

# Simulation of Wear Using LiveLink™ for MATLAB®

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## Abstract

An incremental wear model has been developed using COMSOL Multiphysics® with MATLAB® to predict the evolution of component geometry as a result of wear. Whilst Archard's wear law is a well-known empirical model for the prediction of wear volume, the design engineer is interested in changes in tolerance as a result of component geometry. At each time step, the simulation extracts the pressure distribution of a quasistatic contact model and evaluates wear depth. The model geometry is updated at each step and Forward Euler iteration is used to integrate the model in time. Specifically, the ball-on-flat contact of an AISI 440C steel ball and a Diamond-Like Carbon coating are modelled based on laboratory predictions of the specific wear rate.