LUBSOIL® POLISHING FLUID #45 (5305)

Cam Shaft Manufacturer – Central United States

APPLICATION
Micro Polishing Machine.

CHALLENGES
A leading manufacturer of cam shafts purchased a new Thielenhaus microfinisher. During the run off of the new machine, the current fluid was not able to perform to the standards that were needed. The MICROFINISH process, also known as Superfinish, is a metalworking process for improving the surface and geometric form of components, with a precision of up to 0.1 Microns (0.0001 mm).

The MICROFINISH process employs special finishing stones, finishing tape or cup wheels for extremely precise and controlled removal of material. Light pressure is applied to the component surface across a relatively large contact area, serving to remove the brittle, amorphic layer resulting out of previous processes, such as grinding. Tools and components are arranged in a specific fashion and subsequently rotated at several thousand RPMs in opposite directions. Depending on the objective, the tool or the component may additionally be made to oscillate. Polishing fluid or cooling solution serves to dissipate process heat so that no amount of undesired material deformation takes place.

ACTIONS TAKEN
A Tulco Lubrication Engineer worked with the client's engineering department to diagnose where the current fluid was failing. The microfinisher was using a 40-micron tape to polish the cam shafts, with a resulting minimum goal of a finish of Rz 2.2 µm, Ra .5 µm on the bearing and Rz 1.5 µm, Ra .25 µm on the lobes. Mean Roughness Depth (Rz) is calculated by measuring the vertical distance from the highest peak to the lowest valley within five sampling lengths, then averaging these distances. Average Roughness (Ra) is calculated by an algorithm that measures the average length between the peaks and valleys and the deviation from the mean line on the entire surface within the sampling length. The current fluid was causing the polishing tape to slip on the spools and the optimum flow rate was not able to be achieved, causing the tape to be loaded up with microfines.

TULCO OILS LUBSOIL® SOLUTION
The Tulco R&D team developed a fluid with a lower viscosity fluid, ISO 6 viscosity. State-of-the-art lubricity additives were used to help the polishing tape remove the surface material and aid in heat removal.

RESULTS
Lubsoil Polishing Fluid #45 was used during the run off of the new microfinisher. The 40-micron tape slipping issue was eliminated. Optimum flow rates were achieved and, in fact, the PSI on the fluid pump was able to be reduced, resulting in energy savings. All surface finish goals were achieved during testing.