

THE BENEFITS AND CHALLENGES OF LIQUID STATE PROCESSING FOR LIGHT WEIGHT Al/SiC MMCs

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Abstract

While SiC-reinforced Al-MMCs are considered amongst the most promising candidates for light weight materials intended for transportation, a major part of the success lies on the fabrication route. Particularly, processing by the liquid state route unveils not only some attractive advantages but also inherent drawbacks. In view of the vast experience of handling molten aluminum in the foundry industry, the idea of using liquid aluminum for the preparation of Al/SiC MMCs is always compelling. Moreover, compared to the solid and semi-solid state processing technologies, it is expected that investment, in terms of equipment and the alterations in plant will be minimum. However, a number of factors related to the processing parameters and composites' microstructure should be taken into consideration before speaking of product performance. These factors include the Al alloys and prior treatments to the SiC reinforcements. In this contribution, the pros and cons of using the liquid state route for Al/SiC composites, particularly when using the infiltration route, are examined.

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