

**LOCTITE***Adhesives for more  
reliable assemblies***APPLICATION CASE HISTORY****No. 220**

# Loctite® Retaining Compound Decreases Scheduled Downtime of Pebble Mill By 11.5 Hours

## Previous Situation:

A large iron ore mining operation in Michigan is a consortium of companies that mine iron/ore in an open pit mine. One of their largest pieces of machinery is a 2250 HP #17 Pebble Mill that is run at 750 RPM, 24 hours a day. It grinds chunks of iron/ore into dust, producing an average of 100 tons an hour. Required maintenance is scheduled periodically, including replacement of the bearings and seals in the gearbox. Demounting and re-mounting of the primary input coupling onto the 12" long, 6" diameter gearbox shaft was causing extended labor hours and downtime. In fact, the company often scheduled extra downtime, knowing that there would be problems.

The coupling hub had been bored to .006-.008" smaller than the actual size of the shaft. Then the hub was heated to 400° F to increase the size of the bore to .005 to .006" larger than the size of the shaft. The shaft was suspended over the coupling hub and then lowered into the bore. As it was being positioned inside the bore, the hub would cool off and the shaft would warm up. This caused shrinking of the bore and swelling of the shaft, resulting in the shaft getting stuck part-way in. The hub would then need to be reheated (being careful not to heat the shaft) so that the shaft could be withdrawn. The process would then be repeated until the coupling hub was properly in place. This repositioning often caused an extended installation time of 10 to 16 hours.

## Solution:

During Loctite ProActive Maintenance Training, someone brought up the problem they had been having with the primary coupling hub assembly.

The Loctite ProActive Maintenance Specialist researched the problem and came up with a solution using Loctite® RC™ 635 Retaining Compound.

He advised the maintenance engineering staff to bore the coupling hub to .002" loose — that is, larger than the size of the gear box shaft. The hub is next laid on the floor and leveled, and all parts are cleaned with Loctite 7070 cleaner. The Gear Box shaft is suspended and verified plumb. The coupling hub is then heated to 200-250° F and maintained, using an infrared heat gun to monitor proper heating.

Loctite 635 Retaining Compound is then applied to the shaft and keyway, except for the first one inch of the shaft to allow for initial alignment. The hub is quickly mounted by starting the shaft into the bore and rapidly lowering. This procedure provides enough clearance for mounting and a tight fit that is easy to remove with heat when necessary. While cooling, Loctite 609 Retaining Compound is applied to the outboard end of the assembly to seal the end of the shaft.

## Results:

Mounting and demounting time has been cut by as much as 11.5 hours. Now, after replacing the bearings and seals, the #17 Pebble Mill primary coupling can be demounted in 30 minutes and installed in only one and a half hours. The Maintenance Supervisor declared, "We've had so much success using this method, we're now using it on our other pebble mills. Loctite has helped us decrease labor costs and downtime, enabling us to increase our overall production."

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