

SILICON CARBIDE BONDING FOR HIGH TEMPERATURES RESISTANT JOINTS PART 2

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ABSTRACT

This article is intended to present a follow-up research to joining development for silicon carbide (SiC)-based materials used for structural applications in harsh environments. The paper reports results of our continuous study on SiC bonding by the Spark Plasma Sintering (SPS) Technique. SiC pipe, disk couples and combination of pipe-disk couples were bonded by the SPS method. In addition, the samples were analyzed non-destructively by scanning acoustic microscopy (SAM) and then by light and electron microscopy, while the mechanical properties were measured by the nanoindentation method. High quality bonding was observed, with existence of only a few defects at the interface periphery. SPS proved efficient for bonding different shaped SiC parts, however, an adjustment of bonding parameters due to geometry must be taken into consideration.

KEY WORDS: Silicon Carbide, Spark Plasma Sintering, Nanoindentation, Scanning Acoustic Microscope, Elastic Modulus, Hardness, Fracture Toughness

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