



Design of Modern Concept Tribometer with Circular and Reciprocating Movement

This paper considers construction and advantage of modern tribometer conception. Tribometer TPD-04 enables simulation of different contact and test types. Special device enables pin on disk, circular and linear reciprocating test types. The main purpose of tribometer was investigation of friction and wear of polymer materials with or without lubricant according to appropriate standards. Tribometer concept and design solution of same subassemblies that provide defined requests fulfill were described in details. Measure system and software for data acquisition and processing results are specially described.

Keywords: tribometer, design, concept,

1. INTRODUCTION

The word tribology was first reported in a landmark report by Jost (1966.) [1]. The word is derived from the Greek word tribos meaning rubbing, so the literal translation would be "the science of rubbing". Dictionaries define tribology as the science and technology of interacting surfaces in relative motion and of related subjects and practices. Tribology is the art of applying operational analysis to problems of great economic significance, namely, reliability, maintenance, and wear of technical equipment, ranging from spacecraft to household appliances. Surface interactions in a tribological interface are highly complex, and their understanding requires knowledge of various disciplines including physics, chemistry, applied mathematics, solid mechanics, fluid mechanics, thermodynamics, heat transfer, materials science, rheology, lubrication, machine design, performance and reliability.

A tribometer (tribotester) is the general name given to a machine or device used to perform tests and simulations of wear, friction and lubrication which are the subject of the study of tribology. Often tribometers are extremely specific in their function and are fabricated by manufacturers who desire to test and analyze the long-term performance of their products.

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By theoretical analysis of friction process and wearing and different tribometer construction [2], [3], [4], [5] it could be concluded that the tribometrical problems are related not just to tribology, but to many other theoretical sciences (dynamics, construction theory, electronics and other). All this implies to necessity of multidisciplinary approach to this problem, from both theoretical and engineering aspects.

A large number of tribometers for different applications were realized by Faculty of Mechanical engineering in Kragujevac in Metal processing and tribology laboratory. Design of this tribometer is realized by Yugoslav Tribology Society and Faculty of Mechanical Engineering in Kragujevac.

2. CONCEPT OF THE TRIBOMETER

Tribometer TPD '04 is designed according to purchaser's request. The main purpose of tribometer was investigation of friction and wear of polymer materials with or without lubricant.

2.1. Design demands and requirements

For concrete experimental investigations purchaser defined following demands:

- Maximum $PV = 300$ Mpa m/min,
- Maximum velocity $v = 65$ m/min,
- Maximum Applied Load $FN = 200$ N,