3DCS FEA CM - Compliant Modeler Add-on
Apply Finite Element Analysis (FEA) to your 3DCS model

Utilize FEA Methods to Accurately Simulate Variation of Compliant Parts and Assemblies

3DCS FEA Compliant Modeler Add-on adds to traditional variation methods of 'rigid-body' by simulating the effects of welding, clamping, heat and gravity.

Advanced Simulations Include Force

Most commodities like sheet metal, plastic and aluminum can be heavily influenced through the manufacturing process. Compliant Modeler accurately depicts these influences, adding them to your tolerance analysis.

### FEA Mesh and Analysis - The How

3DCS FEA Compliant Modeler uses a material mesh connected to nodes along the part surface. The analysis is then done within 3DCS, adjusting the nominal build based on the force applied. This makes it easy to add finite element analysis to Monte Carlo simulations and other variation analyses.

Get the Most Accurate Results - The Why

3DCS FEA Compliant Modeler enhances the ability to model flexible parts and assemblies that contain deformable parts such as sheet-metal, plastics, composites, aluminum or glass. The software simulates the dimensional variation of part deformation resulting from spring-back, gravity, heat and manufacturing operations (clamping, unclamping, welding, fastening, force application) to allow you to account for this additional variation in your design in order to improve product fit, finish, assembly and function.

Use FEA Mesh from Any FEA Software

Regardless of your FEA Solver, you can generate a mesh file for your CAD parts to enhance your simulation. The FEA Analysis is completed within 3DCS and does not require any pre- or post- analysis in a separate software.
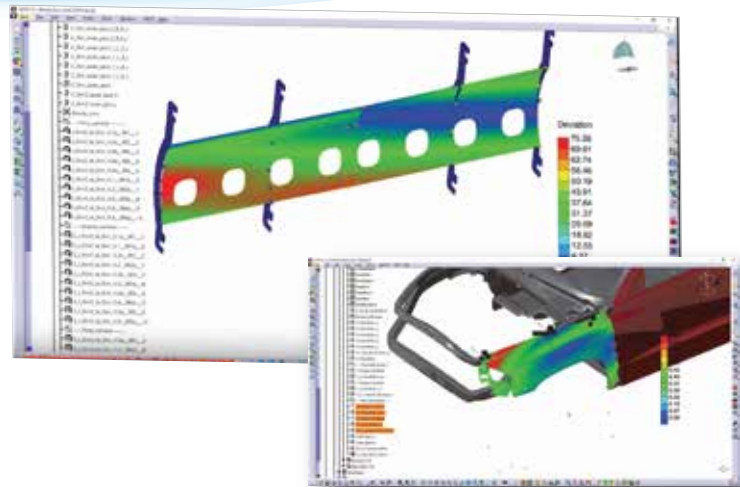
Key Product Highlights:

Account for Gravity and Heat -
See how the mass of the product affects its function, or how the heat from environmental changes affects the dimensional integrity.

Study Spring-Back –
Learn how spring-back affects the parts and optimize your assembly process to account for the changes.

Apply Clamps and Welds –
View the effect of clamps and welds on your parts.

Determine Optimal Processes –
Test different patterns of clamps or welds to determine optimal patterns to reduce deformation.

Include Multiple Forces -
Include welds, clamps and gravity in the same model.

Get Accurate Results –
Be confident in your results as tested against leading FEA software packages.

Test Different Materials -
Find out how different materials affect the dimensional integrety of your products.

Include Compliancy in Your Tolerance Analysis

Create a Mesh File from any FEA Solver
Create a mesh file from any FEA Solver and apply it to your parts. Connect material characteristics to node locations along the part's surface that respond to force effects.

See how heat changes the geometry of your parts.
Use either heat from operation or from the environment

Apply Clamping and Welding
Add clamps and welds to your model, and add both the deformation and nominal shift to your Monte Carlo analysis.

Test Process Operations
Manufacturing processes can be tested and simulated on products before going to production. Design to account for variation from processes in addition to manufacturing tolerances and simulate to validate your design.

Flush variation measured at these locations

Identify the effect of flexible materials on the variation of your products like aluminum or sheet metal

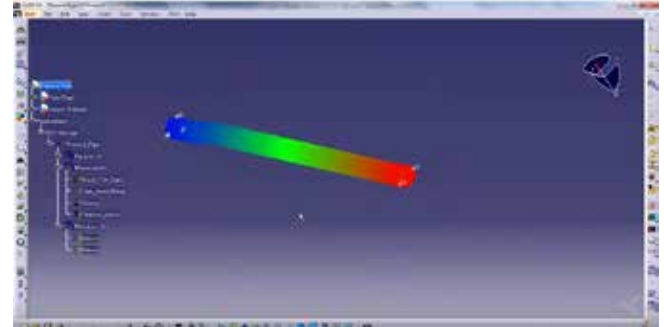**Compare Order of Operations**
Create different process order of operations and compare the results to find the optimal locations of welds, rivets or clamps.
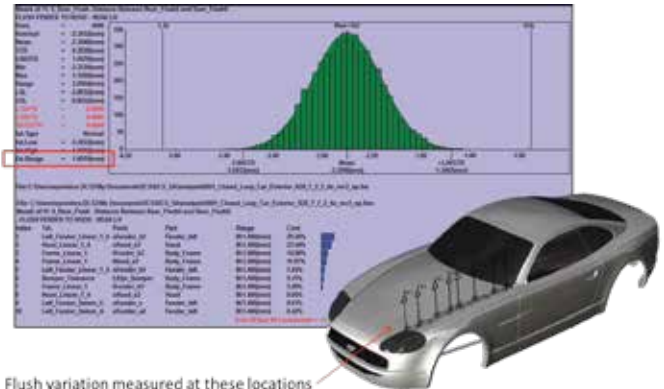
Make Changes and See the Results
Review your results and make changes. Quickly run new Monte Carlo analyses and see the difference to test design changes.
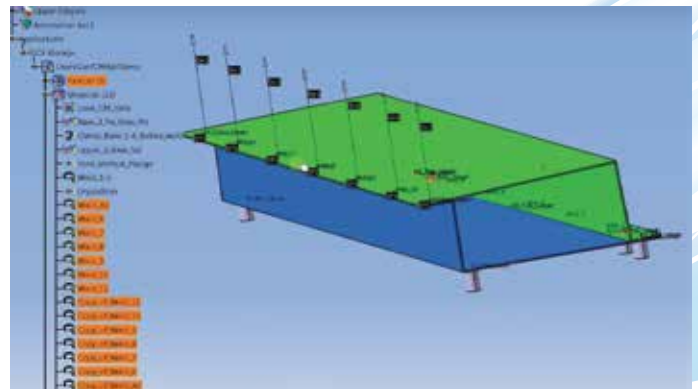
Create More Accurate Models
Products that include flexible materials often have additional variation not captured in traditional rigid body tolerance analysis. Utilizing FEA Compliant Modeler allows for a more accurate depiction of the actual material behavior.

Create weld, rivet and bolting sequences and then determine the best order of operation as well as the optimal number of operations

DCS has been supporting quality management in industries including automotive, aerospace, medical device, electronics and industrial machinery for over 20 years. DCS solutions are used daily by companies like Airbus, BMW, GM, LG, Nissan, Phillips, Sony, Textron Aviation and VW. By applying DCS's 3D Model Based environment for Predictive Variation Analysis and Responsive SPC, manufacturers have reduced quality costs related to yield, scrap, rework and warranty issues.