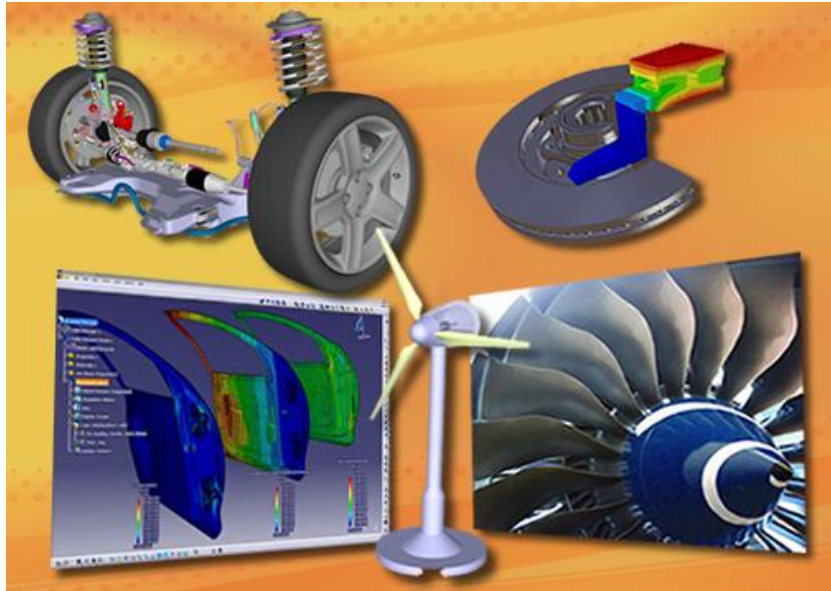


V5R21 – SIMULIA Design Analysis FACT SHEET



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INTRODUCTION

SIMULIA provides complete design-integrated simulation capabilities within the CATIA V5 design environment. Designers can use the familiar CATIA user interface to perform analysis directly on their master reference model in CATIA. Data integrity issues are avoided since there is no transfer and translation of geometry.

The V5R21 Design Analysis solutions include enhancements to the traditional CATIA Analysis product, Generative Part Structural Analysis (GPS) as well as the SIMULIA Extended Analysis products Nonlinear Structural Analysis (ATH) and Thermal Analysis (ANL).

The combined CATIA Analysis and the SIMULIA Extended Analysis product suites have been developed for designers and engineers who need to accurately size their designs and quickly evaluate their real world performance during the design phase. To access the basic nonlinear and thermal analysis capabilities included in ANL and ATH, users must first be working with Generative Part Structural Analysis (GPS), the backbone product to the CATIA V5 Analysis offering.

WHAT'S NEW AT A GLANCE

- **Enhancements to CATIA Generative Part Structural Analysis (GPS), a traditional CATIA Analysis product**
- **Enhancements to the SIMULIA Extended Analysis products**

V5R21 ENHANCEMENTS

CATIA Analysis:

The V5R21 release further enhances the ease of use of CATIA Generative Part Structural Analysis (GPS) by providing a surface selection capability that enables users to select faces by continuity angle. For models with complex surfaces, this enhancement can save substantial time during model creation and make surface selection more reliable and intuitive.

SIMULIA Extended Analysis:

With this release it is now possible to import composite properties from the CATIA Composite Design (CPD) workbench into an analysis model, greatly expanding the composite structural analysis capabilities of CATIA integrated analysis. V5R21 also provides a simpler, more efficient approach to contact modeling, using the Abaqus “general contact” technology. Enhancements to traditional CATIA Analysis products

Analysis Product Enhancements:

General product description: This offering expands the capabilities of CATIA V5 Analysis, enabling the analysis of complex contact interactions and highly deformable materials such as rubber, plastic, and human tissue. It also enables the study of thermal behavior within designs such as circuit boards, engines, and consumer goods.

Users can now import composite properties from the CATIA Composite Design (CPD) workbench or from XML files into an ANL analysis model, using the same import tool that is available in the Generative Structural Analysis workbench. Composite analysis in ANL enables nonlinear – especially large rotation and large deflection and deformable contact – composite analysis in CATIA.

Abaqus “general contact” technology is now available in ANL. General contact is an entirely new approach to contact modeling, in which the user can simply turn on contact in the model and be done with the contact definition, while still having full control over the behavior of individual contacting surfaces when desired. This capability is a tremendous step forward in ease of use for models involving contact.

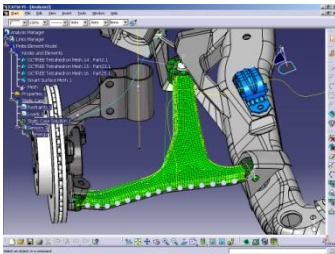
Job execution has been extended to permit running jobs in parallel on up to 4 cores. In V5R20 the limit was 2 cores.

Users have the ability to export the Abaqus input file from ATH and ANL models, enabling more convenient model sharing with Abaqus analysts.

GPS has been enhanced in this release to enable power surface selection that enables users to select faces by continuity angle, making surface selection more intuitive.

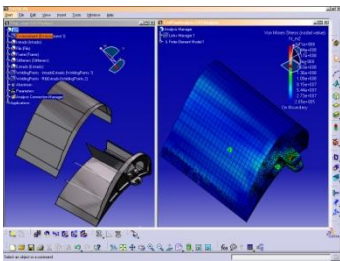
V5R21 PRODUCT OVERVIEW:

CATIA Analysis Product Portfolio:



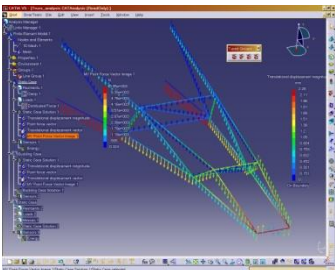
Generative Part Structural Analysis:

Generative Part Structural Analysis (GPS) allows designers to understand how their designs behave and to accurately calculate the displacements and stresses within the part under a variety of loading conditions. It also allows the vibration characteristics of parts to be assessed by calculating the natural frequencies and the associated mode shapes. Analyses can be performed on volume parts, surface parts and wireframe geometries.



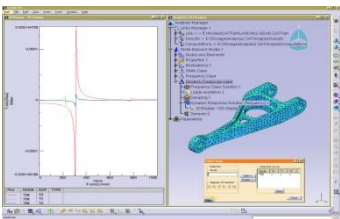
Generative Assembly Structural Analysis:

Generative Assembly Structural Analysis (GAS) extends the capability of GPS, allowing designers to analyze assemblies as well as individual parts. The analysis of assemblies, including an accurate representation of the way the parts interact and are connected, allows for more realistic and accurate simulation.



Elfini Structural Analysis:

Elfini Structural Analysis (EST) extends the capabilities of the GPS product to include multiple analysis cases for static, frequency, and buckling analysis. This product is more tailored to the needs of specialists, while maintaining a consistent user interface between specialists and design engineers.



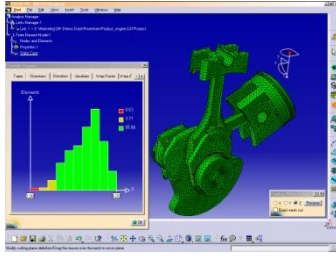
Generative Dynamic Response Analysis:

Generative Dynamic Response Analysis (GDY) allows users to study the response of their designs to dynamic loading. This allows designers to ensure early in the design phase that their designs do not suffer from resonance and other dynamic effects. GDY provides both transient and harmonic analysis.



FEM Surface:

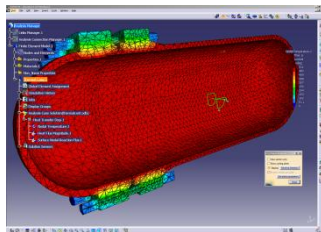
FEM Surface (FMS) FMS provides advanced meshing capability for complex surface and wireframe parts. Meshes generated on geometry are fully associative with the geometry and FMS provides more control and more sophisticated meshing algorithms than the standard surface meshing capability in GPS.



FEM Solid:

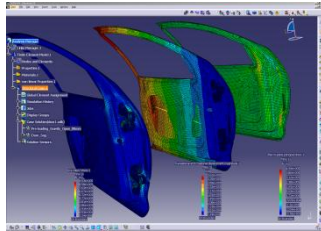
FEM Solid (FMD) is intended for the specialist that wants to mesh complex solid geometry quickly and efficiently while retaining a lot of control over the resulting element quality and the number of elements in the mesh. FMD provides a tetrahedral filler meshing algorithm and also provides tools to create hexahedral meshes. Various pre-defined and customizable criteria for mesh quality can be displayed.

SIMULIA Extended Analysis Product Portfolio:



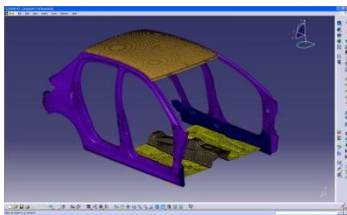
Thermal Analysis:

Thermal Analysis (ATH) extends the CATIA V5 Analysis capabilities, allowing designers to understand the thermal behavior of their designs. The steady-state or transient temperature distribution can be calculated in response to the direct heating of a surface, the flow of a fluid past a surface, or the specified temperature of the surface. The thermal material properties can be temperature-dependent. When analyzing assemblies, the conductivity across the interface between contacting parts can be specified.



Nonlinear Structural Analysis:

Nonlinear Structural Analysis (ANL) extends the CATIA V5 Analysis capabilities to allow more advanced simulation that includes nonlinear effects, such as large displacements and material nonlinearity. Material plasticity, typical of metals, can be modeled, as can the nonlinear elasticity in hyperelastic materials like rubber. ANL also provides more advanced contact capability including the automatic creation of contact surfaces based on their geometric proximity.



Rule Based Meshing:

Rule Based Meshing (RBM) extends the capabilities of FMS to enable automated and higher quality surface meshing for all workflows that use CATIA meshing tools. RBM gives the user a means to specify globally the desired meshing treatment of entities such as holes, fillets, and beads. RBM also gives the user a means to specify acceptable element quality criteria, such as minimum edge length, aspect ratio, and skewness.