**OVERVIEW**

SimOffice™ is a stand-alone environment in which engineers can build, test, review, and improve their designs. SimOffice gives product development engineers the shared technologies they need to assess product performance and accelerate innovation.

The MSC.Nastran™ product family is modular, enabling you to analyze products ranging from simple components to complex structures and systems. This also enables you to start simply and to grow your analysis capabilities as your Virtual Product Development (VPD) needs expand. As part of your VPD process, you can use MSC.Nastran to assess many functional aspects of your products, such as the structural response (displacement, strain, stress, vibration, and temperature) due to its material properties and the loads and boundary conditions that are applied to it during operation.

**MSC.Nastran™ Connectors**

The MSC.Nastran™ Connectors product module provides the capability to more accurately model and analyze various flexible structural connections and fasteners intended to connect two surfaces or points, such as spot welds, bolts, and screws. Two elements (CWELD and CFAST) are now available for modeling surface connections made with spot or more arbitrary connectors.

**Spot Weld Connectors**

The CWELD / PWELD element and property combination provides the ability to easily define several connection types with generalized stiffness definitions and calculation. Various connection types can be made between grids, elements, patches, or any combination of the three. Until now, the modeling of fasteners has been difficult and error prone with the conventional modeling tools available. However, the spot weld element overcomes these modeling difficulties by generating connections and constraints automatically, while ensuring accurate results.

**Fasteners**

The new CFAST / PFAST element and property combination connects two surface patches or shell elements and provides the ability to model situations where the joint (anisotropic) stiffness of the relative connecting elements is critical. Several improvements have been made to the weld connector PARTPAT and ELPAT options to provide a useful tool for the automation and simulation of Full Vehicle Assembly greatly improving the design process and accelerating the design cycle.

**Easier, More Robust Analysis of Connectors and Fasteners**

**PRODUCT LINE**

SimOffice™

Product Family

MSC.Nastran™

**CAPABILITIES**

- Model Spot Connections and Other Types of Fasteners such as Welds, Bolts, Screws, and Engine Mounts.
- Connect Panels, Shell Elements, and Grid Points in Any Combination.
- Easily Connect Any Part Mesh Combinations: Congruent or Non-Congruent.

**BENEFITS**

- Easy Assembly of Independently Meshed Components Using Spot Connections and Fasteners.
- Reduce Vehicle Assembly Modeling Time.
- Increase Modeling and Analysis Productivity.
- Improve Results Accuracy Involving Spot Connections and Fasteners.
- Avoid Costs Associated with Physical Prototypes and Testing.
Congruent and Non-Congruent Mesh Connections

Connection and fastener modeling is easy, fast, and accurate. Both the CWELD and CFAST elements provide the capability to connect surfaces that are made up of congruent and non-congruent meshes and automatically generate the localized connections with up to a 3x3 mesh fidelity and the corresponding constraints required to simulate the localized effect of a spot connection or fastener.

Additional Enhancements

In addition to the new CFAST element, other major feature improvements include:

- Additional arbitrary connection definitions.
- Increased maximum elements per patch to 3 x 3 for each layer of spot-welds for finer meshes.
- Stochastic capability to allow for random deletion of CWELD elements based on user specified percentage.

Spot Weld Element Modeling with BMW

MSC.Software completed the delivery of an assembly and spot welding tool with an adaptable architecture incorporating all connection types, and allowing the integration of the complete process with the flexibility for fast adaptation for process changes (MSC.AMS FVA). Use of this tool at BMW reduced modeling assembly time by a factor of 5 to 7, allowing for a more accurate body-in-white (BIW) assembly in 30% less time.

EXTEND YOUR INVESTMENT

MSC.Software recommends MSC.Patran™ or MSC.SOFY™ for an integrated modeling and analysis environment.

MSC.MasterKey™ delivers a flexible, token-based licensing system that provides access to the breadth and depth of MSC.Software’s world-class Virtual Product Development software portfolio, allowing you to use whatever simulation tools you want, whenever you need them – maximizing your productivity and reducing cost.

MAXIMIZE YOUR RETURN ON INVESTMENT

MSC.Software provides the most comprehensive training, support, and professional services with offices worldwide to provide local and centralized support. Investing in MSC.Software gives you access to extensive client support through comprehensive documentation, direct technical expertise, and customized onsite and offsite training classes taught by experienced engineers.