

Method For Manufacturing Thermoplastic Composite From Microwave-assisted Compression Moulding

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ABSTRACT

A method for manufacturing thermoplastic composite via microwaveassisted compression moulding, the method including stacking at least one polymer matrix layer and at least one reinforcement layer. The method includes covering the stack of the at least one polymer matrix layer and the at least one reinforcement layer placed in an alumina mould with an alumina pressure plate. The method further includes heating the stack of the at least one polymer matrix layer and the at least one reinforcement layer via microwaves generated by a microwave arrangement, and simultaneously applying pressure on the stack of the at least one polymer matrix layer and at least one reinforcement layer via putting a deadweight on the alumina pressure plate. The simultaneous heating and applying pressure in the plurality of stages, enables interfacial bonding between the polymer matrix and the reinforcement, thereby saving the energy and reducing a manufacturing cycle time.

KEY APPLICATION AREAS

- 1.Thermoplastic composite manufacturing.
- 2.Microwave-assisted compression moulding.
- 3.Polymer composite processing.
- 4.Automotive and aerospace composites.
- 5.Construction materials.
- 6.Industrial composite manufacturing.

POTENTIAL USES

- 1.Rapid fabrication of thermoplastic composites.
- 2.Energy-efficient composite production.

- 3.Low-cost manufacturing of composite parts.
- 4.Manufacturing lightweight structural components.
- 5.Production of fiber-reinforced polymer composites.
- 6.High-throughput industrial composite processing.