

Design Studio for Genesis

A Graphical User Interface for the *GENESIS* Structural Analysis and Optimization Software

New Features and Enhancements

Versions 15.0

January 2016

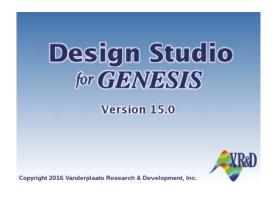
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- o General Enhancements
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- New Example Problems
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1 Introduction

This document describes the enhancements and new features added in Design Studio for Genesis 15.0.

Enhancement Summary

- GENESIS 15.0 Compatibility
- Open File Dialog Enhancement
- Save File Dialog Enhancement
- Import Post Dialog Enhancement
- Dynamic Grid/Element/Group Lookup
- Enhanced Grid Highlighting
- Enhanced Show/Hide Elements
- Enhanced Assembly Control
- Enhanced Annotation Tags
- Element Editing Enhancements
- Enhanced Synthetic Results
- Compressed File Import



2 General Enhancements

- 1. *GENESIS* 15.0 Compatibility. Design Studio has been enhanced to handle all of the new capabilities of *GENESIS* 15.0. New features in *GENESIS* 15.0 include: bolt preload; topology cloning; new topology fabrication constraints; CGLUE1 connection; compressed OUTPUT2 post-processing files.
- 2. Open File Dialog Enhancement. Design Studio now remembers the last file filter used, including user-typed custom filters. The next open/import file dialog begins with the same filter enabled.

🎇 🖈	Import Punch/Output2 Results	🗸 🔨 😣
Look <u>I</u> n: 📑 vrand		
📑 bcw	🗋 D027_dsg05.pch	D027_dsg13.pch
📑 exl	🗋 D027_dsg06.pch	D027_dsg14.pch
🗂 sms	🗋 D027_dsg07.pch	D027_dsgOPOST00.pcl
🗋 D027_dsg00.pch	🗋 D027_dsg08.pch	D027_dsgOPOST01.pcl
🗋 D027_dsg01.pch	🗋 D027_dsg09.pch	D027_dsgOPOST02.pcl
🗋 D027_dsg02.pch	🗋 D027_dsg10.pch	D027_dsgOPOST03.pcl
🗋 D027_dsg03.pch	🗋 D027_dsg11.pch	D027_dsgOPOST04.pcl
🗋 D027_dsg04.pch	🗋 D027_dsg12.pch	D027_dsgOPOST05.pcl
•		•
File <u>N</u> ame:		
Files of Type: D027*.p	ch	~
	ort Similar Results for All Des	ign Cycles
Result Types: 🖲 All 🔾 🤅	Only 🔲 Displacement 🔲 Stre	ess 🗌 Eigenvector 🔲 ESE
Loadcases: 🛛 🖲 All 🔾 🤅	Only	
Modes: 🔹 🖲 All 🔾 🤅	Only	
		Open Cancel

3. Save File Dialog Enhancement. Now save file dialogs remember the directory where a file is saved. The next save/export file dialog begins in that same directory.

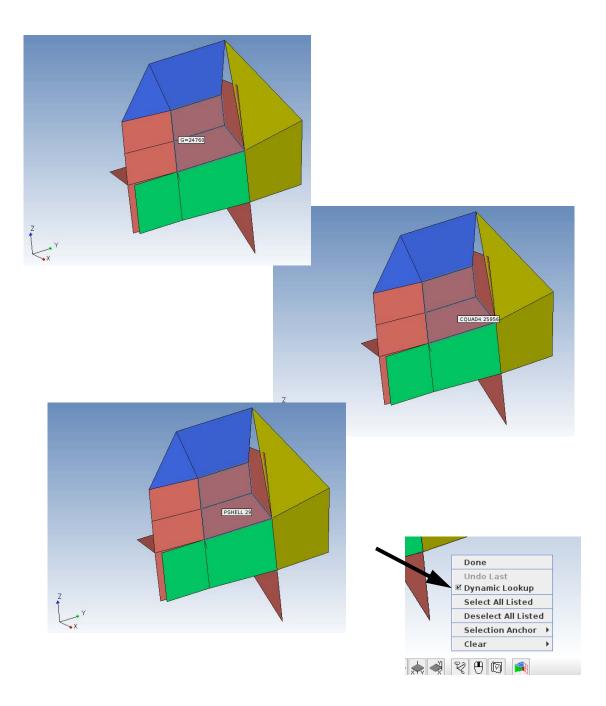
4. Import Post Dialog Enhancement. The Import->Post open file dialog now allows multiple files to be selected. If the "Import Similar..." box is checked, then files similar to any selected file will also be imported.

P	Ι	mport Punch/Out	put2 Results.		~ ^ 😣	
Look <u>I</u> n: 📑 vr	and			- A (
📑 bcw		D027_dsg05	5.pch	D027_ds	g13.pch	
📑 exl		🗋 D027_dsg06	5.pch	🗋 D027_ds	g14.pch	
📑 sms		D027_dsg07	7.pch	D027_ds	gOPOST00.pcl	
D027_dsg00	.pch	🗋 D027_dsg08	3.pch	D027_ds	gOPOST01.pcl	
D027_dsg01	.pch	🗋 D027_dsg09).pch	D027_ds	gOPOST02.pcl	
D027_dsg02	.pch	🗋 D027_dsg10).pch	D027_ds	gOPOST03.pcl	
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D027_dsg04	.pch	🗋 D027_dsg12	2.pch	🗋 D027_ds	gOPOST05.pcl	
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	🗌 Import	Similar Results	for All Desi	gn Cycles		
Result Types: @	🛛 All 🔾 On	ly 📃 Displacem	ient 🗌 Stre	ss 🗌 Eigen	vector 🗌 ESE	
Loadcases: (🖲 All 🔾 On	ly				
Modes:	🖲 All 🔾 On	ly				
				Open	Cancel	

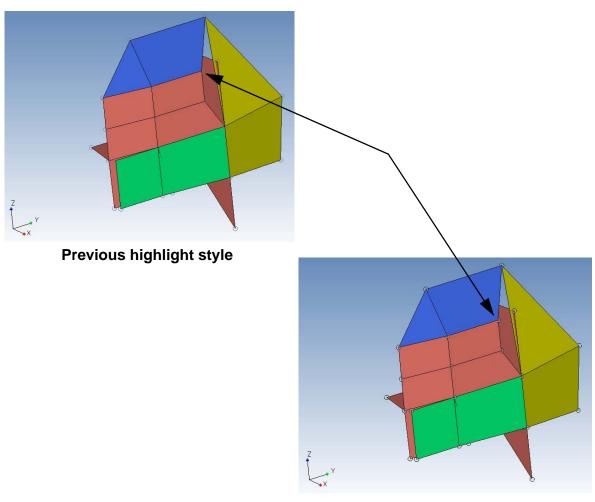
5. New Examples. There are seven new step-by-step example problems in the Design Studio Examples manual that illustrate new capabilities of Genesis.

3 Display Enhancements

1. Dynamic Grid/Element/Group Lookup. Now all grid/element/group selection panels have the option to dynamically lookup and display the ID of the grid/element/group under the mouse. The right-click menu contains an option to disable/enable this option.



2. Enhanced Grid Highlighting. Selected grids are draw with a different style intended to make the selection more visible on a wider range of model/background colors.

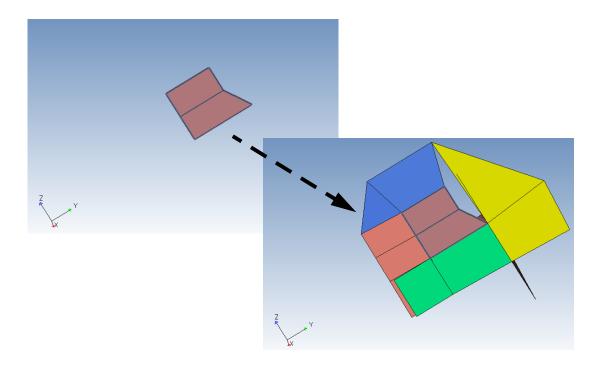


Version 15.0 highlight style

New Features

3. Enhanced Show/Hide Elements. A new button in the show/hide elements panel can show elements connected to the currently shown elements. This option can "bring back" hidden elements that are connected to a shown element. Note that if connected elements are in a hidden group, the group (and hence those elements) will remain hidden.

Display Analysis Topology Design Post Plugins
🐒 🐨 Show / Hide Elements 🏠 1
Select Elements to Keep or Hide Element Selection Options
Pick Elements from the Viewport
Pick By Feature-bounded Surface
Select by Element ID:
Remove
Select All Select None Invert
All in Group
Add Elements Connected to Current Selection
Add Elements Connected to Selected Grids
2 elements selected
Show Connected to Currently Shown
Show All Show Only Selected Hide Selected

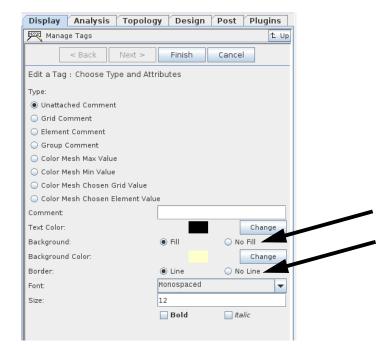


4. Enhanced Assembly Control. The Assembly panel now allows multiple assemblies to be shown or hidden with one button click. Previously, when multiple assemblies were selected, the Show and Hide buttons were disabled.

Display	Analysis	Topology	Design	Post	Plug	jins
💐 Manag	ge Assemblies					î Up
Built-in				Visi	ible Gr	roups
Built-in					All Gr	
Built-in					PS	SHELL
Built-in						SOLID
Built-in						PCOMP
Built-in						omain
Built-in			Rig	id / Int		
Built-in Built-in						CONM2
Built-in				Topolod		
Built-in			т	opograph		
Built-in			'		ng Desi	
Built-in				Topometr		
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		2 items sel	ected			
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New Features

5. Enhanced Annotation Tags. Tags used to annotate grids, elements or groups have new options to be drawn with or without a filled color background and with or without a border outline.



4 Analysis Preprocessing Enhancements

1. Element Editing Enhancements. Now RBE2 elements can be converted into RBE3 elements and vice versa.

Display Analysis Topolog	gy Design Post Plugins
Elements	▼
< Back Next >	Finish Cancel
Edit Elements : Choose RBE Refe	rence Grid
Choo	se Grids
Pick Grids from the Viewport	
Select by Grid ID:	
Туре:	RBE2
	⊖ RBE3
Independent Grid:	16796
Dependent Components:	123456

5 **Postprocessing Enhancements**

1. Enhanced Synthetic Results. Now a synthetic result can be created from a temperature load. This can allow easy visualization of applied temperatures of static loadcases.

Display Analysis Topolog	gy Design Post	Plugins
🌇 Manage Result Datasets		1 Up
< Back Next >	Finish Cancel	
Create Synthetic Result : Define F	Processing Step	
Operation:	Temp. Load Set	-
	Generate from Temp. Load	d Set
Scalar Parameter (a):		
First Result Parameter (R1):		
Existing Result		
O Previous Step:		-
Second Result Parameter (R2):		
Existing Result		
O Previous Step:		-
Temperature Set:	1 Operating temp load	•

2. Compressed File Import. To support the new compressed OUTPUT2 files produced by *GENESIS*, Design Studio now has the ability to open/import any file compressed in the standard gzip format (*.gz). Compressed files selected for open/import will be transparently uncompressed while reading.

6 New Example Problems

The following table describes new examples and their corresponding input file names. The listed files are provided with the installation:

Name	Problem	Special Features	Figure
TPDSG029.dat	Topology Optimization with Different Material Types	 Using different types of materials Compare designs from the multiple runs 	
TPDSG030.dat	Fabrication Constraints - Periodic and Mirror Symmetry	 Using mirrored peri- odic fabrication con- straints 	
TPDSG031.dat	Fabrication Constraints - Pattern Repetitions	 Using pattern repeti- tion fabrication con- straints in three directions simulta- neously 	
TPDSG032.dat	Cloning Topology Design Over Multiple Regions	 Cloning topology design across regions Cloning with and with- out scaling 	
TMDSG014.dat	Coarse Topometry Optimization - Mesh- independent Symmetry Constraints	 Coarse topometry with the cell size option Mesh independent symmetric design 	\succ
FRDSG010.dat	Optimizing Equivalent Radiated Power (ERP)	 Defining panel to compute ERP Topology optimization for ERP reduction 	

New Features

ASDSG009.dat	Static Analysis with Bolt Preloading	Defining bolt pre-loads in model Perform analysis with and without bolt loads	

7 Compatibility with Previous Versions

1. Design Studio database files (*.dsg) written with version 14.0 or earlier are compatible with version 15.0. However, database files written with version 15.0 are not compatible with previous versions.