

# **DECLARATION**

I hereby declare that the project entitled “**EXPERIMENTAL INVESTIGATION OF CO-EFFICIENT OF FRICTION FOR PINS (BRASS & M.S) ON M.S PLATE (PLAIN & SQUARE MICRO DIMPLED TEXTURE) FOR VARIOUS REGIME OF LUBRICATION**” being submitted by me, is a bona fide record of my own work carried by me under the guidance and supervision of **Sh. R.C.SINGH** (Assistant Professor) in partial fulfillment of requirements for the award of the Degree of **MASTER of ENGINEERING** (Production Engineering) in Mechanical Engineering, from University of Delhi, Delhi. The matter embodied in this project has not been submitted for the award of any other degree/diploma.

**VINAY KUMAR**  
10/ME/PROD/2K9  
Roll No: 9059

## **CERTIFICATE**

This is to certified that the project entitled “**EXPERIMENTAL INVESTIGATION OF COEFFICIENT OF FRICTION FOR BRASS & M.S PIN ON PLAIN & SQUARE MICRO DIMPLED TEXTURE M.S PLATE FOR VARIOUS REGIME OF LUBRICATION**” being submitted by **Mr. VINAY KUMAR (9059, 10/ME/PROD/2K9 )**, is a bona fide record of his own work carried by him under my guidance and supervision in partial fulfillment of requirements for the award of the Degree of Master of Engineering (Production Engineering) in Mechanical Engineering, from University of Delhi, Delhi. The matter embodied in this project has not been submitted in part or full to any other university/institute for the award of any other degree.

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**VINAY KUMAR**

## ABSTRACT

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Tribology is the science and technology of interacting surfaces in relative motion and related subjects and processes. The problem of friction and wear is likely to occur whenever there is relative motion between two mating surfaces. There are different regimes of lubrication i.e. boundary, mixed, elasto hydrodynamic and hydrodynamic. Coefficient of friction varies in all regimes with the load and relative velocity between mating surfaces and finally loss in power.

Surface texturing is an emerging effective method for improving the tribological performance of materials in contact with lubrication oil. Experiment has been carried out on "Pin on disc set up as per ASTM G99" with different variables for evaluation of coefficient of friction i.e. load, speed and different regimes of lubrication. Two plates as plain and micro hexagonal dimpled of micrometer level has been taken for the tribological study. Also mild steel and brass pin has been taken for the evaluation of coefficient of friction on mild steel disc plate of plain and micro hexagonal dimpled plate. The Hexagonal dimples were produced with the help of chemical etching process.

The coefficient of friction decreases with load as well as speed for both plain and textured plate. But it is less for textured plate in case of dry and hydrodynamic regime of lubrication at room temperature with respect to plain plate. It also observed that in case of elasto hydrodynamic lubrication, the coefficient of friction on textured plate is higher than the plain plate.

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## ABBREVIATIONS

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<b>Symbol</b>	<b>Explanation</b>
$\mu$	co-efficient of friction
$\Phi$	pin dia
g	grams
Kg	kilogram
N	load in Newton
Hv	Vickers micro hardness
$\mu\text{m}$	Micrometer
$A^\circ$	Armstrong
d	Intermolecular distance
$\theta$	Angle of incidence
3D	Three dimensional
$D_1, D_2$	Diagonals of indenter
Rpm	Revolution per minute
$V_w$	Wear volume
L	Applied load
S	Total sliding distance
K	Specific wear rate