**creo® 9**

ADDITIVE MANUFACTURING
IN CREO

CREO CLOSES THE GAP BETWEEN 3D CAD AND ADDITIVE MANUFACTURING.

WITH CREO, WHAT YOU DESIGN IS ACTUALLY WHAT YOU PRINT.

With Creo you can design, optimize, validate, and run a print-check all in one environment, reducing overall process time, tedium, and mistakes. When you're ready, simply send the file straight to the 3D printer. You can design for additive manufacturing in polymers and in metal and then connect directly to your chosen printer with its optimized printer profile and support structures. No switching between software packages, and no hassle. Our metal printing capabilities cover most of the metal printers currently on the market.

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DIGITAL TRANSFORMS PHYSICAL
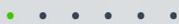
CREO PARAMETRIC
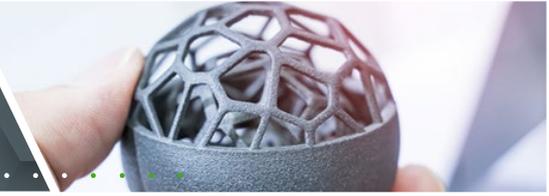
›› DIRECT CONNECT TO 3D SYSTEMS PLASTIC PRINTERS, AND TO I.MATERIALISE AND 3D SYSTEMS PRINT BUREAUS ›

- Out-of-the-box (OOTB) functionality: print parts, assign materials, colors, and calculate build and building material directly from Creo.

- Ability to direct order parts from i.materialise and 3D Systems on demand manufacturing (ODM) print bureaus.

›› DIRECT CONNECT TO PLASTIC PRINTERS IN THE MATERIALISE LIBRARY ›

- OOTB functionality: print plastic parts directly from Creo.

- Manage print drivers and profiles for plastic printers in the library.

- Ability to print support structures requires *Creo Additive Manufacturing Advanced Extension for Materialise.*

- Materialise provides optimized printer profiles for each printer in the Materialise library. Build processors available from Materialise.

3MF CONSORTIUM

The 3D manufacturing format (3MF) is an industry-supported file format that applications can use to send full-fidelity 3D CAD models to a mix of other applications, platforms, services, and printers. With the 3MF specification, companies can focus on innovation rather than on basic interoperability issues. PTC is a Steering Member of the 3MF Consortium.

CREO ADDITIVE MANUFACTURING EXTENSION
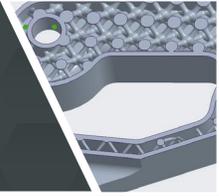
LATTICE MODELING ❯
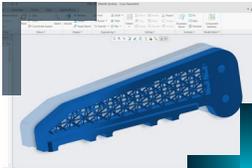
- Optimization of lattice structures with simulation.
- Create parametrically-controlled lattice structures, fully-detailed parts with accurate mass properties. With variability control you can optimize the lattices to achieve your engineering goal.
- Use the full spectrum of cellular structures such as: 2 ½ D, 3D beam-based, Formula-driven, custom-cell type, and Stochastic for closed volumes and open quilts.
- Take advantage of lattice transitions between beam-based lattices and the supported downskin patches of a model, based on the build orientation and critical angle.
- Improved FEA Simulation of very dense full BREP beam-based lattices using homogenized representation, coupled with Creo Simulate to analyze the linear, static, and modal response of a part.
- Lattice variability based on FEA results.

## CREATE, MODIFY, MANAGE, AND SAVE PRINT TRAY ASSEMBLIES ❯
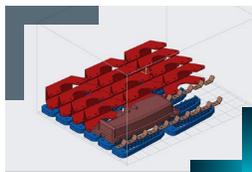
- Define print tray specific to printer, where the tray assembly is the repository for the 3D print job.
- Add parts at any time, define positioning and rotations, assign materials/colors, etc.

AUTOMATIC POSITIONING AND NESTING IN PRINT TRAY ASSEMBLIES ❯

- Optimize the orientation of parts in print tray according to printer specifications
- Nest parts in print tray assemblies (assumes printer supports nested parts).
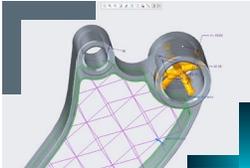
BUILD DIRECTION ❯
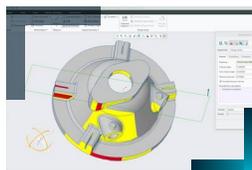
- Define the optimal orientation for printing your design

# CREO ADDITIVE MANUFACTURING ADVANCED EXTENSION FOR MATERIALISE

DIRECT CONNECT TO METAL PRINTERS IN THE MATERIALISE LIBRARY ❯

- Out-of-the-box (OOTB) functionality: print parts, assign materials, colors, and calculate build and building material directly from Creo.

- Optimized printer profiles for every printer in the Materialise library. Build processor available from Materialise.

GENERATE AND CUSTOMIZE METAL SUPPORT STRUCTURES ❯
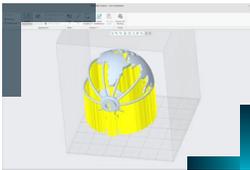
- Materialise-based support structures (point, line, gusset, web, tree, hybrid, contour & block) are generated in the tray assembly once the part is placed in the tray and the printer is selected.

- Supports are created in Creo and update when models are changed.

- Support parameters are dependent on the specific printer, and modifiable by the user.

- Users can modify specific support structures if needed.

CREO CAM SOLUTIONS

| Creo Versions	6	7	8	9
Creo Additive Manufacturing Extension				
Lattice Modeling (Beam, Formula-Based, Stochastic)	•	•	•	•
Stochastic lattices with Delaunay algorithm and edge recognition		•	•	•
Stochastic lattices, Trabecular shape option for Voronoi triangulation			•	•
Homogenized lattice representation for fast simulation and light weight files storage	•	•	•	•
Custom defined cells (based on Creo .prt files)	•	•	•	•
Improvements to custom defined cells, support of Quilts and Curves		•	•	•
Selective removal of dangling beams			•	•
Lattice variability based on geometric references	•	•	•	•
Simulation and optimization of lattices using idealizations in Creo Simulate and Creo Simulation Live	•	•	•	•
Automatic Lattice variability based on simulation results, (for beam-based lattices)			•	•
Print Tray Assemblies – Position, Nest, Modify, Manage, Check for Interference and Save	•	•	•	•
Insert multiple parts in the Tray Assembly in one step			•	•
Define the Print Build Direction in Part Mode and direct placement in the Print Tray	•	•	•	•
3MF Core specification export and Materials and colors extension support	•	•	•	•
Windows 10 driver support for 3D printing	•	•	•	•
Support for open quilts on stochastic lattices				•
Variable wall offset for formula-driven lattices				•

Creo Versions	6	7	8	9
Creo Additive Manufacturing Advanced Extension for Materialise				
Support of Metal Printers in the Materialise Library (Manage print drivers & profiles)	•	•	•	•
Generate and Customize Metal Support Structures	•	•	•	•
Additional support structures: Tree, Cone and Hybrid		7.0.1	•	•
Optimization of the Print Build Direction in Part Mode and direct placement in the Print Tray	•	•	•	•
Multi-objective Optimization of the Print Build Direction and detection of overhang edges and vertices			•	•
User-defined support structures				•

Creo Versions	6	7	8	9
Amphyon Additive Process Simulation for Creo				
Simulation of parts, lattices and supports on the Tray Assembly. For Powder-bed metal 3D Printers		•	•	•
Creation of compensated models and insert them on the Tray Assembly model tree		•	•	•

# CREO GENERATIVE DESIGN WITH ADDITIVE MANUFACTURING

››› CREO GENERATIVE TOPOLOGY EXTENSION ❯
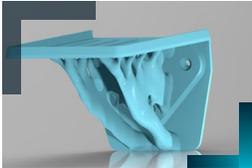
Optimize designs according to your requirements

- Seamless set-up for your scenario. Simply select design spaces, add your loads and constraints, then define the objectives, material, and manufacturing process for the scenario. Use the results as your final design or continue to iterate.

- Support for many common manufacturing requirements, from traditional to additive manufacturing.

- Ability to preview and interrogate optimized design along with simulation results. Interactive process where results dynamically update with edits to geometry and setup.

- Automatic reconstruction of optimized results to rich B-rep geometry or tessellated model.

- Optimize to a given safety factor. Conduct modal optimizations, based on the desired frequency response.

››› CREO GENERATIVE DESIGN EXTENSION ❯
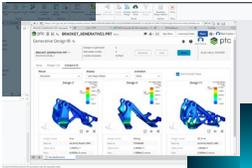
Consider multiple scenarios in parallel

- Use the power of the cloud

- Automatically identifies the top options, including those you might have considered.

- Enables junior design engineers to contribute earlier in the design process by using GDX to turn product requirements into designs.

Creo Versions	6	7	8	9
Creo Generative Topology Optimization Extension (GTO)				
Set constraints and requirements, including material and manufacturing process		•	•	•
Work with both additive manufacturing and more traditional processes		•	•	•
Output is rich, B-rep geometry.		•	•	•
Conduct modal optimizations, to generate designs based on the desired frequency response of the specified material.				•
Optimize to a given safety factor (structural design).				•

Creo Versions	6	7	8	9
Creo Generative Design Extension (GDX)				
Turn to cloud-based GDX to evaluate multiple scenarios in parallel		7.0.2	•	•
Side-by-side comparison of top options		7.0.2	•	•

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THE CREO ADVANTAGE

Creo is the 3D CAD solution that helps you accelerate product innovation so you can build better products faster. Easy-to-learn Creo seamlessly takes you from the earliest phases of product design to manufacturing and beyond. You can combine powerful, proven functionality with new technologies such as generative design, augmented reality, real-time simulation, additive manufacturing and the IIoT, to iterate faster, reduce costs and improve product quality. The world of product development moves quickly, and only Creo delivers the transformative tools you need to build a competitive advantage and gain market share.

Please visit the PTC support page for the most up-to-date platform support and system requirements.

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