



CATIA V5R18 - FACT SHEET

Strengthen Collaborative Solutions to Streamline Innovations

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CATIA V5R18

"Strengthen collaborative solutions to streamline innovations"

INTRODUCTION

CATIA V5 is the leading solution for product development success. It addresses all manufacturing organizations, from OEMs through their supply chains, to small independent producers. CATIA, for virtual product design, can be applied to a wide variety of industries, from aerospace, automotive, and industrial machinery, to electronics, shipbuilding, plant design, and consumer goods. Today, CATIA is used to design anything from an airplane to jewelry and clothing. With the power and functional range to address the complete product development process, CATIA supports product engineering, from initial specification to product-in-service, in a fully-integrated manner. It facilitates reuse of product design knowledge and shortens development cycles, helping enterprises accelerate their response to market needs.

In conjunction with ENOVIA for collaborative product lifecycle management, SIMULIA for virtual testing and analysis, and DELMIA for virtual production performance, CATIA V5 is a key component of V5 PLM.

WHAT'S NEW AT A GLANCE

CATIA V5R18 allows you to:

- **Empower end-to-end industry process coverage** for composite design to manufacturing, electrical harness design to documentation and printed circuit board design.
- **Increase range of manufacturing part** designed with Functional modeling
- **Superior productivity** for powertrain and chassis designer with breakthrough auto-draft
- Extends the scope for **multi-discipline 3D collaborative** environment with ENOVIA VPLM Navigator
- **Expands the reach of 3D** to a wider community with CATIA 3DLive and 3D XML

OVERVIEW:

CATIA V5R18's products and features listed below bring value to the customer reinforcing Dassault Systèmes' and IBM's CATIA fundamentals:

Your CATIA PLM, Designed for you, designed with you

- CATIA V5R18 further **improves the quality of final composite parts**, delivering a new composites analysis capability along with a new design review environment that provides access across the entire value chain to part specifications.
- CATIA V5R18 enables **effective Electronics CAD and Mechanical CAD design collaboration** by strengthening the Printed Circuit Board (PCB) design process, delivering new benefits to the hi-tech industry.
- CATIA V5R18 takes **Electrical Harness Design performance one step further** by integrating knowledge early in the design process for significant quality improvements.

Design performance for Innovation, Just be the imagineer

- CATIA V5R18 **strengthens 3D Master representations** and maximizes users' productivity by allowing automatic creation of FT&A features. This ensures that 3D conceptual design complies with product specifications.
- **Functional modeling now supports the design of complex machined parts**, especially in the aerospace industry, extending this unique modeling approach to more manufacturing processes.
- CATIA V5R18 **makes photorealistic rendering of product design available to all users**, providing them with emotional feedback at the start of product development.

Breakthrough technologies, Your innovation starts with ours

- CATIA V5R18 **brings stunning productivity to automotive powertrain and chassis designers** for foundry tooling design thanks to the breakthrough Auto-draft capability that complements Auto-fillet, introduced in V5R17.
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Collaborative PLM, Networking mind to speed up innovation

- CATIA V5R18 with 3DLive leverages 3DXML as one of **the most efficient backbones for live 3D collaboration**. This step forward widens 3D collaborative interaction from designers, collaborators, and consumers.
- 3DLive for CATIA brings **3D Functional Tolerancing & annotation into the reach of thousands of non-specialists** and gives PLM value no matter your location.
- CATIA V5R18 **extends the scope for multi-discipline 3D collaboration**, extending applicative data support from within VPM Navigator to offer a superior design environment for CATIA users.

Easy, Open and Smart, Adaptable to you

- Key PLM market players continue to adopt V5 architecture. **V5R18 reaches with more than 100 partners**, with several new CAA partners and extending the process coverage of V5 in many disciplines such as reverse engineering and electrical design.
- **ICEM ISD V5 set a new standard for Automobile Class A design** in the automotive industry. V5 users benefit from improved workflow operations and increase productivity.

DETAILED DESCRIPTION

Your CATIA PLM

CATIA V5R18 extends the end-to-end composites process from design to simulation to manufacturing for automotive and aerospace industries. It delivers impressive post-processing analysis on composite parts for an accurate product behavior evaluation. It embeds failure criteria specification to composites structures (Tsai-Hill and Tsai Wu criteria) to give a better assessment of composites parts. In addition, composites analysis environments can receive all production information needed to ensure accurate manufacturing results.

CATIA V5R18 enables effective Electronics CAD and Mechanical CAD design collaboration by strengthening the Printed Circuit Board (PCB) design process. It takes benefit of 3D components library defined in a neutral data exchange format from several construction methods either designed in CATIA or imported through data exchange formats. It is now very easy to map with several ECAD import/export referential tools for position without need for redesign in CATIA.

CATIA V5R18 takes Electrical Harness Design performance one step further by integrating knowledge early in the design process for significant quality improvements. It enables generative electrical design based on company rules captured in V5 knowledge: generative harness covering placement (tube, tape), Generative electrical parts connections (auto create electrical assemblies from catalog) and it delivers more electrical design checks (part connection compatibility, wire route and manufacturability, splice location in harness, completion of V5 electrical model).

CATIA V5R18 increases the value of CATIA Electrical Harness flattening for harness drawing production by delivering more accurate harness manufacturing documentation (back shell representation), smooth harness flattening process for device orientation and improving the harness drafting quality. CATIA Electrical Harness reduces the design to manufacturing cycle time especially for Automotive & Aerospace CATIA V5 Electrical design customers. The flattening process becomes more robust and completes the layout process more efficiently.

CATIA V5R18 improves the structure functional design on two major axis:

- Process: thanks to a new FEM Command, the process of designing a ship gets easier. Naval architects have to validate the structure of the ship during this iterative phase. This requires making analysis quickly using finite element solvers. SFD provides a new bridge to automatically develop the mesh model within CATIA. Each SFD object geometries and properties are taken into account such as seams on SuperPlate, stiffener trace, etc. Then, the user is able to locally redefine a detailed mesh, using the regular advanced meshing tools.
- Drawing: with multiple changes and improvements, the drafting solution for classification gets a massive upgrade. Performance has been increased by 50 percent on average, and several new features are facilitating the automatic generation of drawings.
- V5R18 enhances the structure detailed design in many ways, among them:
 - An important evolution in V5R18, thickness compensation enables users to automatically delimit objects (plates or stiffeners) to other objects while taking into account the thickness of the limiting objects.
 - V5R18 reinforces existing detailed design with new built-in end cuts, new catalog openings for more productivity, the break command that supports now more features and computed attributed that are enlarged.

CATIA V5R18 enhances CATIA Machining solutions' efficiency from NC Programming to simulation to considerably increase overall manufacturing process productivity.

- V5R18 expands the CATIA Machining simulation coverage to mill-turn process by allowing user to define, program and simulate ISO Code on lathe and mill-turn machines including multi-spindle, multi-turrets and auxiliary devices. V5R18 significantly enhances lathe productivity by improving global lathe operations, by releasing new turning revolution envelop computation and by supporting new "4-axis Pocketing" operation.
- CATIA V5R18 appreciably reduces the programming and machining time of the milling process. The new release delivers the "3 to 5 axis switch" capability on finishing operations to prevent collision and greatly improve machining time and the cutting tool lifecycle. Users can take advantage of the new 5-axis spiral milling operation and improved existing 5-axis operations, leading to major

productivity gains in 5 axis solutions. V5R18 drastically reduces multi-part programming time by merging and reordering the sub-programs to machine several parts on a single setup. CATIA V5R18 enlarges and improves 2.5 & 3-axis operations with T-slotter for efficient undercut areas finishing, new sequential axial operations for more flexibility on non standard holes, and helical machining strategy for machining time reduction.

CATIA V5R18 accelerates quality control and enforces inspection mechanisms during reverse engineering process.

- To accelerate the data validation during reverse engineering processes, CATIA V5R18 offers a new deviation analysis command to analyze the deviation between elements. Quality is a key point in reverse engineering process, and with this new command, users are able to rapidly compare physical mock-ups to the CAD model, and easily check the quality of rebuild surfaces in comparison to the scanned data.
- CATIA V5R18 reinforces the role of the inspection during the reverse engineering process. It enables users to create associative annotations on a deviation analysis. Thanks to the CATIA associativity mechanism, any modifications of deviation analysis will automatically update the associated annotations. In addition users can summarize the results of the deviation check in a report to cover the last stage of the inspection process.

V5R18 keeps going on 64-bits advantages for analysis. CATIA V5R18 takes full advantage of the 64 bits initiatives to leverage companies' resources. It enables the manipulation of very large analysis models (over 2 GB) including many load cases that are handled thanks to the capability of multi-occurrence combination.

CATIA V5R18 brings improvements in the SheetMetal arena.

- CATIA V5R18 accelerates SheetMetal design processes based on industrial requirements. The SheetMetal parts design process is improved with new functional capabilities to help designers define SheetMetal parts, by enhancing capabilities' efficiency with function evolutions, by enlarging the process coverage and by saving design-time.
 - V5R18 aims at winning productivity gains with more powerful extrusion capabilities, to design more complex parts with the joggle plane definition as start or end and to have a better process coverage with characteristic curves improvements
- The SheetMetal design workbench is improved with a new technological differentiator that dramatically increases the number of parts that can be designed. Now double curvature, non-ruled SheetMetal parts can be managed.
 - CATIA V5R18 opens a new technological domain that enables more complex design with the double curvature hopper, and allows displaying distortions management when surface is not ruled.

CATIA V5R18 expands the CATIA Tooling capabilities and efficiency with dedicated functionality. It provides productivity gains for toolmakers, as it streamlines the Design procedures of complex Mold Tooling and gives more freedom and automation tools.

- V5R18 now allows users to replace one conceptual plate by one detailed with the management of existing tooling drills with the Replace Plate functionality.

- CATIA V5R18 decreases time during the Die process creation and reduces memory size, with Generate Final Holes & Pads, a new command to delay execution of tooling drills.
- CATIA V5R18 allows users to insert components with adaptable geometry via the Morphing User Component, which is very useful for toolmakers designing punches for progressive Die tooling.
- CATIA V5R18's new functionality for productivity improvement and ease of use, allowing independent rotation of components management by the Manage All option located on the component insertion panel.

Design Performance for Innovation

CATIA V5R18 enhances design to manufacturing performance especially for the industrial equipment industry, with the introduction of a new assembly feature that generates a single “machined” part from an assembly of parts such that the part preparation can now be done and machining operations added in the context of the assembly without modifying the reference parts.

CATIA V5R18 widens the scope of functional modeling applicability to additional manufacturing processes and industries, from plastic molded parts and automotive cast and forged parts, through to machined parts. The aerospace industry now also fully benefits from breakthrough functional modeling for the design of complex machined structure parts.

- Full support of detailed design as the transition from a functional design to the rough part and the machined part is enabled through the import of geometrical features from one part to another.
- Better design to manufacturing process coverage: the intelligence embedded in a hole feature can now be completely propagated as a technological result to provide the information necessary for downstream applications, such as drafting thread generation and machining, while protecting intellectual property.
- Improved flexibility for complex part design methodologies: the specification tree is managed much more easily and effectively as users can now automatically insert the input body underneath the functional feature. Quality and productivity are also improved with the definition of one Draft Properties for multiple solid functional sets.

CATIA V5R18 strengthens 3D master product representation and maximizes users' productivity. It is essential that the final product precisely matches its original concept and design. The 3D master process enables users to precisely produce the same product that is conceptualized at the earliest stages with a unique associative approach. This approach updates all 2D/3D engineering data as it changes so that every user is working with exactly the same information, making it easy for every user to design with quality. CATIA V5R18 drastically increases productivity and quality with its enhanced 3D master process:

- CATIA V5R18 enables users to easily perform 2D conceptual design in a complex environment, including relational design with existing components. Plus, they can quickly create easily understandable and high-quality 3D model layouts.
- The dimension line-up capabilities drastically help users to achieve the utmost output by limiting the number of interactions and automatically creating several features (framed dimensions).

The new CATIA Photo Studio 1 (PH1) provides SMB companies emotional feedback at the earliest stages of product development thanks to high-end photorealistic images. Easy to use, it is designed for casual users who need to quickly create high quality renderings.

- CATIA Photo Studio 1 (PH1) has been designed to fit casual users' skill and requires a short learning curve to produce rendering images.
- The ease of use of CATIA Photo Studio 1 (PH1) enables users to decrease the time required to create and validate product appearance. No need to convert or export / import data. Users just switch from one V5 workbench to another and can start generating rendering images.
- Because it is simple to use and part of the complete V5 set of tools, it's very easy to position product appearance as a key factor of the product development at the very beginning of the process.

Speed up BiW process for automotive body in white specialists. CATIA V5R18 provides Automotive Body In White specialists with new capabilities to speed up the Automotive BiW process. For example, it enables users to strengthen the associativity mechanism during curves stretching, promote the automation of FTA weld annotation, and the integration of knowledge formula.

Maximize efficiency in Product Engineering Optimizer. CATIA V5R18 maximizes efficiency in Product Engineering Optimizer via the lean update protocol making possible to update only what need to be updated to reach the engineering specifications.

Breakthrough technologies

CATIA enhances fillet for more productivity in molded parts design. CATIA V5R18 achieves huge productivity gains in plastic molded parts design. It enables designer to control accurately fillets, especially for plastic molded parts. Depending on the fillets' parameters, users can choose between:

- Conical fillet: to use any type of conic as the fillet section
- Chordal Fillet : to control the width of a fillet
- Associative G2 Fillet: to define quickly the shape of G2 styled fillet

The new CATIA Imagine & Shape multi-edition capability enables stylists to propagate modifications from a subdivision surface to other subdivision surfaces. For example, it enables them to modify detailed design surfaces linked with styled concept surfaces. Thanks to this new approach, it is very easy to iterate on design change between stylists and mechanical designers.

CATIA V5R18 continues to dramatically improve design productivity with a revolutionary capability on the market. CATIA V5R18 delivers a new, unique breakthrough, Auto-draft, which complements the unmatched Auto-fillet capability introduced in the previous release. It brings stunning productivity to automotive powertrain and chassis designers for foundry tooling design and optimizes the resulting casting parts. The drafting activity is shortened considerably as all drafts are computed in a single operation.

Collaborative PLM

CATIA V5R18 delivers a new light design review environment, CATIA Composites Review 2 (CPR) product, to provide access to composites material and knowledge across the extended value chain. It extends the access to composites material defined in CATIA V5 to cross disciplines, teams and suppliers. It fosters better communication and collaboration between the different stakeholders for more efficient design-to-manufacturing process

CATIA V5R18 meets a milestone for adopting a lightweight 3D XML format as a standard for efficient communication across the supply chain. A big step is achieved in the archiving process via STEP and/or IGES, V5R18 makes it possible to visualize archived data on 3D XML via a batch conversion program between STEP, IGES and 3D XML. This release enriches 3D XML format with 3D annotations and real-time rendering camera and lights exposure.

Easy, Open and Smart

CATIA V5R18 delivers a new small-scale geometrical range that operates from 0.01µm to 1m. It allows the MEMS (Micro-Electro-Mechanical Systems) industry to create smaller geometry with a more precise accuracy, less than 1 micron. This requirement is key for the clock and watch industry.

Key PLM players are adopting V5 architecture. V5 applications launched by partners since V5R17 extend process coverage of V5 solutions with highly specialized applications including for instance RealViz V Experience.

A new partner, Creaform will deliver within the V5R18 timeframe CREAFORM VxScan CAA V5-based software to bring innovative technology and specialized end-to-end solutions for reverse engineering within the DS V5 PLM environment

ICEM ISD V5 reinforces Dassault Systèmes' leadership in the automotive industry, especially in Automobile Class A design, improving user workflow operations for increased productivity.