THE ROLE OF TRIBOLOGY IN SUSTAINABILITY
GENERAL-PURPOSE IN-SITU TRIBOLOGY TEST CHAMBER FOR FLUID POWER APPLICATIONS IN COLLABORATION WITH

Press Release IFPE 2023 Conference – Las Vegas

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As the global interest in developing sustainable and environmentally friendly technologies continues to rise advances made in tribology have significantly improved the environmental impact of numerous components in many industries around the world.

To further analyze such effects Test Industry in collaboration with Purdue University's researches developed the:

GENERAL PURPOSE IN-SITU TRIBOLOGY TEST CHAMBER FOR FLUID POWER APPLICATIONS

Test Industry is an Italian leading company in the design and construction of industrial test benches.
The Test Industry Group brings together four important international brands, Bimal, Leonardo (Italy) TestingService and GiM (Germany), specialized in the design and construction of testing machines for production line and laboratory in many industries like hydraulics, automotive, aerospace, tires & wheels.

They developed in collaboration with Purdue University's researchers the General Purpose In-Situ Tribology Test Chamber For Fluid Power Applications.

Tribological interfaces significantly influence the hydrostatic pumps and motors' energy efficiency and reliability. Those interfaces normally function as a seal and a bearing simultaneously.
The performance of the tribological interfaces highly depends on their designs – clearance, roughness, material, surface finishing, etc. as well as the operating conditions – speed, load, temperature, fluid properties, etc. The experimental investigation of such interfaces with various designs at different conditions is critical to help the pump/motor designers to meet the growing requirement of hydrostatic machine efficiency. Such investigation is also essential to expand the speed and pressure range of an existing unit.

This test stand is designed to measure the friction, leakage, pressure/temperature distribution, and loading capability of hydrostatic machine tribological interfaces.

The test rig is designed to be flexible and can test different machines and different interfaces. The first measurement will be conducted on a piston pump to investigate the friction and leakage from each of its interfaces – piston/cylinder, block/valve plate, and slipper/swashplate separately at various operating conditions, including the speed at around zero rpm. The presentation will also highlight the general capability of the test rig and the possibility of investigating different types of machines and interfaces.
Press conference will be held by Dr. Lizhi Shang Professor at Purdue University and Chris Jorge, Test Industry America Inc. CEO.

Dr. Lizhi Shang, Ph.D. Biography:

Shang earned his Ph.D. from Purdue University in 2018 with the guidance of his Ph.D. advisor, the late professor Dr. Monika Ivantysynova. His dissertation focuses on the scaling of the axial piston machine lubricating interfaces.
Dr. Shang joined Purdue University as an assistant professor in 2020. Since then, he has led a research group at the Maha Fluid Power Research Center studying designing and modeling hydrostatic pumps and motors, hydrodynamic pumps and turbines, fluid power systems, and advanced computational and experimental tribological analysis.
His research aims to improve the energy efficiency, reliability, and controllability of fluid power systems by conducting interdisciplinary research on both component and system levels and exploring and expanding fluid power's use and fluid power technology in new applications.
Dr. Shang is the author of more than 20 papers, most of them published in international journals or conferences. He is also active in the fluid power research community. He is the co-chair of the 2022 Maha Fluid Power conference and the 2023 ASME/BATH symposium on fluid power and motion control (FPMC). He is also serving on Fluid Power Systems and Technology Division (FPST) executive committee board.

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