

# Performance Assessment of the Developed Flux Powder on the Tensile and Hardness Properties of Steels Joints Using TIG-Welding.

- **Source:** Revue des Composites et des Matériaux Avancés . Jun2021, Vol. 31 Issue 3, p153-157. 5p.
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- **Abstract:** The conversion of waste to wealth has recently grossed high attention as it possesses the ability to boost the economy of any nation; hence, this research. In this study, the characterization and investigation of mechanical properties of nano-flux (CaO) welding powder developed from bio-agrowaste (eggshell) was carried out. Mild, galvanized and stainless steel of plates and rods were used as parent metals for the experiment. Results obtained from hardness test in the base metal, weld joint and heat affected zone for the galvanized and mild steel plates with nano-flux powder gave the best hardness of 111.95, 120.30, 182.99 and 206.21, 164.85, 110.56 BHN respectively. The tensile stress obtained both for mild and stainless steel was 88.14 MPa while the tensile strain obtained for both plates were 0.0155 mm/mm. Microstructural analysis results shows an improvement in the structure, surface and patterns of the weld with the use of developed flux compared with imported flux. Hence eggshells can be recycled and used for developing flux powder for welding processes.