Altair HyperWorks™

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FE Absorb Connectors

Use the FE Absorb tools to create connectors from existing mesh that meet specific types of realizations.

1. From the Connectors ribbon, click the **FE Absorb** satellite icon on any of the tools in the Create tool set.

   Each type of absorption is separated by the type of connector you are trying to absorb. The Point tool is shown here as an example.

   

   Figure 1.

2. Click ≡ on the guide bar.
3. On the FE details options page, choose a selection method.
   - **Automatic** - Select the type of realization you wish to absorb before running the process.
   - **Manual** - Specify the elements you want to absorb within your model and the realization type, then run the absorb algorithm on just those selected elements.

4. Define the remaining FE details options.

FE Connectivity (Spots Only)

For many FE config types, this option is pre-determined. But for some types of weld representations, multiple configurations of connectivity are valid. In such cases, you should select the type that is best for the model. For example, a Nastran CWELD element is a mesh-independent weld, which does not directly connect to the shell elements; depending on how it was generated, plot elements are sometimes used to connect the CWELD to the shells. In such situations, you should select option 2 - mesh independent (head), rather than option 3. Depending on the FE config selected, one or more connectivity types are valid.

Mesh dependent	Valid for weld elements that share nodal connectivity with the connecting shell parts.
Mesh independent (head)	Valid for weld elements that are mesh-independent (do not share nodal connectivity with the connecting shell parts) but are connected to the shell parts via secondary entities (plot elements, equations, and so on).
Mesh independent (projs)	Valid for weld elements that are mesh independent (do not share nodal connectivity with the connecting shell parts) and are not connected to the shell parts in any way. Only their projections fall on the shell elements.

Combine in case of equivalent body nodes (Spots Only)

FE Absorption logic enhancement while absorbing connectors if body is separated on both sides of the layer. Even if body has coincident nodes on both sides of a layer, instead of absorbing as multiple connectors, it is absorbed as one single connector.

Enhanced approach (Lines and Areas only when set to Manual)

The absorption of solid seams and area connectors can be performed on all elements in a model. In order to identify valid connector elements from such a selection, instead of identifying regular solid parts as connections, certain characteristics need to be true.

Note: The pre-selection of valid connection elements helps to absorb connectors faster.

Select this checkbox when some of the characteristics the tool is looking for might be too strict for certain connections, thus preventing them from being absorbed, even though they represent solid connections.

The enhanced approach requires a pre-selection of only connection elements. The complete selection is treated as valid connection elements, and only connector creation and link detection are

performed.

Area connector mid-position (Area Only)

Position and absorb area connectors into the middle of the hexa adhesive realization. By default, this option is activated.

Consider single element cluster (Area Only)

Identify element clusters using certain rules during absorption. This approach finds plane solid (hexas, pentas) element constellations which are connected to 1D elements on two opposite sides. This option provides better control of the identification of adhesives. The general identification approach allows the creation of adhesive connectors even from single elements, if all other rules are observed. Normally these single elements should be absorbed into spots; this checkbox allows you to also absorb single elements into an adhesive connector.

However, to prevent you from doing this by mistake, even when this option is selected, it only becomes activated if all the selected 3D elements belong to a unique component.

With tie contact (Lines when set to Solid Seams and Areas)

Determine links by investigating tie contacts. Only entities that are part of a tie contact will be considered for links.

Group links (Lines when set to Solid Seams and Areas)

During absorption, the top and bottom side of the solid connection is identified. Combine all found links connected to the top side of the solid connection into one group link and combine all found links connected to the bottom side into a second group link.

When realizing a connector that is defined with group links, it is guaranteed that at each test point valid projections for both group links have to be found in order to have a successful connection. That behavior encourages more reproducible results.

With head only (Lines when set to Solid Seams and Areas)

Only consider solid connections with head elements for absorption.

Tip: It is recommended that you use this option in case you have connections with heads, because it will lead to a better performance and a safer link detection.

Clear this checkbox to also consider connections without head elements. Link detection will rely on projections.

5. Define Creation and Link details options.

   Creation:

Organise connectors into connector groups	Save connector entities into the connector group named after the FE that they are linked to.
Spot line	Combines the Spots into a Spot line if they meet the combine settings.

   Link details:

Maximum link distance	Consider only connections in which the link distance is smaller than this value for absorption. Depending on the unit system used, it may be useful to increase or decrease the value. Very large values can affect performance.
Link type	Can be set to Parts, Properties or Components,
Re-connect rule	This is how the links are referred to by the connector.

use id	Use the selected link entity's IDs to re-connect. If the link entity is not currently in the model, the connector with this re-connect rule will search for entities with the same ID.
use name	Use the selected link entity's names to re-connect. If the link entity is not currently in the model, connectors using this re-connect rule search for entities with the same name.
use uid	Only for Parts. Use the selected link entity's UID to re-connect. If the link entity is not currently in the model, the connector with this re-connect rule will search for entities with the same UID.

6. Select the specific type of realization to absorb using the drop-down menu on the guide bar. If the selection method is set to **Manual**, select the elements you want to absorb.

   All the different realizations that are loaded through the feconfig file (except for a notable few) are listed. For more information on the feconfig file, click here.

7. On the guide bar, click one of the following:
   - ▶ - Run the absorption algorithm and stay in the tool
   - ✓ - Run the absorption algorithm and exit the tool at the end of the process
   - ✗ - Exit the tool without saving changes