

Teamcenter Visualization VSA

Dimensional analysis to reduce variation and improve product quality

fact sheet

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► Summary

Teamcenter® Visualization VSA is a powerful dimensional analysis tool used to simulate manufacturing and assembly processes and predict the amounts and causes of variation. Teamcenter Visualization VSA can help reduce the negative impact of variation on product dimensional quality, cost and time-to-market. Teamcenter Visualization VSA's foundation lies within Teamcenter Visualization. It extensively leverages the digital prototyping and visualization capabilities of Teamcenter Visualization Mockup, UGS' powerful real-time visualization and digital prototyping solution.

Features and benefits

Teamcenter Visualization VSA is one of several interoperable tools in the Teamcenter Quality solution. With Teamcenter Visualization VSA, manufacturers can:

- Identify tolerances and assembly processes that contribute to variation and perform quick "what-if" analyses to optimize tolerances, design and the assembly process
- Create feature-based models before or after geometry is available; creating models prior to geometry helps drive the design before parts are made or tooling is cut
- Leverage the most powerful variation assembly constraint engine in the world
- Perform comprehensive statistical or simulated worst-case analyses
- Incorporate component flexibility through linking with finite element analysis results
- Display a variety of graphical reports tied to 3D geometry
- Represent tolerances with different types of distributions
- Extend the analysis to support user-defined equations such as gear backlash, pressure, imbalance, etc.
- Capture knowledge and re-use models; morph features to new geometry

Teamcenter Visualization VSA's business value

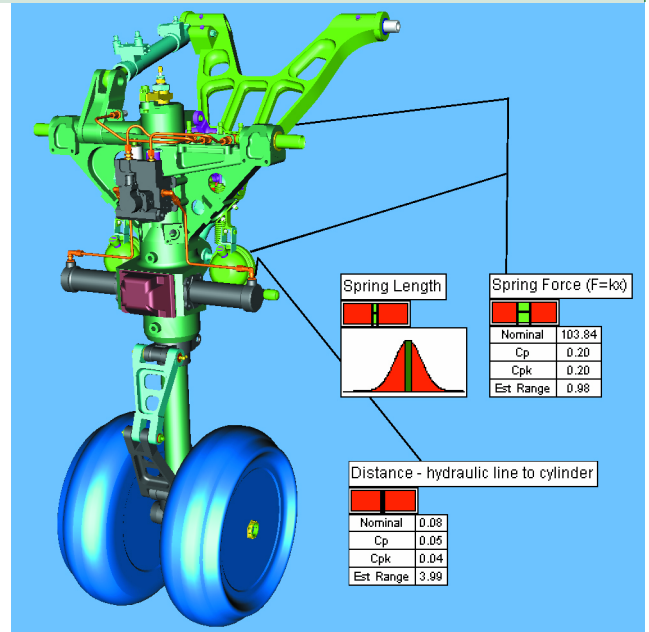
Optimize product and process.

Teamcenter Visualization VSA allows users to identify dimensional problems early in the design cycle, avoiding assembly build and quality issues due to excessive variation. With this solution, design flaws can be caught before committing to tooling.

Identify critical dimensions.

Teamcenter Visualization VSA identifies critical dimensional tolerances and assembly processes that are key contributors to variation. These areas have a significant impact on product quality and therefore warrant careful monitoring.

Reduce costs. Teamcenter Visualization VSA reduces costs by catching manufacturing problems earlier in the development cycle when they are easier and less costly to correct. Manufacturing costs can be reduced by maximizing allowable part tolerances, while still controlling critical assembly dimensional specifications. Controlling these dimensional characteristics helps minimize scrap, rework and warranty defects. With Teamcenter Visualization VSA product quality is significantly improved by insuring that parts fit and work together properly – the first time.



Features and benefits continued

- Visualize assemblies with thousands of parts and run analyses on data from multiple CAD systems simultaneously – all in one standard interface
- Add actual manufacturing capability data into Teamcenter Visualization VSA for real-time root cause analysis of production build problems
- Create comprehensive tolerance libraries that can be used to represent manufacturing processes from any industry

System requirements

Teamcenter Visualization VSA is a vertical application of Teamcenter Visualization Mockup and has the same system requirements as Teamcenter Visualization Mockup.

Using Teamcenter Visualization VSA

With Teamcenter Visualization VSA, a 3D digital prototype is created to simulate the production build process.

The digital prototype includes a comprehensive representation of geometry, product variation (tolerances), assembly process variation (sequence, assembly attachment definition, tooling) and measurements. The model is used to predict if there will be any assembly build problems – before any physical parts are made or tooling is cut.

Teamcenter Visualization VSA also identifies the root causes of the build problems and enables the design, tolerances and assembly process to be optimized very early in the product development process.

Teamcenter Visualization VSA features several major capabilities including:

Teamcenter Visualization foundation. The CAD-neutral, lightweight Teamcenter Visualization environment allows the geometry from dissimilar CAD systems to be combined and included in the analysis. In addition, this enables the analysis of large assemblies and leverages many of the digital mockup capabilities such as cross section, 3D clearance/markup/measure and more.

Geometric tolerancing capability. Teamcenter Visualization VSA supports feature-based modeling with the features varied based on the ASME Y14.5M tolerancing standard. Key tolerancing aspects supported include maximum material condition, composite position and profile, multiple datum reference frames and unilateral/unequal bilateral surface profile.

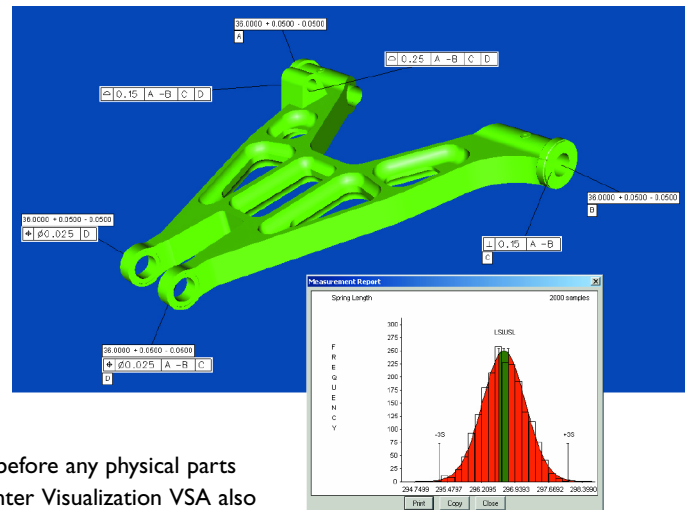
Conjoin assembly constraint engine. Conjoin is an equation-based, generic assembly solver for over- and under-constrained static and kinematic assembly constraints using a single common user interface.

Flexible component capability. Through integrating with many FEA solvers, Teamcenter Visualization VSA is able to comprehend component flexibility due to clamping, welding and springback.

The Teamcenter Visualization VSA advantage

No other dimensional analysis solution on the market:

- works in a CAD-neutral, graphically rich, digital prototyping environment
- is feature-based using tolerances based on GD&T
- supports over- and under-constrained static and kinematic assembly operations
- links to FEA solvers for comprehension and analysis of component flexibility



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