



## Experimental Studies on Tensile Properties of Various Steels Using Miniature Specimens

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**Abstract :** This paper presents the design, development and application of a miniature specimen test technology for predicting the tensile properties of structural steels using rectangular miniature specimens. For the present investigation rectangular shaped miniature specimens of dimensions  $10\text{mm} \times 2\text{mm} \times 1\text{mm}$  are carefully prepared from five varieties of structural steels viz. EN8, EN19, EN24, EN31, EN36. Specimens were subjected to Small Punch Testing at room temperature using Universal Testing Machine (UTM). A specially designed and fabricated fixture was used to hold the specimens in the UTM and the load vs load point displacement measurements were taken during the test. The experimental data obtained from miniature specimen tests were further analyzed to obtain the standard mechanical properties of the structural steels. Further, a relation is developed between the ultimate tensile strength of the standard specimens and peak loads of the corresponding miniature specimens using Mini-tab statistical analysis software. By using this relationship one can determine the tensile strength of the structural steel.

**Keywords :** Tensile property, Miniature specimen, Structural steel, Small Punch Test, Regression Equation.

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