Technion-Israel Institute of Technology
Faculty of Mechanical Engineering

הטכניון-מכון טכנולוגי לישראל
הפקולטה להנדסת מכונות

סמינריון

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ה' 1.02.2018 (טז' בשבט, תשע"ח), בניין דן קאהן, אודיטוריום 1, 13:30.

מרצה: אורי סתיו

מנחה: פרופ' יצחק עציון

על הנושא:

חקירה ניסויית של טיפול מכנו-כימי להקטנת חיכוך בתנועה מחזורית

Experimental investigation of Mechano -Chemical Surface Treatment for friction reduction in reciprocal motion

The seminar will be given in Hebrew

להלן תקציר ההרצאה:

From tribological point of view, it is well established that frictional performance of mechanical components is mostly governed by the top-most layers of the surfaces. Therefore, appropriate modification of chemical and mechanical properties of these layers seems to be an obvious means of reducing friction and hence, friction-related energy losses .

In this context, the present research work aims at investigating the possibility of reducing friction and wear of mechanical components experiencing relative motion by Mechano-Chemical Surface Treatment (MCST).

The main concept of MCST is the creation of chemically modified layers enriched with solid lubricant elements such as sulfide or copper-sulfide. The chemical modification process is based on mechanical activation of the surface which accelerates diffusion activity, thus, initiates strong chemical bond between the solid lubricant and the original material of the surface.

Experiments in the present study were conducted using a dedicated reciprocal test rig capable of simulating, as close as possible, the sliding motion between a piston ring and cylinder liner in Internal Combustion Engine. The control of the test conditions - temperature, oil rate, load and sliding speed, allow one to simulate the different lubrication regimes, i.e. boundary, mixed and full film hydrodynamic .

Obtained results shows clearly that using MCST can reduce friction up to 50% (in laboratory conditions). This finding consolidates the idea that MCST can be employed as a promising technology to induce superior lubricity and be used as a novel surface treatment in particular for mechanical components experiencing reciprocal relative motion. This includes, internal combustion engine, plunger pump and hydraulic press, to name a few.

בברכה,

פרופ"א מתי סאס
מרכז הסמינרים