



Transient Thermal Modeling of Thermoplastic Composite Filament Winding Process

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Thermosetting Vs Thermoplastic Composite Filament Winding





Applications of Thermoplastic Composite Filament Winding Process



Fuselage structures

Hydrogen Tanks

Deep submarines

FEM Implementation Scheme









Parametric numerical study of the effects of winding velocity and heating power on the temperature and stress distribution

Heating power vs Temperature

←→ S, S33 (Avg: 75%): 350W







- In all the layers: The maximum temperature increased with lower winding velocity.
- Higher maximum temperature on the second layer.
- Larger heat diffusion area is observed on the third layer.
- In all the layers: The maximum temperature increased with increasing heating power.
- Higher maximum temperature on the second layer.
- Larger heat diffusion area is observed on the third layer.
- Higher positive stress at the center of the boundary and compressive stress at the immediate areas.
- Higher stress resulted with increasing heating power.
- Edge effects at the free ends and vary with heating power.