

## **INFLUENCE OF $Al_2O_3$ PARTICLE CONTENT ON THE SLIDING WEAR BEHAVIOUR OF ZA-27 ALLOY COMPOSITES**

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### **ABSTRACT**

The lubricated and dry sliding wear behaviour of ZA-27 alloy composites reinforced with  $Al_2O_3$  particles of size 250  $\mu m$  was evaluated. The content of  $Al_2O_3$  particles in the alloy was 3, 5 and 10 wt.%. Composites were produced by the compocasting process using mechanical mixing of the matrix, i.e.  $Al_2O_3$  particles as reinforcement were added into the semi-solid ZA-27 alloy by infiltration and admixing. A block-on-disc wear test device was used to evaluate the wear rate, whereat 30CrNiMo8 steel disc was used as the counterface, under dry and lubricated sliding conditions at different specific loads and sliding speeds. Results indicated that the wear rates of the composites were lower than those of the matrix alloy and further decreased with the increase in  $Al_2O_3$  particles content in all combinations of applied loads and sliding speeds in both dry and lubricated tests.

*Keywords:* composites, ZA-27 alloy,  $Al_2O_3$  particles, sliding wear, wear rate.

### **AIMS AND BACKGROUND**

Zinc-aluminium alloys (ZA) have broad industrial application. These alloys show very good wear resistance under high loads, slow to medium speed and poor lubrication conditions, good tribo-mechanical properties, low weight, excellent foundry cast ability and fluidity, good machining properties, low initial cost and environmental-friendly technology. ZA alloys are capable of replacing aluminum

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