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Effects of Compressive Stresses on Torsional Fatigue

Sina Mobasher Moghaddam^{a*1}, John AR. Bomidi^{a1}, Farshid Sadeghi^{a1}, Nick Weinzapfel^{b1},
Alexander Liebel^{c1}

^aPurdue University, School of Mechanical Engineering, West Lafayette, IN 47907, US

^bSchaeffler Group USA, Inc. Troy, MI 48083

^cSchaeffler Technologies AG & Co. KG, 91074 Herzogenaurach, DE

*Corresponding author.

smobashe@purdue.edu

jbomidi@purdue.edu

sadeghi@ecn.purdue.edu

Nick.Weinzapfel@schaeffler.com

liebeaex@schaeffler.com

Abstract

Rolling contact fatigue (RCF) is the dominant failure mode in properly installed and maintained ball and roller element bearings. Lundberg and Palmgren in their seminal publication indicated that this failure is due to the alternating component of shear stress. Thus, torsional fatigue experiments have been used to predict the RCF behavior of bearing materials. In non-conformal contacts, due to Hertzian pressure the contact experiences large compressive stresses. Hence, it is critical to take into account the effect of these large compressive stresses in torsional fatigue to better simulate RCF conditions. This paper presents an investigation of torsional fatigue of bearing steels, while the effects of combined compressive stress and its relevance to material

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