

# Generative Design in Creo®

Creo Generative Topology Extension and Creo Generative Design Extension

## Harness the power of AI and deliver your best designs in less time

Generative design autonomously creates optimal CAD model designs from a set of requirements you specify. Both of Creo's generative design solutions help you deliver high-quality, lower-cost, ready-to-manufacture products, all within the Creo design environment. Choose to adapt the results or use them as a final design.

Let generative design bring you the benefits of digital transformation. When you can rapidly explore innovative designs, you're closer to cutting costs and improving quality and time-to-market. Faster exploration allows more in-depth examination of different combinations of materials and manufacturing processes, revealing solutions you may never have considered.

### Generative Topology Optimization (GTO)

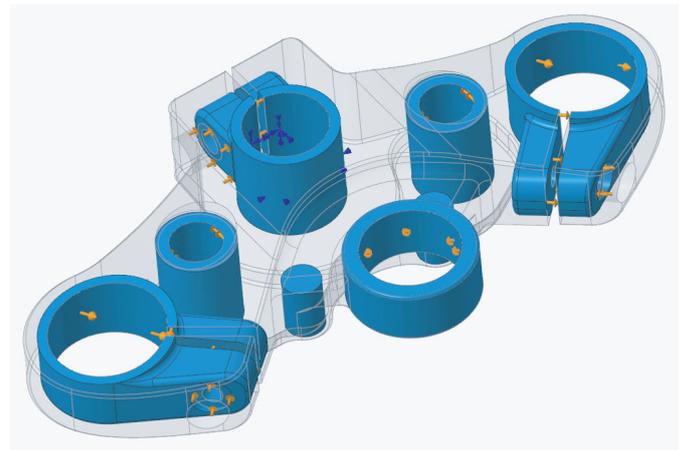
GTO quickly generates optimized designs to meet your requirements and converts them into rich B-rep geometry so you can enjoy an uninterrupted parametric workflow. Since generative design is integrated into Creo, you don't need to import/export load cases and geometry.

### Features and Benefits

- 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 your changes to geometry and setup.
- Automatic reconstruction of optimized results to rich B-rep geometry or tessellated model.
- For structural studies, minimize the mass for a defined safety factor lower limit or maximize stiffness at target volume/mass.
- For modal analysis, minimize mass at floor fundamental frequency or maximize fundamental frequency at target mass.

### Simple Setup



Easily set up optimization by defining the design space, physics, loads and constraint goals, manufacturing process and materials. Quickly run an initial simulation to ensure that the study is set up correctly.

## Optimization Preview



A converged solution that leverages a parting line constraint to support a casting manufacturing process.

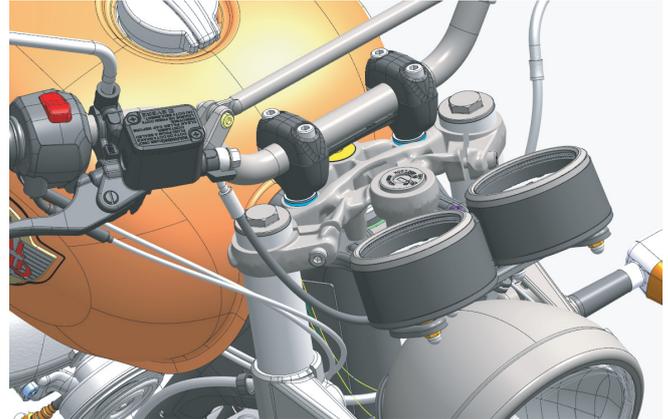
## Creo Generative Design Extension (GDx)

When you want to consider many scenarios in parallel and quickly, turn to cloud-based GDx. GDx extends Creo's generative design capabilities by enabling analysis of multiple design studies simultaneously. GDx automatically identifies the top options, including those you may not have considered.

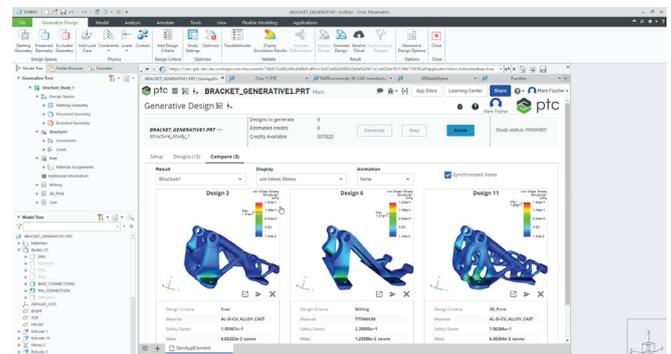
### Features and Benefits

- Use the cloud to evaluate multiple scenarios with several materials and production methods. The AI-driven generative engine will automatically produce more manufacture-ready designs faster.
- Set-up is easy, with commands consolidated in the familiar Creo UI ribbon, with context-sensitive menus.
- Enjoy increased innovation and productivity. You won't be constrained by "carry-over" geometry or established practices.
- Work with rich CAD output data in the Creo design environment. Automatic reconstruction of optimized results to rich B-rep geometry or tessellated model.
- Design for additive manufacturing's ability to produce shapes not possible with traditional manufacturing processes.
- Enhancements include automatic envelope, draft handling, and radius constraint - meaning increased productivity. Users no longer need create and define a body to be used for starting geometry, and can now work on multiple tasks while the optimizations are running.

## Manufacturable Results



Final component in the full assembly for a motorcycle



Alternative designs to consider

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 IoT, 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 competitive advantage and gain market share.

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