

Project Report on
**EXPERIMENTAL INVESTIGATION OF TRIBOLOGICAL
BEHAVIOR OF ALUMINUM SILICON AND ALUMINUM BRONZE
BY LASER SURFACE TEXTURING**

Submitted to



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Abstract

An experimental study was carried out to investigate the tribological behavior of different laser surface texture patterns, with Aluminum Silicon and Aluminum Bronze, under realistic operating conditions of starved lubrication, for use in automobile components. Compared to un-textured surfaces, the texture patterns showed significant tribological improvements. Various experiments also highlight the improvement in surface properties such as hardness and oil retention capabilities.

Surface texturing has emerged in the last decade as a viable option of surface engineering resulting in significant improvement in load capacity, wear resistance, friction coefficient etc. of tribological mechanical components. Various techniques can be employed for surface texturing but Laser Surface Texturing (LST) is probably the most advanced so far. LST produces a very large number of micro-dimples on the surface and each of these micro-dimples can serve either as a micro-hydrodynamic bearing in cases of full or mixed lubrication, a micro-reservoir for lubricant in cases of starved lubrication conditions, or a micro-trap for wear debris in either lubricated or dry sliding.