

# Mechanical and microstructural characterization of laser weld-brazed AA6082-galvanized steel joint

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Laser brazing of aluminum 6082 to galvanized steel was carried out with different laser power followed by mechanical and microstructural characterization. Hardness, tensile and low cycle fatigue tests were conducted for mechanical property evaluation, while microstructural analyses were consisted of optical microscopy, SEM and XRD studies. Microstructures revealed the presence of different eutectics at the inter-dendritic region, whereas ternary Al-Fe-Si and binary iron-rich intermetallics were at the steel interface. Asymmetrical hardness profile throughout the braze joint with lowest value in the brazed region was noted. The sample, brazed with 4 kW laser power, showed best tensile strength, and was failed through the base material. Low cycle fatigue tests showed cyclic stabilization at lower strain amplitudes. Fatigue failure occurred in the brazed region and exhibited fatigue striations, flow lines, and intergranular cracking. (More in: *Journal of Materials Processing Technology*, 263 (2019) 21-32, DOI: 10.1016/j.jmatprotec.2018.08.002 DOI: 10.1016/j.jmatprotec.2018.08.002) or <https://www.sciencedirect.com/science/article/pii/S0924013618303364>

