

“ANALISIS PENGARUH PARAMETER PROSES *EXTRUSION WELDING* TERHADAP KUALITAS SAMBUNGAN *HIGH DENSITY POLYETHYLENE (HDPE)*”

ABSTRACT

This study aims to analyze the effect of extrusion welding process parameters on the quality of High Density Polyethylene (HDPE) joints. The parameters investigated include welding temperatures of 230°C, 240°C, and 250°C; welding speeds (speed wayer) of 2, 4, and 6; and nozzle distances of 3 mm, 4 mm, and 5 mm. The material used was HDPE plate joined using the extrusion welding method. Joint quality testing was conducted through tensile and bending tests to determine the effect of each parameter on the mechanical properties of the joint. The test data were analyzed using the average values of each parameter variation and presented in tables and graphs to determine the most optimal welding conditions.

The results showed that each parameter affected the quality of the HDPE joints. The 240°C temperature variation produced the highest average tensile strength of 12.50 MPa, while the 250°C temperature produced the highest average bending strength of 743.33 MPa. For the welding speed variation, the highest tensile strength was obtained at speed Speed4, with a value of 9.43 MPa, while the highest bending strength was obtained at speed Speed6, with a value of 743.33 MPa. For the nozzle distance variation, a distance of 3 mm produced the highest average tensile strength of 13.07 MPa, while the highest bending strength was obtained at a nozzle distance of 5 mm, with a value of 788.33 MPa.

Based on the test results, the welding temperature, welding speed, and nozzle distance affected the quality of the HDPE joints. The best-performing parameters were 240°C for tensile strength, 250°C for bending strength, speed Speed4 for tensile strength, speed Speed6 for bending strength, 3 mm nozzle distance for tensile strength, and 5 mm nozzle distance for bending strength.

Keywords : HDPE, Extrusion Welding, Welding Parameters, Tensile Test, Bending Test.