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Tribological Performance of Polymer Syntactic Foams in Low-Speed Conditions

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Abstract : Syntactic foams are closed-cell foams with high specific strength and high compression strength. At Low speeds, the wear rate is sensitive to the sliding speeds and other tribological parameters like applied load and the sliding distance. In the present study, the tribological performance of the polymer-based syntactic foams was reported based on the experiments conducted on a pin-on-disc tribometer. The syntactic foams were manufactured with epoxy as the matrix and the cenospheres obtained from the thermal powerplants as the reinforcement. The experiments were conducted at a sliding speed of the 1 m/s. The applied load was varied from 1 kg to 5 kg up to a sliding distance of 3000 m. The wear rate increased with the sliding distance at lower loads. The trend was reversed at higher loads of 5kg. This may be due to the high plastic deformation at the initial stages when higher loads were applied. This was evident with the higher friction constants for the higher loads. The adhesive wear was found to be predominant for lower loads, while the abrasive wear tracks can be seen in micrographs of samples tested under higher loads.

Keywords : sliding speed, syntactic foams, tribological performance, wear rate
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