عنوان مقاله:

Experimental Study of Wear Behavior in Polyacetal(POM)/Clay Nanocomposite Gears

محل انتشار:

دومین کنفرانس بین المللی کامپوزیت (سال: 1389)

تعداد صفحات اصل مقاله: 7

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خلاصه مقاله:

Nowadays, polymeric nanocomposites have attracted many attentions due to their special characteristics. Addition of nano-clay into a polymer matrix can improve the mechanical properties, enhance barrier properties and reduce flammability dramatically. Polyacetal(POM) composite gears are used for many light and medium power transmission applications in which they are deflected and worn when subjected to loads. Polymer gears can be improved by adding a definite amount of nano particles. This article presents an experimental investigation of wear in polyacetal/clay nanocomposite gears. The compounds of 1, 3, 5.5 weight percents were prepared by a twin-screw extruder. Electron microscopy and X-ray diffraction (XRD) techniques were employed for evaluating the extent of intercalation and exfoliation of silicate layers in the nanocomposites, as well as for investigating the structure of the samples. Thereafter, the compounds were molded in the form of gears. Finally, the effect of addition of nano-particles on the wear properties of gears was studied by using a gear test rig. The results show that the wear properties of POM/nanoclay gears have been improved compared with the net POM gears. The results of experimentations provoked that the POM/1% nano clay composite possesses the least amount of wear.

کلمات کلیدی:

wear; gear; nanocomposite; POM; nanoclay