

Spring-loaded fixture, method of performing microwave-assisted compression moulding, and method of manufacturing thereof

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ABSTRACT

A spring-loaded fixture (100) for microwave-assisted compression moulding is disclosed. The spring-loaded fixture (100) comprises a hollow rectangular body (102) formed of a microwave-safe material. The hollow rectangular body (102) comprises a threaded opening (104). A hollow cylindrical threaded rod (106) to engage with the threaded opening (104). The hollow cylindrical threaded rod (106) comprises a threaded outer surface (202), a hollow cavity (402) extending from a lower end toward upper end of the hollow cylindrical threaded rod (106), and a first collar (204) integrally formed at the lower end. A solid cylindrical rod (206) disposed within the hollow cavity of the hollow cylindrical threaded rod (106). The solid cylindrical rod (206) having a second collar (208) at a lower end of the solid cylindrical rod. A compression spring (210) disposed between the first collar of the hollow cylindrical threaded rod and the second collar of the solid cylindrical rod.

KEY APPLICATION AREAS

1. Composite materials manufacturing.
2. Microwave-assisted compression moulding.
3. Polymer matrix composites (PMCs).
4. Natural fibre composite processing.
5. Advanced manufacturing and tooling.

POTENTIAL USE

- 1.Manufacturing lightweight fibre-reinforced composite components.
- 2.Producing automotive, aerospace, and sporting goods composites.
- 3.Processing natural fibre-PLA and other thermoplastic composites.
- 4.Research and pilot-scale composite manufacturing.
- 5.Improving composite quality by maintaining uniform pressure during microwave curing.