

Composite analysis

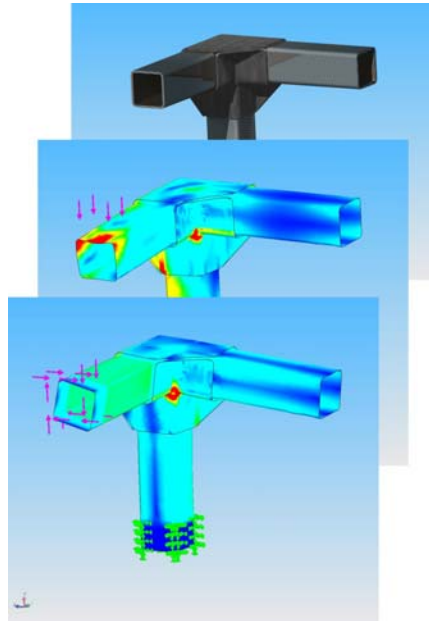
- Modelling of mechanical, physical, chemical, and thermal properties
- Failure analysis using maximum stress, maximum strain, Tsai-Hill, Hoffman, or Tsai-Wu
- Optimization of laminate stacking sequence, reinforcement location, and core placement
- Optimization of high temperature and room temperature curing mechanisms
- Moulding simulations
- Validation, quality, and performance testing

Finite element analysis (FEA/FEM)

- Stress & displacement
- Thermal stress
- Contact analysis in assemblies with friction
- Frequency & buckling,
- Heat transfer - steady state & transient
- Temperature dependent materials
- Drop test
- Fatigue
- Optimization
- Nonlinear stress analysis
- Dynamic response
- Laminate composite (Tsai-Wu ply-by-ply) failure
- Stress & displacement for fibre oriented parts (e.g. SMC, BMC parts)
- Structural analysis (seismic, snow loads, and wind loads)

Mould design & analysis

- Design of RTM, VARTM, open moulds, compression moulds, transfer moulds, pultrusion, extrusion, and injection moulds
- Thermal analysis and optimization
- Cycle time determination
- Moulding simulations
- Mould deflection/stress analysis and optimization



Material formulation

- Thermoset and thermoplastics Reinforced with glass, carbon, aramid, or wood fibres
- Moulding formulations for SMC, BMC, RTM,
- VARTM, extrusion, and pultrusion moulding
- Customized reaction kinetics for room temperature or high temperature catalyst systems
- Customized electrical conductivity properties
- Customized thermal expansion & conductivities
- Customized mechanical properties
- Customized physical properties
- Low flammability and toxicity formulations

2D & 3D Part design

- 3D solid models and assemblies
- 2D construction and shop drawings
- Parts configured for compression, transfer, RTM, VARTM, and injection moulding
- ISO, ANSI, DIN drawing standards
- Geometric tolerances
- Interference checks/tests
- Model texturing and rendering
- Animation of moving parts and assemblies
- 3D web pages of parts and assemblies

Reverse engineering

- Material characterization (matrix and reinforcement identification)
- Geometry capturing (e.g. white light, CMM)

Prototype design & construction

- CNC cutting - Ren board, aluminium, stock fibre glass
- 3D printing & stereo lithographing.
- Hand lay-up prototyping
- Casting
- Prototype moulds

Project management

- Managing material and product certification (e.g. NEMA, UL, OBC)
- Managing tooling and mould construction



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