Numerical investigation of a shot peening process by a finite element approach - DTU Orbit

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Shot peening is a surface impact treatment widely used to improve the performance of a metal or a component. The better performance of the shot peened part is controlled by compressive residual stresses resulting from the plastic deformation of the surface layers by impacts of shot. The compressive residual stress is generally measured by X-ray diffraction. However, considerable cost and time are needed for such measurements. For this reason, in this work a 3D finite element (FE) model is introduced for a shot peening process. Through the FE simulations, the effect of process parameters such as damping ratio of material, friction coefficient, shot velocity and shot angle on the magnitude and distribution of the compressive residual stress is examined.

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