

Section D Software

Section Analysis and Design of Vehicle Structure Components

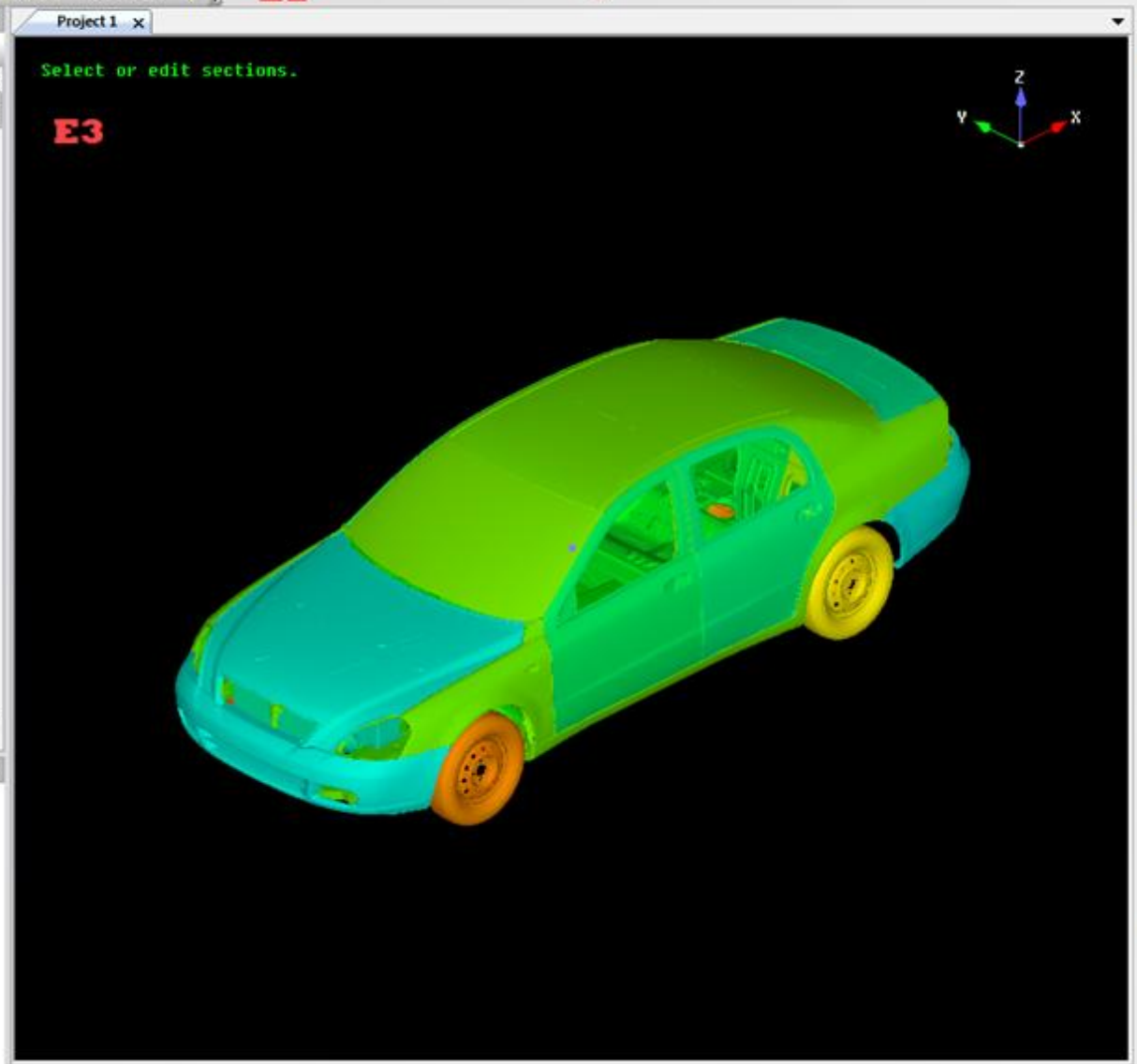
User Tutorial

2015.1

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Project Explorer

- Project 1 **E4**
 - Materials:
 - Properties:
 - PART_1
 - PART_5
 - PART_8
 - PART_23
 - PART_35
 - P0154002
 - .1
 - .2
 - .3
 - .4
 - .5
 - .6
 - 154101
 - 154102
 - 154103
 - 154104
 - 154105
 - 154106
 - 154107
 - 154108
 - 154109
 - 154111



Properties **E5**

Output **E7**

Total number of section: 256
Total number of material: 301
Total number of property: 361
Total number of node: 392933
Total number of 2D element: 357329
Done: Input Dyna

Tools **E6**

Display

- Reset View
- Adjust View
- Center View
- Left Right
- Bottom Top
- Back Front
- Set Rotate Center

Color mode:
 Property Material

Model mode:
 Shade Mesh
 Grid Hide

Show edges on shade mode
 Show coordinate system
 Print Mode

Edit

- Undo (Ctrl+Z)
- Redo (Ctrl+Y)

Edit mode:
 Property Material
 Element Node
 Section Model

Edit

- Create New
- Delete Selected
- Adjust Group of Selected
- Move Selected

View

- Open Selected Section's View
- Close Selected Section's View

File

Project File

- New Project
- Open Project
- Close Current Project
- Save Current Project
- Save Current Project As ...
- Print Current Project

Project View

- Open Current Project's View

File Edit Analysis Display View Help **E1** **E2**

Project Explorer

- PID:10143
- PID:10145
- PID:1014 **E4**
- PID:10155
- PID:10157
- PID:10159
- PID:10163
- PID:10165
- PID:10167
- PID:10169
- PID:10188
- PID:50959152
- Models:
 - b_pillar.nas
 - Section Group 1:
 - Section 1-1
 - Section 1-2
 - Section 1-3
 - Section 1-4
 - Section 1-5
 - Section 1-6
 - Section 1-7
 - Section 1-8
 - Section 1-9
 - Section 1-10

Properties

E5

Project 1.sdproj Section 1-2

144357.1
115980.1
72352.2
24117.4
(L) Fz- 3.0 30.8 58.5

E3G

Select or edit elements.

E3

Title	Result	Co
Geometric:		
Geom A	817.8	E3S
Geom Asx	301.3	
Geom Asy	641.6	
Geom by	-50006.9	
Geom lx	961348.1	
Geom ly	128631.1	
Standard Eqv:		
Eqv. A	817.8	
Eqv. Asx	301.3	
Eqv. Asy	641.6	
Eqv. by	-50006.9	
Eqv. lx	961348.1	
Eqv. ly	128631.1	
Axial Force z+:		
Fz+ Max	214678.9	
Fz+ Cri	171743.1	
Fz+ Avg	161009.2	
Axial Force z-:		
Fz- Max	144357.1	
Fz- Cri	115980.1	
Fz- Avg	48234.8	
Bending Mx+:		
Mx+ Max	3601244.8	
Mx+ Cri	2880995.8	
Mx+ Avg	2700933.5	
Bending Mx-:		

Output

Opened project D:\Project\测试中文路径\Project 1.sdproj

E7

Tools

Display **E6**

Reset View

Adjust View

Center View

Color Mode:

Property Material

Show Nodes

Show Elements

Show Element Thickness

Show Grid Guides : Scale = 10

Show Coordinate System

Print Mode

Analysis

Check for Analysis

Copy Result to Clipboard

Assumption Mode:

Upper (All stable post buckling)

Lower (Instable if any buckling)

Loading Case:

Axial F+ Axial F-

Bending Mx+ Bending Mx-

Bending My+ Bending My-

Sheet Option:

Scientific Value: Corner

Value: Critical Value: Average

Value: Max Value: Min

View Option:

Show Weakest Element Mark

Show 360° Moment Of Inertia

Show Principal / Shear Center

Edit

Undo (Ctrl+Z)

Redo (Ctrl+Y)

Edit mode:

Property Material

Element Node

Weld

Draw

Draw Segment

Draw Line Strip

Draw Line Loop

Draw Bezier Curve

E1:Menu

Menu.

E2:Toolbar

Contains most frequently used common commands.

E3:Main View

Displays project/section.

E3G:Section Strength Graph View

Displays section's analysis result curve.

E3S:Section Strength Sheet View

Displays section's analysis result sheet.

E4:Project Explorer Window

Contain project and its models, materials, properties, sections in tree form.

E5:Property Window

Shows selected object's editable information.

E6:Tool Panel Window

Shows all available commands for current viewed project / section.

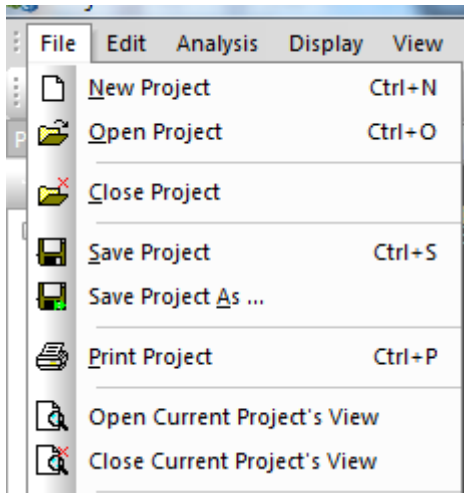
E7:Output Window

Shows output text.

Project new/open/save/close/print/open view/close view

Project contains models, materials, properties and sections. One project can be saved into one file, with all your analysis and design work saved. Open it next time to continue your work.

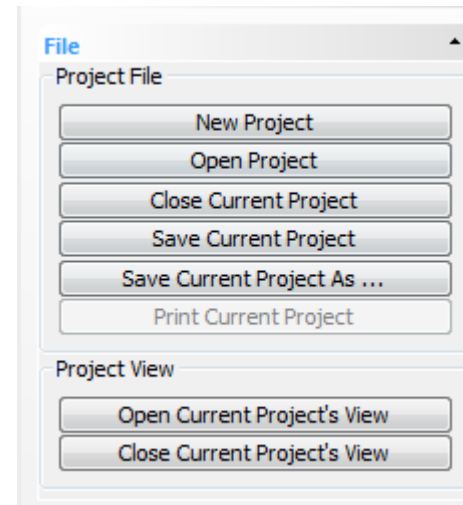
Using Menu:



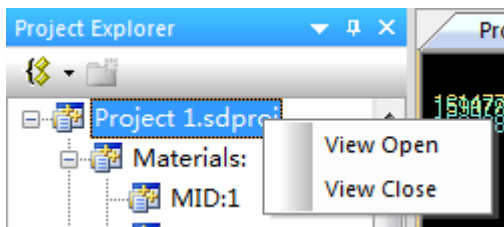
Using Toolbar:



Using Tool Panel



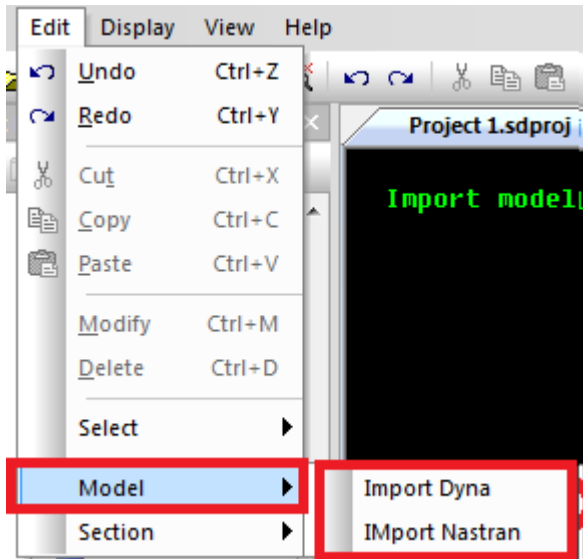
Using Project Explorer



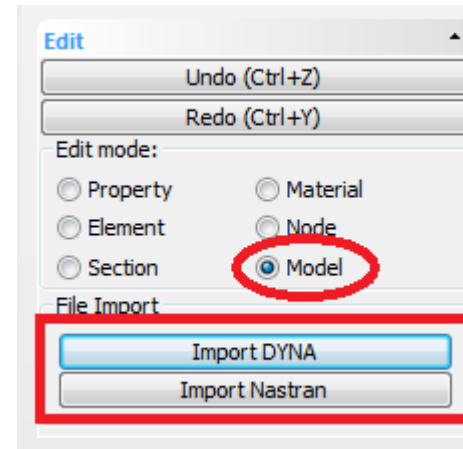
Model Import:

Import FEA model (dyna / nastran)

Using Menu:



Using Tool Panel:



Rotate/Zoom/Move:

To rotate:

shift/ctrl key + mouse left button drag

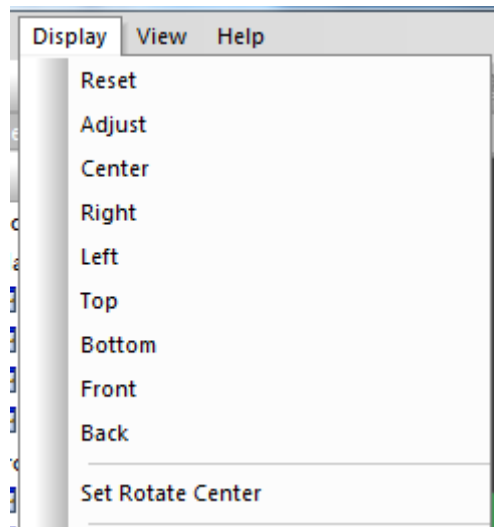
To Zoom:

shift/ctrl key + mouse scroll, or
shift/ctrl key + mouse middle button drag

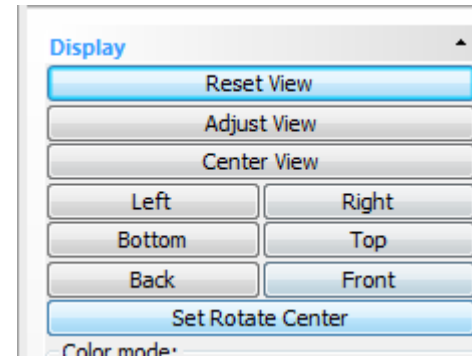
To Move:

shift/ctrl key + mouse right button drag

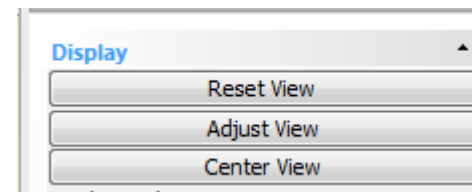
Using Menu:



(For Project)Using tool panel:



(For Section)Using tool panel:



Select Object:

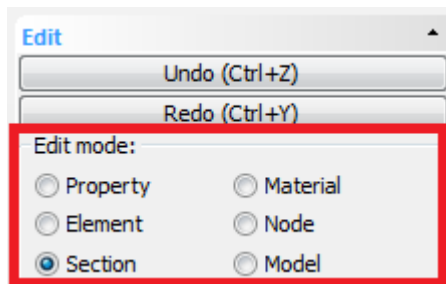
Select object(s) to view its information or for further operation.

Change Select/Edit Object Mode:

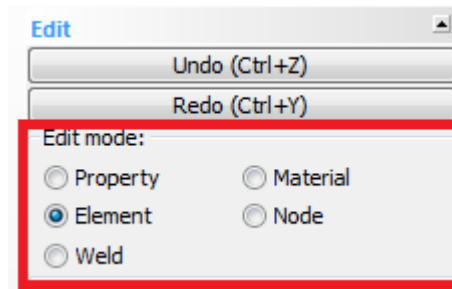
Change the object type you want to select/edit. For example:

- material
- property
- node
- element
- model
- section
- weld

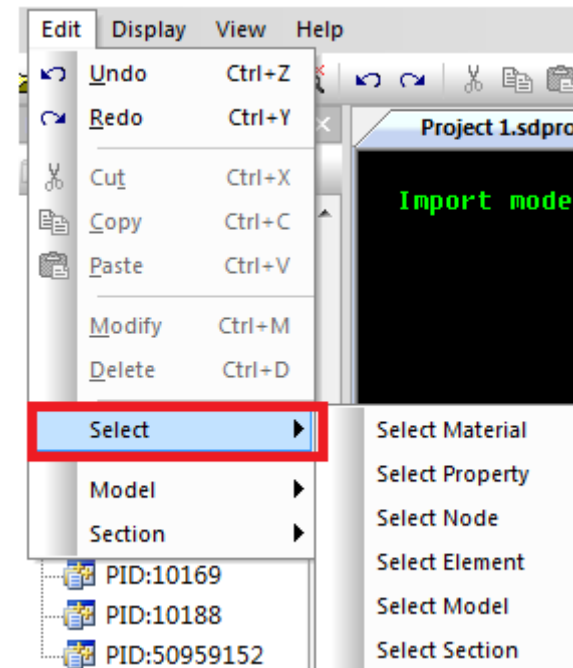
(For project)Using tool panel:



(For Section)Using tool panel:

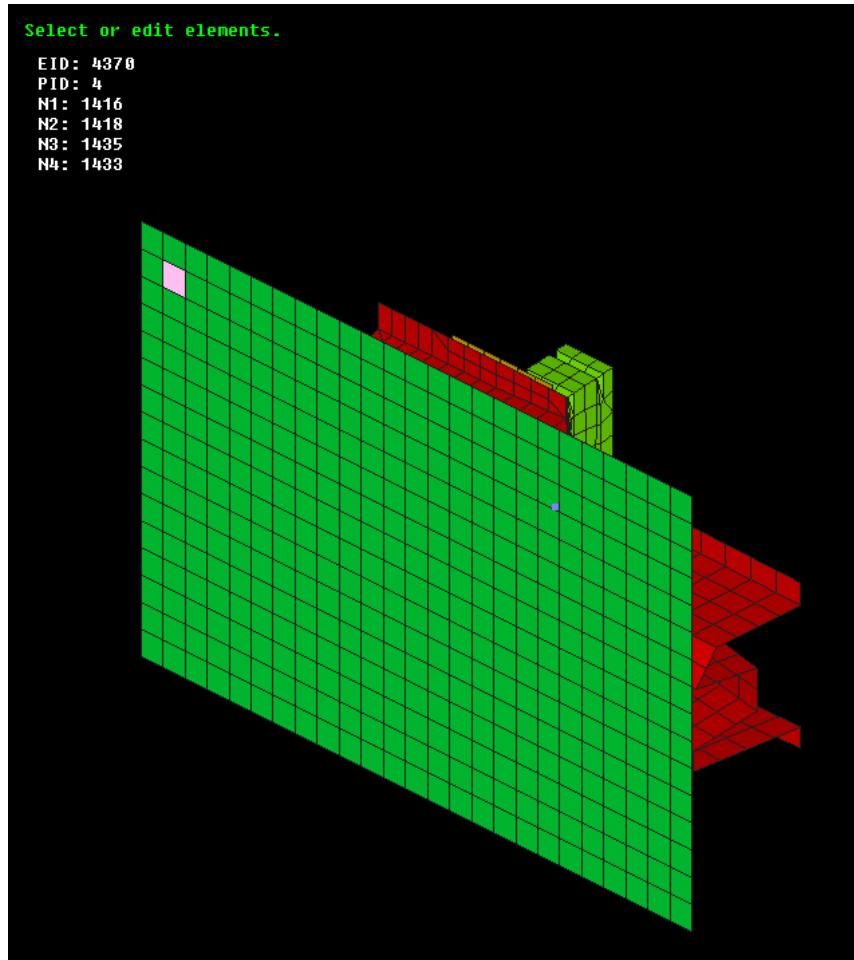


Using menu:



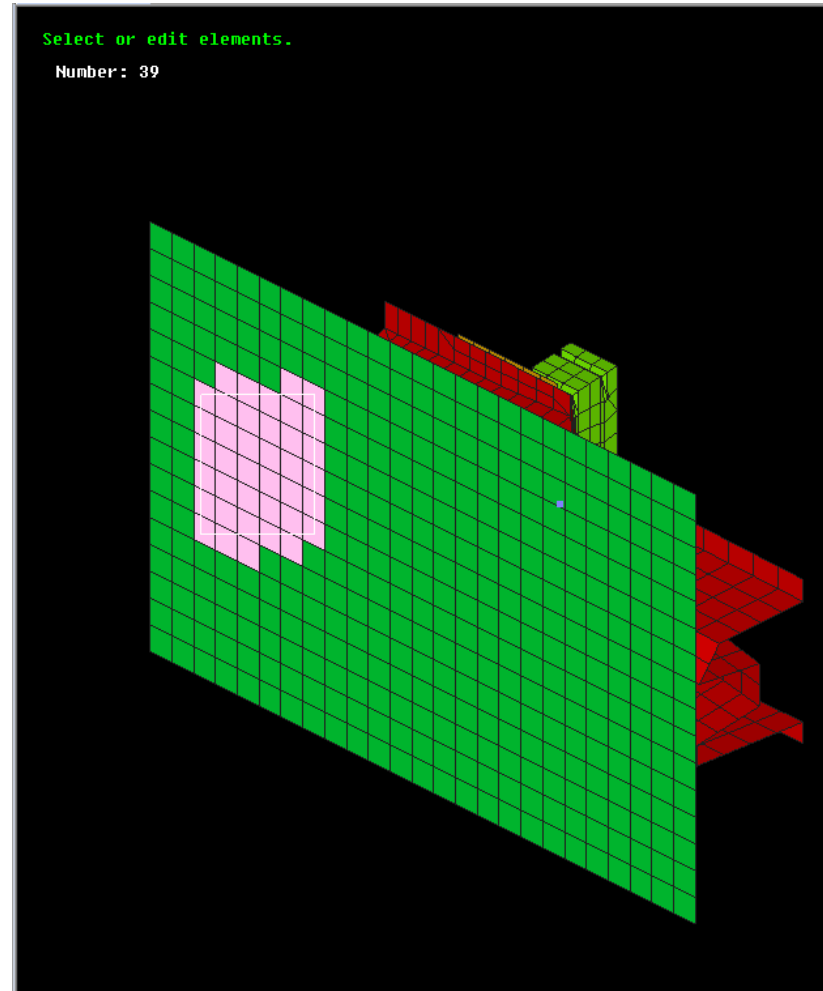
Single select:

Move mouse to cover the wanted object, then click.



Multiple select:

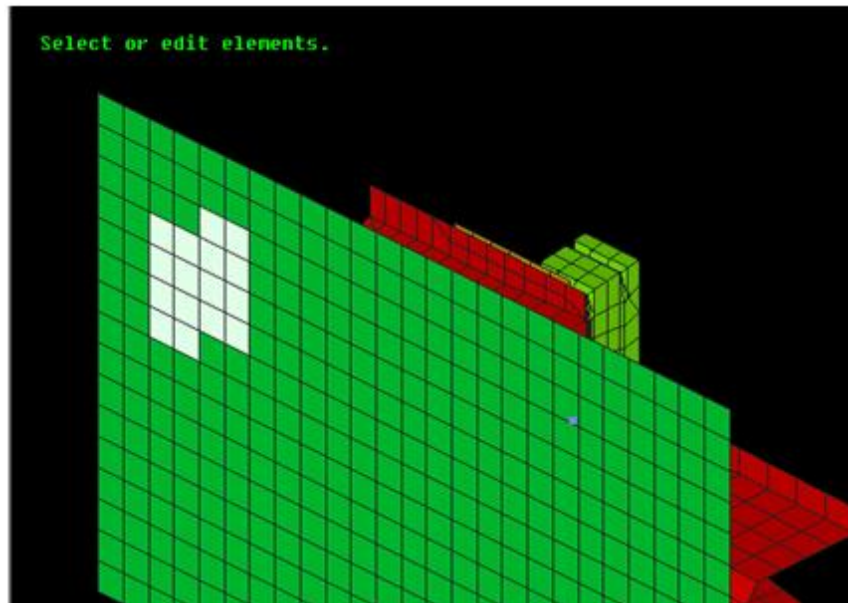
Push the left button and drag to create a selection box.



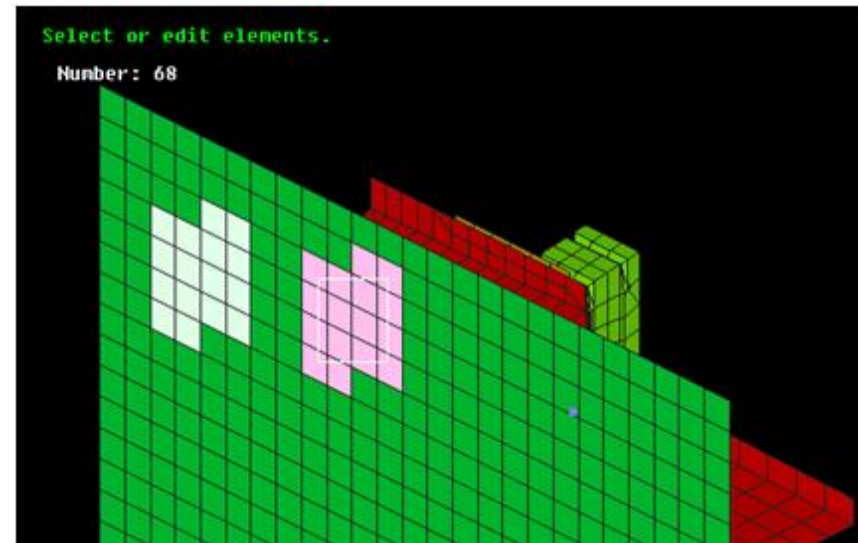
Shift + Select

Select object(s) with shift key down, will select without clearing previously select object(s).

Before:



After:



Note that:

When multi-selecting. First drag to create the selection box, then push shift and release the left button with shift down.

If you push the shift before dragging, the app will consider it is a rotate operation.

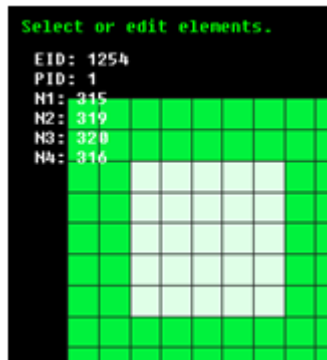
drag -> push shift -> release L button = shift selection

push shift -> drag -> release L button = rotation

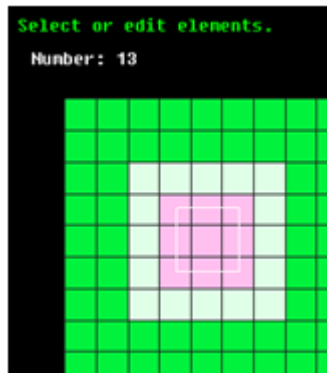
Ctrl + Select

Select object(s) with ctrl key down, will reverse the object(s)' selected/unselected status.

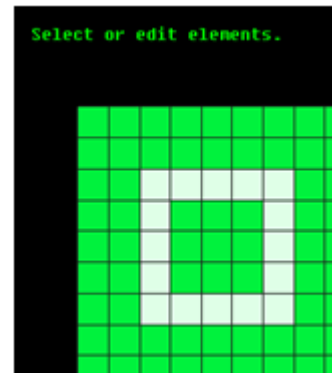
Before:



Operating:



After:



Note that:

When multi-selecting. First drag to create the selection box, then push ctrl and release the left button with ctrl down.

If you push the ctrl before dragging, the app will consider it is a rotate operation.

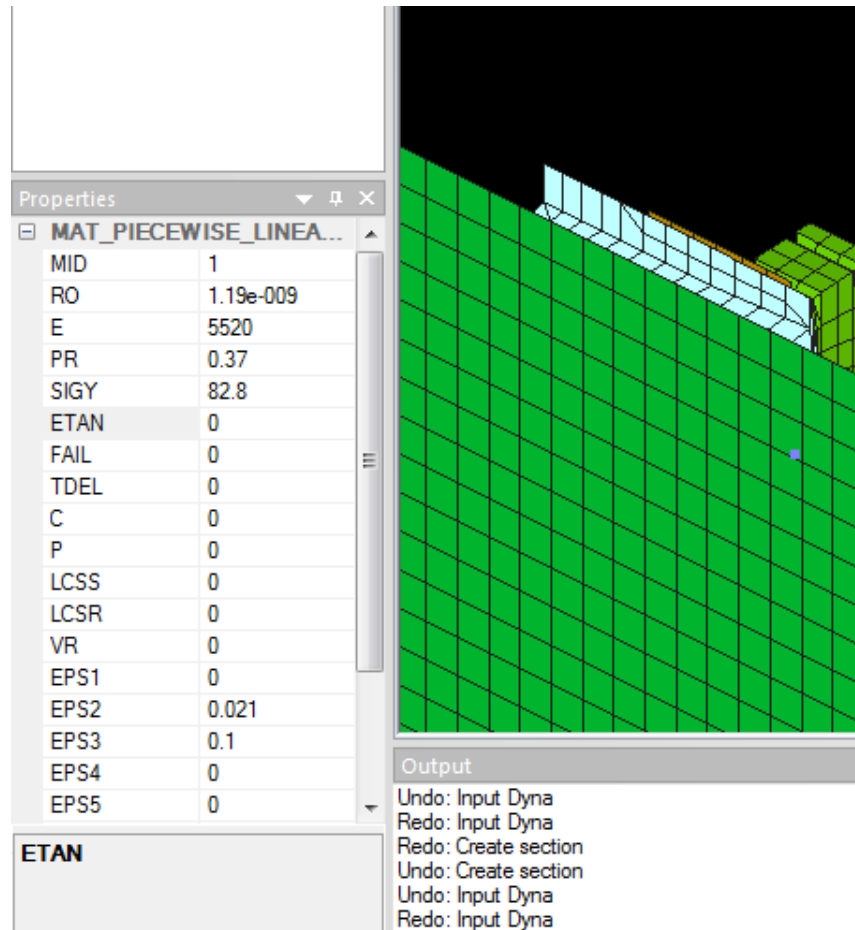
drag -> push ctrl -> release L button = ctrl selection

push ctrl -> drag -> release L button = rotation

Edit Object:

Using Property Window:

Select one object, and modify the data in property window.



The screenshot displays a 3D model of a structure with a green mesh. A Properties window is open on the left, showing the following data:

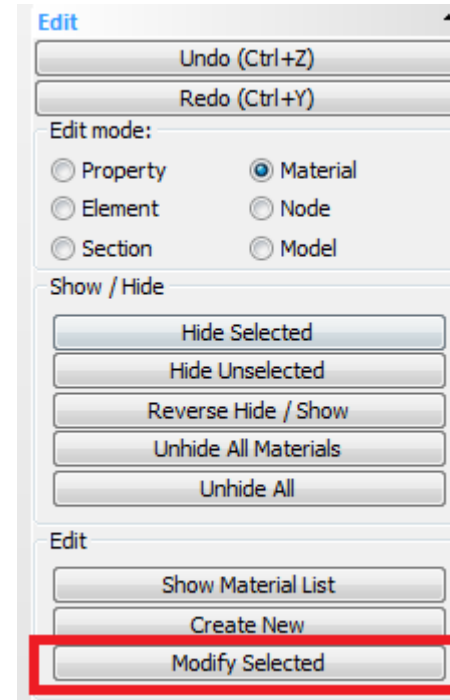
Property	Value
MID	1
RO	1.19e-009
E	5520
PR	0.37
SIGY	82.8
ETAN	0
FAIL	0
TDEL	0
C	0
P	0
LCSS	0
LCSR	0
VR	0
EPS1	0
EPS2	0.021
EPS3	0.1
EPS4	0
EPS5	0

Below the Properties window, the Output window shows the following text:

```
Undo: Input Dyna  
Redo: Input Dyna  
Redo: Create section  
Undo: Create section  
Undo: Input Dyna  
Redo: Input Dyna
```

Using Menu Or Tool Panel:

Select one object, then click the modify button.

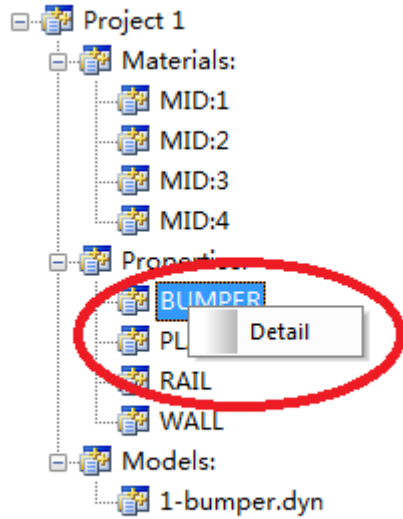


The screenshot shows the Edit menu with the following options:

- Undo (Ctrl+Z)
- Redo (Ctrl+Y)
- Edit mode:
 - Property
 - Material
 - Element
 - Node
 - Section
 - Model
- Show / Hide
 - Hide Selected
 - Hide Unselected
 - Reverse Hide / Show
 - Unhide All Materials
 - Unhide All
- Edit
 - Show Material List
 - Create New
 - Modify Selected**

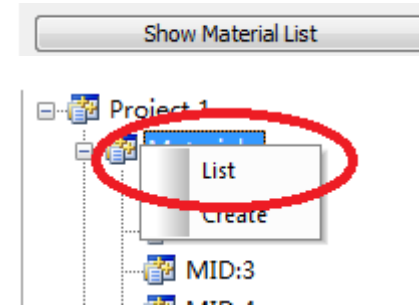
Using Project Explorer:

Right click the item in the project explorer window you want to edit, and click the detail button on the popped menu.



Using List Dialog:

Call the list dialog.

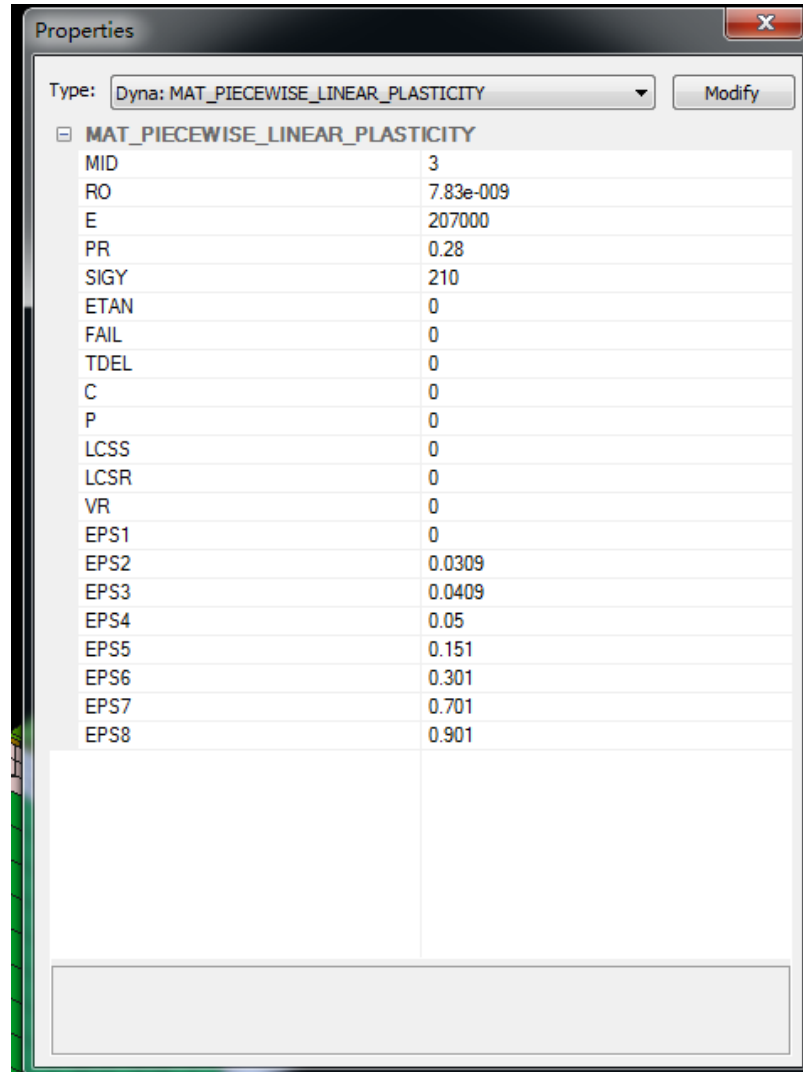


Click the detail button in list dialog.

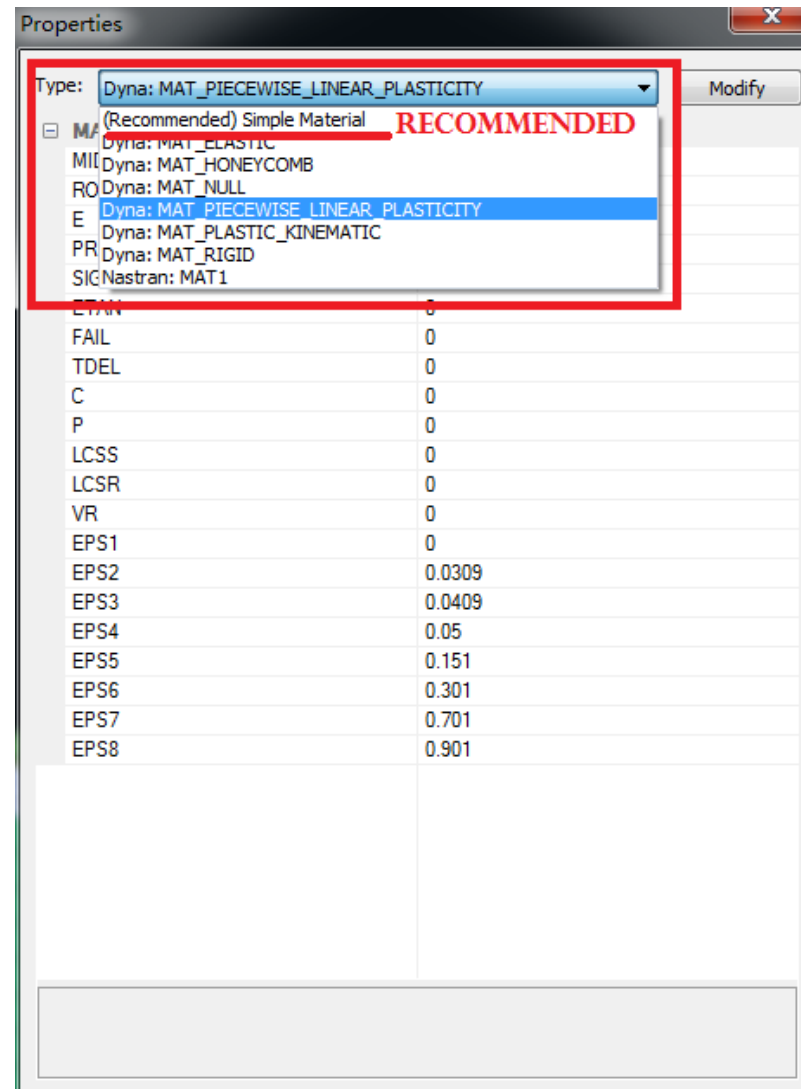
A screenshot of the material list dialog. It features a table with columns for 'Poisson Ratio', 'Young's Modulus', 'Yield Stress', and 'Ultimate Stress'. The table contains four rows of data. To the right of the table are 'Create' and 'Detail' buttons. The 'Detail' button is circled in red.

	Poisson Ratio	Young's Modulus	Yield Stress	Ultimate Stress
E...	0.37	5520	82.8	103.5
E...	0.28	207000	210	262.5
E...	0.28	207000	210	262.5
	0.28	207000	-	-

Edit the object data in popped dialog:



You can also change the card type:



Hide/Unhide Object(s):

You can hide/unhide materials/properties/elements.

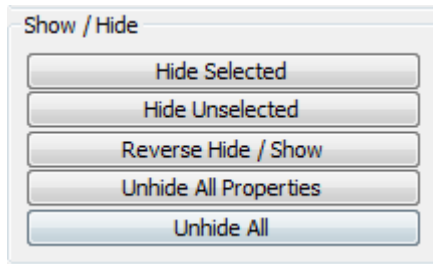
An element is considered hidden if any of the following takes effect:

- 1.the element is hidden
- 2.the element's property is hidden
- 3.the element's material is hidden

The hidden element will be invisible and will not be cut into any section element.

Use this function to analysis small part of big model.

Using Tool Panel:



Note that:

1."Unhide All Materials/Properties/Elements" will only unhide all Materials/Properties/Elements. But as long as there is other hidden type takes effects, the related element(s) will remain hidden. to clear all hidden setting, use "unhide all" button.

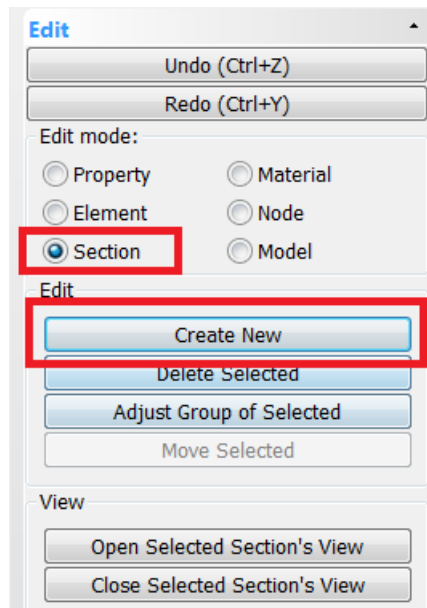
2."Hide Selected"/"Hide Unselected"/"Reverse Hide/Show" are similar, only effects the objects depend on current select mode.

3.All Hide/Unhide function is not considered as edit behavior, so it is not applicable for do/undo function. Also the hidden status will not be saved/loaded with project save/open function.

Section Create:

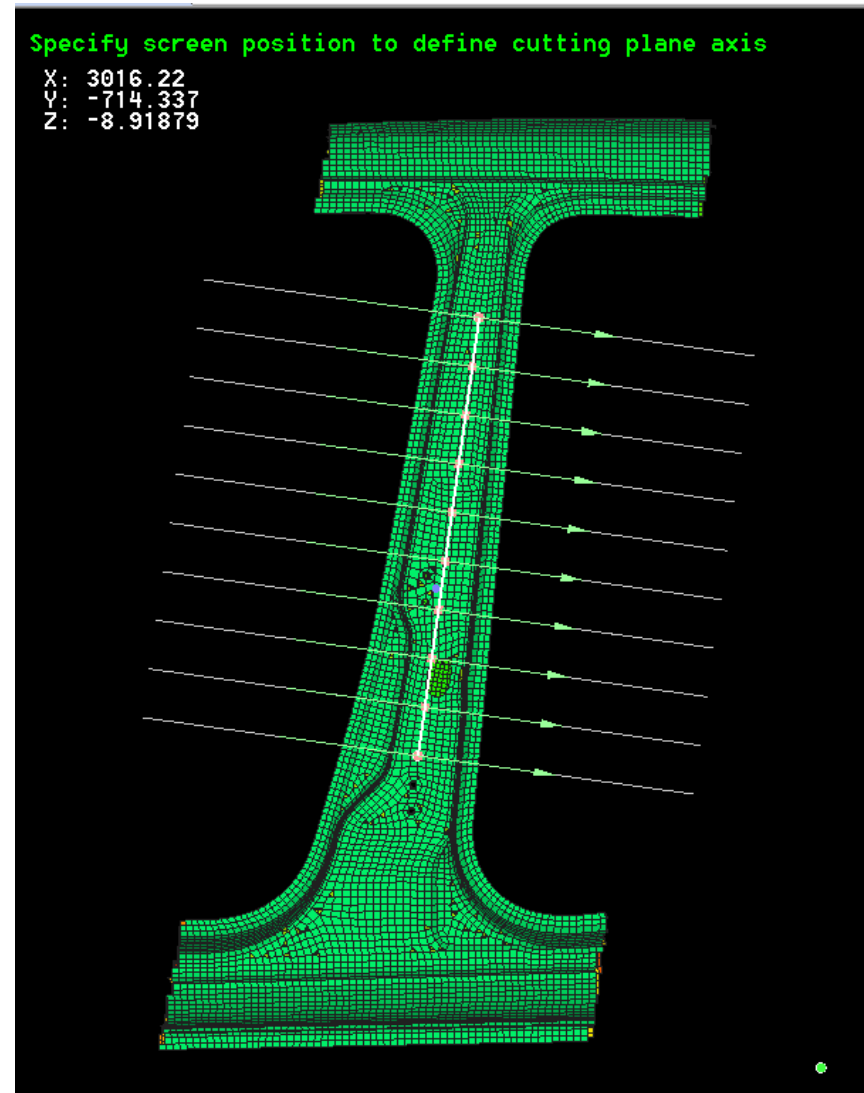
Step1:

Click the "Create New" Button.



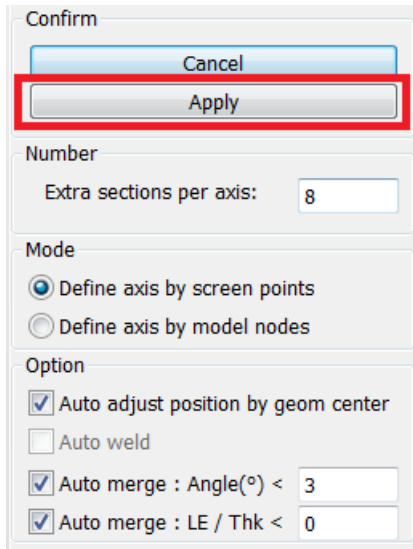
Step2:

Define cutting plane axis in main view.



Step3:

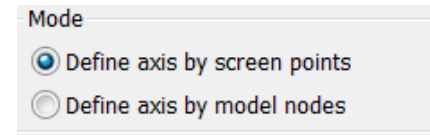
Confirm.



Options:

1. Created section's direction depends on the view orientation when you click the "Create New" button. After that you can freely rotate the view when defining cutting plane axis with the section direction unaffected.

2. There are 2 modes to define cutting plane axis node.



Screen point mode means to specify point directly; the point's depth will be same as rotate center depth. Rotate the view to define the very position you want.

Model node mode means to select the existing model node.