



Inventor 2008: Design Accelerator, Part 1

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Sunith Babu L, AUGI Board of Director, INDIA Chapter



*Submitted by Sunith Babu, President of the AutoCAD Local User Group, Bangalore, and Board of Director for AUGI India Chapter, Sunith currently works for **M.S. Ramaiah Institute of Technology (MSRIT)**, www.msrit.edu, a leading Educational Institution at Bangalore, Karnataka, founded way back in 1962. He has provided training related to Autodesk products since 2003 to both staff and students from various colleges across India and regularly conducts ATP (AUGI Training Program) segments for students, staff, and working professionals. He is an active and supportive member of AUGI and is currently working on projects related to Autodesk Inventor. He also runs a consulting group called CADAZINE, which focuses on projects related to CAD CAM CAE. He is a member of Autodesk Developer Network (ADN) and can be contacted at sunith.augi@gmail.com.*

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In this segment I will introduce you Design Accelerator, a feature in Autodesk Inventor® 2008. Design Accelerator is an important component of functional design, the process used to reduce or simplify the design of computer software involving 3D modeling. The basic advantage of this process is that the parts designed by this technique can be easily modified and can attain higher levels of design quality and accuracy. Further it eliminates the need for physical prototypes. Design Accelerator provides component generators and calculators to create various components which generally meet the design criterion. Let's explore!

To automate the process of creating parts and assemblies that are based on real-world attributes, such as speed, power, and material properties, we will use Design Accelerator's Engineer's Handbook, Mechanical Calculators, and Component Generators.

To start Design Accelerator, make sure you are in the Assembly module in Inventor 2008.

Once done, make sure you select the Design Accelerator as shown in Figure 1.

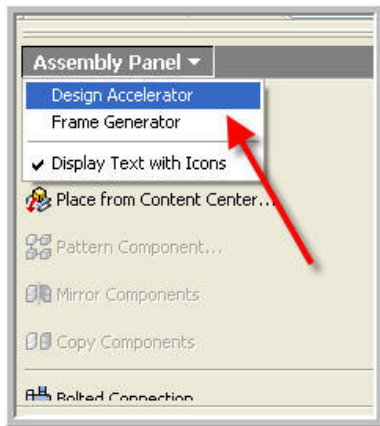


Figure 1: Select Design Accelerator from the Assembly module in Inventor.

Once you select Design Accelerator, the panel bar changes its options (see Figure 2).

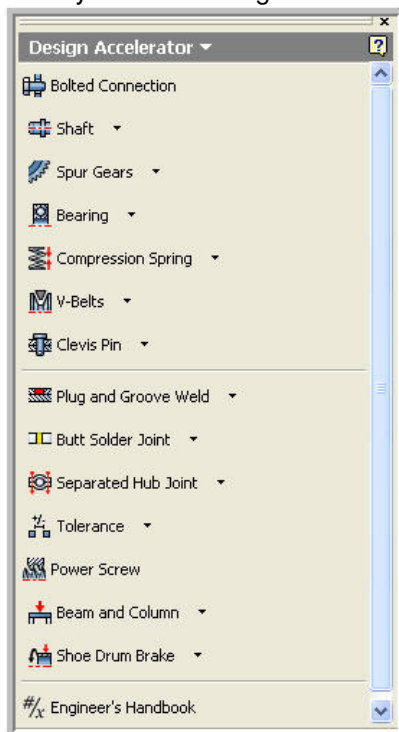


Figure 2: Design Accelerator options

Note: To insert any component using design accelerator, you need to be within Inventor assembly module and be sure to save the assembly file.

Only one generator or calculator can be opened at a time. Generators are opened in the Design Tab while calculators open on the Calculation tab. The design accelerator is divided into three types: Component generator (see Figure 3), Mechanical calculator (see Figure 4), and Engineering Handbook.

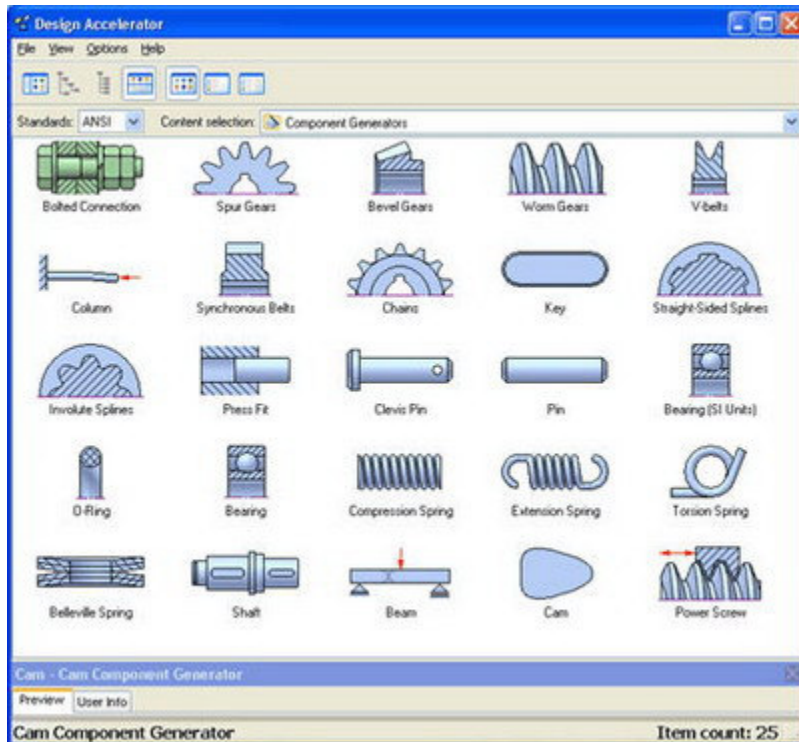


Figure 3: Component Generator

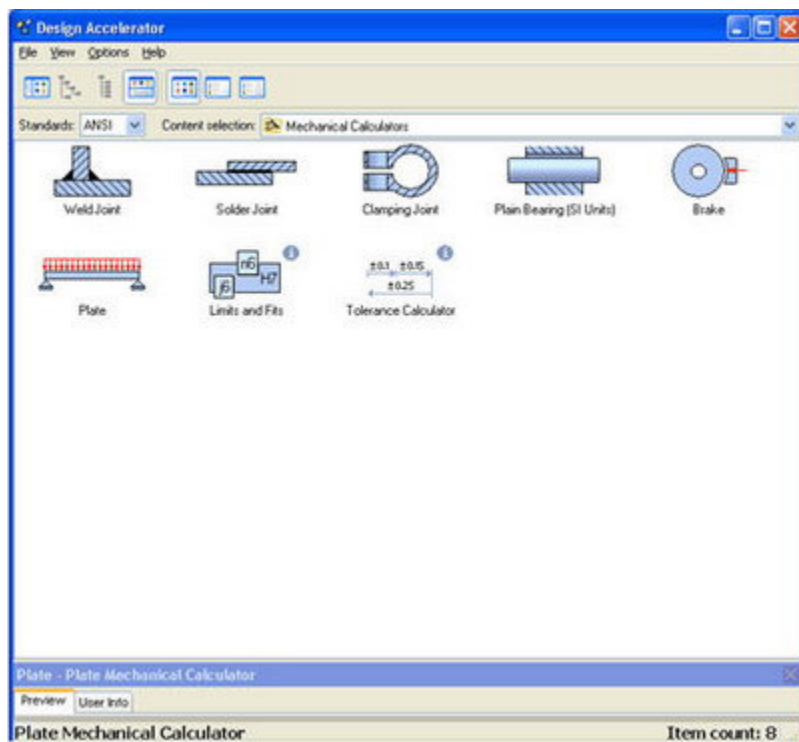


Figure 4: Mechanical Calculator



When you use the component generator, you can design desired components. Further, you can integrate component generator along with content center to insert components. (Example: Bolted Connections).

You can use the following Design Accelerator generators:

- Bolted Connection
- Shaft
- Involute Splines
- Parallel Splines
- Key Connection
- Disc Cam
- Linear Cam
- Spur Gears
- Bevel Gears
- Worm Gears
- Bearing
- V-Belts
- Synchronous Belts
- Roller Chains
- Clevis Pin
- Joint Pin
- Secure Pin
- Cross Pin
- Radial Pin

The engineering calculators make use of standard mathematical formulae to design and validate the mechanical components added by Design Accelerator.

A list of Mechanical Calculators is given below.

- Plain Bearing
- Plug and Groove Weld
- Butt Weld
- Spot Weld
- Filled Weld (Connection Plane Load) Weld
- Fillet Weld (Spatial Load) Weld
- Butt Solder Joint
- Bevel Solder Joint
- Lap Solder Joint
- Step Tube Solder Joint
- Step Solder Joint
- Separated Hub Joint
- Slotted Hub Joint
- Cone Joint, Tolerance
- Limits and Fits
- Press Fit
- Power Screw
- Beam and Column
- Plate
- Shoe Drum Brake
- Disc Brake
- Cone Brake
- Band Drum Brake



You can alternatively enable the tool bar for design accelerator by selecting Tools > Customize. Now select the Toolbar tab and select the Design Accelerator to activate the toolbar (see Figure 5).



Figure 5: Design Accelerator toolbar

The Engineering Handbook contains formulae for solving problems associated with:

Joints

Shafts

Bearings

Spring Generators

Transmission Mechanisms Generators

Beam and Column Calculator

Tolerance Calculator

Plate Calculator

The Design Accelerator database can be shared by installing it on to a server. The Design Accelerator is enabled by solver. In a nutshell, Design Accelerator can be used to design complex parts or assemblies with out spending much time on actually modeling them.

We shall review Design Accelerator in detail next month in detail by solving some simple problems