عنوان مقاله:

ANALYTICAL SOLUTION AND ENTROPY GENERATION MINIMIZATION ANALYSIS FOR POWER LAW NON NEWTONIAN FLUID FLOW IN A JOURNAL BEARING

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خلاصه مقاله:

An analytical solution for a power law non-Newtonian fluid plus entropy generation analysis in a journal bearing is presented. According the rules of scale up the general form of momentum equation is so simplified that can be solved integrally. No slip condition is applied on the walls. Finally velocity profile is calculated and a worthwhile discussion is done on the variation of velocity in the domain. Furthermore, the entropy generation number is calculated using the viscous dissipation function. Whereas a non-Newtonian fluid is used a general form of viscous dissipation function is introduced which is applicable for all kind of Newtonian and non-Newtonian fluids. According the entropy generation minimization principle, the optimum condition for the bearing characteristic parameters and lubricant non-Newtonian factor is studied. It is found bearing geometry and non-Newtonian parameter influence in entropy generation. Also it is found a fluid with shear-thinning behavior which is well called as Pseudoplastic fluid is the best lubricant from the entropy generation minimization view point.

کلمات کلیدی:

analytical solution، journal bearing، non-Newtonian، power-law، entropy generation

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