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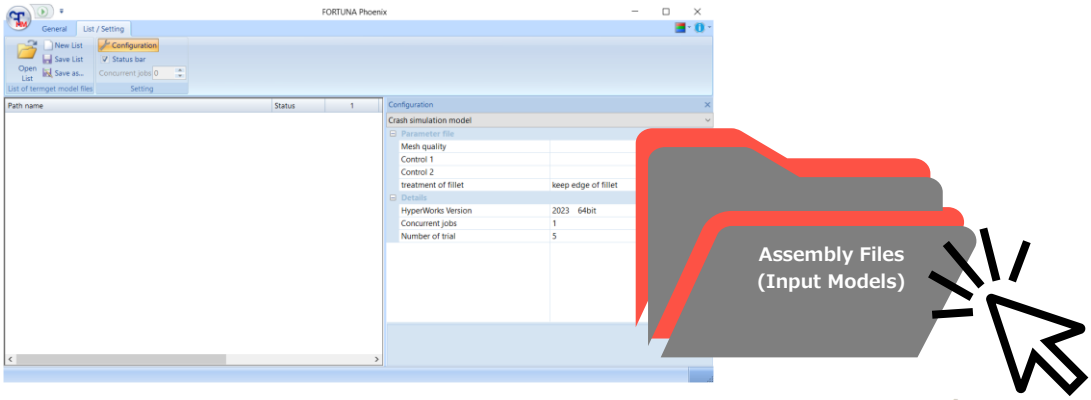
FORTUNA Phoenix

Fully Automatic Mesh Generation Software

① Set the parameter files and register CAD models on GUI.



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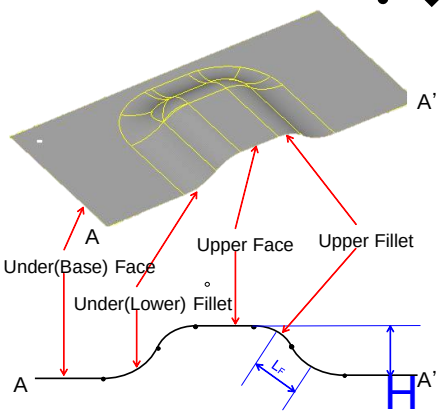
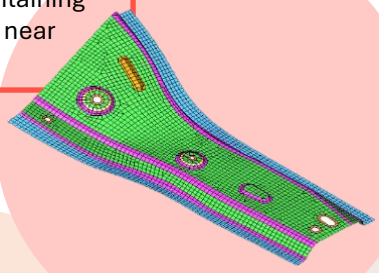


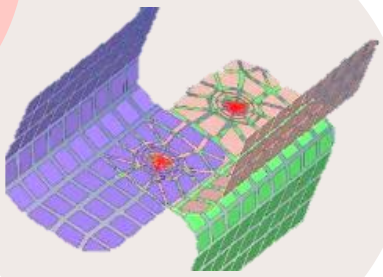
Crash Analysis…Reduces errors by referencing geometry
NV・Strength Analysis・・・ Mesh Generation while maintaining model shapes

Generated Mesh Cases

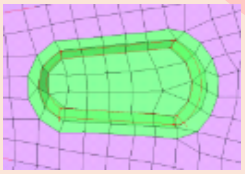
The mesh is generated while maintaining edge lines on one side, and holes near fillets are filled as needed.



Spot weld points on the input CAD model are automatically processed and assembled.



The mesh aligns with the calculated mesh flow.



HyperWorksⓇ is required to run this software.
Please contact us for other compatible software options.

FORTUNA Phoenix

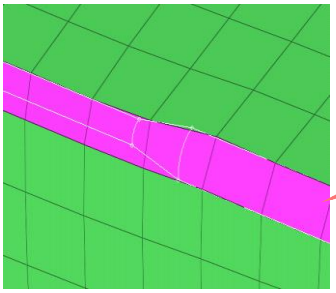
Automatic Shell-mesh Generation According to Your Know-How

Examples of Use Cases for Assembly Models：
Body-in-White (BIW), Under Body Frame, Train Body, Other Sheet-metal Parts, etc

Mesh Control

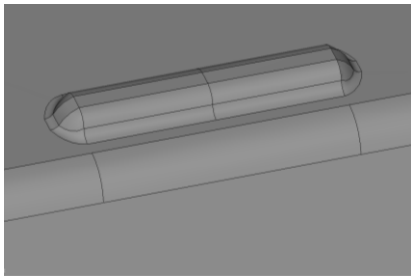
Fillet Mesh Control

①Keeping Fillet Edges ②Keeping Fillet Centers



CASE ①：Generate mesh that keeps fillet edges minimum in case of minimum. height errors, feature lines are move to avoid mesh error
CASE ②：Control Mesh to Keep Fillet Center Lines
(The fillet edges have lower priority)

Specialized Processing for Time-step Error

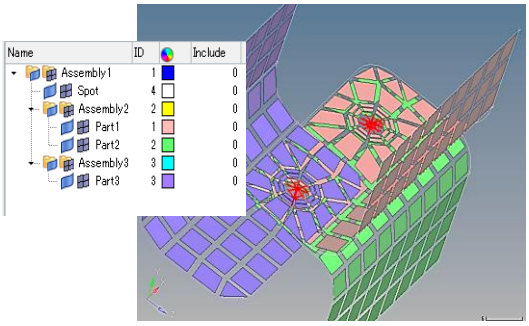


If gaps between a bead and a fillet are narrow, mesh is generated by calculating the time step with the following equations for LS-DYNA.

$$\Delta t = \begin{cases} \mathrm{TSSFAC} \cdot \sqrt{\dfrac{\rho \cdot (1-\nu^2)}{E}} \cdot L_s & \text{for ISDO} = 0 \text{ or } 1 \\ \mathrm{TSSFAC} \cdot \sqrt{\dfrac{\rho}{E}} \cdot L_s & \text{for ISDO} = 2 \end{cases}$$

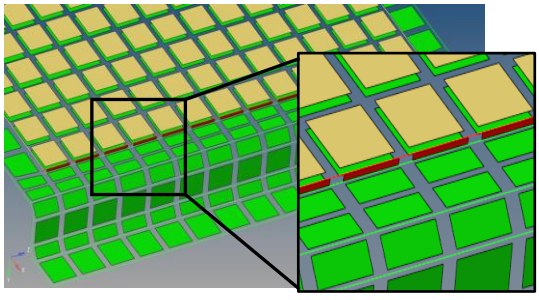
Assembly

Mesh Control for Spot-welding



Bead-welding Connections（Customization）

Mesh is controlled for the evaluation of stresses around bead-welding.



Modification Methods for Mesh Quality Errors

- ✓ Move Node
- ✓ Insert Node
- ✓ Paste
- ✓ Partial Remeshing
- ✓ Edge Swap

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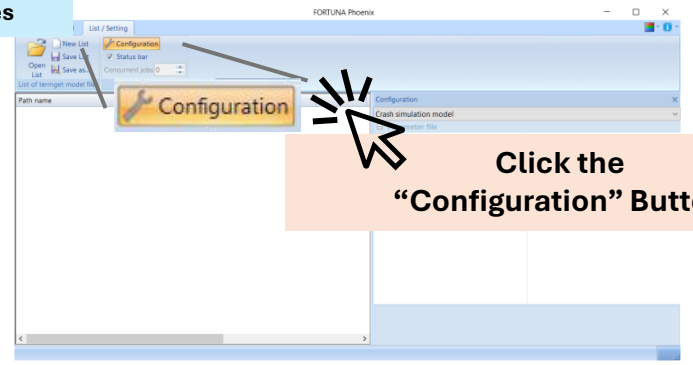
New GUI, Easier to Use!

In addition to the existing interface, the following window will be updated to allow users to set various parameters.

Existing Interfaces



Click the "Configuration" Button

FORTUNA Mesh Quality Settings

ON/OFF	Mesh Quality Items	Criteria	Calculation Method
☑	Target Mesh Pitch	5.0	
☑	Minimum Size	2.5	Minimal Height
☑	Maximum Size	8.5	
☑	Aspect Ratio	2.5	Nastran
☑	Warpage	30.0	Nastran
☑	Minimum Internal Angle (QUADs)	65.0	
☑	Maximum Internal Angle (QUADs)	130.0	
☑	Minimum Internal Angle (TRIAs)	40.0	
☑	Maximum Internal Angle (TRIAs)	110.0	
☐	Skew	40.0	Nastran
☐	Jacobian	0.6	At Integration Points
☐	Time step	6.7E-7	LS-DYNA ISDO=1

Open OK Cancel Save

Mesh Quality Settings

FORTUNA Recognition／Mesh Control／Assembly Settings

Recognition | Mesh Control | Assembly

Filets
Circular Holes
Elliptical Holes
Rectangular Holes
Flanges
Embosses
General Surfaces

■ Unified Fillet Setting
(This setting applies to all fillet widths. For fillet widths that require prioritized processing, please use the 'Individual Fillet Settings'.)

Fillet Processing Priority: Fillet Edges

☑ Individual Fillet Settings (Individual settings override 'Unified Fillet Setting' for applicable fillets.)

Target Fillets					Fillet Divisions		Fillet Processing Priority
					Min.	Max.	
2.0	≦	Fillet Width	<	5.0	1	1	Fillet Centers
5.0	≦	Fillet Width	<	11.0	1	2	Fillet Edges
11.0	≦	Fillet Width	<	30.0	2	Auto.	Fillet Edges

Open OK Cancel Save

Recognition／Mesh Control／Assembly Settings

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FORTUNA SOLID

Fully Automatic Solid Mesh Generation Software

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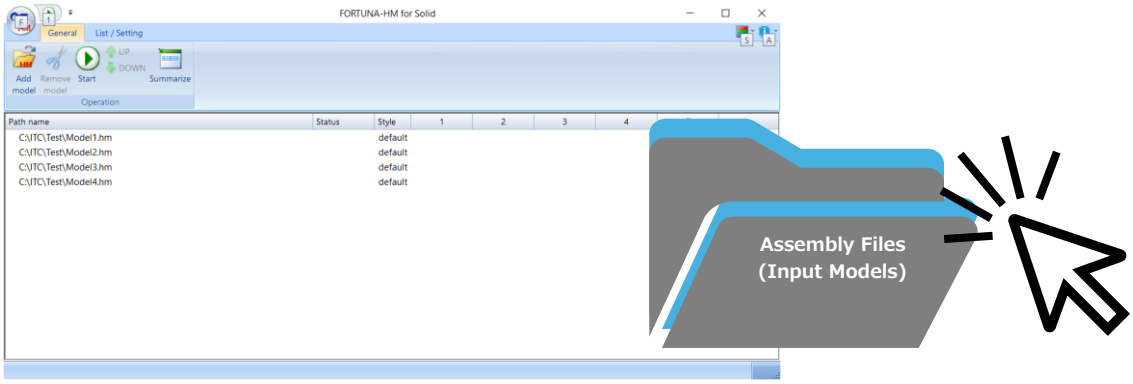

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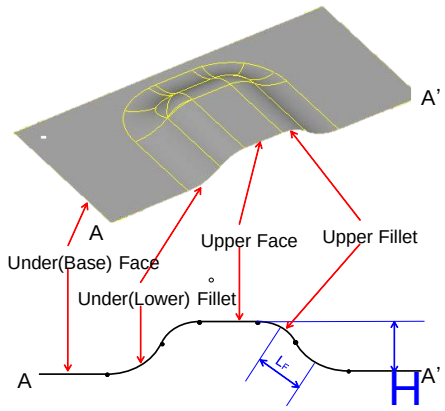

Crash Analysis…Reduces errors by referencing geometry
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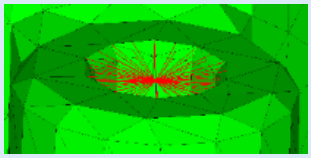
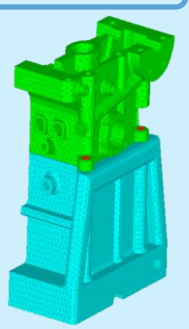
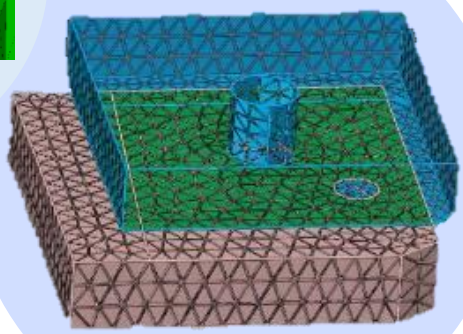
Generated Mesh Cases

Automatic Meshing for Bolt Connectors



Automatic Assembly





Mesh Pattern Matching / Node Sharing

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FORTUNA Solid

Automatic Solid Mesh Generation According to Your Know-How

Examples of Use Cases for Assembly Models :
Powertrain, Pistons, Molds, Cameras, Other Resin Molded Parts, etc.

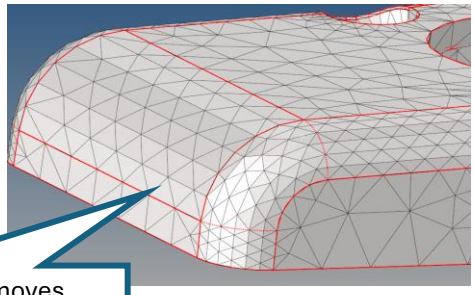
Mesh Control

Mesh Control for Curved Surfaces

Controls the mesh refinement and density so that the deviation from the geometry is within a set value.

Fillet Mesh Control

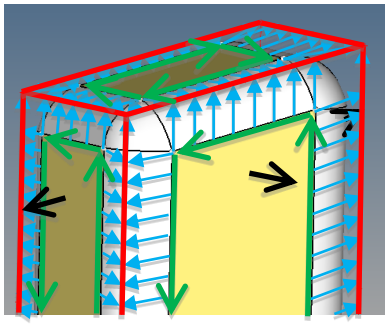
Shape recognition enables detection of fillet flow, guiding mesh generation along the flow. The number of divisions is adjusted for optimal fillet meshing



Shape Simplification

Fillet Defeaturing

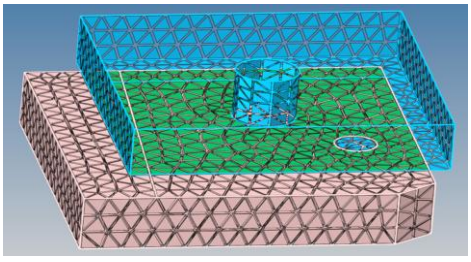
Detects and simplifies fillets/chamfers to enable optimal mesh generation on the cleaned geometry.



Assembling

Mesh Pattern Matching / Node Sharing

Supports mesh matching between parts with non-identical contact surfaces. Contacting areas are automatically detected based on surface normal and gap distances between parts.



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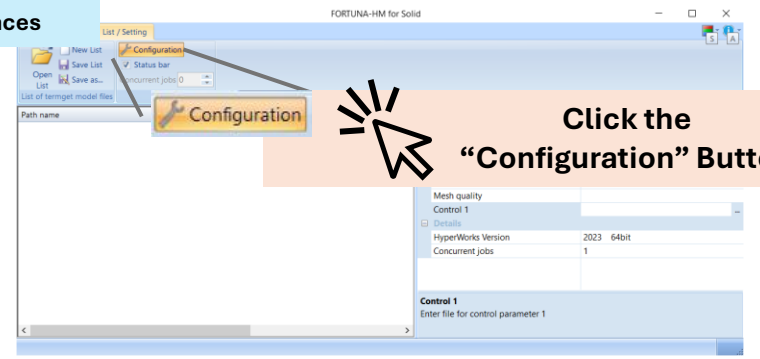

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Open OK Cancel Save

Mesh Quality Settings

FORTUNA Recognition／Mesh Control／Assembly Settings

Recognition | Mesh Control | Assembly

Shape Replication
Fillets
Circular Holes
Elliptical Holes
Rectangular Holes
Cylinders
Logos
General Surfaces

☑ SAG Setting
(SAG represents the maximum deviation between the geometry and the mesh.
To achieve a more detailed mesh representation of the shape, specify a smaller value.)
SAG Value 0.1 mm

☑ Geometry Cleanup
(Unnecessary edges and areas with widths below cleanup standards are removed for shape feature representation. To perform cleanup with a value larger than the minimum element size, specify a desired value.
Cleanup Criteria Minimum Element Size

☑ Shape Simplification
(Fillets and chamfers smaller than the specified value are converted to sharp corners, simplifying the original shape.)
Fillet Width for sharp corner conversion 2.0 mm
Chamfer width for sharp corner conversion 2.0 mm

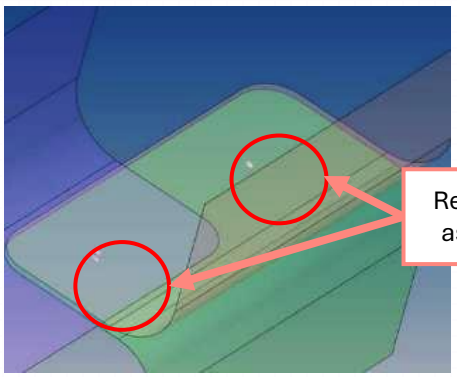
Open OK Cancel Save

Recognition／Mesh Control／Assembly Settings

FORTUNA's Notable Features

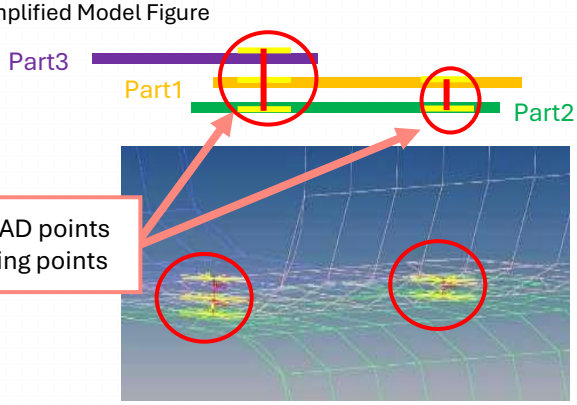
Phoenix — Spot Welding Assembling

◎Retrieve Spot Welding Points

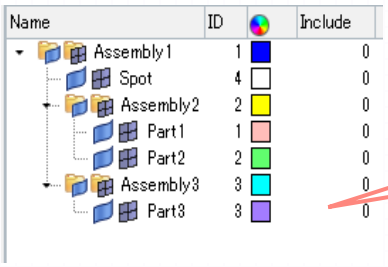


Recognizes CAD points as spot welding points

Simplified Model Figure



◎Retrieve Spot Target Parts Set for Spot Welding Points



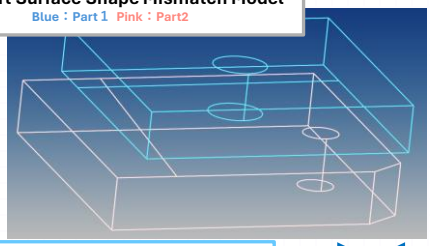
Components located under the assembly that contains CAD points for spot welds are identified as target parts.

Targeting parts within a defined range of spot weld points is possible without specifying the target parts.

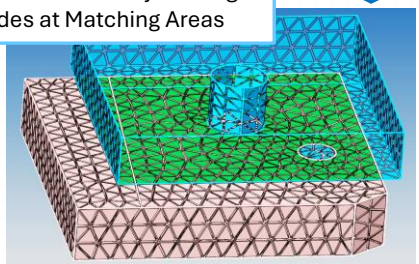
Solid — Contact Surface Recognition ／Node Sharing

Surface matching for node-sharing is performed automatically using directional and spatial evaluations even with non-identical surfaces.

Input Model：
Two-part Surface Shape Mismatch Model
Blue：Part 1 Pink：Part2



Output Model：
Mesh Generated by Sharing Nodes at Matching Areas



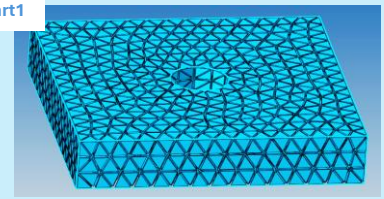
Input

Processing

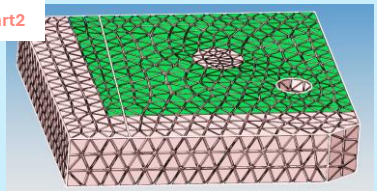
◎Individually generates mesh after cutting each part at matching areas.

◎ Assembles parts through node sharing at matching areas.

Part1



Part2



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