

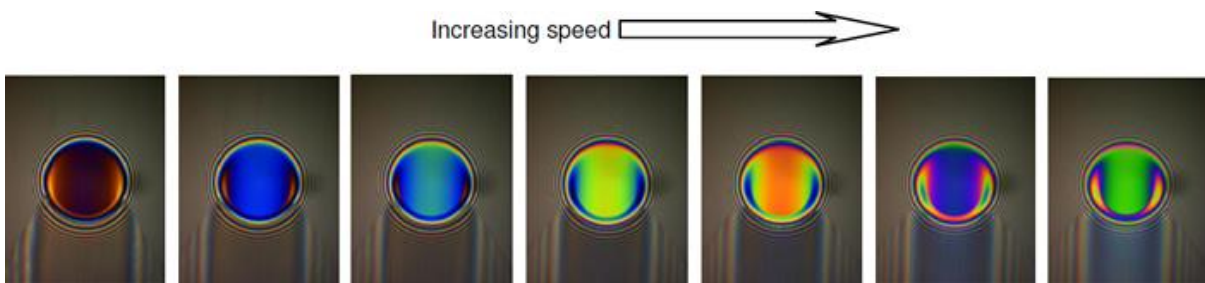
Spacer Layer Imaging Method

Overview

The Spacer Layer Imaging Method (SLIM) is a natural development of the EHL Thin Film Measurement System. Instead of using a spectrometer to determine the wavelength of the light returned from the image of the EHL contact, SLIM uses a high resolution, RGB CCD colour camera to grab an image of the whole contact. The SLIM software uses a previously determined colourspace calibration to match the colours in the image to oil film thicknesses. The system can thus produce a film thickness map of the whole EHL contact in a few seconds. This makes it a unique tool for examining conditions such as parched or starved lubrication, grease lubrication, rough surface EHL and additive boundary film formation.



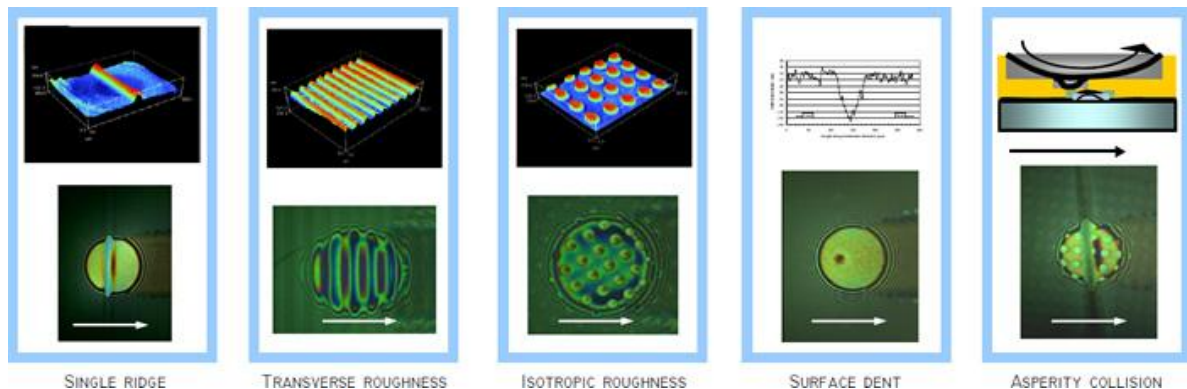
EHDSLIM Method



Screenshot images acquired during a SLIM test (Increasing Speed left to right)

The Effects of 3D Model Surface Roughness Features on Lubricant Film Thickness in EHL Contacts

Below are some results from work performed at Imperial College on the effect of different surface roughness on lubricant film thickness. A variety of surface finishes have been investigated using the 3D Mapper to measure the film thickness.



From work presented by Choo, Olver, Spikes, Dumont and Ioannides at STLE conference in Las Vegas, May 2005

Longitudinal vs Transverse

Work performed comparing longitudinal and transverse roughness showed that the longitudinal roughness lead to a reduced dynamic lift compared to the transverse roughness and a higher proportion of the contact is borne by longitudinal asperities compared to transverse asperities.

Starvation

The 3D SLIM method can be used to investigate parched or starved contacts. The images below show the full contact and the 2D profiles through the centre of the contact for both fully flooded and starved conditions