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# High Shear Dispersion Technology prior to Twin Roll Casting for High Performance Magnesium/$SiC_p$ Metal Matrix Composite Strip Fabrication

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**Abstract**: SiC particulate ($SiC_p$) reinforced AZ31 magnesium alloy composite strips were produced by a novel process. In the process, a high shear technique was utilised to disperse the reinforcing particles uniformly into the matrix alloy, and AZ31/5vol%$SiC_p$ slurry was solidified into thin strip by a horizontal twin roll caster. The experimental results showed that the AZ31/5vol%$SiC_p$ strip obtained with high shear treatment exhibited a significantly refined microstructure and uniform distribution of reinforcing SiC particles. High cooling rate in the TRC process was also considered to contribute to the grain refinement of the matrix alloy, together with the possible heterogeneous nucleation effect of the reinforcing particles. The mechanical properties of the high shear treated composites strips showed enhanced modulus, yield strength and ductility by hardness and tensile tests. The experimental results were discussed in terms of the microstructural features and the macroscopic reliability, where necessary, analytical and statistical analyses were conducted.