COMPARATIVE STUDY OF AN ENVIRONMENTALLY FRIENDLY LUBRICANT WITH CONVENTIONAL LUBRICANTS IN STRIP IRONING TEST

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ABSTRACT

Experimental estimates of ecologically acceptable single-bath lubricant, are presented and compared to those of classical lubricants in this paper. A device was created for the realisation of the strip ironing test with double thinning and a appropriate definition of the friction coefficient is used. Strips of 2.5 mm-thick low carbon steel sheets were used in the single-phase process with a maximum thinning deformation of 25%. In addition to the single-bath ecological lubricant, a phosphate layer with mineral oil was applied, as was lithium lubricating grease with MoS_2 and mineral oil with EP additives. The basic criterion for the estimates was the change in the friction coefficient and the secondary criterion was the level of surface microchanges due to sliding. The applied test procedure enables the clear differences between the lubricating properties of the investigated lubricants to be established.

Keywords: deep drawing, variable friction conditions, variable drawbead height, variable contact pressure.

AIMS AND BACKGROUND

The status of lubricants as potentially dangerous pollutants has been confirmed by the introduction of legal regulations as early as 2000 in both Japan and Europe. The European Union introduced new, stricter rules, known as REACH, in 2006–2007 (Ref. 1). These regulations declare that industry is responsible for

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