

# TENSILE STRENGTH OF FLAME SOLDERED & LASER WELDED JOINTS OF STAINLESS STEEL WIRES WITH BAND

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## ABSTRACT

**Objectives:** To compare the tensile strength of flame soldered joints and laser welded joints formed with stainless steel wires and band materials. Also to determine the tensile strength of various types of joints site preparations (Round wire, Flattened wire, Sandblasted wire).

**Methods:** Sixty joint specimens were prepared using 50mm length 0.036 round Remanium™ (Dentaurum) stainless steel wires and 50mm length 0.180 x 0.005 TruChrome (RMO) band materials. They were assigned in two groups for flame soldering and laser welding of 30 specimens each and divided into three sub-groups of 10 specimens each. Sub group A comprised of round wire. Sub group B comprised of flattened wire. Sub group C comprised of sand blasted stainless steel wire and band material. Tensile testing was conducted with a Universal Testing Machine at a crosshead speed of 2.5 mm/min. The means and standard deviations of the tensile strengths per unit joint length were determined.

**Results:** The laser welded joints were found to be stronger than the flame soldered joints at a statistically significant level ( $P < 0.05$ ). The laser welded joints of sandblasted wire and band material was found to be stronger than the other subgroups but there is no statistically significant difference between them.

Significance: Laser welding can be an alternative to flame soldering of stainless steel wires and band materials. Increasing the surface area by flattening or by sandblasting does not influence the strength of the joint.

Keywords: Laser welding, Soldering, Strength, Stainless steel wire, Band material, Space