

## **Surfaces and Interfaces**

### **Structure-property relationship of the laser clad medium carbon steel: The use of butter layer between the substrate and the top clad layer**

Bolokang, Amogelang  
Council for Scientific and Industrial Research  
Pretoria, 0001, South Africa  
Email: SBolokang@csir.co.za

#### **Abstract**

The structure-property relationship of the laser deposited 316 L/St 1.2311 and Fe/St 1.2311 on E9 substrate was investigated. The variation in the geometrical features of the deposited layers, width, thickness, depth of penetration into the substrate, and the dimensions of the heat-affected zone (HAZ) was studied. The X-ray diffraction (XRD) technique detected structural transformations. Substrate Ferritic and martensitic structures were found on the substrate and clad layers. MnS inclusion was observed on the heat-affected zone (HAZ). Microstructural analysis was conducted by the optical microscopy while Vickers hardness tester measured the macro-hardness.