

INTRODUCTION TO OPTIASSIST FOR SIMCENTER 3D

Highlights Presentation

Solution
Partner

PLM

SIEMENS



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Product Objective

Develop a unified environment to allow users to maximise the potential of the Nastran Optimisation Module (SOL200)

How?

- OptiAssist for Simcenter 3D provides **BOTH**:
 - A simplified interface to Nastran Optimisation
- **AND**
 - Extended optimisation capabilities

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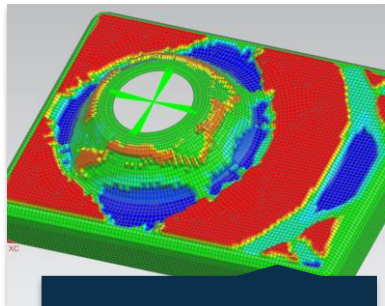
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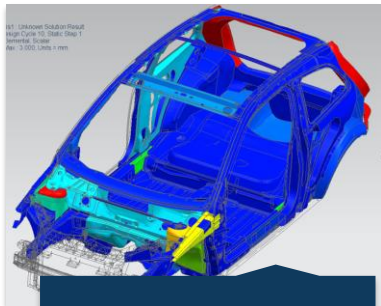
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OptiAssist for Simcenter 3D



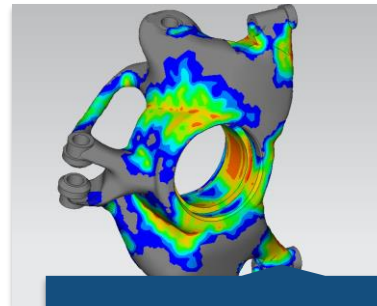
Bead / Topography



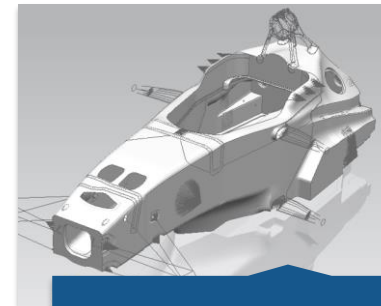
Gauge / Sizing



Free-Sizing /
Topometry



Free-Shape



Composites

The methods of changing your design's properties

Topography Optimisation

Develop reinforcing patterns in
thin shell structures
Suitable to:
Maximise stiffness, frequency

Thickness Optimisation

Develop optimal thickness of
thin shell structural assemblies
Suitable to:
Maximise stiffness, frequency
Minimise stress

Free-Thickness Optim'n

Develop thickness distribution
of thin shell structures
Suitable for:
Castings, mouldings and thin
shell machined parts

Shape Optimisation

Refinement of design's
performance through nodal
position changes
Suitable for:
Resolving local stress issues

Laminate Optimisation

Develop optimal ply shapes
and laminates
Suitable for:
Meeting stiffness, strength and
vibration requirements

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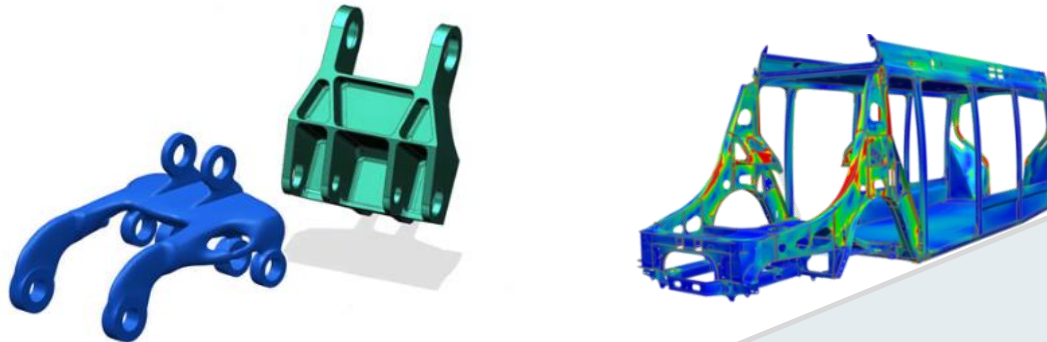
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Siemens Digital Industries Software Prerequisites

- **NXN007** - Nastran Optimisation Module (SOL200)
 - This license is required to run OptiAssist optimisation studies
- **SC13500, SC13510 or SC10100** - Simcenter 3D & Nastran Basic
 - OptiAssist interface is embedded in Simcenter 3D and creates Nastran SOL200 solutions



Why Use OptiAssist?



01	Deliver better designs, faster, maximising the potential of your structural simulation tools	<ul style="list-style-type: none">• Examples• Casting thickness optimisation• Composite Ply shape development
02	Significantly reduce manual iteration time, freeing up engineering resource	<ul style="list-style-type: none">• Examples• Gauge optimisation, eliminating manual iteration• Optimise composite laminates
03	Identify designs that meet multiple requirements	<ul style="list-style-type: none">• Examples• Optimise concurrently for stiffness, stress and vibration targets
04	Minimise part cost and material usage	<ul style="list-style-type: none">• Examples• Optimise bead/swage patterns, allowing down-gauging of shell panels• Reduce material usage in castings/mouldings
05	Rapidly evaluate and compare the feasibility of multiple design concepts	<ul style="list-style-type: none">• Examples• Perform parallel optimisation studies, rapidly determining potential of each concept

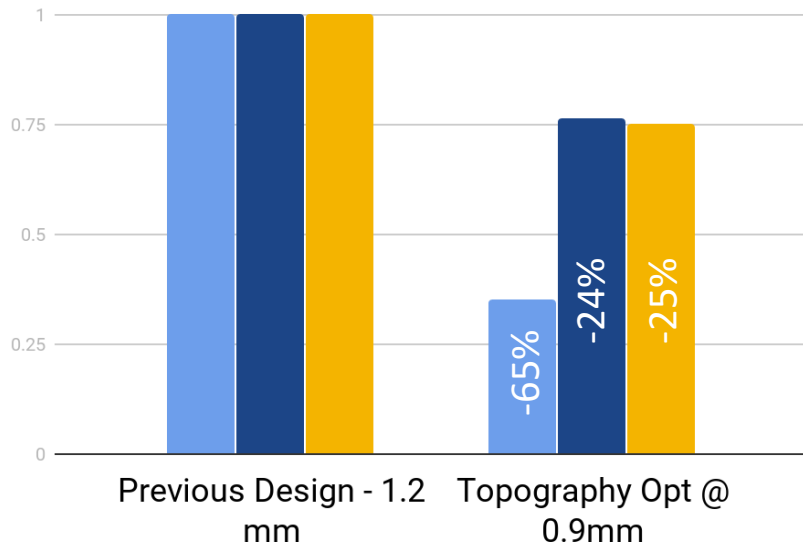


- Dave Jonson - INEOS Team UK America's Cup
 - ***"In such a competitive environment, every piece of the design is focused on using OptiAssist."***

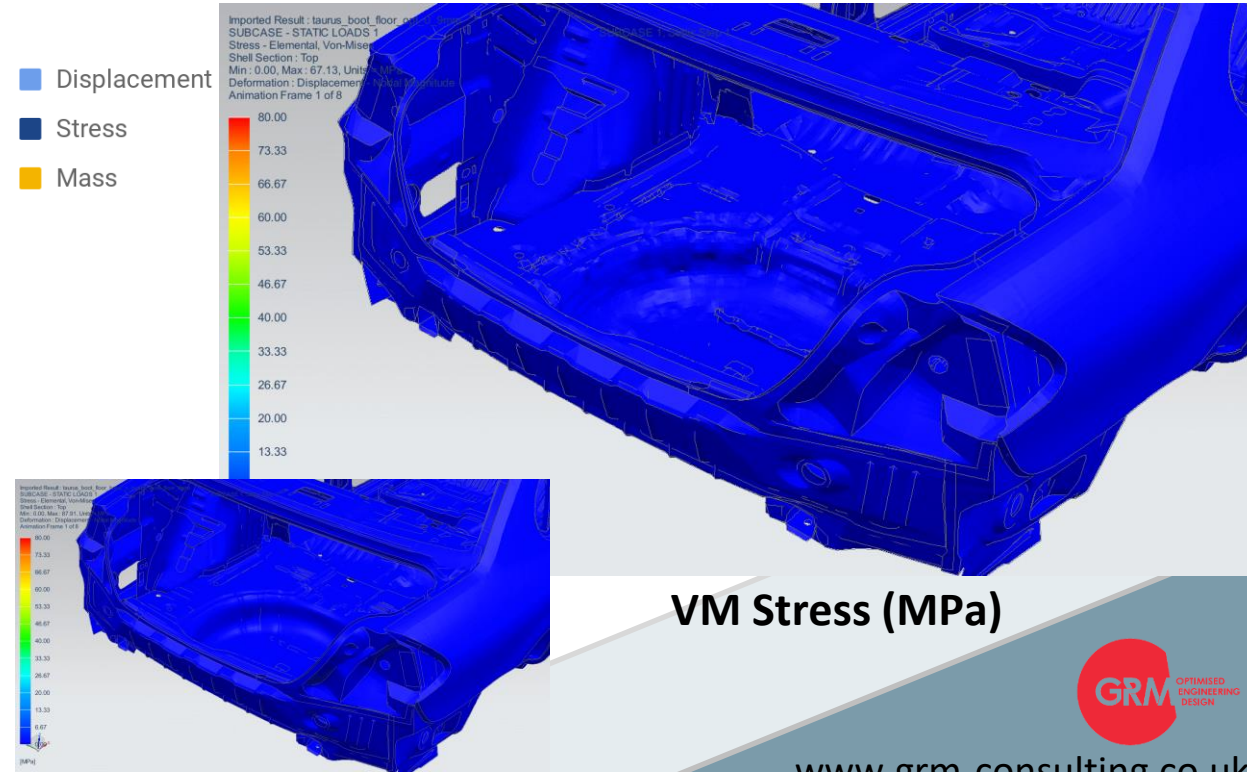
Application Example - Ford Taurus Boot Floor Optimization

- Revised bead patterns enabled downgauging of panel whilst still providing reduction in stress and increased stiffness

Performance Comparison



Optimised Boot Floor Loading



Application Example 3D Printed Wheel Upright

Part surface allowed to move:

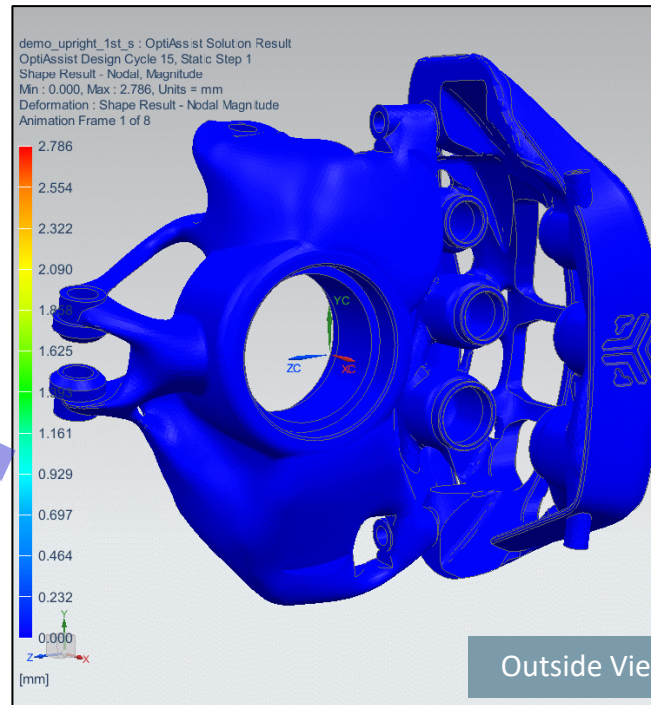
- Outwards by 3mm
- Inwards by 1mm

Stiffness in all cases increased by 15%

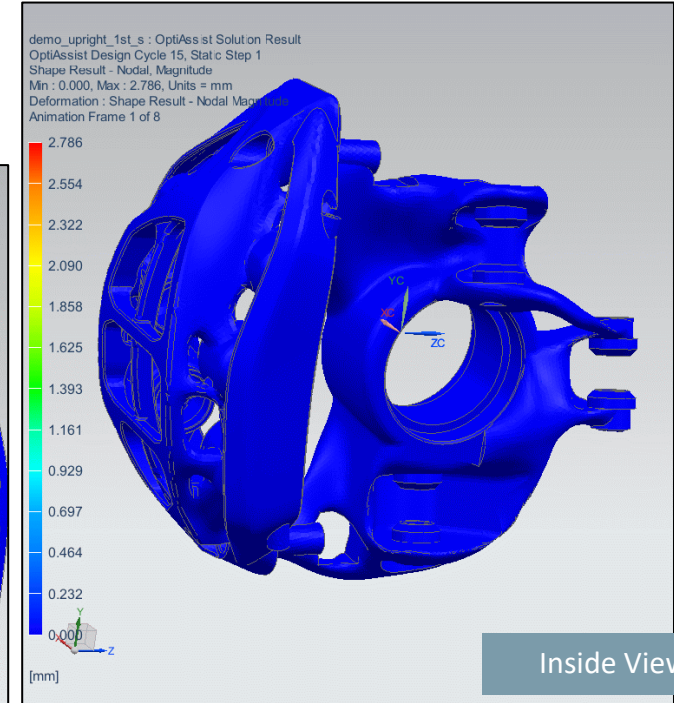
No increase in current mass of 4.4kg



Suspension
Assembly



Outside View



Inside View