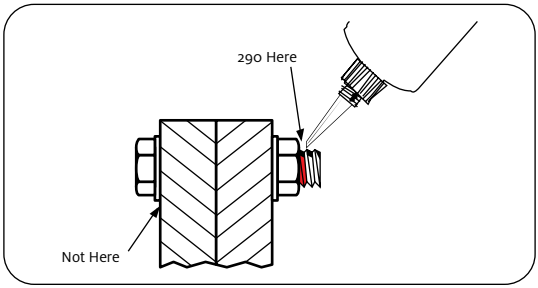
BLIND HOLES (STUDS, ETC.)



1. Adjust screw to proper setting.
2. Apply several drops of LOCTITE® **290™** Threadlocker at screw and body juncture.
3. Avoid touching bottle tip to metal.
   Note: If re-adjustment is difficult, apply heat to screw with soldering gun (230°C).
   LOCTITE® 220™ Threadlocker is a weaker version of LOCTITE® 290™ Threadlocker.

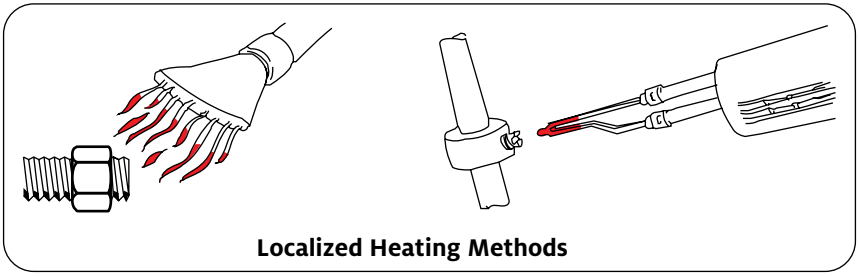
THREADLOCKING

PRE-ASSEMBLED FASTENERS



1. Clean bolts and nuts with LOCTITE® SF 7070 ODC-Free Cleaner & Degreaser, if required.
2. Assemble components.
3. Tighten nuts.
4. Apply several drops of LOCTITE® **290™** Threadlocker at the nut and bolt juncture.
5. Avoid touching bottle tip to metal.
   Note: For preventive maintenance on existing equipment: RE-TIGHTEN nuts and apply LOCTITE® **290™** Threadlocker at the nut and bolt juncture.

HIGH STRENGTH DISASSEMBLY



Localized Heating Methods

1. Apply localized heat to nut or stud (232°C for 5 minutes).
2. Disassemble while HOT.
   Note: Use standard hand tools for disassembly of low and medium strength Threadlockers.

THREADLOCKING

PRODUCT SELECTOR

LOCTITE® THREADLOCKER QUICK SELECTOR			
Use	**Strength**	**Product**	**Color**
Small Screws	Low	222™	Purple
Pre-Assembled	Low	220™	Blue
Nuts & Bolts	Medium	243™	Blue
Pre-Assembled	Medium	290™	Green
Nuts & Bolts	High	263™	Red
Studs (up to 1”)	High	263™	Red
Studs (over 1”)	High	277™	Red

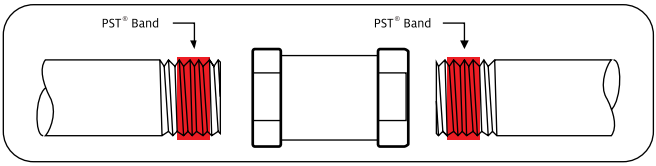
HEAT SEIZURE PREVENTION - ANTI-SEIZE

Anti-Seize compounds protect mated metal parts against friction, galling, and corrosion. Anti-Seize also reduces wrench torque to facilitate assembly and disassembly of threaded connections.

LOCTITE® ANTI-SEIZE QUICK SELECTOR			
Product	**Max Temp.**	**IDH No.**	**Pack Size**
LOCTITE® LB 8008 C5-A Copper Anti-Seize Lubricant	982°C	2096331	1 kg
LOCTITE® LB 8150 Silver Grade Anti-Sieze	870°C	833783	500 g
LOCTITE® LB 771 Nickel Anti-Seize	1315°C	1751839	1 lb.
LOCTITE® LB 8009 Heavy Duty Anti-Seize	1315°C	1751851	510 g

THREAD SEALING

STANDARD FITTINGS - PIPE, HYDRAULIC, OR AIR



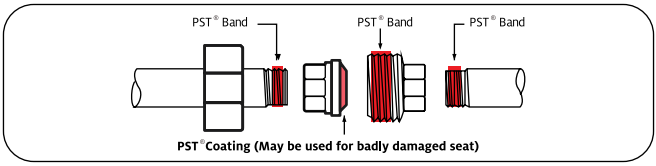
1. Clean parts of contamination. If necessary, spray LOCTITE® SF 7649™ Primer N™ onto threaded parts (male and female). Allow to dry.
   Note: Primer is not required for brass parts.
2. Apply a band of LOCTITE® PST® Pipe Sealant to male threads starting one to two threads from end of pipe.
3. Assemble parts snugly. Do not overtighten.
4. If initial pressure exceeds 6.89 N/mm²*, wait 30 minutes before pressurizing.

Note:

- **For fine threads of hydraulic & pneumatic connectors use LOCTITE® 542™ Thread Sealant.**
- **For course threads, medium strength use LOCTITE® 577™ Thread Sealant.**
- **For stainless steel components, use LOCTITE® 567™ PST® Pipe Sealant.**
- **For general purpose thread sealing, use LOCTITE® 565™ PST® Pipe Sealant.**
- **For fine filtration systems requiring zero contamination, use LOCTITE® 545™ Hydraulic/Pneumatic Sealant.**
- **If sealing chemicals or strong acids/bases, refer to Fluid Compatibility Chart.**
- **Do not use on oxygen or strong oxidizers (chlorine).**

*Depending on conditions

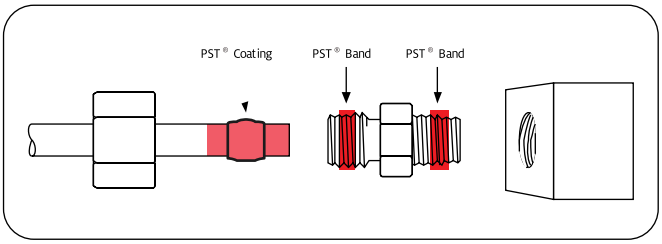
PIPE UNIONS



1. Disassemble and, if necessary, spray all components with LOCTITE® SF 7649™ Primer N™. Allow to dry.
2. Apply a thin coating of LOCTITE® PST® Pipe Sealant to union face.
3. Apply a band of LOCTITE® PST® Pipe Sealant to male threads.
4. Assemble parts snugly.

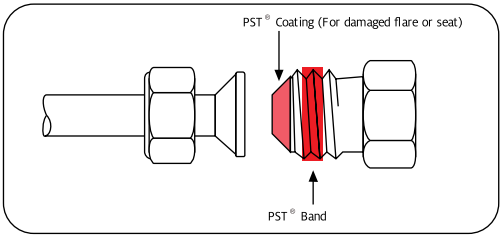
THREAD SEALING

COMPRESSION FITTINGS



1. Slide fitting nut and ferrule back approximately 3/4” from end of tubing.
2. If necessary, spray the entire assembly with LOCTITE® SF 7649™ Primer N™. Allow to dry.
   Note: Primer is not required for brass parts.
3. Apply a thin coating of LOCTITE® PST® Pipe Sealant to tubing where ferrule will be located.
5. Slide ferrule forward over LOCTITE® PST® Pipe Sealant coated tubing, then apply a thin bead of LOCTITE® PST® Pipe Sealant coating to ferrule.
6. Slide ferrule forward over LOCTITE® PST® coated tubing.
7. Apply a small band of LOCTITE® PST® Pipe Sealant to male threads.
8. Assemble and tighten normally.
   Note: Do not use on plastic fittings or tubing.

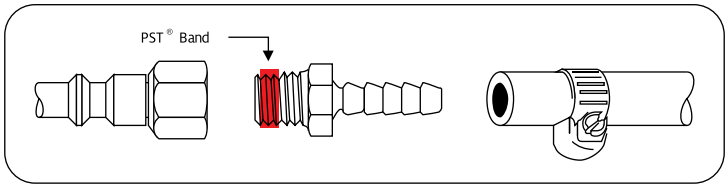
FLARED/SWAGED FITTINGS



1. Disassemble and if necessary, spray all components with LOCTITE® SF 7649™ Primer N™. Allow to dry.
2. Apply a thin coating of LOCTITE® PST® Pipe Sealant to fitting face.
3. Apply a band of LOCTITE® PST® Pipe Sealant to male threads.
4. Assemble parts snugly.

THREAD SEALING

HOSE ENDS - AIR & HYDRAULIC



1. If necessary, spray adapter threads with LOCTITE® SF 7649™ Primer N™. Allow to dry.
2. Insert barbed hose stem into hose I.D. with slight twisting motion.
3. Install appropriate hose clamp.
4. Apply a band of LOCTITE® PST® Pipe Sealant to male hose stem threads upon installation or adding accessory device. Tighten snugly.
   Note: LOCTITE® PST® Pipe Sealant may attack synthetic rubber tubing.

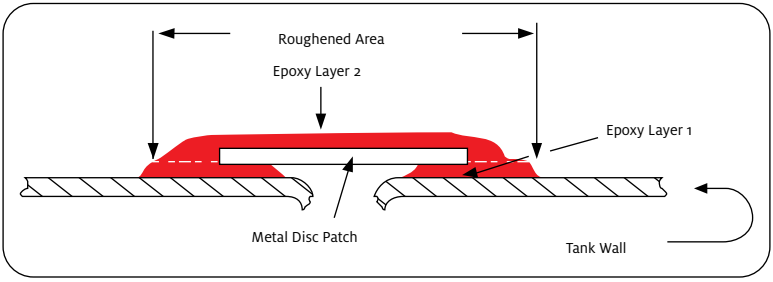
LOCTITE® THREAD SEALING QUICK SELECTOR (TAPERED THREADS)

Application	Product	Primer	Max Pressure	Temp Range
Fine Threads General Purpose	**542™** Thread Sealant	N™	68.9 N/mm²	-54° to +150°C
Coarse Threads General Purpose	**572™** Thread Sealant	N™	68.9 N/mm²	-54°C to +150°C
Coarse Threads Medium Strength	**577™** (Up) Thread Sealant	N™/T™	68.9 N/mm²	-54°C to +180°C
Stainless Steel and All Other Metal Fittings	**567™** (Up) PST® Pipe Sealant	N™	68.9 N/mm²	-54°C to +250°C
Most Metal Fittings Except Stainless Steel	**565™** PST® Pipe Sealant	N™	68.9 N/mm²	-54°C to +150°C
High Filtration/ Zero Contamination Systems	**545™** Hydraulic/ Pneumatic Sealant	T™	68.9 N/mm²	-54°C to +150°C

DO NOT USE THESE PRODUCTS ON OXYGEN OR STRONG OXIDIZERS.
FLUID COMPATIBILITY QUESTIONS?
1. Refer to Fluid Compatibility Chart. 2. Contact your local Industrial Distributor. 3. Call Henkel Technical Services.

PUNCTURE SEALING

TANKS, VESSELS, ETC.



1. **IMPORTANT! TAKE PROPER SAFETY PRECAUTIONS IF WORKING WITH FLAMMABLE LIQUID TANKS. AVOID USE WITH COMPRESSIBLE GASSES.**
2. Clean the repair area with LOCTITE® SF 7070 ODC-Free Cleaner & Degreaser.
3. Roughen a 1”- 2” radius around hole with emery cloth. Clean again.
4. Prepare a metal disc patch slightly larger than hole.
5. Mix LOCTITE® PC **3473** Fast Steel Putty (A and B) per directions.
6. Apply a thin layer of LOCTITE® PC **3473** Fast Steel Putty to roughened area.
7. Immediately position disc patch over hole.
8. Apply a cover layer of LOCTITE® PC **3473** Fast Steel Putty over disc patch and Epoxy layer 1.
9. Allow to cure before service use:
   a. Liquid storage - 1 hour
   b. Low pressure (under 1.03 N/mm²) - 1 hour
   c. High Pressure - Not Recommended over 1.03 N/mm²
10. Paint as required.

SEALING CRACKS

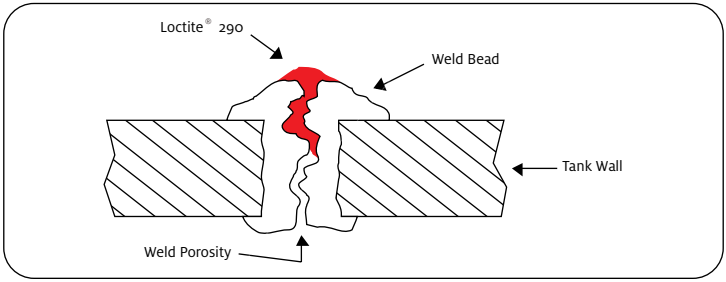
1. Drill termination holes to prevent further cracking.
2. Follow directions above. Modify as needed.

SEALING PIN-HOLES

1. Follow directions above. No disc patch needed.

POROSITY SEALING

EXISTING WELD POROSITIES AND CASTINGS



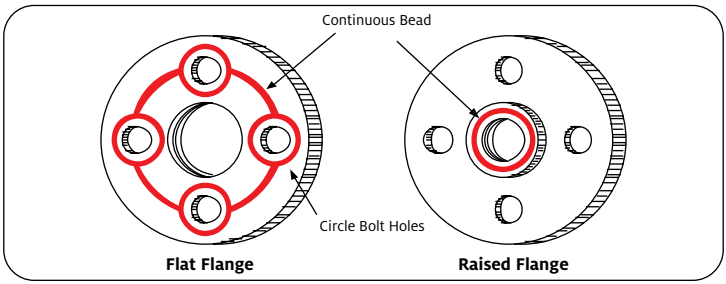
1. **IMPORTANT! TAKE PROPER SAFETY PRECAUTIONS IF WORKING WITH FLAMMABLE LIQUID TANKS. AVOID USE WITH COMPRESSIBLE GASSES.**
2. Wire brush to remove paint, rust, etc. from repair area.
3. Clean repair area with LOCTITE® SF 7070 ODC-Free Cleaner & Degreaser.
4. Apply localized heat to bring repair area to approx. 120°C.
5. Allow repair area to cool to approx. 80°C.
6. Brush or spray sealant on repair area.
   Note:
   • Steel - Use LOCTITE® 290™ Threadlocker at 80°C.
   • Aluminum/Stainless Steel - Use LOCTITE® 290™ Threadlocker at 50°C.
   Note:
   • Not recommended for "blowholes"
   • Maximum porosity sealed - 0.005"
7. Allow to cure for 30 minutes (High Pressure above 1.03 N/mm² - 1 hour)
8. Clean with LOCTITE® SF 7070 ODC-Free Cleaner & Degreaser to remove excess sealant. Do not grind.
9. Paint as required.
   Note: Casting repair uses same procedure.

SEALING NEW WELDS - PREVENTATIVE MAINTENANCE

1. Remove all slag and scale while hot.
2. Apply sealant when weld is 80°C and falling.
3. Follow information above.

FORM-IN-PLACE GASKETING

SEALING CAST RIGID FLANGES



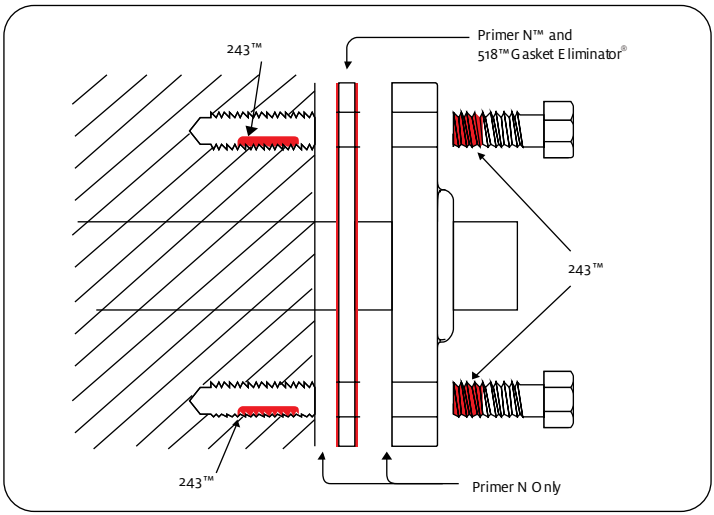
1. Remove old gasketing material and other heavy contaminants with LOCTITE® SF 790 Chisel® Gasket Remover. Use mechanical removal technique if required.
   Note: Avoid grinding.
2. Clean both flanges with LOCTITE® SF 7070 ODC-Free Cleaner & Degreaser, if required.
3. Spray LOCTITE® SF 7649™ Primer N™ on only one surface. Allow 1-2 minutes to dry.
4. Apply a continuous bead of LOCTITE® Flange Sealant to the other surface.
   Note: Circle all bolt holes with sealant, if appropriate.
5. Mate Parts. Assemble and tighten as required.
   Note: Immediate assembly not required; however avoid delays over 45 minutes.
6. Allow to cure:
   a. No pressure - immediate service
   b. Low pressure (up to 3.44 N/mm²) - 30 to 45 minutes
   c. High pressure (3.44 N/mm² to 17.23 N/mm²) - 4 hours
   d. Extreme high pressure (17.23 N/mm² to 34.47 N/mm²) - 24 hours

LOCTITE® GASKETING QUICK SELECTOR

Use	Product	Gap Fill	Temp Range
Rigid and semi rigid metal flanges	574™	0.010"	-54°C to 150°C
Rigid iron, steel and aluminium flanges	518™ (UP)	0.010"	-54°C to 150°C
Flexible applications	515™	0.010"	-54°C to 150°C
Hi-Temp	510™	0.010"	-54°C to 204°C

GASKET DRESSING

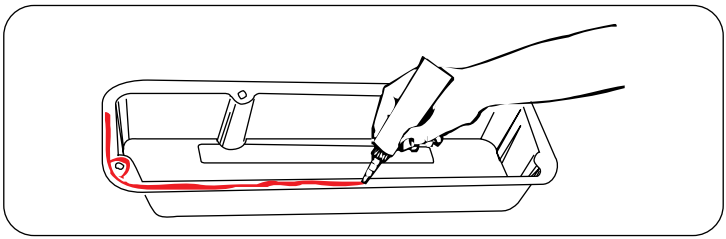
SEALED FLANGES



1. Remove old gasketing material and other heavy contaminants with LOCTITE® SF 790 Chisel® Gasket Remover. Use mechanical removal technique if required.
   Note: Avoid grinding.
2. Clean both flanges with LOCTITE® SF 7070 ODC-Free Cleaner & Degreaser.
3. Spray LOCTITE® SF 7649™ Primer N™ on both flange faces and both sides of the precut gasket. Allow 1-2 minutes to dry.
4. Smear LOCTITE® Flange Sealant to both sides of precut gasket with a clean applicator.
5. Place coated gasket on flange surface and assemble parts immediately.
   Note:
   - **If cover bolts into blind holes (as above), apply LOCTITE® 243™ Threadlocker into hole and on threads. Tighten normally.**
   - **If through bolt assembly, apply LOCTITE® 243™ Threadlocker to bolt threads.**
6. Tighten normally.

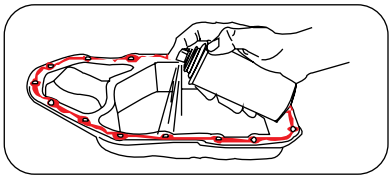
FORM-IN-PLACE SILICONES

STAMPED OR SHEET METAL FLANGES



1. Remove old gasketing material and other heavy contaminants with LOCTITE® SF 790 Chisel® Gasket Remover.
2. Clean both flanges with LOCTITE® SF 7070 ODC-Free Cleaner & Degreaser.
3. Apply a continuous bead of High Performance Silicones to sealing surface. Circle all bolt holes.
   Note:
   • Use proper bead diameter to seal flange width and depth 3mm or sufficied to cover flange.
   • Minimize excessive material "squeeze in".
4. Assemble within 10 minutes by pressing together. Tighten as required.
5. Clean up any excess or squeeze out.
6. Cure times will vary with temperature, humidity, and gap. Typical full cure time is 24 hours.

DISASSEMBLY



• Disassemble flange using hand tools.
Note: For anaerobic/silicone gaskets, clean with LOCTITE® SF 790 Chisel® Gasket remover.

REASONS TO USE LOCTITE® ANAEROBIC GASKETING COMPOUNDS INSTEAD OF STANDARD RTV SILICONES

- LOCTITE® ANAEROBIC GASKETING COMPOUNDS ARE RESISTANT TO GASOLINE AND FUEL OILS. Silicones should not be used to seal fuel systems. They swell and lose sealing ability.
- LOCTITE® ANAEROBIC GASKETING COMPOUNDS RESIST "BLOW-OUT". Silicones are not recommended for high pressure applications.

FORM-IN-PLACE SILICONES

HIGH PERFORMANCE SILICONES

LOCTITE® HIGH PERFORMANCE RTV SILICONES QUICK SELECTOR			
Product	**Use**	**Gap Fill**	**Temp Range**
587™ Blue	General	0.250"	-59°C to 250°C
5699™ Grey	General	0.125"	-59°C to 329°C
5910™ Black	High Adhesion	0.240"	-54°C to 260°C
5920™ Copper	Hi-Temp	0.250"	-54°C to 371°C

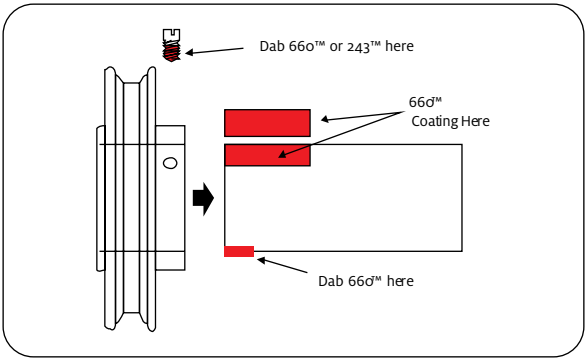
1. Continuous service. Intermittent temperature higher than established range.
Note: Silicones used at extreme high temperatures can seal but lose various properties.

REASONS TO USE LOCTITE® HIGH PERFORMANCE RTV SILICONES INSTEAD OF STANDARD RTV SILICONES

- LOCTITE® HIGH PERFORMANCE SILICONES WILL NOT CORRODE STEEL OR ALUMINUM. Standard RTV acetoxy silicones (vinegar smell) should not be used to seal closed systems (gear boxes, electrical boxes, etc.). Acetic acid will corrode internal parts (bearings, contacts, etc.).
- LOCTITE® HIGH PERFORMANCE SILICONES ARE 8 TIMES MORE OIL RESISTANT THAN STANDARD RTV SILICONES. Standard RTV silicones should not be used to seal "Hot Oil" systems (oil pan, etc.). They swell and lose sealing ability.

STRENGTHEN KEYED ASSEMBLIES

KEYED ASSEMBLIES - STANDARD DUTY



ASSEMBLY

1. Clean all parts with LOCTITE® SF 7070 ODC-Free Cleaner & Degreaser.
2. If necessary, spray all parts (I.D. and O.D.) with LOCTITE® SF 7649™ Primer N™.
3. Apply LOCTITE® **660™** Retaining Compound coating into keyway and on key.
4. Apply dab(s) of LOCTITE® **660™** Retaining Compound onto shaft opposite keyway or evenly spaced around shaft.
5. Assemble parts. Wipe off excess.
6. Apply LOCTITE® **660™** Retaining Compound dab to set screw.
7. Tighten set screw.
8. Allow 5-10 minutes prior to service.

Note:

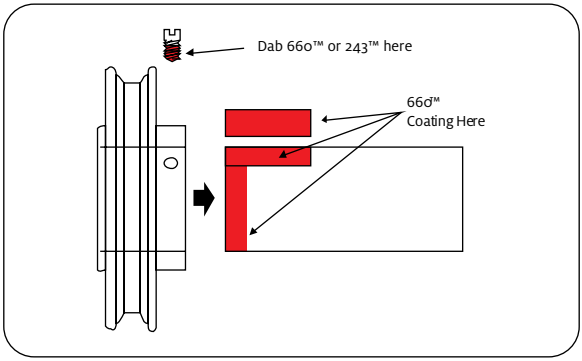
- **LOCTITE® 660™ Retaining Compound is NOT recommended for radial gaps exceeding 0.020" on shaft or keyway.**
- **See BADLY WALLOWED KEYWAY for procedure page 21.**

DISASSEMBLY

1. Tap component and key with hammer.
2. Pull as usual.

STRENGTHEN KEYED ASSEMBLIES

KEYED ASSEMBLIES - HEAVY DUTY



ASSEMBLY

1. Clean all parts with LOCTITE® SF 7070 ODC-Free Cleaner & Degreaser.
2. Apply a LOCTITE® **660™** Retaining Compound coating around shaft, into keyway, and on key.
3. Assemble parts. Wipe off excess.
4. Apply a LOCTITE® **660™** Retaining Compound dab to screw.
5. Tighten set screw.
6. Allow 30 minutes prior to service.

Note:

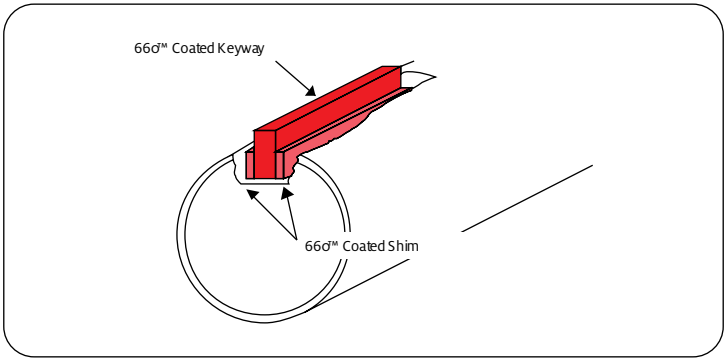
- **If gap exceeds 0.005", use LOCTITE® SF 7649™ Primer N™ on appropriate area (shaft or keyway).**
- **LOCTITE® 660™ Retaining Compound is NOT recommended for radial gaps exceeding 0.020" on shaft or keyway.**
- **See BADLY WALLOWED KEYWAY for procedure page 21.**

DISASSEMBLY

1. Tap component and key with hammer.
2. If necessary, apply localized heat (230°C for five minutes).
3. Pull while hot.

STRENGTHEN KEYED ASSEMBLIES

REPAIR BADLY WALLOWED KEYWAY



1. Determine the gap width on each side of key.
2. Select and trim appropriate shim stock.
3. Clean all parts with LOCTITE® SF 7070 ODC-Free Cleaner & Degreaser.
4. If necessary, spray all parts with LOCTITE® SF 7649™ Primer N™. Allow to dry.
5. Apply a LOCTITE® **660™** Retaining Compound coating into keyway.
6. Install shims.
7. Assemble as required using LOCTITE® **660™** Retaining Compound.
8. Allow 30-60 minute cure time.

Note:

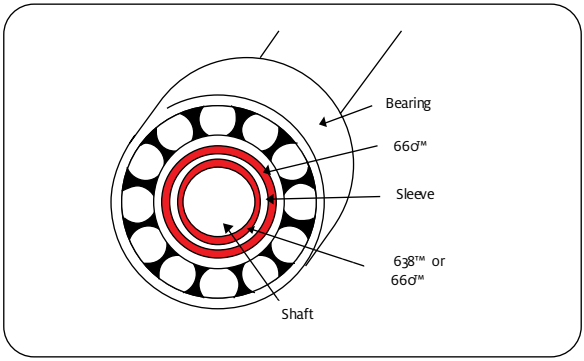
- **Minimize "gap fill" using shim stock.**
- **LOCTITE® 660™ Retaining Compound is NOT recommended for lateral gaps exceeding 0.020".**
- **Higher strengths are obtained by NOT using LOCTITE® SF 7649™ Primer N™ with small (0.002"-0.004") gap, and allowing longer cure (4-24 hours).**

EMERGENCY REPAIR ONLY!

Due to the nature of the damage, this should be considered a temporary repair until the unit can be replaced.

SHAFT MOUNTED ASSEMBLIES

REPAIR BADLY WORN SHAFT



1. Determine a minimum radial gap.
2. Select and trim appropriate sleeve to allow component slip fit.
3. Roughen sleeve O.D. with emery cloth.
4. Clean all parts with LOCTITE® SF 7070 ODC-Free Cleaner & Degreaser.
5. Apply a LOCTITE® **638™** or LOCTITE® **660™** Retaining Compound coating around the shaft.
6. Install sleeve.
7. Apply a coating of LOCTITE® **660™** Retaining Compound to sleeve O.D.
8. Install component as required onto sleeved shaft.
9. Allow 30-60 minute cure.

Note:

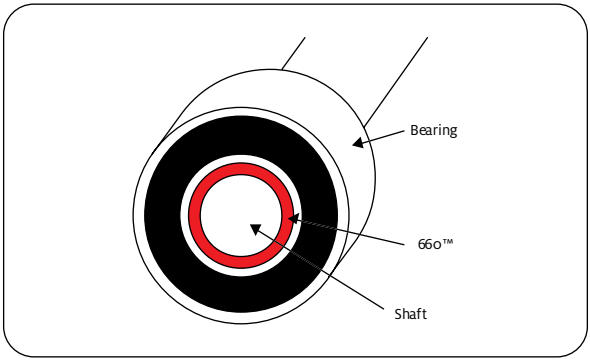
- **Minimize gap fill using shim stock or sleeve material.**
- **LOCTITE® 660™ Retaining Compound is NOT recommended for lateral gaps exceeding 0.020".**
- **Higher strengths are obtained by NOT using LOCTITE® SF 7649™ Primer N™ with small (0.002"-0.004") Gap, and allowing longer cure (4-24 hours).**

EMERGENCY REPAIR ONLY!

Due to the nature of the damage, this should be considered a temporary repair until the unit can be replaced.

SHAFT MOUNTED ASSEMBLIES

SLIP FIT - LIGHT DUTY



ORIGINAL

1. Machine shaft to 0.002" radial slip fit with 50-80 rms finish (second cut).
2. Clean all parts with LOCTITE® SF 7070 ODC-Free Cleaner & Degreaser.
3. Spray all parts (I.D. and O.D.) with LOCTITE® SF 7649™ Primer N™.
4. Apply LOCTITE® **660™/641™** Retaining Compound dabs around shaft at engagement area.
5. Assemble parts. Do not rotate.
6. Wipe off excess.
7. Allow ten minutes prior to service.

WORN SHAFT

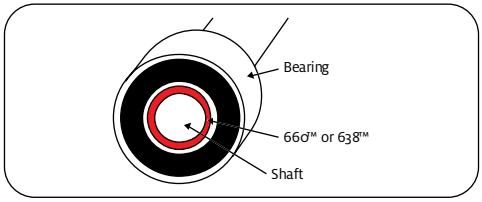
Follow directions above except:

1. Determine radial gap.
2. If radial gap exceeds 0.005", LOCTITE® SF 7649™ Primer N™ must be used.
3. Take steps to maintain concentricity with large gaps.
4. Larger gaps require longer cure times (30-60 minutes).
5. LOCTITE® **660™** Retaining Compound is NOT recommended for radial gaps exceeding 0.020".
6. See procedure for BADLY WORN SHAFT page 22.

Note: LOCTITE® 660™ Retaining Compound is very fast fixturing (30 seconds or less) with LOCTITE® SF 7649™ Primer N™.

SHAFT MOUNTED ASSEMBLIES

SLIP FIT - HEAVY DUTY



ORIGINAL

1. Machine shaft to 0.002" radial slip fit with 50-80 rms finish (second cut).
2. Clean all parts with LOCTITE® SF 7070 ODC-Free Cleaner & Degreaser.
3. Do NOT use LOCTITE® SF 7649™ Primer N™.
4. Apply a LOCTITE® **660™** Retaining Compound coating around shaft and engagement area.
5. Assemble parts with rotating motion.
6. Wipe off excess.
7. Allow 2 hours prior to service.

WORN SHAFT

Follow directions above except:

1. Determine radial gap.
2. If radial gap exceeds 0.005", LOCTITE® SF 7649™ Primer N™ must be used.
3. Take steps to maintain concentricity with large gaps.
4. Larger gaps require longer cure times (30-60 minutes).
5. LOCTITE® **660™** Retaining Compound is NOT recommended for radial gaps exceeding 0.020".
6. See procedure for BADLY WORN SHAFT page 22.

MAXIMUM STRENGTH

1. Same as above, except use LOCTITE® **638™** Retaining Compound with LOCTITE® SF 7471™ Primer T™ or no primer.
2. Allow 4-24 hours to cure.

MAXIMUM TEMPERATURE (200°C continuous)

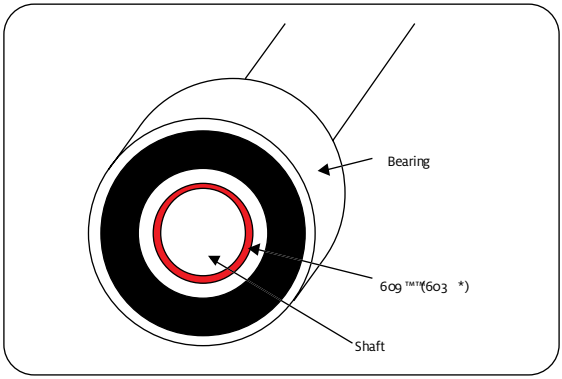
1. Same as above, except use LOCTITE® **620™** Retaining Compound with LOCTITE® SF 7471™ Primer T™.

DISASSEMBLY

1. Pull as usual.
2. If necessary, apply localized heat (230°C for 5 minutes). Pull while hot.

SHAFT MOUNTED ASSEMBLIES

PRESS FIT



STANDARD

1. Clean shaft O.D. and Component I.D.
2. Apply a bead of LOCTITE® **609™ (603™)*** Retaining Compound to circumference of shaft at leading edge of insertion or leading area of engagement.
   Note:
   - **Retaining compound will always be squeezed to the outside when applied to shaft.**
   - **Do NOT use with LOCTITE® Anti-Seizes or similar product.**
3. Press as usual. Wipe off excess.
4. No cure time required.
   Note: LOCTITE® 609™ (603™)* Retaining Compound is used due to low viscosity and Wetting properties.

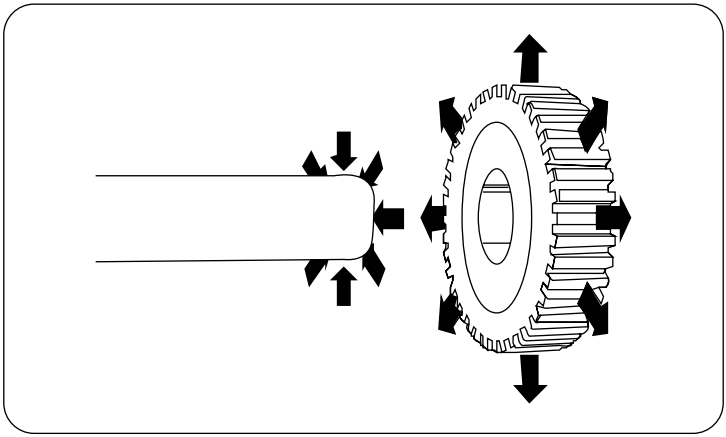
TANDEM MOUNT

1. Apply retaining compound to bore of inside component.
2. Continue assembly as above.

* Worldwide or Application-Specific Alternative

SHAFT MOUNTED ASSEMBLIES

SHRINK FIT

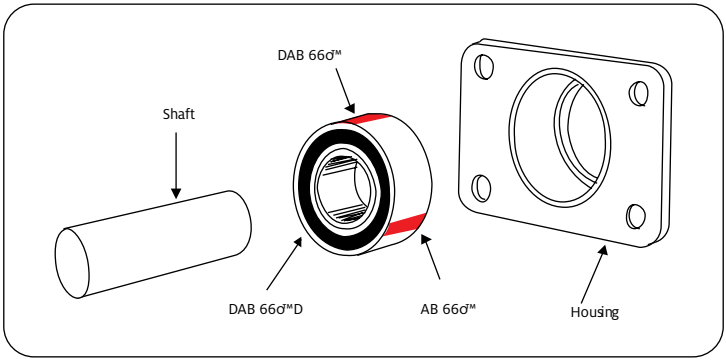


ASSEMBLY

1. Clean the shaft O.D. and component I.D.
2. Cool the shaft to cause contraction, or heat the component to cause expansion.
3. Apply a brush film of LOCTITE® **620™** Retaining Compound to the shaft or lower temperature part.
4. Install component and allow temperatures to equilibriate.
5. Wipe off excess.
   Note: LOCTITE® **620™** Retaining Compound will add lubricity for easier assembly while sealing and protecting the bond area from environmental exposure and filling gaps for a more complete contact area.

HOUSED COMPONENTS

SLIP FIT - LIGHT DUTY



ORIGINAL

1. Select component to fit shaft.
2. Machine to reduce component O.D. or increase housing I.D. to permit approximate 0.002" - 0.004" diametral slip fit.
3. Clean all parts with LOCTITE® SF 7070 ODC-Free Cleaner & Degreaser and spray with LOCTITE® SF 7649™ Primer N™.
4. Apply several LOCTITE® **660™** Retaining Compound dabs to component O.D.
5. Install component. Do not rotate.
6. Wipe off excess.
7. Allow five minutes prior to service.

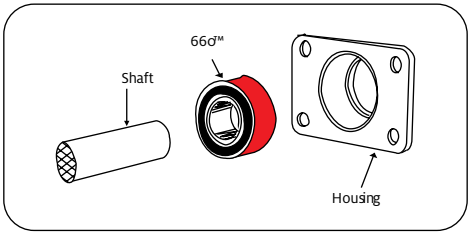
WORN

Procedures identical to original slip fit, except:

1. Determine the maximum radial gap.
2. If the maximum gap exceeds 0.005", LOCTITE® SF 7649™ Primer N™ must be used.
3. Take steps to maintain concentricity on large gaps.
4. Large gaps require longer cure times (30-60 minutes).
5. LOCTITE® **660™** Retaining Compound is NOT recommended for radial gaps exceeding 0.020".
6. See procedure for BADLY WORN HOUSING page 28.

HOUSED COMPONENTS

SLIP FIT - HEAVY DUTY



ORIGINAL - RECOMMENDED ASSEMBLY

1. Select component to fit shaft.
2. Machine to reduce component O.D. or housing I.D. to permit approximate 0.002" - 0.004" diametral slip fit.
3. Clean all parts with LOCTITE® SF 7070 ODC-Free Cleaner & Degreaser.
4. Do NOT use LOCTITE® SF 7649™ Primer N™.
5. Apply a LOCTITE® **660™** Retaining Compound coating to component O.D.
6. Install component with twisting motion.
7. Wipe off excess.
8. Allow 2 hours prior to service.

WORN - RECOMMENDED ASSEMBLY

Procedures identical to original slip fit, except:

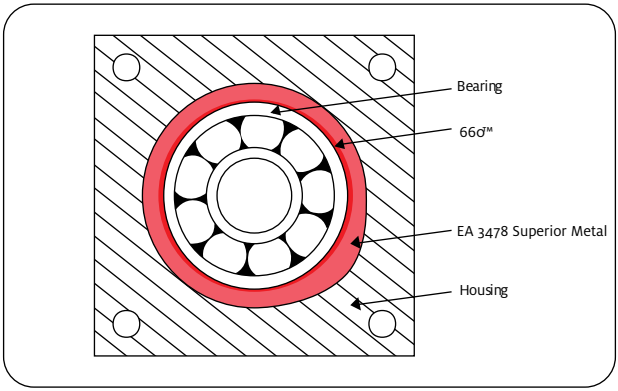
1. Determine the maximum radial gap.
2. If the maximum radial gap exceeds 0.005", then LOCTITE® SF 7649™ Primer N™ must be used.
3. Take steps to maintain concentricity on large gaps.
4. Large gaps require longer cure times (30-60 minutes).
5. LOCTITE® **660™** Retaining Compound is not recommended for radial gaps exceeding 0.020".
6. See procedure for BADLY WORN HOUSING page 29.

DISASSEMBLY

1. Pull as usual.
2. If necessary, apply localized heat (230°C for five minutes).
3. Pull while hot.

HOUSED COMPONENTS

REPAIRING BADLY WORN HOUSING



RECOMMENDED ASSEMBLY

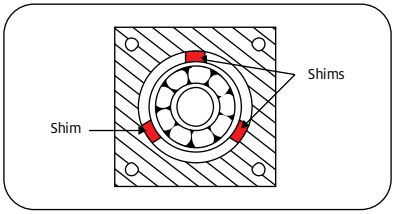
1. Roughen housing I.D. with emery cloth.
2. Clean the housing I.D. with LOCTITE® SF 7070 ODC-Free Cleaner & Degreaser.
3. Clean the component O.D. and apply Silicone Oil / Release Agent. Allow to dry.
4. Prepare (mix) LOCTITE® EA **3478** Superior Metal.
5. Apply a light coating of LOCTITE® EA 3478 Superior Metal to component O.D.
6.. Position the component in housing. Maintain concentricity.
7. Pack LOCTITE® EA **3478** Superior Metal into gaps and voids.
8. Wipe off excess.
9. Allow to cure 30 minutes.
10. Pull component.
11. Clean the release compound from component O.D.
12. Roughen the housing I.D. and clean thoroughly.
13. Assemble with LOCTITE® **660™** Retaining Compound as required.
14. Recommended for light duty service.

EMERGENCY REPAIR ONLY!

Due to the nature of the damage, this should be considered a temporary repair until the unit can be replaced.

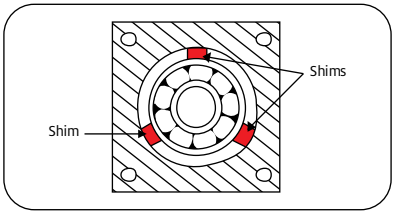
HOUSED COMPONENTS

COMPONENT CENTERING



EXCESSIVE / EVEN WEAR

1. Position the component in bore.
2. Select three equilateral mounting points.
3. Determine the radial gap at those points.
4. Select appropriate shim stock.
5. Cut three pieces approx. 1.8” wide to fit bore depth.
6. Bond the shims to bore at mounting points using LOCTITE® **380™ (401™)*** Instant Adhesive.
7. Assemble as per instructions page 28.



EXCESSIVE / UNEVEN WEAR

1. Position the component in bore.
2. Select three equilateral mounting points.
3. Determine the radial gap at those points.
4. Select and cut appropriate shim stock for each point.
5. Bond the shims to bore at mounting points using LOCTITE® **380™ (401™)*** Instant Adhesive.
6. Assemble as per instructions on page 29.

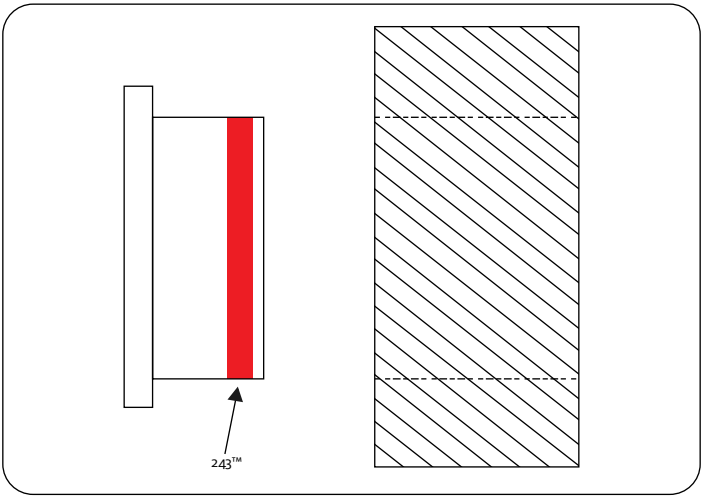
EMERGENCY REPAIR ONLY!

Due to the nature of the damage, this should be considered a temporary repair until the unit can be replaced.

* Worldwide or Application-Specific Alternative

HOUSED COMPONENTS

SEALING/RETAINING - METALLIC SEAL



1. Clean the housing I.D. and seal O.D. with LOCTITE® SF 7070 ODC-Free Cleaner & Degreaser.
2. Spray both the housing and seal with LOCTITE® SF 7649™ Primer N™.
3. Apply a bead of LOCTITE® **243™** Threadlocker to the leading edge of metallic seal O.D.
   Note: Virtually any LOCTITE® Threadlocking product will work here. Medium strength liquid is recommended due to normal gap and strength requirement.
4. Install as usual.
5. Wipe off excess.
6. Allow to cure 30 minutes.
   Note:
   - **LOCTITE® 243™ Threadlocker is normally used with worn seal housings to prevent Leakage or slippage.**
   - **It is not generally necessary to remove pre-applied sealant from seal O.D.**

RETAINING COMPOUNDS

LOCTITE® RETAINING COMPOUNDS QUICK SELECTOR

Application	LOCTITE® Product	LOCTITE® Primer
Shaft Mount - Press Fit		
Medium Strength	**609™ (603™)*** Retaining Compound	None
Low Strength	**641™** Retaining Compound	T™
Shaft Mount - Press Fit		
Small Gap (0.005" Radial max.)	**609™ (603™)*** Retaining Compound	N™
Larger Gap (0.020" Radial max.)	**660™** Retaining Compound	N™
High Strength (0.01" Radial max.)	**638™** Retaining Compound	T™
Maximum Temperature (204°C) (0.008" Radial max.)	**620™** Retaining Compound	T™
Low Strength (0.006" Radial max.)	**641™** Retaining Compound	T™
Housing Mount - Press Fit		
Medium Strength	**609™ (603™)*** Retaining Compound	NONE
Low Strength	**641™** Retaining Compound	T™
Medium Strength	**243™** Threadlocker	NONE
Housing Mount - Slip Fit		
High Strength	**638™** Retaining Compound	NONE
High Strength	**660™** Retaining Compound	N™
Low Strength	**641™** Retaining Compound	T™
Medium Strength	**243™** Threadlocker	N™

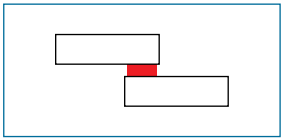
Note:
- Softer metals (Aluminum, Bronze, etc.) provide lower shear strengths than ferrous components.
- Excessive gap reduces shear strengths.
- Ideal surface finish - 50 to 80 rms.

Refer to Technical Data Sheets for more information.

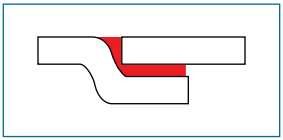
* Worldwide or Application-Specific Alternative

BONDING

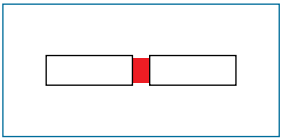
PROPER JOINT DESIGN



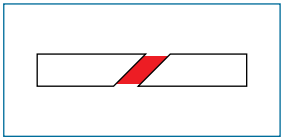
LAP/OVERLAP
GOOD



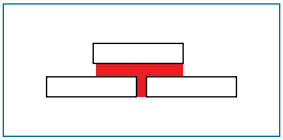
JOGGLE LAP
GOOD



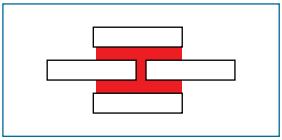
BUTT
FAIR/POOR



SCARF
FAIR

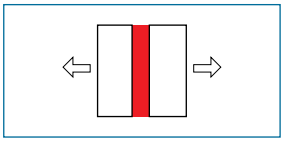


SINGLE STRAP
GOOD

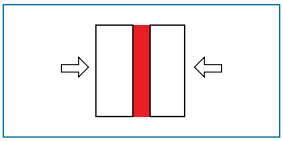


DOUBLE STRAP
BEST

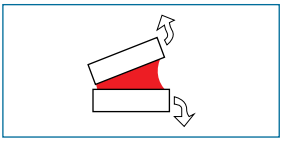
TYPES OF STRESSES



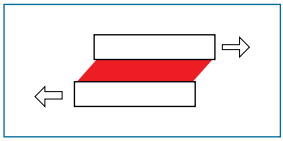
TENSILE
FAIR



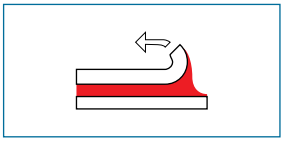
COMPRESSIVE
GOOD



CLEAVAGE
POOR



SHEAR
GOOD



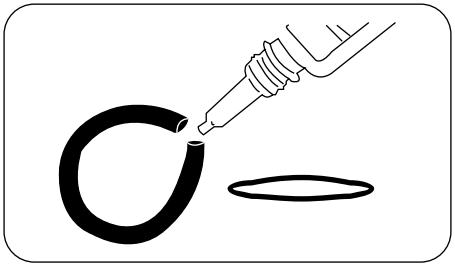
PEEL
POOR

DESIGN GUIDELINES

1. Maximize shear/minimize peel and cleavage.
2. Maximize compression/minimize tensile.
3. Joint width more important than overlap.

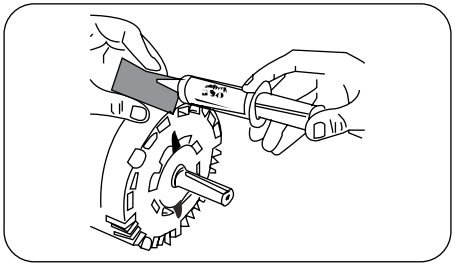
BONDING

O-RING MARKING



1. Cut the starting end of the cord stock with a clean razor blade. Ensure the cut is clean and square. Do not touch the clean cut end.
2. Measure cord stock to appropriate length. For precise measurement, use LOCTITE® O-Ring Tool or the ruler provided in the LOCTITE® O-Ring Making Kit.
3. Cut the measured end of the cord stock with a clean razor blade. Ensure the cut is clean and square to optimize bond area.
4. Apply one drop of LOCTITE® **406™** Instant Adhesive and mate the two ends of the cord stock.

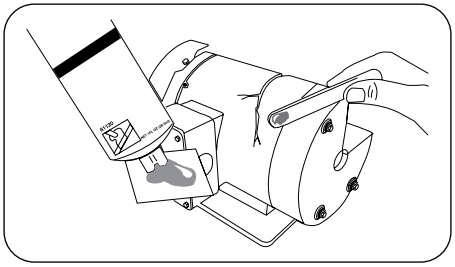
BONDING METAL LABEL



1. Clean surface.
2. Spray LOCTITE® SF **7075™** Activator onto main part. Let dry for two minutes.
3. Apply LOCTITE® AA **324™** Structural Adhesive onto back of label.
4. Press label onto activated surface and hold for a few seconds.
5. Reaches handling strength in 5 minutes. Full cure in 24 hours.

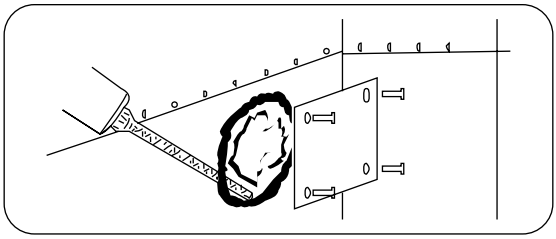
BONDING

FILLING CRACKS



1. Clean surface.
2. Mix LOCTITE® PC **3473** Fast Steel Putty according to package directions.
3. Spread mixed material over crack.
4. Sets in 5 minutes, full cure in 8 hours.
5. For maximum protection, a piece of material can be applied over the top of the crack to spread the load after applying the mixed adhesive. The adhesive will hold it in place.

STRUCTURAL BONDING



1. Prepare the surface using LOCTITE® SF 7070 ODC-Free Cleaner and Degreaser.
2. Attach mix nozzle to the LOCTITE® **H3151™** Structural Adhesive cartridge.
3. Dispense 50 mm (2”) of material to prime nozzle.
4. Apply a continuous bead of adhesive in the area you want to patch and/or seal.
5. Assemble patch using pneumatic pins or rivets, or run screws to hold parts together while the adhesive reaches full cure.
6. Equipment can be back in operation after 24 hours.

BONDING

ADHESIVE QUICK SELECTOR

Product	Typical Application
LOCTITE® 454™ Instant Adhesive - A surface insensitive gel instant adhesive for common and "difficult-to-bond" materials. Excellent for porous materials, overhead applications and large gaps.	Plastics, rubber, foam, ceramics, felt, cork, wood, etc.
LOCTITE® 406™ Instant Adhesive - Particularly suited for bonding rubbers & plastics. A must for every tool box for general maintenance & repair. Makes O-rings instantly. Wicking viscosity for tight bond lines.	General purpose bonding, makes O-ring.
LOCTITE® SF 7452™ Accelerator or SF 712™ Activator - A spray mist for fast surface curing of all instant adhesives.	Tacking jumper wires on PC boards, strain relief, temporary jig placement, etc.
LOCTITE® SF 770™ Primer - Permits bonding of polyethylene, polystyrene, etc. Allow 24 hour adhesive cure time for maximum strength.	Wear pads, bumpers, buckets, etc
LOCTITE® AA 324 Structural Adhesive - A no-mix structural acrylic adhesive used for general purpose, severe environments and less than optimum cleanliness applications. Works on most surfaces except rubber and polyethylene.	Sheet metal, glass, fiberglass, composites, wood, etc.
LOCTITE® PC 3473 Fast Steel Putty - A two-part putty used in rough service, severe environments and for emergency repair.	Casting or case repair, sealing punctures, pin holes, etc.

BONDING

GUIDE TO SUCCESSFUL BONDING

I. JOB EVALUATION - Answer These Questions.

A. What materials are to be bonded? What kind of rubber, plastic, etc.? Porous? Slick? Rough?
B. What kind of service? Operating temperature? Impact? Moisture or water exposure?
C. What kind of stresses? Avoid peel or cleavage!
D. Is gap filling or bridging needed? How much?
E. What cure speed or "return to service" time is needed?

II. ADHESIVE SELECTION (See page 35.)

III. SURFACE PREPARATION

1. Part must be clean. No oil. No grease. No residue.
2. Remove paint from bond area for maximum strength.
3. Roughen smooth surfaces with emery cloth.
4. Treat selected "difficult-to-bond" materials as directed:
   a. Polyethylene, etc. - Use LOCTITE® SF 770™ Primer or 793™ Primer.
   b. PTFE - Use appropriate etching agent.
5. Alcohol wipe parts cleaned with water-based "safety" cleaners.

IV. APPLICATION TECHNIQUES/TIPS

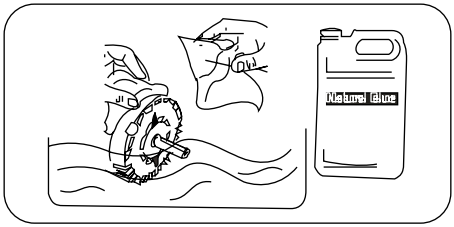
A. Read and follow adhesive package instructions.
B. Use the minimum amount of adhesive to one part only.
   Apply activator (if required) to other part.
C. Avoid "jiggling" mated parts. Apply clamp pressure if possible.
D. Allow maximum cure time possible. See technical data for recommended cure times.

V. QUESTIONS?

Call Henkel Technical Services. See back cover for the nearest Henkel office in your area.

CLEANING

GENERAL PURPOSE PARTS CLEANING



In general, LOCTITE® SF **7840** Natural Blue Biodegradable Cleaner & Degreaser cleaning effectiveness is enhanced by:

a. Higher concentrations of LOCTITE® SF **7840** Natural Blue Biodegradable Cleaner & Degreaser;
b. Longer cleaner on-part times;
c. Dilution with warm water (65°C to 82°C);
d. Agitation of parts or scrubbing.

DIRECTIONS

1. Dilute LOCTITE® SF **7840** Natural Blue Biodegradable Cleaner & Degreaser concentrate with water to most economical/effectiveness level. See package labels for suggested ratios.
2. Spray, dip or wipe dilution onto parts or surface to be cleaned.
3. Soak parts or scrub (if needed).
4. Flush soil/cleaner mixture off of parts or surfaces with water.
5. Disposal: LOCTITE® SF **7840** Natural Blue Biodegradable Cleaner & Degreaser contains no hazardous Ingredients. It should be disposed of in accordance with state and local regulations and will not harm sewage treatment microorganisms. Once LOCTITE® SF **7840** Natural Blue Biodegradable Cleaner & Degreaser is mixed with hazardous waste, it must be treated as hazardous waste and disposed of accordingly.
   Note: LOCTITE® **SF 7070 ODC-Free Cleaner & Degreaser is recommended for cleaning substrates before** LOCTITE® **machinery adhesive use.**

RUSTPROOFING

OPTIMUM USE OF LOCTITE® SF 7625 RUST TREATMENT

SURFACE PREPARATION - OLD STEEL:

Loose or "flaky" rust must be removed. Only conversion of firmly bonded rust will result in durable protection. Oil, grease, old paint, mill scale, form oil, fingerprints and water soluble surfaces and chloridesmust be removed to allow LOCTITE® SF **7625** Rust Treatment to react with rust.

Loose rust, mill scale and oil paint should be removed preferably by power Wirebrushing, followed by rinsing with water to remove powder and solubles. Manual wirebrushing, chipping, scraping and particularly rotopeening can also be used. Oil, grease, form oil and fingerprints should be removed before loose rust. Ideal surfaces will show light rust as well as bare metal surfaces.

RUST CONVERSION TIME AND APPEARANCE:

Two coats of LOCTITE® SF **7625** Rust Treatment are recommended.

On lightly rusted steel (that has been wirebrushed), the first coat will start to develop a violet color within 60 seconds. This will become satin to flat black in appearance. The second coat should dry to a satin black appearance.

On heavily rusted steel (that has been wirebrushed), the first coat should develop a purple-black color within seconds. The second coat should dry to a black color with gloss varying from flat to satin. The second coat should be applied within 15-30 minutes of the first coat.

APPLICATION CONDITIONS:

LOCTITE® SF **7625** Rust Treatment may be applied when surface and air is between 10°C minimum and rising and 32°C maximum and falling. Reaction is slower at lower temperatures. If temperature is too hot, film may surface dry and bubble. High humidity is beneficial; it slows drying but assists rust conversion. LOCTITE® SF **7625** Rust Treatment should not be applied in conditions of condensing humidity (e.g. fog, dew), on ice, in rain or in heavy sea (salt) spray atmospheres. Steel surface may be damp but not wet (i.e. continuous visible film of water). DO NOT APPLY LOCTITE® SF **7625** RUST TREATMENT TO SURFACES IN DIRECT SUNLIGHT.

APPLICATION EQUIPMENT METHODS:

LOCTITE® SF **7625** Rust Treatment may be applied by brush, roller, or spray. Brush or roller is suitable for small areas. Avoid sags and ridges and keep edges wet by coating about a square yard at a time. Roll away from previously coated area then roll back. Do not pour unused material back into the original container. NEVER add solvents to LOCTITE® SF **7625** Rust Treatment. Spray application is recommended for larger areas. Airless spray equipment is faster, and provides more effective conversion due to improved surface penetration. Conventional air-spray equipment may be used, but LOCTITE® SF **7625** Rust Treatment may require thinning up to 10% with water for proper spraying.

TROUBLESHOOTING

CHECKLIST

1. What type failure is occurring? Has the application worked before?
2. Was proper and adequate adhesive/sealant used?
3. Was proper and adequate primer/activator used?
4. Do service conditions exceed the capability of the adhesive sealant?
   (a) operating temperature (c) fluid compatibility
   (b) excessive pressure too soon (d) impact on environment (instant adhesives)
5. Were parts adequately cleaned prior to applying adhesive?
   Note: If adhesive failure, is cured residue on one or both parts? If one part is bare, Check that part for contamination.
6. Were proper assembly techniques utilized?
7. Was adhesive/sealant allowed adequate cure time prior to service?
8. Do assembly/part conditions exceed capability of the adhesive/sealant?
   (a) excessive gaps (c) improper joint design
   (b) component materials (d) inadequate clamping/fixturing
9. If additional assistance is required, please contact us at addresses on back cover.

LIMITATION OF WARRANTY

The data contained herein are furnished for information only and are believed to be reliable. We cannot assume responsibility for the results obtained by others over whose methods we have no control. It is the user's responsibility to determine suitability for the user's purpose of any production methods mentioned herein and to adopt such precautions as may be advisable for the protection of property and of persons against any hazards that may be involved in the handling and use thereof.

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FLUID COMPATIBILITY CHART

for metal threaded fittings sealed with LOCTITE® Sealants

LIQUIDS, SOLUTIONS & SUSPENSIONS

LEGEND:

- • Use LOCTITE® #592, 567, 565, 569,545, 580, 571, 242, 577, 572, 542, 565, 545, 243
- † Use LOCTITE® #277, 271, 554, 270, 277, 554
- ■ Not Recommended
- ☐ <10% (same as l) >10% (same as†) <5% (same as l)
- * <5% (same as †)

Abrasive Coolant	•
Acetaldehyde	•
Acetate Solvents	•
Acetimide	•
Acetic Acid	•
Acetic Acid	☐
Acetic Acid - glacial	•
Acetic Anhydride	•
Acetone	•
Acetyl Chloride	•
Acetylene (Liquid Phase)	•
Acid Clay	•
Acrylic Acid	•
Acrylonitrile	•
Activated Alumina	•
Activated Carbon	•
Activated Silica	•
Alcohol-Allyl	•
Alcohol-Amyl	•
Alcohol-Benzyl	•
Alcohol-Butyl	•
Alcohol-Ethyl	•
Alcohol-Furfuryl	•
Alcohol-Hexyl	•
Alcohol-Isopropyl	•
Alcohol-Methyl	•
Alcohol-Propyl	•
Alum-Ammonium	•
Alum-Chrome	•
Alum-Potassium	•
Alum-Sodium	•
Alumina	•
Aluminum Acetate	•
Aluminum Bicarbonate	•
Aluminum Bifluoride	•
Aluminum Chloride	•
Aluminum Sulfate	•
Ammonia Anhydrous	■
Ammonia Solutions	■
Ammonium Bisulfite	•
Ammonium Borate	•
Ammonium Bromide	•
Ammonium Carbonate	•
Ammonium Chloride	•
Ammonium Chromate	•
Ammonium Fluoride	•
Ammonium Fluorosilicate	•
Ammonium Formate	•
Ammonium Hydroxide	■
Ammonium Hyposulfite	•
Ammonium Iodide	•
Ammonium Molybdate	•
Ammonium Nitrate	•
Ammonium Oxalate	•
Ammonium Persulfate	•
Ammonium Phosphate	•
Ammonium Picrate	•
Ammonium Sulfate	•
Ammonium Sulfate Scrubber	•
Ammonium Sulfide	•
Ammonium Thiocyanate	•
Amyl Acetate	•
Amyl Amine	•
Amyl Chloride	•
Aniline	•
Aniline Dyes	•
Anodizing Bath	•
Antichlor Solution	•
Antimony Acid Salts	•
Antimony Oxide	•
Antioxidant Gasoline	•
Aqua Regia	■
Argon	•
Armeen §	•
Arochlor §	•
Aromatic Gasoline	•
Aromatic Solvents	•
Arsenic Acid	•
Asbestos Slurry	•
Ash Slurry	•
Asphalt Emulsions	•
Asphalt Molten	•
Bagasse Fibers	•
Barium Acetate	•
Barium Carbonate	•
Barium Chloride	•
Barium Hydroxide	☐
Barium Sulfate	•
Battery Acid	☐
Battery Diffuser Juice	•
Bauxite (See Alumina)	•
Bentonite	•
Benzaldehyde	•
Benzene	•
Benzene Hexachloride	•
Benzene in Hydrochloric Acid	•
Benzoic Acid	•
Benzotriazole	•
Beryllium Sulfate	•
Bicarbonate Liquor	•
Bilge Lines	•
Bleach Liquor	•
Bleached Pulps	•
Borax § Liquors	•
Boric Acid	•
Brake Fluids	•
Brine Chlorinated	•
Brine Cold	•
Bromine Solution	†
Butadiene	•
Butyl Acetate	•
Butyl Alcohol	•
Butyl Amine	•
Butyl Cellosolve §	•
Butyl Chloride	•
Butyl Ether - Dry	•
Butyl Lactate	•
Butyral Resin	•
Butyraldehyde	•
Butyric Acid	☐
Cadmium Chloride	•
Cadmium Plating Bath	•
Cadmium Sulfate	•
Calcium Acetate	•
Calcium Bisulfate	•
Calcium Carbonate	•
Calcium Chlorate	•
Calcium Chloride	•
Calcium Chloride Brine	•
Calcium Citrate	•
Calcium Ferrocyanide	•
Calcium Formate	•
Calcium Hydroxide	•
Calcium Lactate	•
Calcium Nitrate	•
Calcium Phosphate	•
Calcium Silicate	•
Calcium Sulfamate	•
Calcium Sulfate	•
Calcium Sulfite	•
Camphor	•
Carbitol	•
Carbolic Acid (phenol)	☐
Carbon Bisulfide	•
Carbon Black	•
Carbon Tetrachloride	•
Carbonic Acid	☐
Carbowax §	•
Carboxymethyl Cellulose	•
Carnauba Wax	•
Casein	•
Casein Water Paint	•
Celite	•
Cellosolve §	•
Cellulose Pulp	•
Cellulose Xanthate	•
Cement Dry/Air Blown	•
Cement Grout	•
Cement Slurry	•
Ceramic Enamel	•
Ceric Oxide	•
Chalk	•
Chemical Pulp	•
Chestnut Tanning	•
China Clay	•
Chloral Alcoholate	•
Chloramine	•
Chlorinated Hydrocarbons	•
Chlorinated Paperstock	•
Chlorinated Solvents	•
Chlorinated Sulphuric Acids	■
Chlorinated Wax	•
Chlorine Dioxide	■
Chlorine Liquid	■
Chlorine Dry	■
Chloroacetic Acid	☐
Calcium Silicate	•
Calcium Sulfamate	•
Calcium Sulfate	•
Calcium Sulfite	•
Camphor	•
Carbitol	•
Carbolic Acid (phenol)	☐
Carbon Bisulfide	•
Carbon Black	•
Carbon Tetrachloride	•
Carbonic Acid	☐
Carbowax §	•
Carboxymethyl Cellulose	•
Carnauba Wax	•
Casein	•
Casein Water Paint	•
Celite	•
Cellosolve §	•
Cellulose Pulp	•
Cellulose Xanthate	•
Cement Dry/Air Blown	•
Cement Grout	•
Cement Slurry	•
Ceramic Enamel	•
Ceric Oxide	•
Chalk	•
Chemical Pulp	•
Chestnut Tanning	•
China Clay	•
Chloral Alcoholate	•
Chloramine	•
Chlorinated Hydrocarbons	•
Chlorinated Paperstock	•
Chlorinated Solvents	•
Chlorinated Sulphuric Acids	■
Chlorinated Wax	•
Chlorine Dioxide	■
Chlorine Liquid	■
Chlorine Dry	■
Chloroacetic Acid	☐
Chlorobenzene Dry	•
Chloroform Dry	•
Chloroformate Methyl	•
Chlorosulfonic Acid	■
Chrome Acid Cleaning	☐
Chrome Liquor	☐
Chrome Plating Bath	☐
Chromic Acid 10%	•
Chromic Acid 50% (cold)	■
Chromic Acid 50% (hot)	■
Chromium Acetate	•
Chromium Chloride	•
Chromium Sulfate	•

FLUID COMPATIBILITY CHART

for metal threaded fittings sealed with LOCTITE® Sealants

LIQUIDS, SOLUTIONS & SUSPENSIONS

Classifier	•
Clay	•
Coal Slurry	•
Coal Tar	•
Cobalt Chloride	•
Copper Ammonium Formate	•
Copper Chloride	•
Copper Cyanide	•
Copper Liquor	•
Copper Naphthenate	•
Copper Plating, Acid Process	•
Copper Plating, Alk. Process	•
Copper Sulfate	•
Core Oil	•
Corundum	•
Creosote	•
Creosote-Cresylic Acid	•
Cyanide Solution	•
Cyanuric Chloride	•
Cyclohexane	•
Cylinder Oils	•
De-Ionized Water	•
De-Ionized Water Low Conductivity	•
Detergents	•
Developer, photographic	•
Dextrin	•
Diacetone Alcohol	•
Diammonium Phosphate	•
Diamylamine	•
Diatomaceaus Earth Slurry	•
Diazo Acetate	•
Dibutyl Phthalate	•
Dichlorophenol	•
Dichloro Ethyl Ether	•
Dicyandamide	•
Dielectric Fluid	•
Diester Lubricants	•
Diethyl Ether Dry	•
Diethyl Sulfate	•
Diethylamine	•
Diethylene Glycol	•
Diglycolic Acid	•
Dimethyl Formamide	•
Dimethyl Sulfoxide	•
Dioxane Dry	•
Dioxidene	•
Dipentene - Pinene	•
Diphenyl	•
Distilled Water (Industrial)	•
Dowtherm §	•
Drying Oil	•
Dust-Flue (Dry)	•
Dye Liquors	•
Emery - Slurry	•
Emulsified Oils	•
Enamel Frit Slip	•
Esters General	•
Ethyl Acetate	•
Ethyl Alcohol	•
Ethyl Amine	•
Ethyl Bromide	•
Ethyl Cellosolve §	•
Ethyl Cellosolve Slurry §	•
Ethyl Formate	•
Ethyl Silicate	•
Ethylene Diamine	•
Ethylene Dibromide	•
Ethylene Dichloride	•
Ethylene Glycol	•
Ethylenediamine Tetramine	•
Fatty Acids	•
Fatty Acids Amine	•
Fatty Alcohol	•
Ferric-Floc	•
Ferric Chloride	•
Ferric Nitrate	•
Ferric Sulfate	•
Ferrocence-Oil Sol	•
Ferrous Chloride	•
Ferrous Oxalate	•
Ferrous Sulfate10%	•
Ferrous Sulfate (Sat)	•
Fertilizer Sol	•
Flotation Concentrates	•
Fluoride Salts	•
Fluorine, Gaseous or Liquid	•
Fluorolube	•
Fluosilic Acid	•
Flux Soldering	•
Fly Ash Dry	•
Foam Latex Mix	•
Foamite	•
Formaldehyde (cold)	•
Formaldehyde (hot)	†
Formic Acid (Dil cold)	•
Formic Acid (Dil hot)	†
Formic Acid (cold)	•
Formic Acid (hot)	†
Freon §	†
Fuel Oil	•
Fuming Nitric Red	■
Fuming Sulfuric	■
Fuming Oleum	■
Furfural	•
Gallic Acid * Gallium Sulfate	•
Gasoline-Acid Wash	•
Gasoline-Alk. Wash	•
Gasoline Aviation	•
Gasoline Copper Chloride	•
Gasoline Ethyl	•
Gasoline Motor	•
Gasoline Sour	•
Gasoline White	•
Gluconic Acid	•
Glue-Animal Gelatin	•
Glue-Plywood	•
Glutamic Acid	•
Glycerine Lye-Brine	■
Glycerol	•
Glycine	•
Glycine Hydrochloride	•
Glycol Amine	•
Glycolic Acid	•
Glyoxal	•
Gold Chloride	•
Gold Cyanide	•
Granodine	•
Grape Pomace Graphite	•
Grease Lubricating	•
Green Soap	•
Grinding Lubricant	•
Grit Steel	•
Gritty Water	•
Groundwood Stock	•
GRS Latex	•
Gum Paste	•
Gum Turpentine	•
Gypsum	•
Halane Sol	•
Halogen Tin Plating	•
Halowax §	•
Harvel-Trans oil	•
Heptane	•
Hexachlorobenzene	•
Hexadiene	•
Hexamethylene Tetramine	•
Hexane	•
Hydrazine	•
Hydrazine Hydrate	•
Hydrobromic Acid	□
Hydrochloric Acid	•
Hydrocyanic Acid	□
Hydroflouric Acid	■
Hydrogen Peroxide (dil)	•
Hydrogen Peroxide (con)	†
Hydroponic Sol	•
Hydroquinone	•
Hydroxyacetic Acid	•
Hypo	•
Hypochlorous Acid	•
Ink	•
Ink in Solvent-Printing	•
Iodine in Alcohol	•
Iodine-Potassium Iodide	•
Iodine Solutions	•
Ion Exchange Service	•
Ion Exclusion Glycol	•
Irish Moss Slurry	•
Iron Ore Taconite	•
Iron Oxide	•
Isobutyl Alcohol	•
Isobutyraldehyde	•
Isooctane	•
Isopropyl Alcohol	•
Isocyanate Resin	•
Isopropyl Acetate	•
Isopropyl Ether	•
Itaconic Acid	•
Jet Fuels	•
Jeweler's Rouge	•
Jig Table Slurry	•
Kaolin-China Clay §	•
Kelp Slurry	•
Kerosene	•
Kerosene Chlorinated	•
Ketone	•
Lacquer Thinner	•
Lactic Acid	•
Lapping Compound	•
Latex-Natural	•
Latex-Synthetic	•
Latex Synthetic Raw	•
Laundry Wash Water	•
Laundry Bleach	•
Laundry Blue	•
Laundry Soda	•
Lead Arsenate	•
Lead Oxide	•
Lead Sulfate	•
Lignin Extract	•
Lime Slaked	•
Lime Sulfur Mix	•
Liquid Ion Exchange	•
Lithium Chloride	•
LOX (Liquid 02)	■
Ludox	•
Lye	■
Machine Coating Color	•
Magnesite Slurry	•
Magnesite	•
Magnesium Bisulfite	•
Magneslum Carbonate	•
Magnesium Chloride	•
Magnesium Hydroxide	•
Magnesium Sulfate	•
Maleic Acid	•
Maleic Anhydride	•
Manganese Chloride	•
Manganese Sulfate	•
Melamine Resin	•
Menthol	•
Mercaptans	•
Mercuric Chloride	•
Mercuric Nitrate	•
Mercury	•
Mercury Dry	•
Methane	•
Methyl Alcohol	•
Methyl Acetate	•
Methyl Bromide	•
Methyl Carbitol	•
Methyl Cellosolve §	•
Methyl Chloride	•
Methyl Ethyl Ketone	•
Methyl Isobutyl Ketone	•
Methyl Lactate	•
Methyl Orange	•
Methylamine	•
Methylene Chloride	•
Mineral Spirits	•
Mixed Acid, Nitric/Sulfuric	■
Monochloracetic Acid	•
Morpholine	•

FLUID COMPATIBILITY CHART

for metal threaded fittings sealed with LOCTITE® Sealants

LIQUIDS, SOLUTIONS & SUSPENSIONS

Mud	•
Nalco Sol.	•
Naphtha	•
Naphthalene	•
Naval Stores Solvent	•
Nematocide	•
Neoprene Emulsion	•
Neoprene Latex	•
Nickel Acetate	•
Nickel Ammonium Sulfate	•
Nickel Chloride	•
Nickel Cyanide	•
Nickel Fluoborate	•
Nickel Ore Fines	•
Nickel Plating Bright	•
Nickel Sulfate	•
Nicotinic Acid	□
Nitrate Sol.	•
Nitration Acid(s)	■
Nitric Acid	■
Nitric Acid10%	□
Nitric Acid 20%	†
Nitric Acid Anhydrous	■
Nitric Acid Fuming	■
Nitro Aryl Sulfonic Acid	•
Nitrobenezene-Dry	•
Nitrocellulose	•
Nitrofurane	•
Nitroguanidine	•
Nitroparaffins-Dry	•
Nitrosyl Chloride	•
Norite Carbon	•
Nuchar	•
Oakite § Compound	•
Oil, Creosote	•
Oil, Emulsified	•
Oil, Fuel	•
Oil, Lubricating	•
Oil, Soluble	•
Oleic Acid, hot	•
Oleic Acid, cold	•
Ore Fines-Flotation	•
Ore Pulp	•
Organic Dyes	•
Oxalic Acid cold	•
Ozone, wet	■
Paint-Linseed Base	•
Paint-Water Base	•
Paint-Remover-Sol. Type	•
Paint-Vehicles	•
Palmitic Acid	•
Paper Board Mill Waste	•
Paper Coating Slurry	•
Paper Pulp	•
Paper Pulp with Amun.	•
Paper Pulp with Dye	•
Paper Pulp, bleached	•
Paper Pulp, bleached-washed	•
Paper Pulp Chlorinated	•
Paper Groundwood	•
Paper Rag	•
Paper Stocks, fine	•
Paradichlorobenezene	•
Paraffin Molten	•
Paraffin Oil	•
Paraformaldehyde	•
Pectin Solution Acid	•
Pentachlorethane	•
Pentaerythritol Sol.	•
Perchlorethylene (Dry)	•
Perchloric Acid	□
Perchloromethyl Mercaptan	•
Permanganic Acid	■
Persulfuric Acid	■
Petroleum Ether	•
Petroleum Jelly	•
Phenol Formaldehyde Resins	•
Phenol Sulfonic Acid	•
Phenolic Glue	•
Phloroglucinol	•
Phosphate Ester	•
Phosphatic Sand	•
Phosphoric Acid 85% hot	■
Phosphoric Acid 85% cold	†
Phosphoric Acid 50% hot	†
Phosphoric Acid 50% cold	†
Phosphoric Acid 10% cold	•
Phosphoric Acid 10% hot	†
Phosphorous Molten	•
Phosphotungstic Acid	•
Photographic Sol.	•
Phthalic Acid	•
Phytate	•
Phytate Salts	•
Pickling Acid, Sulfuric	•
Picric Acid Solutions	•
Pine Oil Finish	•
Plating Sol. as follows:	
Brass Cyanide	•
Bronze-Cyanide	•
Chromium & Cadmium Cyanide	•
Cobalt Acid	•
Copper Acid	•
Copper Alk.	•
Gold Cyanide	•
Iron-Acid	•
Lead-Fluoro	•
Nickel Bright	•
Platinum	•
Silver-Cyanide	•
Tin-Acid	•
Tin Alk. Barrel	•
Zinc Acid	•
Zinc Alk. Cyanide	•
Polyacrylonitrile Slurry	•
Polypentek	•
Polysulfide Liquor	•
Polyvinyl Acetate Slurry	•
Polyvinyl Chloride	•
Porcelain Frit	•
Potash	□
Potassium Acetate	•
Potassium Alum. Sulfate	•
Potassium Bromide	•
Potassium Carbonate	•
Potassium Chlorate	•
Potassium Chloride Sol	•
Potassium Chromate	•
Potassium Cyanide Sol.	•
Potassium Dichromate	•
Potassium Ferricyanide	•
Potassium Hydroxide	■
Potassium Iodide	•
Potassium Nitrate	•
Potassium Perchlorate	•
Potassium Permanganate	•
Potassium Persulfate	•
Potassium Phosphate	•
Potassium Silicate	•
Potassium Sulfate	•
Potassium Xanthate	•
Press Board Waste	•
Propionic Acid	•
Propyl Alcohol	•
Propyl Bromide	•
Propylene Glycol	•
Pumice	•
Pyranol	•
Pyridine	•
Pyrogallic Acid	•
Pyrogen Free Water	•
Pyrole	•
Pyromellitic Acid	•
Quebracho Tannin	•
Rag Stock Bleached	•
Rare Earth Salts	•
Rayon Acid Water	•
Rayon Spin Bath	•
Rayon Spin Bath spent	•
Resorcinol	•
River Water	•
Road Oil	•
Roccal	•
Rosin-Wood	•
Rosin in Alcohol	•
Rosin Size	•
Rubber Latex	•
Safrol	•
Salt Alkaline	•
Salt Electrolytic	•
Salt Refrg.	•
Sand-Air Blown Slurry	•
Sand-Air Phosphatic	•
Sea Coal	•
Sea Water	•
Selenium Chloride	•
Sequestrene	•
Sewage	•
Shellac	•
Shower Water	•
Silica Gel	•
Silica Ground	•
Silicone Tetrachloride	•
Silicone Fluids	•
Silver Cyanide	•
Silver Iodide-Aqu.	•
Silver Nitrate	•
Size Emulsion	•
Skelly Solve E, L	•
Slate to 400 Mesh	•
Soap Lye	■
Soap Solutions (Stearates)	•
Soap Stone Air Blown	•
Soda Pulp	•
Sodium Acetate	•
Sodium Acid Fluoride	•
Sodium Aluminate	•
Sodium Arsenate	•
Sodium Benzene Sulfonate	•
Sodium Bichromate	•
Sodium Bisulfite	•
Sodium Bromide	•
Sodium Carbonate	•
Sodium Chlorate	•
Sodium Chlorite	•
Sodium Cyanide	•
Sodium Ferricyanide	•
Sodium Formate	•
Sodium Glutamate	•
Sodium Hydrogen Sulfate	•
Sodium Hydrosulfite	•
Sodium Hydrosulfide	•
Sodium Hydrochloride	•
Sodium Hydroxide	■
Sodium Hydro. 20% cold	•
Sodium Hydro. 20% hot	†
Sodium Hydro. 50% cold	†
Sodium Hydro. 50% hot	■
Sodium Hydro. 70% cold	†
Sodium Hydro. 70% hot	■
Sodium Hypochlorite	•
Sodium Lignosulfonate	•
Sodium Metasilicate	•
Sodium Molten	•
Sodium Nitrate	•
Sodium Nitrite-Nitrate	•
Sodium Perborate	•
Sodium Peroxide	■
Sodium Persulfate	•
Sodium Phosphate-Mono	•
Sodium Phosphate-Tri	•
Sodium Potassium Chloride	•
Sodium Salicylate	•
Sodium Sesquicarbonate	•
Sodium Silicate	•
Sodium Silcofluoride	•
Sodium Stannate	•
Sodium Sulfate	•
Sodium Sulfide	•
Sodium Sulfite	•
Sodium Sulfhydrate	•
Sodium Thiocyanate	•
Sodium Thiosulfate	•
Sodium Tungstate	•

FLUID COMPATIBILITY CHART

for metal threaded fittings sealed with LOCTITE® Sealants

LIQUIDS, SOLUTIONS & SUSPENSIONS

Sodium Xanthate	•
Solox-Denat. Ethanol	•
Soluble Oil	•
Solvent Naphthas	•
Sorbic Acid	•
Sour Gasoline	•
Soybean Sludge-Acid	•
Spensol Solution	•
Stannic Chloride	•
Starch	•
Starch Base	•
Steam Low Pressure	•
Stearic Acid	•
Steep Water	•
Sterilization Steam	•
Stillage Distillers	•
Stoddard Solvent	•
Styrene	•
Styrene Butadiene Latex	•
Sulfamic Acid	•
Sulfan-Sulfuric Anhydride	•
Sulfathiazole	•
Sulfite Liquor	•
Sulfite Stock	•
Sulfonated Oils	•
Sulfones	•
Sulfonic Acids	•
Sulfonyl Chloride	•
Sulfur Slurry	•
Sulfur Solution	•
in Carbon Disulfide	•
Sulphuric Acid 0-7%	†
Sulphuric Acid 7-40%	†
Sulphuric Acid 40-75%	†
Sulphuric Acid 75-95%	■
Sulphuric Acid 95-100%	■
Sulphurous Acid	†
Sulfuryl Chloride	•
Surfactants	•
Synthetic Latex	•
Taconite - Fines	•
Talc - Slurry	•
Tankage - Slurry	•
Tannic Acid (cold)	†
Tamin	•
Tar & Tar Oil	•
Tartaric Acid	•
Television Chemicals	•
Tergitol §	•
Terpineol	•
Tetraethyl Lead	•
Tetrahydrofuran	•
Tetranitromethane	•
Textile Dyeing	•
Textile Finishing Oil	•
Textile Printing Oil	•
Thiocyanic Acid	•
Thioglycollic Acid	•
Thionyl Chloride	•
Thiophosphoryl Chloride	•
Thiourea	•
Thorium Nitrate	•
Thymol	•
Tin Tetrachlorida	•
Tinning Sol. DuPont	•
Titania Paper Coating	•
Titanium Oxide Slurry	•
Titanium Oxy Sulfate	•
Titanium Sulfate	•
Titanium Tetrachloride	•
Toluol	•
Toluene	•
p-Toluene Sulfonic Acid	†
Transil Oil	•
Trichloracetic Acid	•
Trichlorethane 1,1,1	•
Trichlorethylene	•
Trichlorethylene-Dry	•
Tricresyl Phosphate	•
Triethanolamine	•
Triethylene Glycol	•
Trioxane	•
Tungstic Acid	•
Turpentine	•
UCON § Lube	•
Udylite Bath-Nickel	•
Undecylenic Acid	•
Unichrome Sol. Alk.	•
Uranium Salts	•
Uranyl Nitrate	•
Uranyl Sulfate	•
Urea Ammonia Liquor	•
Vacuum to 100 Micron	•
Vacuum below 100 Micr.	•
Vacuum Oil	•
Vanadium Pentoxide	•
Slurry	•
Varnish	•
Varsol-Naphtha Solv.	•
Versene §	•
Vinyl Acetate Dry or Chloride Monomer	•
Vinyl Chloride Latex Emul.	•
Vinyl Resin Slurry	•
Viscose	•
Vortex-Hydroclone	•
Water-Acid - Below pH7	•
Water pH7 to 8	•
Water Alkaline - Over pH8	•
Water Mine Water	•
Water River	•
Water Sandy	•
Water "White" - low pH	•
Water "White" - high pH	•
Wax	•
Wax Chlorinated	•
Wax Emulsions	•
Weed Killer Dibromide	•
Weisberg Sulfate Plating	•
Wood ground pulp	•
Wort Lines	•
X-Ray Developing Bath	•
Xylene	•
Zelan	•
Zeolite Water	•
Zinc Acetate	•
Zinc Bromide	•
Zinc Chloride	•
Zinc Cyanide-Alk.	•
Zinc Fines Slurry	•
Zinc Flux Paste	•
Zinc Galvanizing	•
Zinc Hydrosulfite	•
Zinc Oxide in Water	•
Zinc Oxide in Oil	•
Zinc Sulfate	•
Zincolate	•
Zirconyl Nitrate	•
Zirconyl Sulfate	•

GASES

Acetylene	•
Acid & Alkali Vapours	•
Air	•
Amine	•
Ammonia	•
Butane	•
Butadiene Gas/Liquid	•
Butylene Gas/Liquid	•
By-Product Gas (Dry)	•
Carbon Dioxide	•
Carbon Disulfide	•
Carbon Monoxide	•
Chloride Dry	•
Chlorine Dry	■
Chlorine Wet	■
Coke-oven Gas-cold	•
Coke-oven Gas-hot	†
Cyanogen Chloride	•
Cyanogen Gas	•
Ethane	•
Ether-see Diethyl Ether	•
Ethylene	•
Ethylene Oxide	•
Freon § (11-12-21-22)	†
Furnace Gas hot	†
Furnace Gas cold	•
Gas drip oil	•
Gas flue	•
Gas manufacturing	•
Gas natural	•
Helium	•
Hydrogen Gas-cold	•
Hydrogen Chloride	•
Hydrogen Cyanide	•
Hydrogen Sulfide wet & dry	•
Isobutane	•
Methane	•
Methyl Chloride	•
Natural gas dry	•
Nitrogen gas	•
Nitrous Oxide	•
Oil-Solvent Vapor	•
Oxygen	■
Ozone	■
Producer Gas 50 PSI	•
Propane	•
Propylene	•
Steam	■
Sulfur Dioxide	•
Sulfur Dioxide dry	•
Sulfur Trioxide Gas	■
Sulfuric Acid Vapor	•

NOTE:

1. The above information does not constitute a recommendation of sealant use. It is intended only as a guide for consideration by the purchaser with the expectation of favorable confirming test results. It is impossible to test sealant reaction with the multitude of chemicals in existence, therefore, compatibility has been estimated based on a wide variety of customer experience.
2. With the stringent action of such chemicals as Freon, strong cold acids and caustics, thorough evaluation is suggested. Sealing of hot corrosive chemicals is not recommended.
3. Contact us for use with chemicals not covered by this information.
4. This is a list of chemical stability only. It does not constitute approval for use in the processing of food, drugs, cosmetics, pharmaceuticals, and ingestible chemicals. LOCTITE® products are not recommended for use in pure oxygen or chlorine environments or in conjunction with strong oxidizing agents.

§Listing(s) may be Brand Name(s) or Trademarks for chemicals of Corporations other than Henkel.

LOCTITE® MANUFACTURING RELIABILITY WORKSHOP

LOCTITE® Manufacturing Reliability Workshop is a hands-on training program designed to improve operating equipment efficiency and profitability. This process helps your maintenance engineers reduce the costs associated with unscheduled maintenance and sub-component failure. Included in this program is training on identification of common causes of failure of mechanical assemblies and the role of engineering adhesives in equipment reliability and proactive maintenance.

Features:

Pre-plant survey

- Workshop can be tailored to meet your needs through a plant tour and pre-survey

In-plant follow up

- Ensure proper application of learning from the workshop

Hands-on training

- Job related and product specific
- Review of common failure causes and prevention
- Various applications cover all trades
- Products and hands-on practice components issued
- Training materials supplied
- Conducted on-site

Training Modules:

- Threadlocking
- Thread Sealing
- Gasketing
- Retaining

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