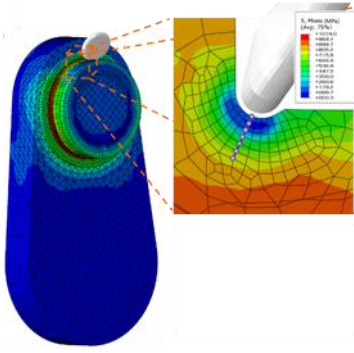




FIAT CHRYSLER AUTOMOBILES



Prediction of residual stress through numerical model simulation and influence on fatigue life of crankshafts submitted to deep rolling process

## Motivation

The determination of the roller parameters to ensure a satisfactory life for the crankshaft is currently done through experimentation. Knowledge of the endurance limit and process parameters of previous designs can help but are not sufficient for assertive determination of parameters for new designs. Fatigue tests are therefore required to check strength and life under cyclic loads

## Objective

To investigate the effects of deep-rolling parameters on the fatigue life of crankshafts. Aiming at a holistic understanding of the influence of the most relevant deep-rolling parameters on the microstructure of the material and the generation of residual stress.

## Approach

The study involved the development of a numerical modeling of the deep-rolling and the comparison with fatigue tests performed on crankshaft specimens.

