

다이아몬드 Grit(흑연)/ Cu-13Sn-12Ti 필러합금 진공 브레이징 접합체의 젖음성 및 계면반응

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The wetting and interfacial reaction of vacuum brazed junction between diamond grit(graphite) and Cu-13Sn-12Ti filler alloy

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Abstract

Various alloy system, such as Cu-Sn-Ti, Cu-Ag-Ti, and Ni-B-Cr-based alloy are used for the brazing of diamond grits. However, the problem of the adhesion strength between the diamond grits and the brazed alloy is presented. The adhesion strength between the diamond grits and the melting filler alloy is predicted by the contact angle, thereby, instead of diamond grit, the study on the wettability between the graphite and the brazing alloy has been indirectly executed. In this study, Cu-13Sn-12Ti filler alloy was manufactured, and the contact angles, the shear strengths and the interfacial area between the graphites(diamond grits) and braze matrix were investigated. The contact angle was decreased on increasing holding time and temperature. The results of shear strength of the graphite joints brazed filler alloys were observed that the joints applied Cu-13Sn-12Ti alloy at brazing temperature 940 °C was very sound condition indicating the shear tensile value of 23.8 MPa because of existing the widest carbide(TiC) reaction layers. The micrograph of wettability of the diamond grit brazed filler alloys were observed that the brazement applied Cu-13Sn-12Ti alloy at brazing temperature 990°C was very sound condition because of existing a few TiC grains in the vicinity of the TiC layers.

Key words : wettability, contact angle, diamond grit, brazing, graphite

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