

---

# Surface Erosion of Carbon Steel 1045 During Waterjet Peening

*Azmir Azhari, Christian Schindler, Jhislain Nkoumbou, and Eberhard Kerscher*

*(Submitted November 20, 2013; in revised form February 16, 2014; published online March 13, 2014)*

The present study investigates the effect of waterjet treatment on the surface characteristics of the carbon steel 1045. The effect of waterjet treatment parameters namely number of jet passes and pressure was investigated. An increase in the number of jet passes as well as pressure leads to a higher roughness and more erosion of the surface. The damage features consist of various fracture mechanism modes occurred at the initial and evolved damage stage. The ferrite phase experienced more damage than the pearlite phase. However, the damage was more concentrated along the grain boundaries. The shearing force from the jet lateral flow raised the circumferential rim and created lateral cracks and sub-tunnels which might eventually be removed in the subsequent jet passes. The hardness of the treated specimens increased with an increase in the number of jet passes and pressure.