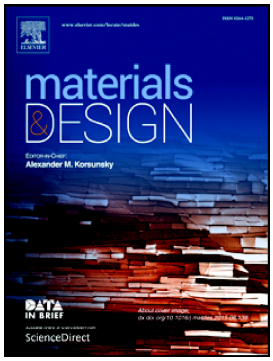

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Investigation on induction brazing of Revolving Heat Pipe Grinding Wheel

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Abstract: Revolving heat pipe grinding wheel (RHPGW) has been proposed to realize dry grinding of difficult-to-machine materials. The RHPGW has a variable wall thickness with a thinnest part of 1.5 mm along the width direction. This investigation aims at developing an induction brazing method for RHPGW in order to prevent deformation, improve the inter-chip space, and achieve uniform grit distribution. Simulations were performed on FLUX to design a suitable induction coil and the related working parameters. Ag-Cu-Ti alloy and CBN grains were applied in the brazing experiments. The brazing temperature, geometric accuracy, microstructure and the compounds at the matrix/Ag-Cu-Ti/CBN interface were analyzed along the width direction, good consistency was achieved for different positions. Further validation experiments were carried out by dry grinding of Inconel 718 and compared with the results ground by electroplated RHPGW. Lower grinding forces and higher service life was obtained with the induction brazed RHPGW. Abrasion wear was found to be the main failure mode for the brazed grinding wheel, while both significant adhesion and wear were the failure forms for the electroplate one.

Keywords: Induction brazing, Revolving heat pipe grinding wheel, Geometric accuracy, Brazing temperature distribution, Brazing quality

1. Introduction

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