

## Effect of Multiple Passes Treatment in Waterjet Peening on Fatigue Performance

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### ABSTRACT

The influence of waterjet peening on the residual stresses and fatigue performance of AISI 304 is investigated. The specimen surfaces were treated with multiple jet passes. The fatigue strength was evaluated using an alternating bending fatigue tester. The results of XRD measurements showed that a higher amount of compressive residual stresses is induced in the treated specimens. This strengthening layer is limited within the first 100  $\mu\text{m}$  below the surface, which had been confirmed by micro hardness measurements. Even though the treated specimens showed compressive residual stresses the fatigue limit is lower than that of the untreated specimens. The roughness of the surface and the resulting notch effect seems to be stronger than the positive effect of the hardened layer.

**KEYWORDS:** Waterjet peening; Compressive residual stresses; Multiple passes treatment; Surface roughness; Fatigue strength

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