Determination of the Tribological Characteristics of Materials with the Pin on Disk Tester

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Overview

Being able to know the tribological characteristics of how materials interact allows us to evaluate the materials we use based on characteristics such as wear rate and coefficient of friction.

The Pin on Disk Friction & Wear Tester precisely and accurately determines the tribological data between materials under a wide variety of temperatures and normal loads, proving to be a valuable tool in gathering pertinent data.

How Our Instrument Works

The K93500 Pin on Disk tester determines the tribological characteristics of materials with a stationary pin held against a rotating disk; the normal load of the pin and disk speed are specified by the user. This is imperative for performing tests with consistency and accuracy.

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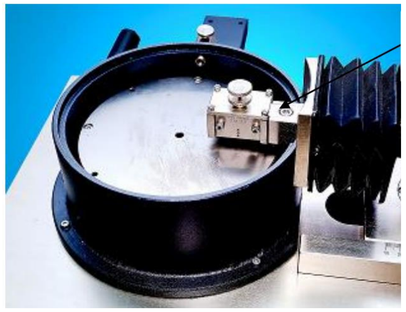
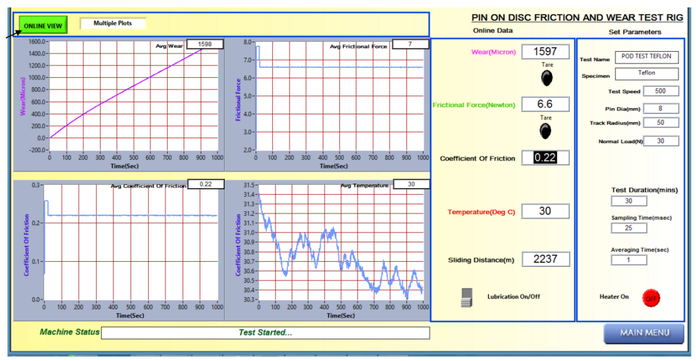


Wear Disk and Fixed Pin

The environmental chamber allows the environment to be flooded with various lubricants, allowing for testers to evaluate the effects that different lubrication states have on certain materials at specific speeds and normal loads

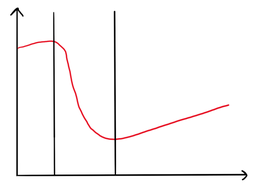


Testing Software

The testing software creates real-time graph of acquired data and creates calculations of coefficients of friction and wear rate. In our case, the software accurately recorded how the wear rates and coefficients of friction of the 3-D printed ABS compared to conventionally manufactured ABS

The Stribeck Curve

The Stribeck Curves models the nonlinear friction function of lubricant viscosity, contact load, and lubricant entrainment speed in situation of fluid-lubricated contacts. The POD is perfect for gathering the data for and modeling such functions.



Preparation for Testing

Several 3D printed pins of ABS polymer thermoplastic are printed in order to extrapolate their coefficients of friction and wear rates The POD tested will allow us to test these pins under consistent conditions, selecting normal loads and disk speeds that are concordant.

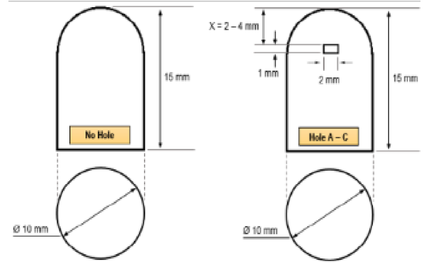


Figure 1 2D modelling of fabricated pins.

Data Analysis

Analyzing the wear rate and coefficient of friction of the 3D printed ABS, it shows us that the 3D printed ABS has superior tribological characteristics to those of conventionally manufactured ABS parts. The POD allows us to extrapolate this data and draw conclusions about our selected materials.

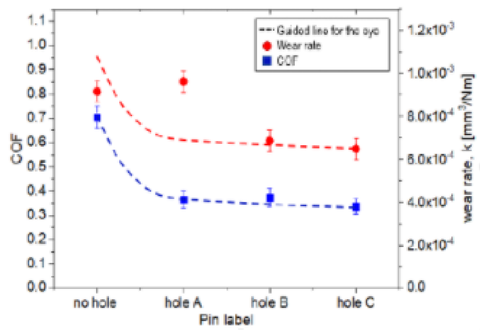


Figure 3 Friction and wear of 3D-printed pins.

Conclusion

The K93500 has superior capabilities in data acquisition and analysis. The plethora of variables like lubrication status and normal load recorded by the user makes it an indispensable in the pursuit of furthering the world's tribological knowledge. With regards to the discussed testing, it provided conclusive data regarding the tribological superiority of 3-D printed ABS.