

Engine and Auxiliary Systems

Edited by
Prof. Dr. A.K.M. Mohiuddin



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Production of Aluminum-Silicon Carbide Composites Using Powder Metallurgy at Sin
Temperatures above the Aluminum Melting Point Part II

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Introduction

Among various metal matrix composite systems, aluminum alloy composites aluminum reinforced with silicon carbide particles has attracted an attention in automotive aerospace applications due to their superior strength-to-weight ratio and high tem strength. However, the widespread use of such composites is still largely unrealized due to limited knowledge of the processin-microstructure-property relationship in such materials. In automotive industry, these materials have been used as pistons, piston ring inserts, cyl liners, brake rotors, brake pads, and connecting rod. A new developed pin-fin substrates made AlSiC for liquid-cooled high-power module system used in hybrid electric vehicle (HEV) in technologies.

As we know, composite materials are designed to have the high strength and stiffness yet low in density. Composite materials are fabricated from combination of matrix reinforcement. Reinforcement which is also known particulate-reinforced has contributes hardness in composite materials. Aluminum is used widely as a structural material especially the aerospace industry because of its light weight properties however the low strength and melting point of aluminum were always a problem. A cheap method of solving these prob was to use a reinforced element such as SiC particles and whiskers. The ceramic parti additions make it possible to increase the specific elastic modulus of aluminum and impro aluminum thermal properties.

Powder metallurgy (PM) method can help us to produce aluminum composites reinfo with SiC particulates produce a homogenous distribution of reinforcement in the matrix. Po metallurgy also has the advantage of producing net-shape components minimizing machin process which is a great problem in case of aluminum silicon carbide composite as a result