

# Thermal Effects in Rough EHL Contacts

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## KEYWORDS

Friction and energy saving in machine elements

**Rough EHL, Rolling-sliding, Thermal effects**

## ABSTRACT

Thermal effects dominate the behaviour of rolling-sliding EHL contacts with the heat generation and dissipation controlling the behaviour for all except the lowest amounts of sliding. The presentation will examine the behaviour of line contacts with low amplitude sinusoidal roughness and show how the fluid properties and the roughness interact to produce complex pressure, clearance and temperature variations that may change rapidly with time.

The theoretical treatment has been described elsewhere and the presentation will concentrate on the main physical effects present and will show, for example, how the pressure and temperature variations are closely

linked and how this relationship is affected by the fluid viscosity at high pressures and temperatures. In addition, the role of the shear rate properties of the fluid will be outlined.

While the analysis deals only with line contacts, the roughness can lie at any angle to the contact and the effect of roughness wavelength and orientation will be discussed.