

소결밀도에 따른 소결금속과 탄소강의 레이저 용접성 고찰

김 용*, 양현석*, 박기영*, 이경돈*

고등기술연구원 로봇생산기술센터*

Laser Weldability Depend on Sintered Density Between Sintered Material and Carbon Steel

Yong Kim*, Hyun-Seok Yang*, Ki-Young Park* and Kyoung-Don Lee*

Institute for Advanced Engineering*

Abstracts ; Sintered specimen which used for a blade of diamond tool was manufactured in order to verify CO₂ laser weldability depend on sintering temperature. Five kind of specimen were made in sintering test, the range of temperature is from 600°C to 1000°C at intervals of 100°C. As a results for sintered density test, the range of porosity rate was appeared by 2.1%~21.4%. Results for OEM test, black region after Nital etching was identified to Fe and porosity, the rate of black zone are decreased when the sintering temperature is getting more and more. In case of hardness test, it was showed the best value (97HRB) at the specimen for sintering temperature of 800°C and dimple fracture shape was appeared in higher temperature specimen. In the welding test, a variable of laser beam discharge is fixed to check the laser weldability in relation to sintering-extent. After welding the most segments have exceeds the minimum fracture stress (600MPa, The Standard Safety of Europe) in welding strength test except on the sintered at 600°C. In case of the sintered at 700°C, even satisfied the safety allowable stress but cannot get the good quality for bead appearance because of humping defect. In the conclusion, we could know that it showed not only relatively soundness bead but also enough welding strength when the sintered blade for diamond tool is included less than 4% of porosity rate.

Key Words : Sintered density, Porosity rate, laser weldability, Diamond tool, shank.