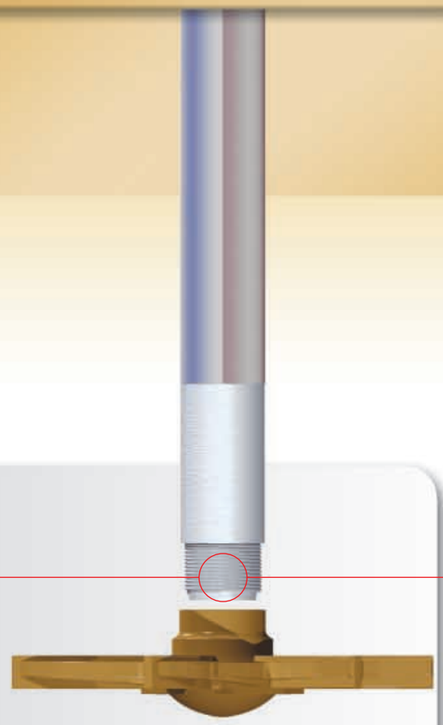
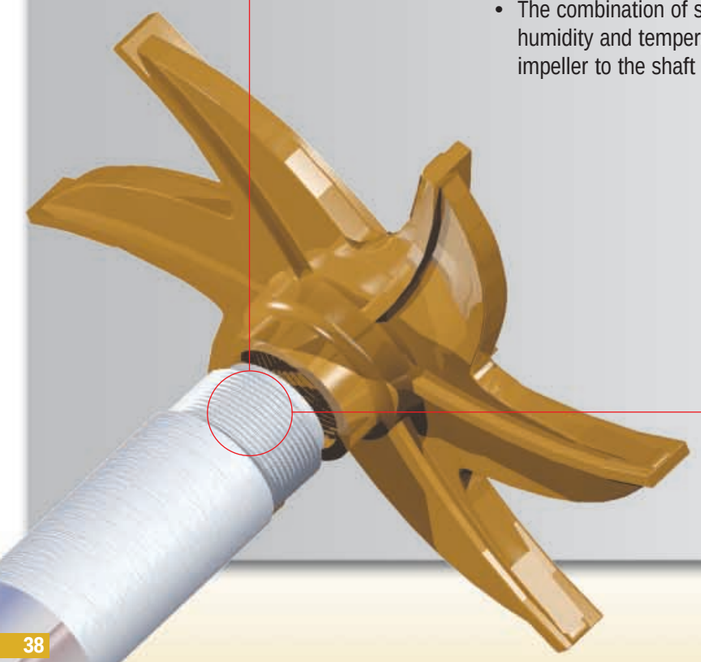
CHALLENGE



Prevent seizure of the impeller to the shaft

Cause:

- The combination of small air spaces within the threads and high humidity and temperatures allows for rust to develop and seize the impeller to the shaft



SOLUTION

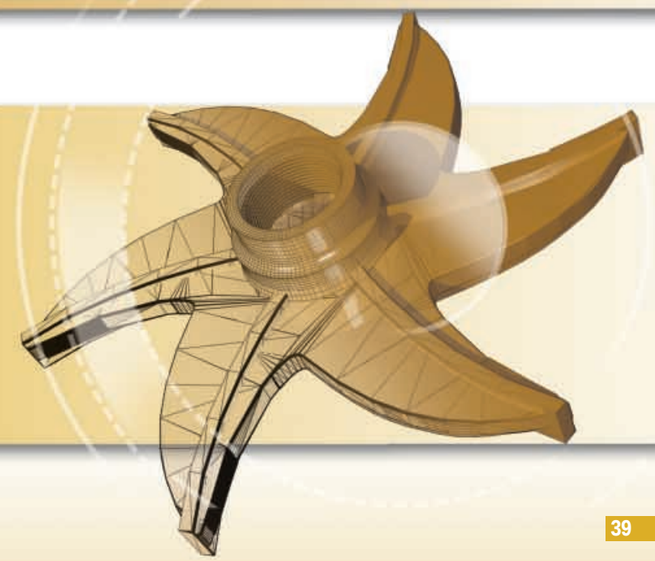
- **Apply Loctite® 8023 Marine Grade Anti-Seize compound to the shaft threads prior to impeller assembly**

Steps:

1. Clean the shaft and impeller threads
2. Apply Loctite® 8023 Marine Grade Anti-Seize to the shaft threads
3. Assemble the impeller using normal techniques

RESULTS

- **Prevention of seizure**
- **Easier disassembly**



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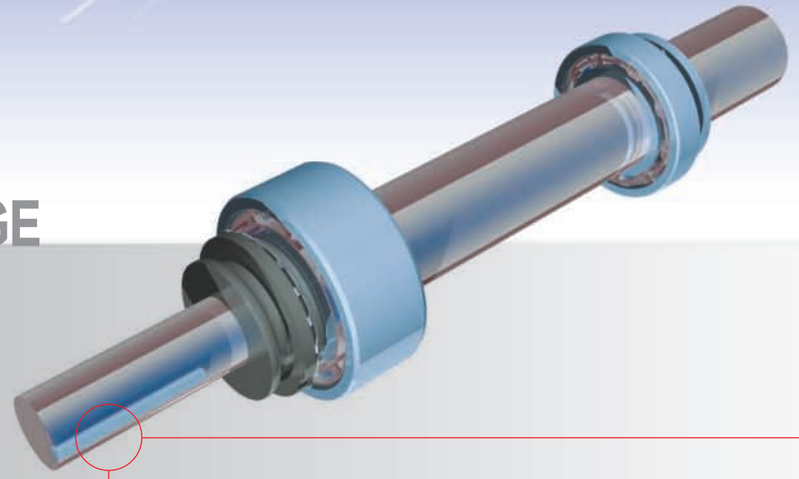
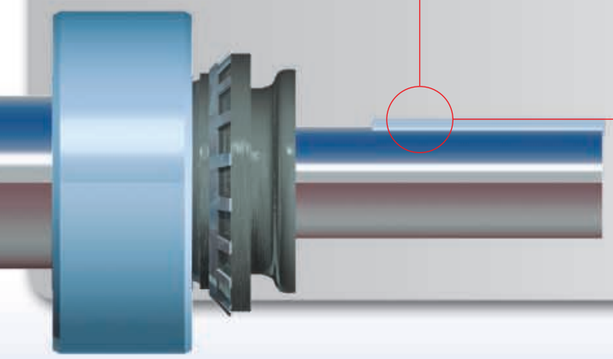


Prevent keyway wallow by securing the key stock in the keyway – new components

Cause:

- In a new assembly the fit between the key stock and the keyway are usually fairly tight. Over time the fit between the key stock and the keyway can loosen and lead to damage to the keyway



SOLUTION

Proactively apply Loctite® 243 Medium Strength Threadlocker to the keyway and then insert the key stock

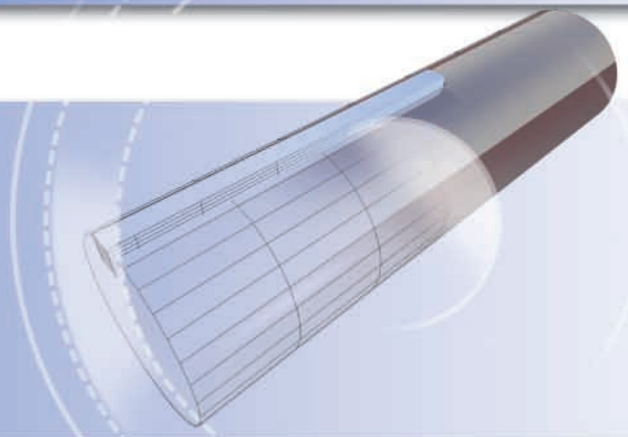
- **The viscosity of a Loctite® Medium Strength Threadlocker is appropriate for the gap fill and provides the proper amount of strength, while allowing for easy removal**
- **If the key needs to be removed, simply use a hammer to tap a metal chisel or drift against the key stock to pop it out of the keyway**

Steps:

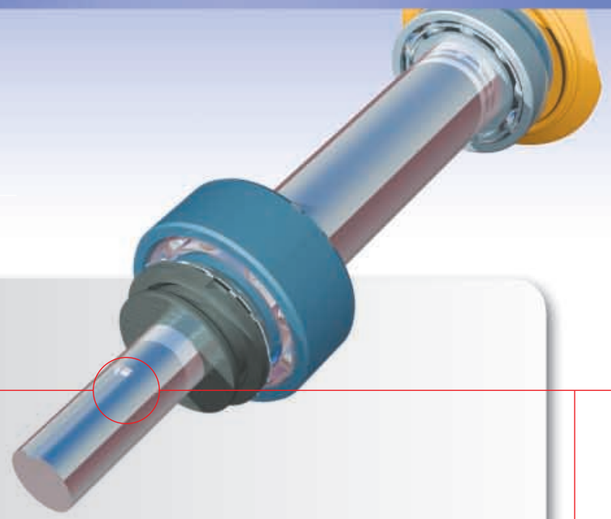
1. Clean the keyway and key stock with Loctite® 7063 Cleaner & Degreaser
2. Apply several drops of Loctite® 243 Medium Strength Threadlocker directly into the keyway
3. Insert the key stock into the keyway
   Note: Cover the shaft with a rag to prevent splatter when inserting the key stock
4. Wipe off any excess threadlocker

RESULTS

- **Prevention of corrosion**
- **Prevention of keyway wallow**
- **A unitized assembly**



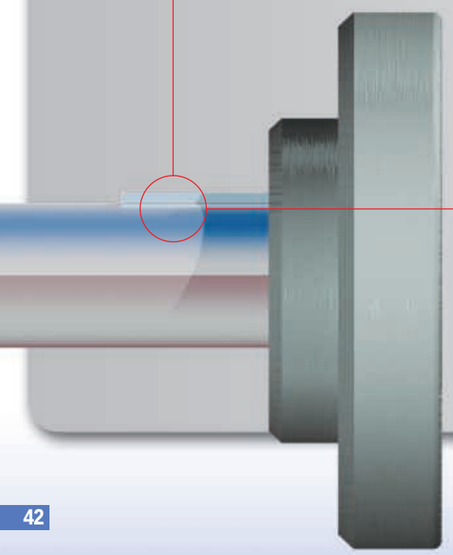
CHALLENGE



Stop keyway wallow and prevent downtime and scrap costs – worn components

Cause:

- Over time, keyways can wear out if the key stock is not secured in place, which results in keyway wallow. This is a common failure for power transmission components such as couplings, sprockets, sheaves, etc.
- If keyway wallow is allowed to perpetuate, further damage can result, such as a sheared key stock or damage to the coupling. If the key stock shears, the result is a loss of power transmission (i.e. the pump will stop running) and further damage to the shaft will occur



SOLUTION

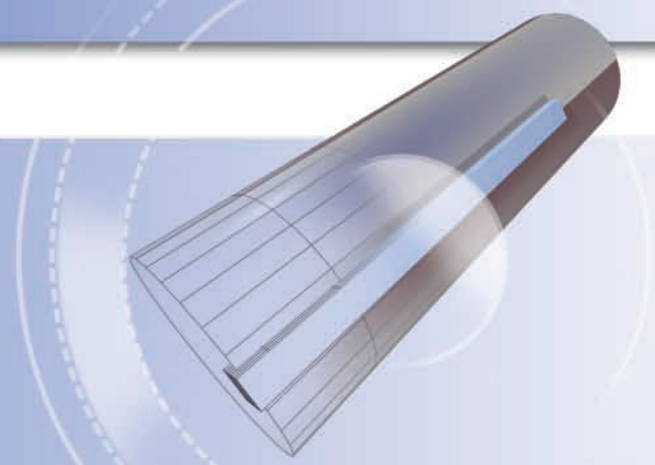
- **If the keyway has already been wallowed out, use Loctite® 660 Quick Metal Retaining Compound to stop the wallow and allow the components to return to service**
- **Loctite® 660 Quick Metal Retaining Compound is a very thick product, which allows it to fill large gaps**

Steps:

1. Clean the keyway and key stock with Loctite® 7063 Cleaner & Degreaser
2. Apply Loctite® 660 Quick Metal Retaining Compound into the keyway
3. Assemble parts and wipe off excess
   Note: If keyway wallow is severe, shims can be used on both sides of the keyways in conjunction with the Loctite® 660 Quick Metal Retaining Compound

RESULTS

- **Assembly is restored, unitized, and ready for service without a major overhaul**



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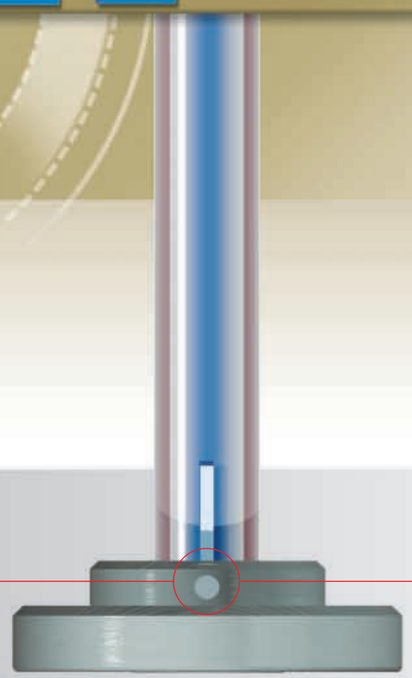
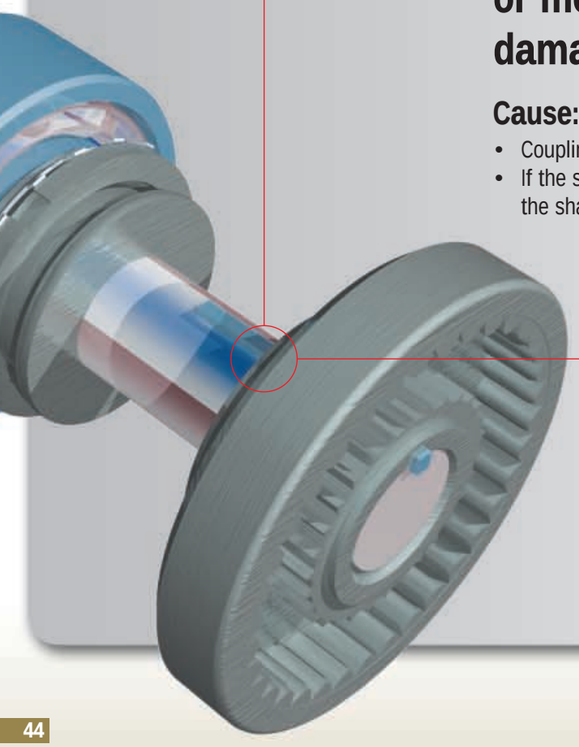


Prevent coupling from loosening or moving, resulting in disengagement, damage, or misalignment

Cause:

- Couplings are held in place by a key and a set screw
- If the set screw was to loosen, the coupling can begin to slide along the shaft and disengage, or it can begin to wallow out the keyway



SOLUTION

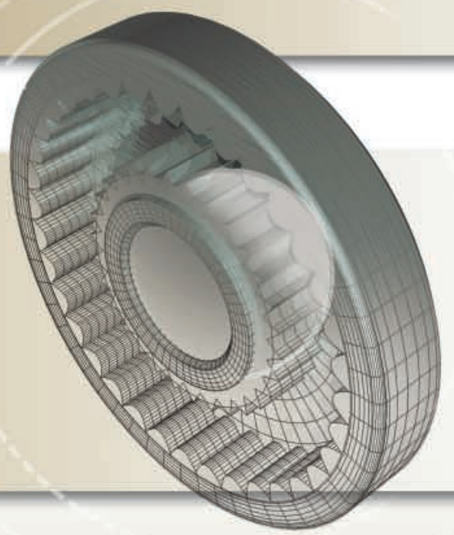
Loctite® 243 Medium and Loctite® 222 Low Strength Threadlockers

Steps:

1. Clean set screw with Loctite® 7063 Cleaner & Degreaser
2. If necessary, spray all threads with Loctite® 7649 Primer or Loctite® 7240 Activator and allow to dry
3. Apply a couple of drops of a Loctite® 222 Low Strength Threadlocker to the set screw (use a Loctite® 243 Medium Strength Threadlocker if the set screw is over 1/4" in diameter)
4. Assemble in the coupling as usual
   Note: Consider applying a Loctite® Retaining Compound or Threadlocker to the shaft prior to assembling the coupling to completely unitize the coupling to the shaft and prevent any possible corrosion

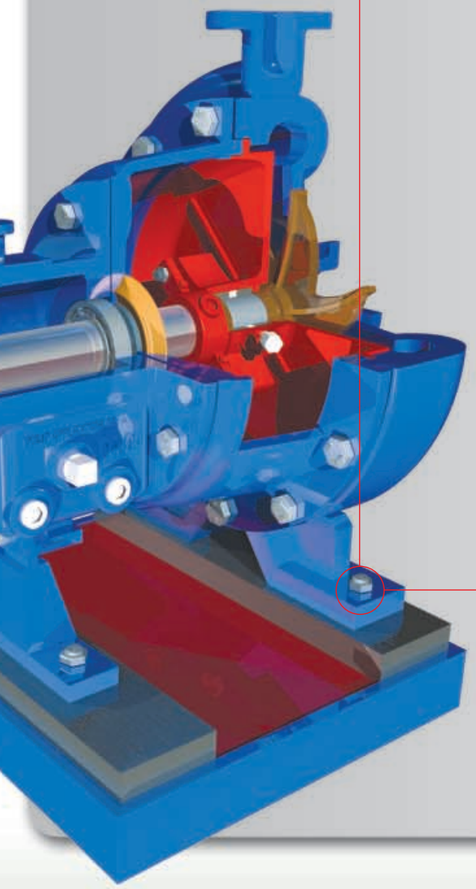
RESULTS

- **Assembly is restored, unitized, and ready for service without a major overhaul**



Pump Base Mounting

CHALLENGE



Prevent pump mounting bolts from losing clamp load, leading to misalignment

Cause:

- Vibration and possible impact shock can work to loosen the mounting bolts
- Loose bolts result in a loss of clamp load, which in turn allows the pump to lose its level and aligned configuration

SOLUTION #1

Apply Loctite® 2701 High Strength Threadlocker to the mounting bolts

Steps:

1. Clean threads with Loctite® 7063 Cleaner & Degreaser
2. Apply several drops of Loctite® 2701 High Strength Threadlocker to the mounting bolts
3. Assemble and tighten as usual

SOLUTION #2

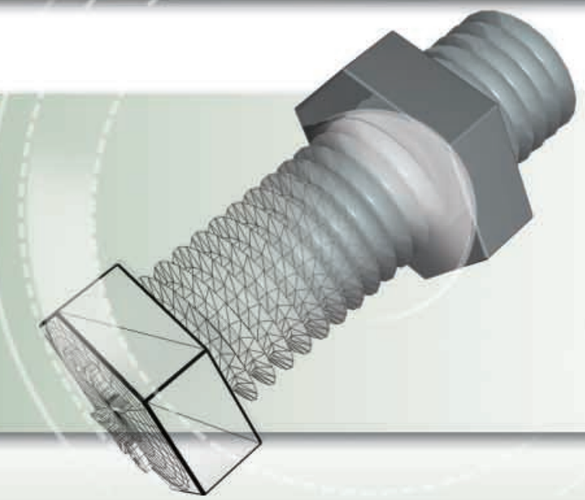
Apply Loctite® 290 Wicking Grade Threadlocker to the mounting bolts after the pump has been levelled and aligned

Steps:

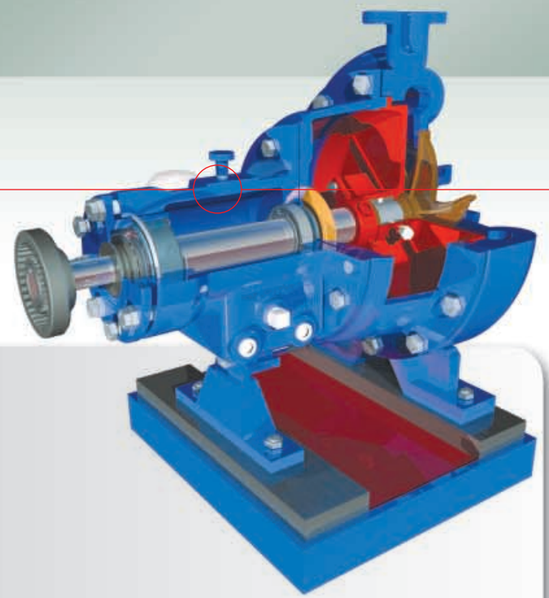
1. Clean the parts with Loctite® 7063 Cleaner & Degreaser
2. Align the pump
3. Tighten the nuts on the mounting studs
4. Apply several drops of Loctite® 290 Wicking Grade Threadlocker to the mounting bolts

RESULTS

- **Mounting bolts are secured in place**
- **Proper clamp load is maintained**
- **Elimination of bolt corrosion**
- **Prevention of misalignment**



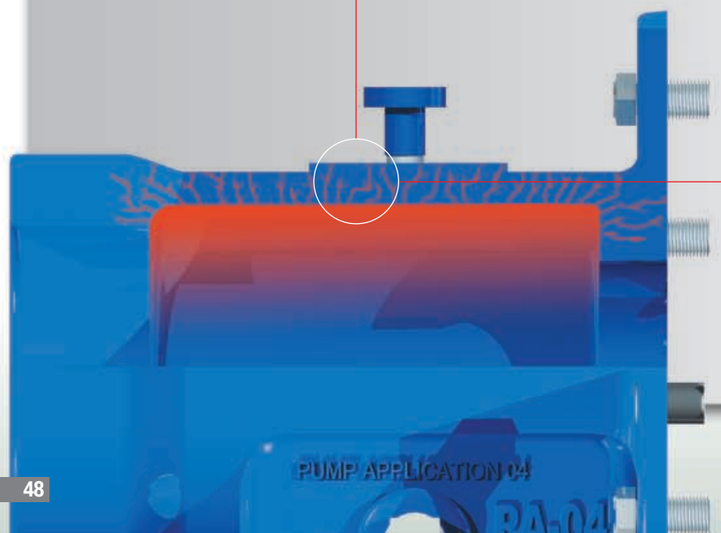
CHALLENGE



Prevent oil loss from seepage

Cause:

- This cast part can have porosities created during the casting. These porosities can lead to the housing weeping oil



SOLUTION #1

- **Coat interior of bearing frame to seal porosities with Loctite® Nordbak® 7221 Chemical Resistant Coating**

Steps:

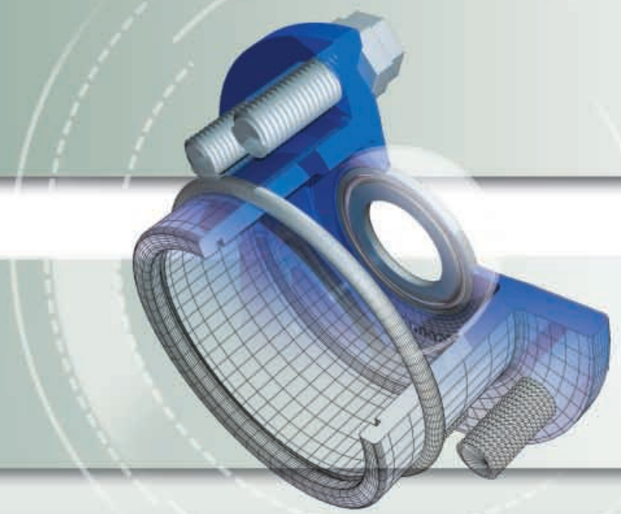
1. Remove visible and invisible contaminants. Clean with Loctite® 7063 Cleaner & Degreaser
2. Abrasive blast the surface to a near white metal finish. Remove dust. Clean with Loctite® 7063 Cleaner & Degreaser
3. Mix and apply Loctite® Nordbak® 7221 Chemical Resistant Coating to the interior of the bearing frame, min 0.5 mm thick, using two coats. Apply second coat when gel time of first coat is reached

SOLUTION #2

For a part where the specific leak points are known, brush on Loctite® 290 Wicking Grade Threadlocker

Steps:

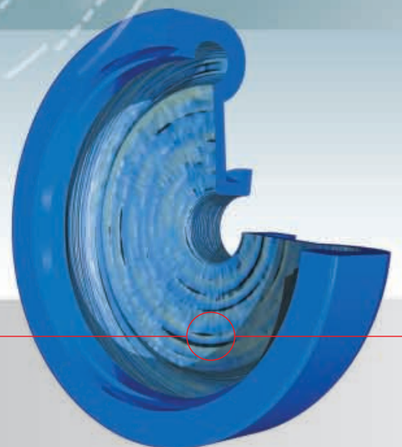
1. Clean the surface
2. Bake it dry
3. Brush on Loctite® 290 Threadlocker
4. Allow to cure



RESULTS

- **Elimination of oil loss through seepage**
- **Reduced oil consumption**
- **Reduced clean up**

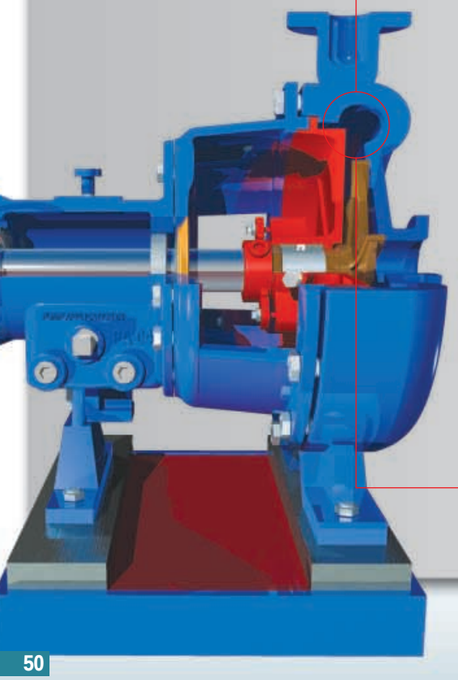
CHALLENGE



Rebuild worn areas to restore pump casing and impellers

Cause:

- Pump casings and impellers are subject to wear from abrasive slurries and solids, cavitation, and chemical attack. Each of these can wear down internal sections of pump casing
- Some of the common wear areas include the cutwater, wear ring seats, impeller vane tips, and inside the volute
- Casing and impeller wear typically falls within the following four category types:
  1. Minor abrasive wear from pumping light slurries
  2. Heavy casing wear and erosion from pumping solids and/or cavitation
  3. Chemical attack
  4. Wear to specific areas of the casing or impeller



SOLUTION #1

- **Rebuild minor surface wear, or rebuild worn areas of the casing and impeller. Apply Loctite® 3478 Superior Metal or Loctite® Nordbak® 7222 Wear Resistant Putty to rebuild worn cutwaters, wear ring seats, impeller vane tips, or other specific areas of the casing. Coat with the surface with Loctite® Nordbak® 7227 or 7228 Brushable Ceramic**

- **Provides a high gloss, low friction finish to help ensure the pump runs as close to its BEP (Best Efficiency Point) as possible**
- **Use Loctite® 3478 Superior Metal to rebuild worn areas, where machining is required to reach the desired dimensions**
- **Use Loctite® 7222 Wear Resistant Putty to rebuild worn areas on places where cavitation and wear are constantly present. Product is not machinable**

Steps:

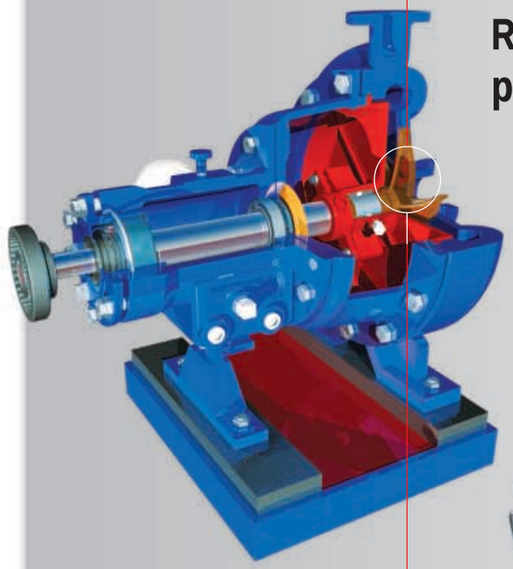
1. Remove visible and invisible contaminants. Clean with Loctite® 7063 Cleaner & Degreaser
2. Abrasive blast the surface to a near white metal finish. Remove dust. Clean with Loctite® 7063 Cleaner & Degreaser
3. Rebuild the surface with Loctite® 3478 Superior Metal or Loctite® 7222 Wear Resistant Putty. Mix and apply products according to the package instructions
4. Apply a coat of Loctite® Nordbak® 7228 Brushable Ceramic White. When gel time is reached, apply a second coat of Loctite® Nordbak® 7227 Brushable Ceramic Grey, to a min 0.5 mm final thickness, to allow for easy visual inspection of the coating and wear

Note: Use Loctite® 7232 High Temperature Wear Resistant Putty and Loctite® 7234 High Temperature Brushable Ceramic at elevated temperatures, up to 205 °C dry service temperture.

Casing / Impeller Wear

CHALLENGE

Rebuild worn areas to restore pump casing and impellers



SOLUTION #2

Repair damage from chemical attack and provide a protective coating. Coat the casing and the impeller with Loctite® Nordbak® 7221 Chemical Resistant Coating

- **Protects parts in severe chemical environments**

Steps:

1. Remove visible and invisible contaminants. Clean with Loctite® 7063 Cleaner & Degreaser
2. Abrasive blast the surface to a near white metal finish. Remove dust. Clean with Loctite® 7063 Cleaner & Degreaser
3. Mix and apply Loctite® Nordbak® 7221 Chemical Resistant Coating, min 0.5 mm thick, using two coats. Apply second coat when gel time of first coat is reached

SOLUTION #3

Repair heavy surface wear to the casing. Rebuild the casing with Loctite® Nordbak® 7218 or 7219 or 7230 or 7226 or 7229 Wearing Compound

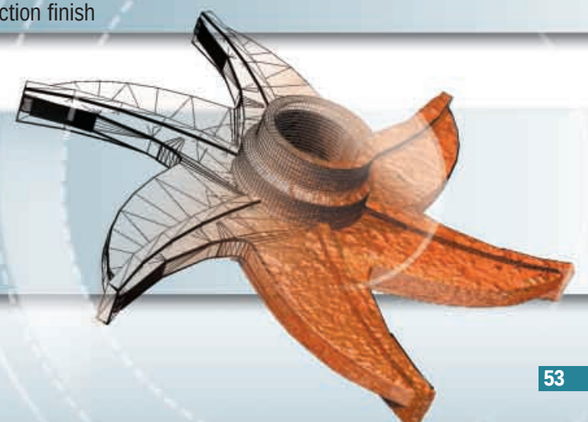
- **Consult a Henkel Technical Specialist for correct product selection**

Steps:

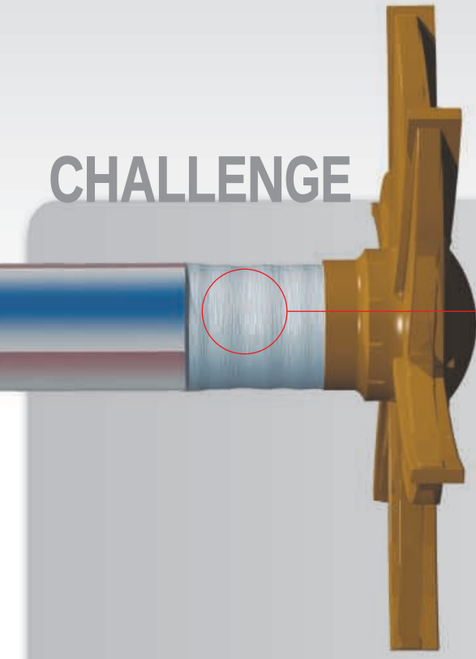
1. Remove visible and invisible contaminants. Clean with Loctite® 7063 Cleaner & Degreaser
2. Abrasive blast the surface to a near white metal finish. Remove dust. Clean with Loctite® 7063 Cleaner & Degreaser
3. Mix and apply the selected Loctite® Nordbak® Wearing Compound as per the package instructions
4. Apply a topcoat of Loctite® Nordbak® 7227 or 7228 or 7234 Brushable Ceramic. When gel time is reached, apply a second coat, to a min 0.5 mm final thickness, to provide a low-friction finish

RESULTS

- **Reduced component consumption by salvaging and extending the life of pump casings**
- **Casings protected from wear and chemical attack**
- **Pumps helped to run close to their BEP**



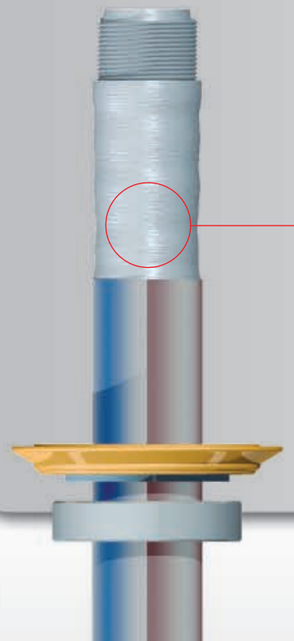
CHALLENGE



Restore worn shaft to the original condition

Cause:

- Wear caused by packing and oil seals is typically the result of constant pressure and abrasion against the shaft surface
- Over time, oil seals can cut a groove in a shaft
- Neglect and improper water lubrication can cause the packing to heat up and in turn to cause severe wear to the shaft



SOLUTION

Rebuild shafts with Loctite® 3478 Superior Metal

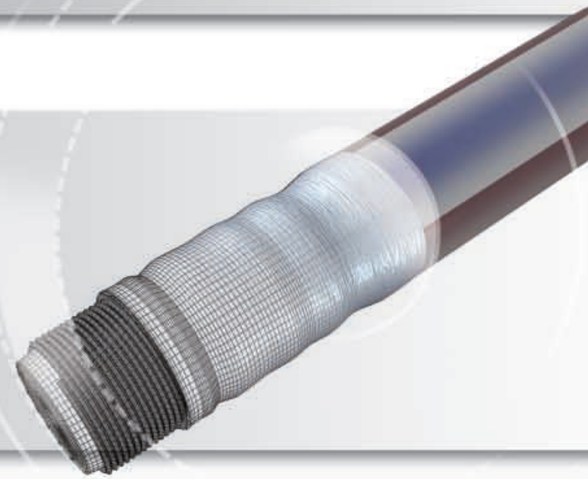
- **Loctite® 3478 Superior Metal is an epoxy with high compressive strength that will not rust**

Steps:

1. To make the repairs, turn the shaft on a lathe and even out the worn areas to at least 0.75 mm (0.03"), leaving a rough surface finish
2. Clean the shaft of any cutting fluids or oils with Loctite® 7063 Cleaner & Degreaser
3. Mix the product as per the package instructions
4. While the shaft is turning on the lathe, apply Loctite® 3478 Superior Metal by pressing it into the shaft Firm pressure is required to squeeze out any potential air pockets
5. The cured product can be turned on the lathe and brought down to the original shaft diameter

RESULTS

- **Quick return to service**
- **Reduced component consumption**
- **Extended shaft life**



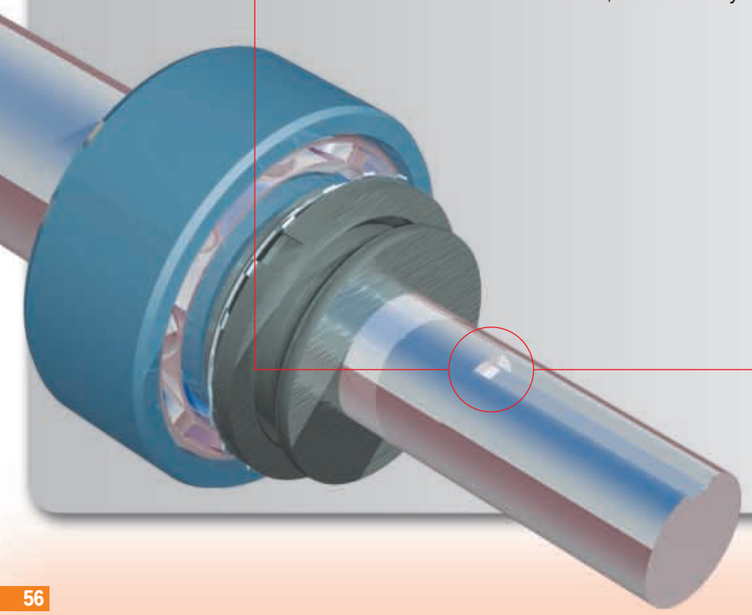
Keyway Wallow

CHALLENGE

Repair wallowed out keyways

Cause:

- Shaft vibration and external forces affect key stability. Over time, this instability leads to keyway wallow



SOLUTION

Apply a bead of Loctite® 660 Quick Metal Retaining Compound directly in the worn keyway

- **Loctite® 660 Quick Metal Retaining Compound is a heavy-bodied product designed to fill large voids, up to 0.25 mm (0.01"). For voids bigger then 0.25 mm (0.01") use Loctite® 3478 Superior Metal**

Steps:

1. If the keyway wallow is severe, you may need to add shims to both sides
2. Apply Loctite® 660 Quick Metal Retaining Compound directly into the keyway
3. Press the new key stock into the keyway and the assembly is restored without having to take apart the pump

RESULTS

- **A secured fit to the keyway**
- **Elimination of repeat wallowing**