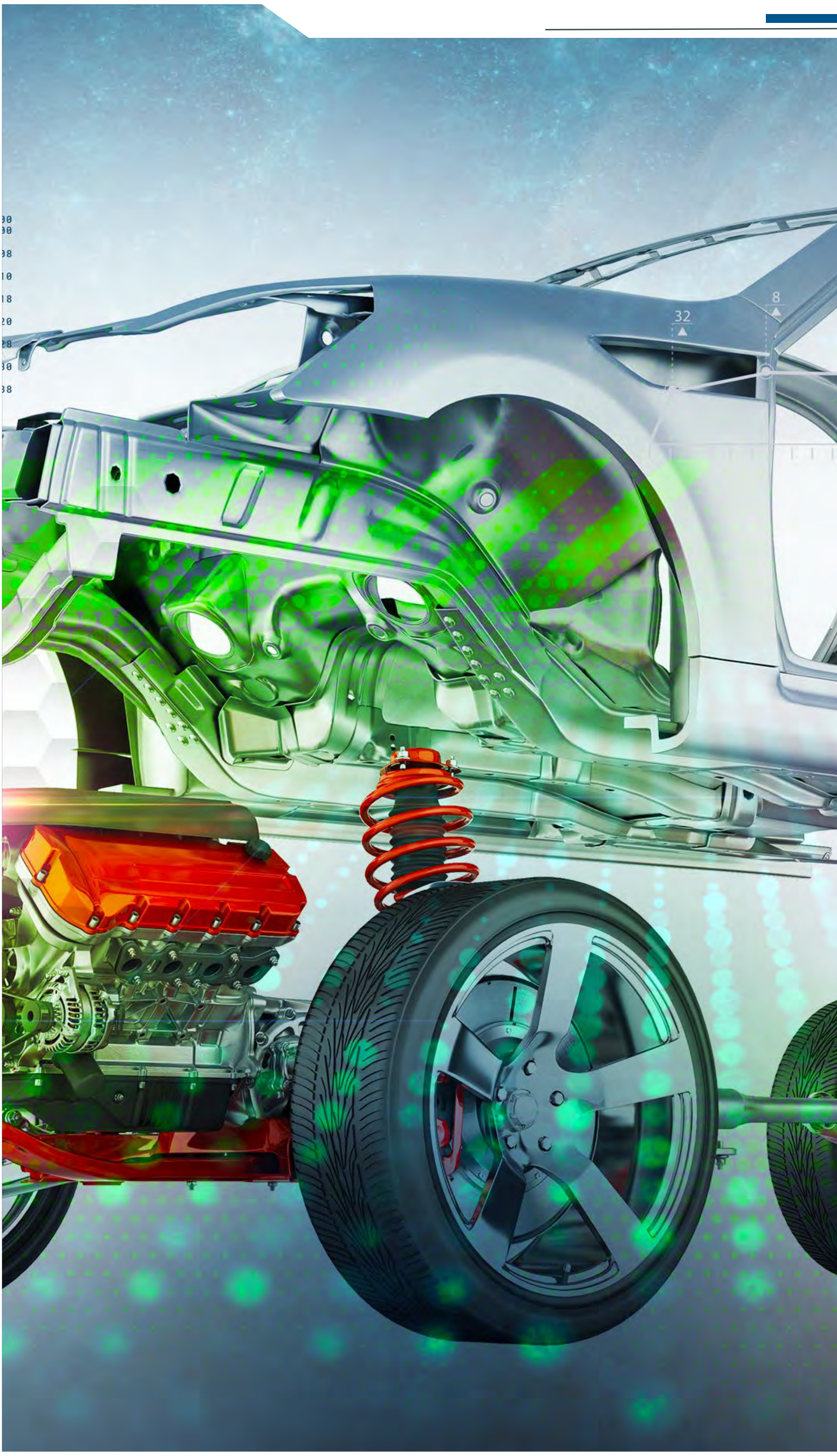
A COMPARISON:

SOLIDWORKS VS. creo®



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SOLIDWORKS

Features	SOLIDWORKS 2024 Top Enhancements
ASSEMBLY DESIGN	Apply rules when defeaturing models Represent post-assembly machining operations Simplify assembly STEP file import
PART DESIGN	Preview and edit a dimension after selecting entities Create bidirectional, symmetric patterns Unit of measurement as a custom property in notes and tables
DETAILED DRAWINGS	Reattach dangling dimensions to the proper reference point Access chain dimensioning alignment Exclude hidden sketches
SHEETMETAL DESIGN	Access an option for slots when tabs are created at an angle Automatically propagate slots where a tab intersects a specific part Create a stamp/form feature on the fly
STRUCTURE SYSTEM	Edit corner treatments faster and automatically create an open corner when adding a connection block
ELECTRICAL DESIGN	New options for flattening, reorienting, and displaying wires and connectors Faster creation of electrical documentation
MODEL-BASED DEFINITION (MBD)	Export Hole Tables to 3D PDF Edit dangling dimensions to reattach to a feature in the model Display dual dimensions while creating geometric tolerance symbols

creo® 11

Features	Creo 11 Top Enhancements
PART DESIGN	Improvements to multibody design workflow includes support for the multibody design of sheetmetal parts With improved Spot welding, get faster and more flexible definition of multiple projected point references Get faster, more comfortable selection of many surfaces with support for Box, Lasso, and Trace selection as well as selection priority for Quilts
USER INTERFACE	Create simplified models easier with a Shrinkwrap option to collect bodies from a referenced assembly into a part Pick up enclosure volume information for packaging optimization
SIMULATION & ANALYSIS	Creo Simulation Live now includes support for conjugate heat transfer between solid geometry and fluid bodies Creo Ansys Simulation Advanced includes support for transient structural simulation (time dependent boundary conditions)
GENERATIVE DESIGN	Creo's award-winning generative design has been improved with minimum feature size constraints, bearing load support, and planar symmetry constraints
ELECTRICAL DESIGN	With cabling, access the remove locations capability to get a dynamic preview in the graphics area, expanded filtering, and Undo/Redo options Harness settings can now be changed during routing, and the cabling tree has been updated for greater visibility of harness structure Get more flexibility to control the transparency control of various layers in ECAD with improved context data visibility
MODEL-BASED DEFINITION (MBD)	Quickly and easily organize data in simple tables. Get access to flat-to-screen or annotation planes and support for parameter callouts With semantic query for inheritance models enhance search precision and efficiency GD&T Advisor has now been enhanced with support for ISO 22081 for indication of general tolerances and combined simplified hole callouts for ISO models Support for export of STEP AP242, edition 3. This ISO standard for data exchange enables seamless sharing of 3D models along with associated semantic product manufacturing information. (Available in an upcoming maintenance release)
ADDITIVE MANUFACTURING	It's now easier to create complex lattices with a new lattice command to connect two or more separate lattices Get additional flexibility with expanded capabilities for stochastic lattices and the ability to adjust Simplified lattices using Warp
SUBTRACTIVE MANUFACTURING	High-Speed Milling now supports 4-Axis rotary roughing and finishing toolpaths Additional Area turning capabilities have been added to 4-Axis
COMPOSITE DESIGN	Explore expanded functionality for transitions, laminate section, and draping simulation, making it easier to manage and visualize plies With zone based design apply conceptual top-down composite design using zone regions and zone stack recipes to automatically create plies Get more flexibility during composite design and preparation for manufacturing as well as better clarity on the ply book drawing Increase composite product quality through support of leading laser projection formats

2024

SOLIDWORKS

Features	SOLIDWORKS 2023 Top Enhancements
ASSEMBLY DESIGN	Automatically optimize resolved mode Repairing a missing mate reference Additional end conditions for cut features
DETAILED DRAWINGS	Overrides for Bills of Materials Filters for Bill of Materials
PART DESIGN	Coordinate systems Dimension support for the Move/Copy Body command Single-line fonts for Wrap features
SHEETMETAL DESIGN	Sensors
MODEL-BASED DEFINITION (MBD)	Limiting geometric tolerances to a standard Dimension extension lines
STRUCTURE SYSTEM	Corner treatment to similar corners in structure systems Configuration-specific size of weldment members

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creo 10

Features	Creo 10 Top Enhancements
PART DESIGN	Freestyle and Style surfacing tools have been enhanced with rotational symmetry and smooth normal connection, respectively Improved global modeling with enhancements to spline and stretch in the warp feature Improvements to multibody design workflows including a new split/trim feature and the ability to propagate appearances and references during Boolean operations Standard parameters and hole note for simple holes More flexible dimension pattern for pattern-of-pattern
USER INTERFACE	The model tree has been improved to remove confusion between restructuring and reordering an assembly Drag and drop support between quilt/body tree and design items tree
SIMULATION & ANALYSIS	Support for non-linear materials including Neo-Hookean hyperplasticity, linear orthotropic elasticity, and bi-linear plasticity Support for combined thermal and structural analysis Support for non-linear contact including new contact types such as frictional and rough is included Creo Simulation Live now includes expanded contact simulation options and improved result options for fluids and structures Creo Flow Analysis and Creo Simulate have been enhanced with better animation and multibody support, respectively
GENERATIVE DESIGN	For generative design, there is now rotational symmetry and the ability to add point mass and remote loads
ELECTRICAL DESIGN	The split/merge harness tool for cabling can split an existing harness into two separate harnesses which can be later merged back together A new application-centric tree has been added with three different views (cables, bundles and connectivity views) New ECAD capabilities have been added, including paste masks and hole parameters, to better design and control PCB design
HUMAN FACTORS	Updated manikin library as inseparable assemblies Support multiple reach envelopes per hand Improved usability with multiple snapshots and dimension control for manikin manipulation Visual Field feature is updated to now support reflection analysis as well
MODEL-BASED DEFINITION (MBD)	The user can now relate a symbol or a surface finish to other annotations in the 3D model, inheriting its annotation plane from the parent during the placement The user can learn about the relation nature between any related annotations, by choosing either one of them and observing the cross highlighting of the other one GD&T Advisor has now been enhanced for improved semantic behavior of general profile tolerances, enhanced compliance with detailing standards and other usability improvements
ADDITIVE MANUFACTURING	Create several new beam-based lattice types such as rhombic, rhombic with diamond structure, dodecahedron and elongated dodecahedron. Support for Auxetic cells which produce geometry that exhibits negative Poisson ratio Supports simulation-based variable wall thickness and highly efficient l-graph-wrapped (IWP) lattice cell for formula-driven lattices
SUBTRACTIVE MANUFACTURING	High-speed milling now supports barrel tools for both wall and floor 5-axis finish, to reduce toolpath time and increase surface finish quality Additional control for CUTCOM and clearance has been added to area turning New CL player for synchronized NC steps
COMPOSITE DESIGN	Dedicated environment and tools to accurately define, validate and manufacture composite products

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creo+™

Features	Creo+ Top Enhancements
CLOUD-BASED CAPABILITIES	Creo+ is a SaaS product that combines the power and proven functionality of Creo, with new cloud-based tools to enhance design collaboration and simplify CAD administration PTC Control Center, powered by Atlas and included in Creo+, has cloud-based tools to help you deploy software licenses, right from your desktop, along with rich telemetry to help you optimize license usage Creo+ includes real-time design collaboration tools to enable multiple team members to review, explore and edit assemblies

SOLIDWORKS 2022

Features	SOLIDWORKS 2022 Top Enhancements
ASSEMBLY DESIGN	Open subassemblies in Large Design Review or resolved mode from an assembly opened in Large Design Review mode. Use configuration table to modify configuration parameters for parts and assemblies with multiple confirurations
DETAILED DRAWINGS	Detailing mode Geometric tolerance symbols Symmetric linear diameter dimensions
PART DESIGN	Using numeric values to define coordinate systems Selection for coordinate systems Draft across parting lines External threaded Stud Wizard Hole Wizard slots Hybrid modeling Mirroring about two planes
SHEETMETAL DESIGN	Etched contours on bends
STRUCTURE SYSTEM	Connection element for a structure system

Creo 9

Features	Creo 9 Top Enhancements
ASSEMBLY DESIGN	Quick and easy access to the circular references report Replace a component with an assembly Replace a component with a copy Retrieve a missing component Grouping of exploded view offset lines
DETAILED DRAWINGS	Placement and editing workflows for surface finish New gallery of surface finish symbols Improved surface finish customization Improved drawing support for model replace operations and inseparable assemblies New hatch tree in drawings Hatch designer for creating and editing hatch patterns
USER INTERFACE	Improvements to the model tree help to clarify design intent New quilt tree, new design items tree and a toolbar in the model tree itself
PART DESIGN	New Divide Surface and Unify Surface commands Freestyle brushes allow unrivaled sculpting of organic geometric shapes as well as greater control of curve definition and connection Sketcher improvements include enhanced project command, enriched inspection tools and Auto-scale first sketch. Increased flexibility in Pattern feature New functionality to define a geodesic curve on surface starting from a point and an angular direction
SIMULATION & ANALYSIS	Creo Simulation Live introduces multiphysics capabilities for simultaneous structural and thermal analysis, and now allows the inclusion of gyroids and lattices features in fluid studies With Creo Ansys Simulation, automatically create mid-surface geometry for shell meshes, apply loads to create a pin and hole connection and simulate unconstrained structures Use Creo Flow Analysis to carry out multiple computational fluid dynamics projects in more than one model, enjoy more robust meshing and support for lattice geometry, and take advantage of an integration with Creo Behavioral Modeling Extension for optimization and sensitivity studies Improvements to generative design include the ability to design products to a specified safety factor Conduct modal optimization to achieve the desired frequency response of the specified material
ELECTRICAL DESIGN	ECAD enhancements allow you to import silk screen layers and solder mask layers as ECAD data from the EDA (electric design automation) files
MODEL-BASED DEFINITION (MBD)	Streamlined placement and editing workflows for surface finish New gallery for surface finish symbols Including 3 new ASME/ISO standard symbols Improved surface finish customization Semantic support for surface finish Ability to define which parameters will be exposed on symbol instances in MBD Weld symbol parameters are automatically created
ADDITIVE MANUFACTURING	Support for open quilts on stochastic lattices enables the creation of skin lattices Variable wall offset for formula-based lattices User defined support structures
MANUFACTURING	Adaptive feed for HSM rough and rest-rough Geodesic 5-axis finish toolpath for better surface finish and additional flexibility for 5-axis finishing Tool motions tab in all HSM sequences for increased tool life Fully associative in-process stock models, now on the model tree Added flexibility to define the NC tool paths and tool path color setting
FRAMEWORK	Expanded library to include aluminum sections
HUMAN FACTORS	New manikin editor allows creation of custom manikin populations Improved manikin manipulation and constraint handling 3D dragger control for forward and inverse kinematics Reach behavior shows missing distance when the target is too far and provides an optional reach constraint Model tree alignment and modernization New Visual Field feature to construct a vision cone representing the field of view accounting for obstructing objects

SOLIDWORKS 2021

Features	SOLIDWORKS 2021 Top Enhancements
ASSEMBLY DESIGN	Detect and report circular references Assembly performance improvements Save defeatured models as configurations
DETAILED DRAWINGS	Improved drawing creation performance
USER INTERFACE	Search for tools on shortcut bars and commands tabs Improved graphics performance
SHEETMETAL DESIGN	Add edge flange on nonplanar tangent edges
SIMULATION & ANALYSIS	Use mesh diagnostics to identify and fix poor-quality elements Faster meshing with accuracy bonding improvements
ELECTRICAL DESIGN	Use splines or other sketch entities to route harnesses Join wires using splice component or splice without component Use the Terminal Types Manager to handle terminals and interconnections Bring information on end terminations from SOLIDWORKS electrical schematics into 3D for more complete documentation
MODEL-BASED DEFINITION (MBD)	Publish sheet metal bend tables as 3D PDF Define driving and driven locating dimensions as semantically correct datum targets Improved 3D PDF display quality

Creo 8

Features	Creo 8 Top Enhancements
ASSEMBLY DESIGN	Inseparable assemblies
DETAILED DRAWINGS	New sketching tools in drawings Improved creation of construction draft entities Creation of 2D views for sketch entities Snapping guide control during sketching in drawings
USER INTERFACE	Improved dashboard interaction and layout Modernized datums display Transparency control for bodies, quilts, tessellated geometry Model tree enhancements: - Design items folder containing quilts & bodies independent of regeneration sequence - Organize bodies and quilts in custom groups - Separate model tree from design items tree
PART DESIGN	Show Snapshot to easily investigate quilt/body history Snapshot copy to create copy of quilt/body at selected time in model history for further consumption Multi-hole feature with sketch-based placements Lightweight representation for all hole types Enhanced hole standards support Enriched thread handling Ability to create geodesic curves
SHEETMETAL DESIGN	Create multiple flat walls based on a common definition Miter & corner relief support for flat wall tool
SIMULATION & ANALYSIS	Automatic envelope, draft-handling, and radius constraint for generative design. Steady-state flow analysis as part of Creo Simulation Live. Improved mesh and deflection control in Creo Ansys Simulation
ELECTRICAL DESIGN	Support for ECAD slots Branch tape & stiff shrink feature for cabling
MODEL-BASED DEFINITION (MBD)	Symbol modernization: streamlined workflows, semantic definitions, and symbol gallery GD&T Advisor support for assemblies. Improved workflows for dimension creation Advanced surface collection capabilities for standalone annotations
ADDITIVE MANUFACTURING	Simulation-driven lattices Solid representation support for stochastic lattices Improvements to build direction optimization Insert multiple components in the tray assembly in one step
MANUFACTURING	Support for 5-axis high speed machining 3+2 machining for HSM rough and rest rough 3 to 5 conversion for finish and rest finish

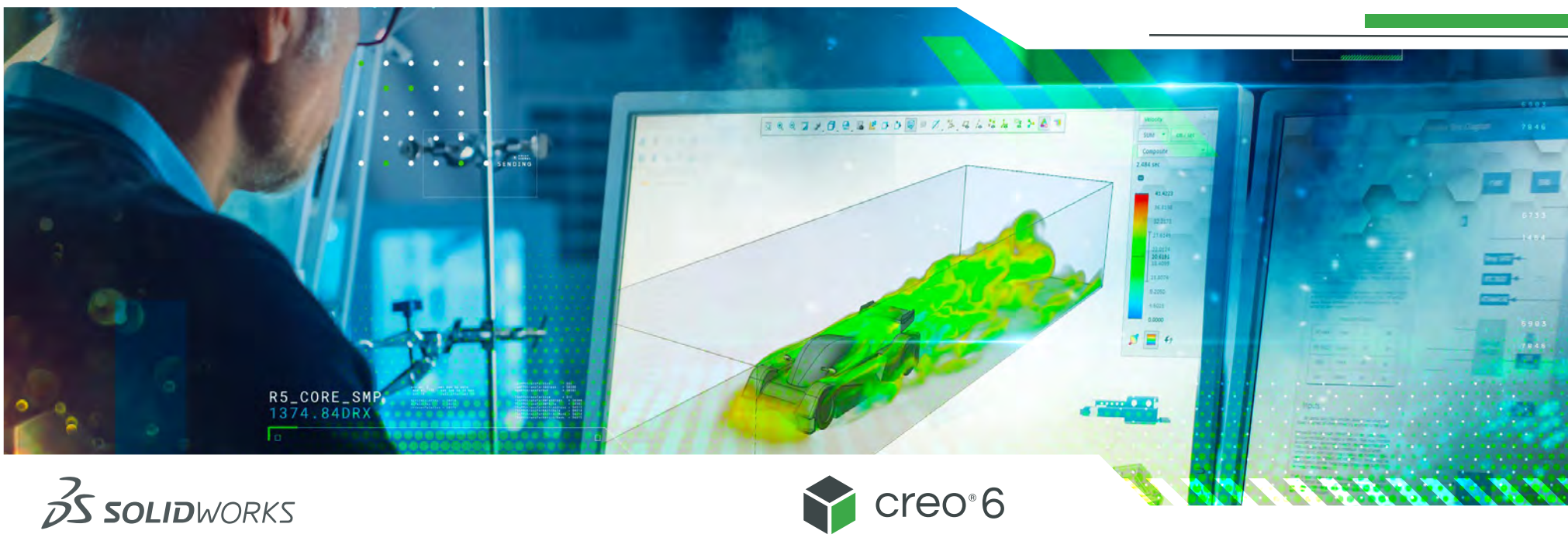
SOLIDWORKS

Features	SOLIDWORKS 2020 Top Enhancements
ASSEMBLY DESIGN	Create and edit component patterns in large design Create mates to reference geometry in large design Flexible components
DETAILED DRAWINGS	Detailing mode
PART DESIGN	Expanded support for mesh BREP bodies in features Pattern and mirror support
USER EXPERIENCE	Improved performance when opening and saving files from a previous version

2020

creo® 7

Features	Creo 7 Top Enhancements
ASSEMBLY DESIGN	Enhancements to Creo Intelligent Fastener (IFX)
DETAILED DESIGN	Control the gap between a GTOL frame and the indicator frame Alignment of spacing for composite GTOLS with additional text is improved Parser for the syntax checker and symbols palette are updated Improved support for intersecting bodies or components in hidden line removal (HLR) Align ordinate dimensions with a baseline
ELECTRICAL DESIGN	Working with tie wraps is easier Working with markers is easier Create tables in Creo Harness Manufacturing
GENERATIVE DESIGN	Generative Design Topology Optimization
MANUFACTURING	Swiss turning added to mill-turn work in subtractive manufacturing New support structures in Creo Additive Manufacturing Plus Extension Improvements to custom cells in additive manufacturing Stochastic lattices are improved in additive manufacturing Point distribution control in HSM finishing toolpaths
MODEL-BASED DEFINITION (MBD)	Control the gap between a GTOL frame and the indicator frame Alignment of spacing for composite GTOLS with additional text is improved Set your standard for syntax checking Parser for the syntax checker and symbols palette are updated Improved support for intersecting bodies or components in hidden line removal (HLR) Align ordinate dimensions with a baseline GD&T Advisor syntax checker support for recent detailing standards
PART DESIGN	Draft feature is enhanced Visualizing design intent in Sketcher is improved: - Mirror tool in Sketcher is enhanced Multibody design is introduced: - Multibody for design - Multibody for multi material parts - Multibody for master model design - Multibody for advanced design workflows Align draft connections in Freestyle Creation of forms is improved in sheet metal design Solid weld is improved
SIMULATION AND ANALYSIS	Creo EZ Tolerance Analysis replaces Tolerance Analysis Extension (TAE) Creo Simulation Live Plus (Fluid Flow Analysis) Transient thermal studies in Creo Simulation Live Support for behavioral modeling studies for probes in Creo Simulation Live Fluids in Creo Simulation Live
USER EXPERIENCE	Display filters for geometry representations



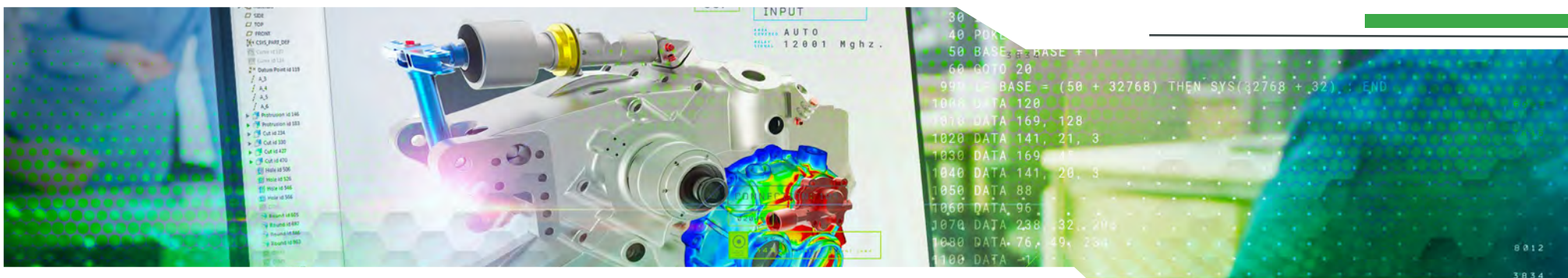
SOLIDWORKS 2019

Features	SOLIDWORKS 2019 Top Enhancements
MODEL-BASED DEFINITION (MBD)	Support for sheet metal in MBD
ASSEMBLY DESIGN	Saving an assembly as a part
DATA EXCHANGE	Reading tessellation data from foreign CAD files
GRAPHICS	Creating 3D textures
PART DESIGN	Using Interference Detection for multibody parts
PDM	Conditional notifications
SHEET METAL DESIGN	Costing task pane for sheet metal

Creo 6

Features	Creo 6 Top Enhancements
ADDITIVE MANUFACTURING	New lattice transitions in additive manufacturing Stochastic lattices are available in additive manufacturing Formula-driven cells for lattices in additive manufacturing Custom is added as a lattice type in additive manufacturing Support for beam lattices in 3D manufacturing format (3MF) in additive manufacturing Create slices for supported lattice types in additive manufacturing Build direction command is added in additive manufacturing
ASSEMBLY DESIGN	Active component is easier to see in the model tree
AUGMENTED REALITY (AR)	Hololens is supported for viewing models in augmented reality (AR) Managing your model in augmented reality (AR)
DETAILED DRAWINGS	Modernized notes in model-based definition and detailed drawings Name your drawings automatically in detailed drawings GD&T Advisor syntax checker support for recent detailing standards Set your standard for syntax checking Summary for a specific drawing view See child views from the drawing tree
ELECTRICAL DESIGN	Create tables in Creo Harness Manufacturing
GRAPHICS	Emissive appearance is supported
MODEL-BASED DEFINITION (MBD)	Modernized notes
SHEET METAL DESIGN	Enhanced productivity and usability when working with wall features
SIMULATION AND ANALYSIS	Creo Flow Analysis wizard Creo Simulation Live is available in Creo 6.0.1.0 Creo EZ Tolerance Analysis is introduced
USER EXPERIENCE	Improved user experience working with features Enhanced model tree column display and configuration Modernized and improved charting tool

2019



SOLIDWORKS

Features	SOLIDWORKS 2018 Top Enhancements
ASSEMBLY DESIGN	Lightweight mode for assemblies
DATA EXCHANGE	You can open Autodesk® Inventor™ 2018 files in SOLIDWORKS 2018 SP1.
PART DESIGN	Creating mirrored entities in 3D sketch
PDM	Automated drawing PDF creation in SOLIDWORKS PDM Standard SOLIDWORKS PDM cupport for non-SOLIDWORKS CAD
SHEET METAL DESIGN	Tab and slot
SIMULATION AND ANALYSIS	Topology study Sensor for simulation mass properties
USER EXPERIENCE	Touch-based interactions

creo® 5

Features	Creo 5 Top Enhancements
ADDITIVE MANUFACTURING	Creo Additive Manufacturing Plus for Materialise Simplified visualization and mass properties calculation in additive manufacturing Support for conical beams from additive manufacturing in Creo Simulate Support for truss lattice in additive manufacturing Support structures are available for 3D printing
ASSEMBLY DESIGN	IFX supports inserting heli-coils IFX supports collapsible lists
AUGMENTED REALITY (AR)	Spatial targets introduced in Creo 5.0.1.0 ThingMarks introduced in Creo 5.0.3.0
DATA EXCHANGE	Support for importing and exporting 3MF format Opening inventor files through Creo Unite
DETAILED DRAWINGS	Improved performance for large assemblies in detailed drawings Additional values for symbol font in detailed drawings and model-based definition
ELECTRICAL DESIGN	Applying stripes to cables and wires
GENERATIVE DESIGN	Creo topology optimization
MANUFACTURING	Creo mold machining Modern user interface for conventional milling (subtractive manufacturing) Modern user interface for CMM (subtractive manufacturing)
MODEL-BASED DEFINITION (MBD)	Additional values for symbol font in detailed drawings and model-based definition Conversion tool for legacy set datum annotations in model-based definition Mini toolbars for 3D annotations in model-based definition Improved undo and redo support in model–based definition Improved failure notifications for 3D annotations in model-based definition Enhanced workflow for radial dimensions in model-based definition
PART DESIGN	New volume helical sweep tool Using Sketch regions Round handling in Draft The mirroring of features is enhanced Creating symmetrical curves in Style Creating mirror curves in Style Freestyle surfacing in box mode is available Align curvature is available in Freestyle Improved rounds and chamfers for Flexible Modeling Flattened representation of sheet metal part is improved
SIMULATION AND ANALYSIS	Creo Simulation Live is available in Creo 5.0.3.0 Introduction of Creo Flow Analysis (basic, plus, premium) Defining the analysis in Clearance and Creepage Analysis is easier Defining electrical nets in Clearance and Creepage Analysis is easier
USER EXPERIENCE	Searching the model tree is easier Designing in perspective Additional commands for showing and hiding Mini toolbar is improved

2018

SOLIDWORKS

Features	SOLIDWORKS 2017 Top Enhancements
COSTING	Feature recognition for operations Rules-based costing for parts
DATA EXCHANGE	Exporting SOLIDWORKS files as 3M files SOLIDWORKS 3D Interconnect
ELECTRICAL DESIGN	SOLIDWORKS PCB
GRAPHICS	Controlling decals and scenes by display states
MODEL-BASED DEFINITION (MBD)	Comparing 3D PMI between parts
PART DESIGN	Wrap creates geometry on any face

creo 4

Features	Creo 4 Top Enhancements
ADDITIVE MANUFACTURING	Design, validate, optimize, print-check all within Creo Ability to create parametrically controlled lattice structures Direct connection to stratasys and 3D systems printers Ability to create and manage tray assemblies Printability validation
ASSEMBLY DESIGN	Automatic representation Intelligent mirroring Managing reference backups
DETAILED DRAWINGS	Improved workflows for editing GD&T Flexible and standard compliant datum reference and tolerance value for GD&T
GRAPHICS	Advanced rendering
MANUFACTURING	Classify surfaces by pull direction in mold design and casting Shape volume tool is available in mold design and casting Volume split enhancements in mold design and casting
MODEL-BASED DEFINITION (MBD)	Improved workflows for editing GD&T Flexible and standard compliant datum reference and tolerance value for GD&T Standards-based syntax checking Support for ISO GPS GTOLS Geometric tolerances as standalone annotations in model-based definition Support for fully semantic references for dimensions in model-based definition
PART DESIGN	Sketch-based feature enhancements Enhanced draft tool Working with groups is easier New geometry search tool in Creo Flexible Modeling Extended quilts with substitute in Creo Flexible Modeling Support for multiple objects in Freestyle Importing from and exporting to OBJ files in Freestyle Acceleration connections (G3) in Style Solid weld is available
SHEETMETAL DESIGN	Dependency options for punch form and die form in sheetmetal design Flat pattern and flatten form improvements in sheetmetal design Perform direct modeling on sheetmetal parts Design intent objects for sheetmetal design New geometry search tool tuned for sheetmetal design
SIMULATION AND ANALYSIS	Adjusting models in Creo Simulate is easier with Flexible Modeling
SMART CONNECTED PRODUCT DESIGN	Ability to connect digital models to real-world products Replace/verify assumptions in the design process with real world data Use Creo to perform analysis of real world data for other uses Design and improve smart connected products with Creo Product Insight Extension
USER EXPERIENCE	Geometry-based selection and mini toolbar 2D box selection Customize the user interface

A COMPARISON:

SOLIDWORKS VS. creo®

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THE CREO ADVANTAGE

Creo is the 3D CAD solution that helps you accelerate product innovation to build better products faster. Easy-to-learn Creo uses a model-based approach to seamlessly take you from the earliest phases of product design to manufacturing and beyond. Combining powerful, proven functionality with new technologies including generative design, real-time simulation, advanced manufacturing, IIoT and augmented reality, Creo helps you iterate faster, reduce costs and improve product quality. Creo is also available as a SaaS product, providing innovative cloud-based tools for real-time collaboration and streamlined license management and deployment. The world of product development moves quickly, and only Creo delivers the transformative tools you need to build competitive advantage and gain market share.

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