HIGH THROUGHPUT FRICTION AND WEAR TESTER

US Pat. No.: Patent Pending
Technology Readiness Level: 8/9
Operational use of deliverable

Sandia designed a friction and wear tester that can carry out tests on multiple samples in parallel—enabling the statistical study of material coatings while saving time and money.

There is a need for high volume material testing/qualification, but industry and researchers are currently limited by commercially available testing devices. Most wear testers can only handle one sample at a time and are often expensive. Sandia's High Throughput Friction and Wear Tester enables testing on up to 16 samples simultaneously. It can complete a statistical study of material coatings under a variety of environmental conditions in a few hours rather than months.

Sandia's High Throughput Friction and Wear Tester

Sandia's High Throughput Tester can be used to investigate deposition and chemical optimization, speed dependence, reliability, uniformity of coating, and friction/wear behavior. The tester contains multiple environmentally isolated testing modules. Each module comprises four load cells, loading arms, deadweight loads and specially designed quick-change ball holders. Each module can have different environmental and loading conditions, allowing users to evaluate the same coating under different conditions. Alternatively, users can test different materials in similar environments to select the right coating for a particular application. Once the samples are in place, the system's specially designed software allows users to set test conditions (length, speed, cycle) in each module and automatically acquires, organizes, saves, and displays real-time testing data. In addition to real-time data, the software generates a comprehensive data analysis summary for quick and easy review.

The entire system is less expensive and more user-friendly than current-state-of-the-art—enabling testing for material development, qualification, or quality control that would have been too cost prohibitive in the past.

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Interior view of one of the testing modules. Each module is designed to test up to four samples at a time and the entire system can contain multiple testing modules

TECHNICAL BENEFITS

- Low cost (≈5x-6x less expensive than conventional testing devices)
- Enables simultaneous testing using different environmental and loading conditions
- Automated system that requires minimal user interaction
- Corresponding software monitors results in real-time and reduces large amounts of data for quick review and analysis

POTENTIAL APPLICATIONS

- Coating/material statistical studies
- Coating/material development
- Coating/material qualification
- Coating/material quality control

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