

***TENSILE STRENGTH ANALYSIS OF FRICTION WELDING JOINT
RESULTS ON ST 41 STEEL WITH TIME VARIATIONS USING A
MACHINE SPEED OF 1.400 RPM.***

Ir. Azamataufiq Budiprasojo S.T., M.T. *Chief Conselor*

Hendra Maulana

Study Program of Automotive Engineering

Department of Engineering

ABSTRACT

This study aims to analyze the effect of friction time variation in the friction welding process on the tensile strength of ST 41 steel at a machine rotational speed of 1.400 rpm. The method used in this research was an experimental method with friction time variations of 8 seconds, 10 seconds, and 12 seconds. The specimens were prepared according to the ASTM International tensile test standard ASTM E8/E8M-13a, and tensile testing was conducted using a Hydraulic Universal Material Testing Machine to obtain the values of yield strength (σ_y), ultimate tensile strength (σ_u), strain (ϵ), and modulus of elasticity (E). The analysis based on the ultimate tensile strength (σ_u) results showed that the highest value was obtained at a friction time of 8 seconds, reaching 490.85 MPa. All specimens experienced fracture in the welded area, indicating that the 8-second friction time variation was the most optimal parameter for producing maximum tensile strength compared to the 10-second and 12-second friction times.

Keywords: *friction welding, ST 41 steel, friction time variation, tensile strength, tensile test.*