Mechanical Design

CATIA - Assembly Design 1 (AS1)

CATIA V5R20
Mechanical Design

CATIA - Assembly Design

Define mechanical assembly constraints, automatically position parts and checks assembly consistency.

Product overview

CATIA - Assembly Design 1 (AS1) is a P1 product for managing assemblies in a highly productive way. It gives the user the ability to design in assembly context with a user-control associativity, to perform concurrent engineering between the design of the assembly and the design of individual components through a hierarchical assemblies using a top-down or bottom-up approach. Assembly Design 1 establishes mechanical assembly constraints using mouse movements or graphical commands to easily and intuitively snap parts into position.

Through a manual/automatic update choice, the designer can reorder the product structure, drags dynamically parts into position and makes collision and clearance checks. A productive work is provided through a catalog access for standard parts or assemblies, the access of advanced and powerful assemblies features, automatic exploded view generation and automated BOM generation. Assembly Designers get great time reduction and increased quality. Introducing an intuitive user interface, common user interface across NT and UNIX, offering productivity, ease of use, and low training costs.

Product Highlights

Products offer the following main functions:

- Complete range of assembly tools supporting concurrent design teams.
- Providing assembly annotation and documentation for all types of High productivity assembly manipulation modification tools allowing dynamic analysis of assembly definitions and collision checking.
- Assemblies represent real-world applications by using mechanical assembly definition (flexible-assemblies) as well as rigid BOM based assemblies.

Product Key Customer Benefits

Top-down Assemblies... AS1’s productive generation of assembly structures is due in part to its intuitive, top-down definition of assembly structures involving parts and subassemblies with an unlimited number or levels. Menus control modifications to the assembly structure, including cut, copy, paste, etc.

AS1’s design in assembly context provides
user control of associativity. A part can be designed using the assembly context. When design changes are made, the user can control the propagation of modifications.

**Concurrent Engineering...**  AS1 supports concurrent engineering during the design of the assembly and its individual parts. Parts specifications are managed independently from assembly specifications.

**Advanced Constrained or Unconstrained Part Placements...**  Multiple unconstrained part placement methods can be proposed to accelerate the preliminary definition of assemblies. Parts can be snapped in position, dragged and dropped using rotations or translations.

**Automated Parts Placement...**  Intuitive specifications of assembly constraints include contacts between the planar, cylindrical, spherical, circle and conical faces of a part.

**Dynamic Parts Movement...**  AS1 supports dragging parts into position and moving constrained parts by respecting their assembly constraints, or freely moving them without constraints.

**Dynamic Analysis of Assembly**
AS1 offers fully integrated, part-to-part collision detection and distance and clearance analysis functions (on exact or mock-up geometry representations). The user may perform an analysis of the assembly constraint network at any time. When design changes have caused an assembly inconsistency or an over-constrained situation, a diagnosis will be produced.

**Assembly Structure Editor...**  The Assembly Structure Editor offers an intuitive and powerful management of the assembly structure to facilitate design changes, including capture of assembly intent and fast assembly changes through edit, cut, copy, paste and drag and drop.

**Assembly features...**  AS1 gives user the ability to perform pocket, split, hole, remove and add features at the assembly level. He can also use an existing Part Design feature as an input for the command. Assembly Hole features has the user-flexibility to adapt to its context. For instance a user can define a different type of hole for each impacted part of the Assembly feature. He can define different diameters and depths for instance that are integrated in the preview panel. With this feature a screw hole in 3 parts can easily and automatically be performed, the first one will be adapted to the screw head and the third one will be threaded and blind.

**Symmetrical sub-assemblies...**  Assembly Design gives user the ability to create a symmetrical sub-assembly to a defined plan. Thanks to this powerful associative feature, you can use a "true" symmetry (e.g. for car wing) or a "fake" symmetry (e.g. for wheels) to create symmetrical sub-assembly. Besides the symmetrical sub-assembly is associative in shape and position which gives the user much more design productivity.

**Flexible Sub-Assemblies to dynamically unlink product structure and mechanical behavior...**  , a component in the product structure necessarily defined a rigid element regarding the update in Assembly Design. Flexible Sub-Assembly gives, on the one hand, user the ability to dynamically unlink product structure and mechanical behavior (update, compass manipulation, scene,...) : each component of a flexible sub-assembly can be moved individually in the parent assembly. On the other hand, in a product, several instances of a same sub-product can be overloaded independently to manage different internal positions of the sub-component. Besides, the user has the ability to overload on a constraint instance according to its value, activity parameter and driving-driven status.

**Independent Structure and Parts Representations...**  AS1 manages the resolution of links between assembly files or between an assembly file and a representation file. This allows users to easily move from a configuration involving in-work designs to another involving released designs. This way,
the system can fully match the customer methodology and design process.

**BOM Generation...** Exploded views of Bill of Materials (BOMs) can be generated using AS1 Version 5’s interactive generation capabilities, in textual or HTML format.

**STEP File Exchange...** Assembly structure definitions can be exchanged in a native STEP AP203 format, facilitating exchanges between designers in an extended enterprise.
ABOUT CATIA V5R20

CATIA is Dassault Systemes’ PLM solution for digital product definition and simulation.

www.3ds.com/products/catia