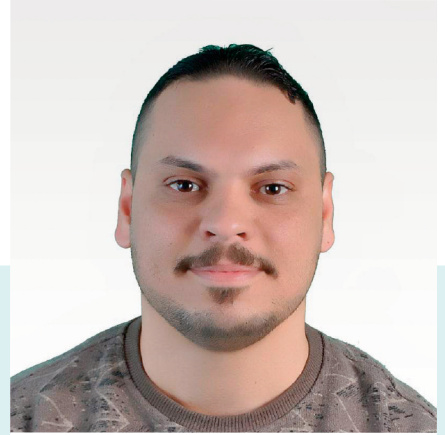




UNIVERSITY OF  
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Poster 2

## *Effect of 304L stainless steel cladded thickness with Q345R steel on mechanical properties and microstructure*



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*ABSTRACT:*

The combination of 304L stainless steel with Q345R steel alloy is widely utilized in welded clad pipes, processing vessels, and heat exchangers due to its exceptional corrosion resistance and mechanical properties.

This study investigates the microstructural and mechanical properties of Q345R Carbon steel (approximately 18 mm) with 304L Stainless Steel Cladding (approximately 3mm). Microhardness mapping assesses the impact of the cladding interface on hardness.

Tensile tests reveal distinct mechanical properties, with ultimate tensile strengths of 691 MPa for 304L SS, 654 MPa for cladded, and 451 MPa for Q345R steel. The cladded sample exhibits higher ductility than 304L SS and greater strength than Q345R steel.

The optical microstructure shows variations of nickel and chromium within the parent alloy, influencing mechanical properties and hardness across cladding regions. The highest hardness occurs in the cladding interface due to martensite phase formation and carbon-chromium dilution, providing valuable insights into cladding's microstructural and mechanical behaviour.



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