

Studi perbandingan proses pengelasan antara metode gas metal arc welding (GMAW), gas tungsten arc welding (GTAW) dan plasma arc welding (PAW) pada baja lembaran lapis seng dengan ketebalan 1 MM = Characterization study of welding process between gas metal arc welding (GMAW), gas tungsten arc welding (GTAW) and plasma arc welding (PAW) method in joining zinc coated steel sheet with 1MM thickness

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Abstrak

Karakterisasi hasil proses pengelasan dengan metode Gas Metal Arc Welding, Gas Tungsten Arc Welding dan Plasma Arc Welding pada baja lembaran berlapis seng dibandingkan untuk mengetahui pengaruh seng terhadap hasil lasannya. Perbedaan besar butir yang sangat jauh antara daerah fusion zone, yaitu 32  $\mu\text{m}$ , dan daerah HAZ, yaitu 90  $\mu\text{m}$ , pada proses pengelasan dengan metode Gas Metal Arc Welding menyebabkan penggetasan dan perpatahan di fusion line pada pengujian tarik dan pengujian tekuk. Hasil pengelasan dengan metode Plasma Arc Welding memiliki sifat fisik yang paling optimum di antara kedua metode lainnya, dengan kekuatan tarik sebesar 352 N/mm<sup>2</sup> dan struktur butir mikro yang relatif halus. Terdapat pelarutan seng ke daerah fusion zone, dengan kandungan paling besar pada metode pengelasan Plasma Arc Welding.

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The characterization of weldments produced by Gas Metal Arc Welding, Gas Tungsten Arc Welding and Plasma Arc Welding methods in joining zinc coated steel sheet is compared to know the effect of Zinc on the properties of weldments. The grain size difference between the fusion zone, which is 32  $\mu\text{m}$ , and HAZ area, which is 90  $\mu\text{m}$ , on Gas Metal Arc Welding method is causing the brittleness and cracking at the fusion line while testing with tensile and bending test. Weldments produced by Plasma Arc Welding have the optimum physical property among the two other welding process, with tensile strength 352 N/mm<sup>2</sup> and relatively fine microstructure. There is some zinc dilution in fusion zone, with the biggest concentration occurs in Plasma Arc Welding process.