

V9R1 New Mesher Tutorial

1. Remove Edge
2. Keep the Connector/Contact
3. Auto Mesh (Max/Min size, Gradation Factor, Chordal Error Ratio)
4. Run Simulation

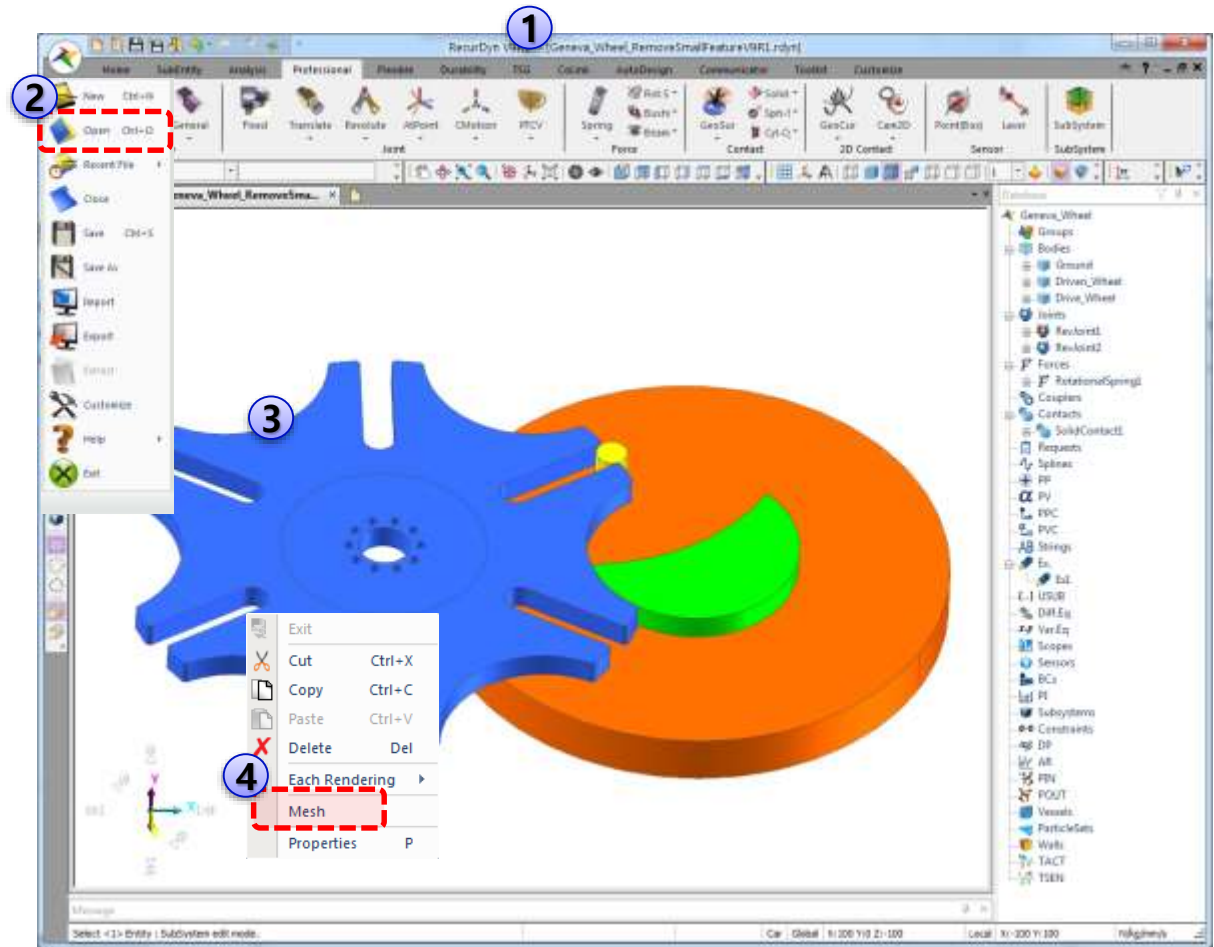
English

한국어

Step 01 – Enter the Mesh Mode

Steps

- ① Starts RecurDyn V9R1.
- ② Open the "Geneva_Wheel.rdyn"
- ③ Select the body, "Geneva"
- ④ Right-click on the "Geneva" body, and select the "Mesh" command

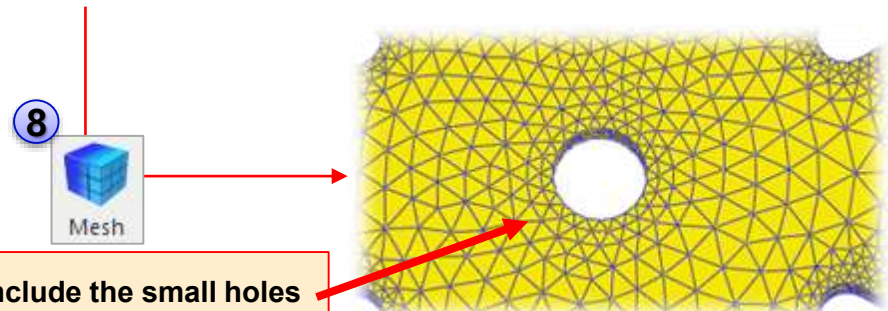
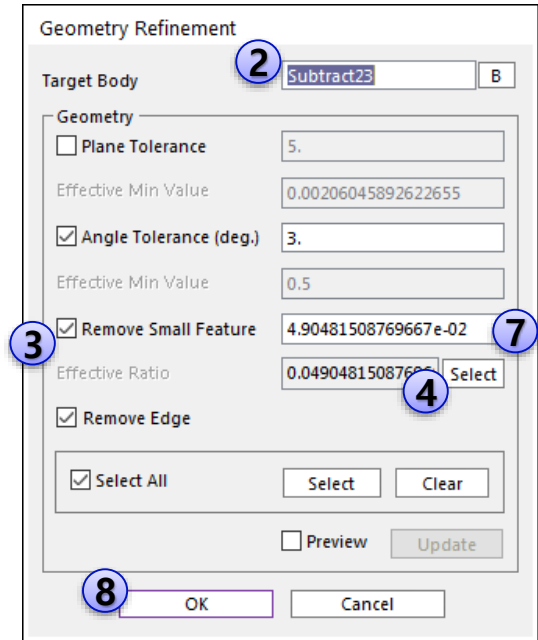
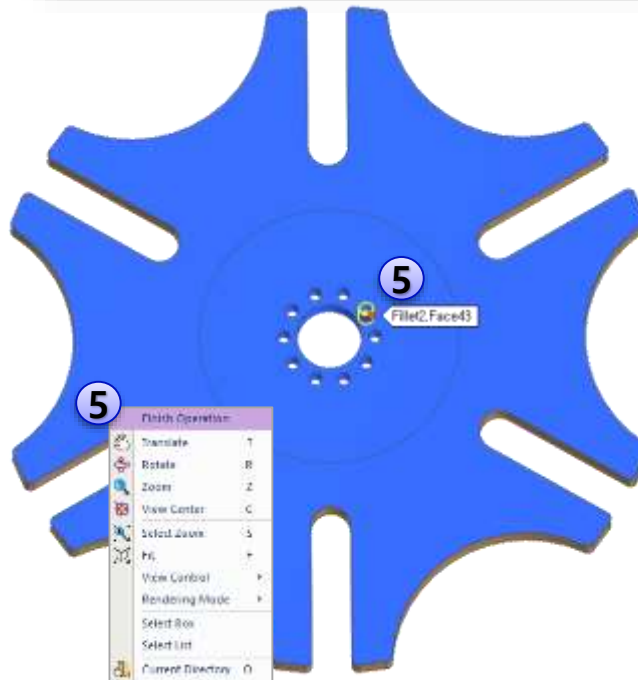
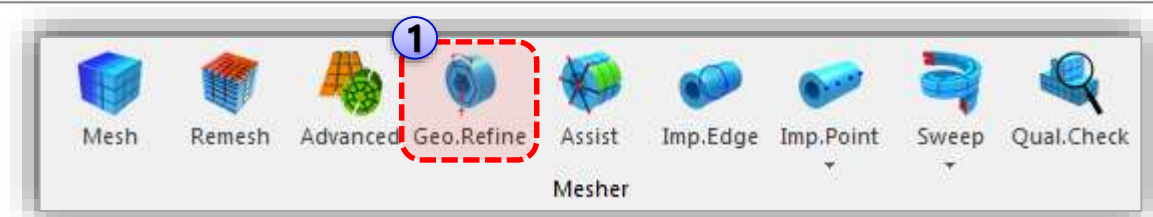


Step 02 – Geo. Refinement(1)

Steps

► Remove Edge

- 1 Click the “Geometry Refinement” Icon in the Mesh group
- 2 Set ‘Subtract23’ as Target Body
- 3 Check “Remove Small Feature”,
- 4 Click the “Select” button.
- 5 Pick the **small hole** as shown image.
- 6 Right-click and run the “Finish Operation” in the pop-up menu.
- 7 Effective Ratio will be updated. (it’s about 0.049...) **Copy** the that value in the field and **paste** it to “Remove Small Feature” input field. (or type the similar value)
- 8 Click the “OK” button
- 9 Run Mesh with the below setting:
 - Mesh Type: Shell3 (Tria3)
 - Property: PShell1
 - Max: **10**
 - Min: **1**
 - Gradation Factor: **0.1**
 - Chordal Error Tolerance:
 - **Relative & 0.01**



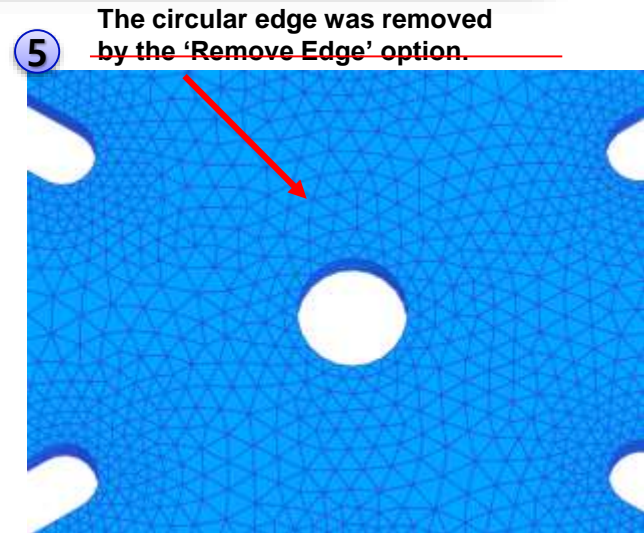
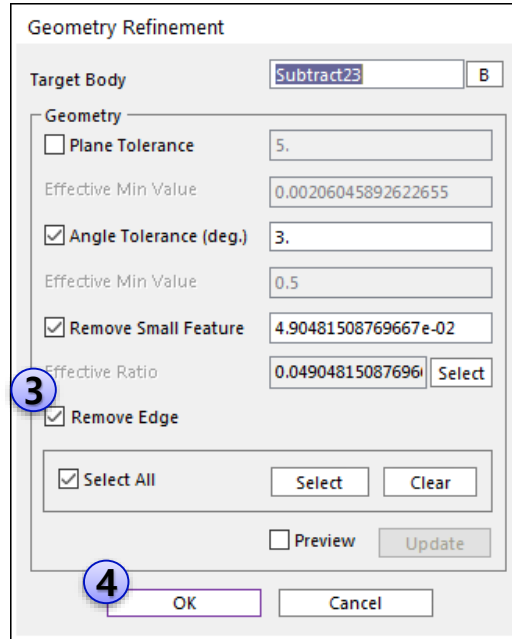
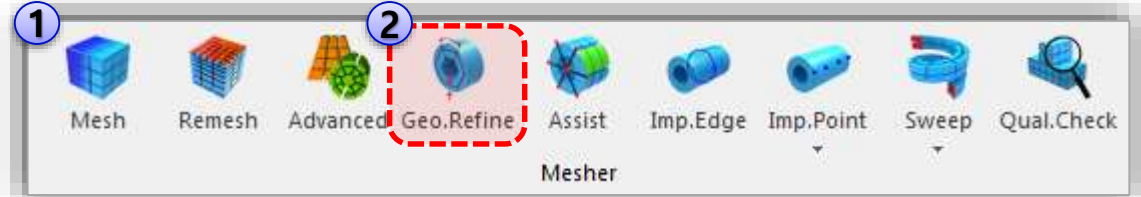
You can see that the mesh doesn't include the small holes

Step 03 – Geo. Refinement(2)

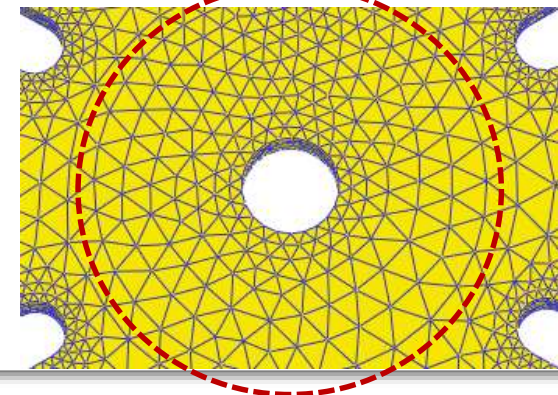
Steps

► Remove Edge

- ① **Revert** mesh in Mesh dialog.
- ② Run **"Geometry Refinement"** again.
- ③ Check **"Remove Edge"**, and **"Select All"** option (or select the geometry using **"Select"** button)
- ④ Click **"OK"** button
- ⑤ Run the **Mesh** again
You can see the removed circle at the mesh data



The circular edge is conserved when meshed without the 'Remove Edge' option

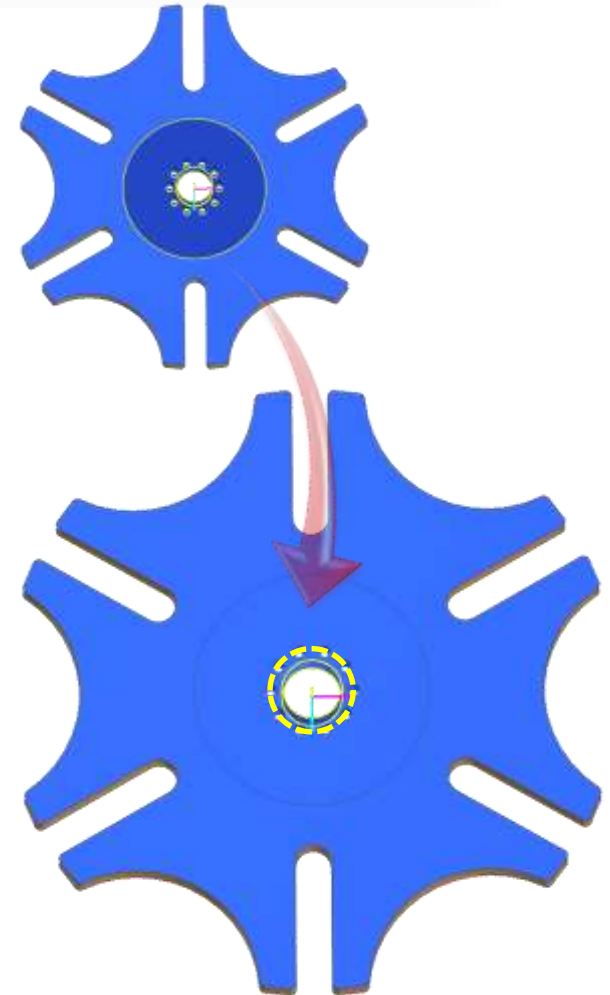
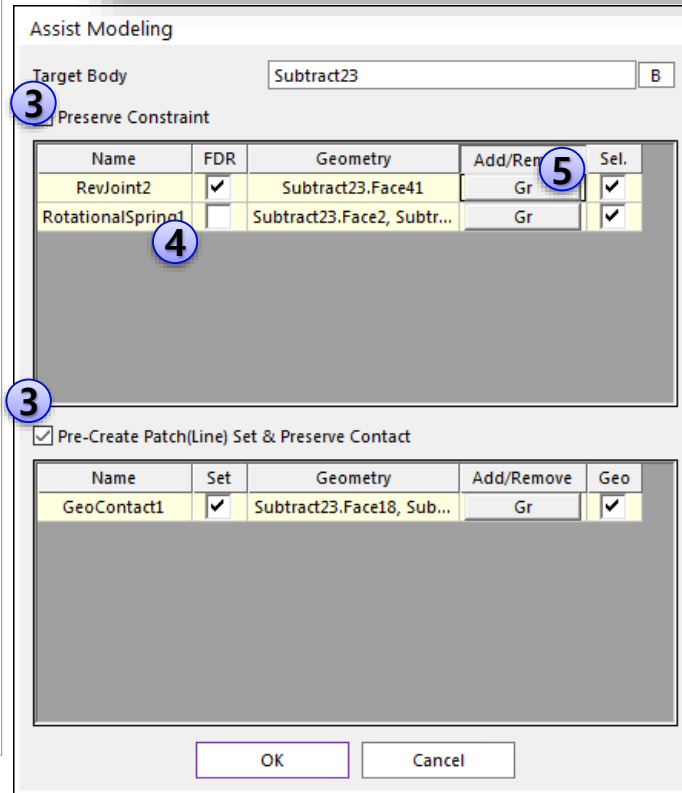
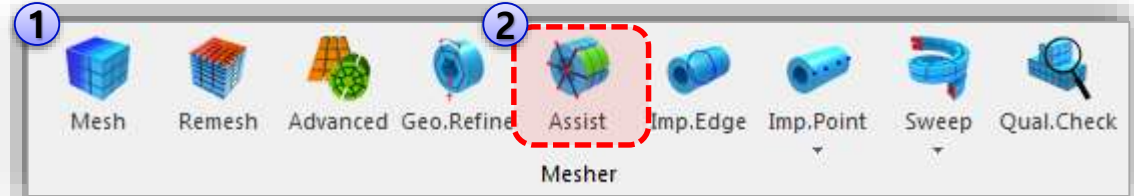


Step 04 – Assist Modeling

Steps

► **Keep the Connector/Contact**

- ① Revert mesh in Mesh dialog.
- ② Click the “Assist Modeling” icon.
- ③ Check “Preserve Constraint” and “Pre-Create Patch (Line) Set & Preserve Contact”
- ④ Check OFF the FDR of “RotationalSpring1” (Because, it is located on same position with joint)
- ⑤ Click the **Gr** of RevJoint2, and Pick the inner surface of the Hole in the center of the geometry
- ⑥ Check the GeoSurContact.
- ⑦ Click the **OK** button

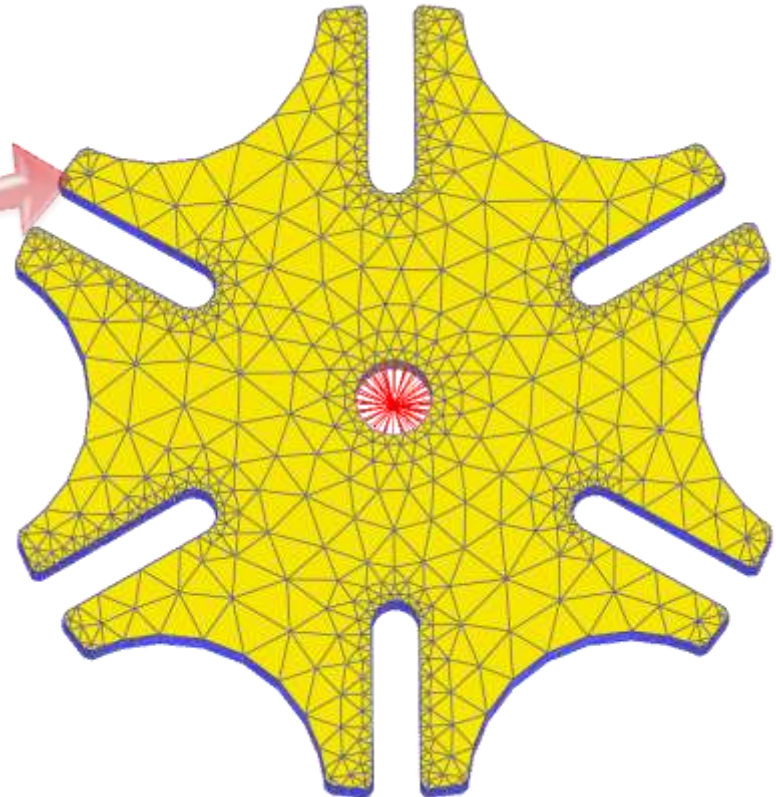
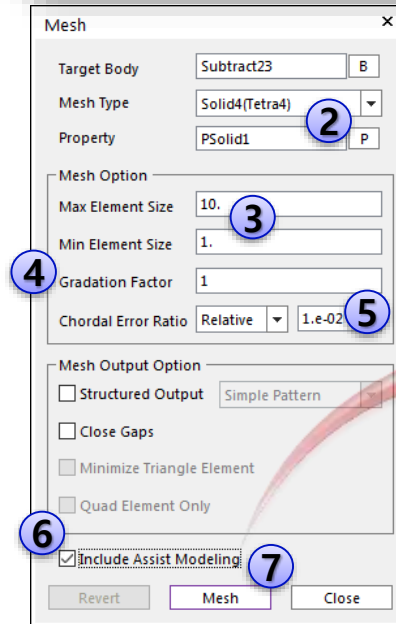
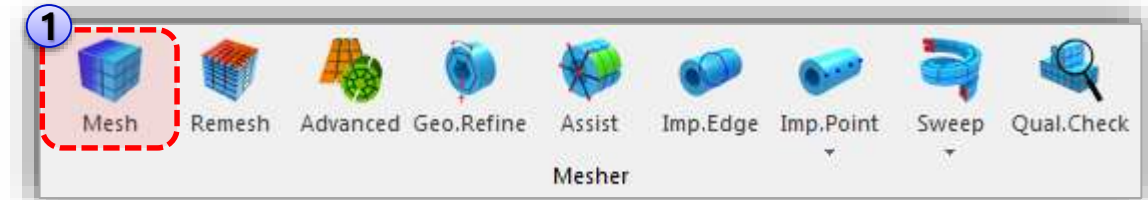


Step 05 – Auto Mesh(1)

Steps

► Do the mesh

- ① Click the **"Mesh"** Icon.
- ② Select **"Solid4 (Tetra4)"** & Property type as **"PSolid1"**
- ③ Set **Max/Min size** to **"10"** & **"1"** respectively
- ④ Set **"Gradation Factor"** to **"1"**
- ⑤ Set **"Chordal Error Ratio"** to **"0.01"** (Relative)
- ⑥ Check **ON** the **"Include Assist Modeling"** option
- ⑦ Click the **"Mesh"** button
- ⑧ RecurDyn will generate Solid4 mesh using the Geneva geometry



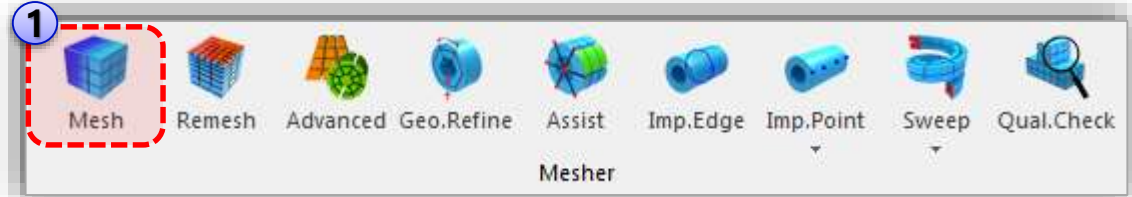
Step 06 – Auto Mesh(2)

Steps

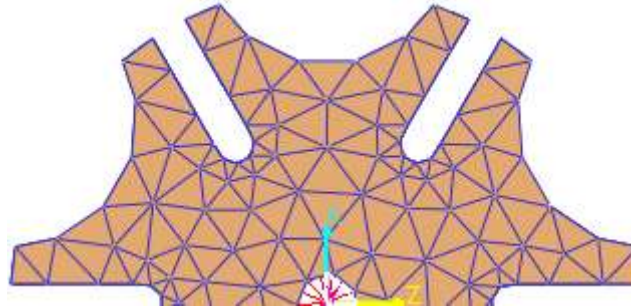
► Do the mesh with various settings

- ① Click "Mesh" Icon.
- ② Change the option values as shown on the right images
- ③ Exit mesh mode

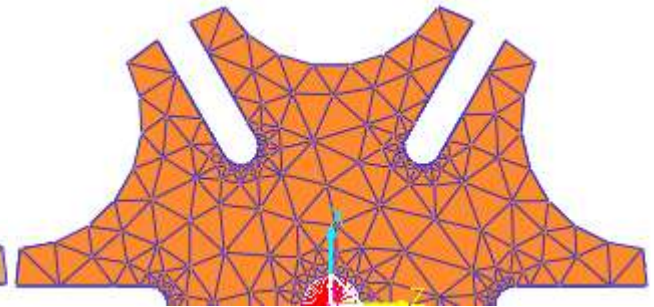
※ According to the option values of the "Gradation Factor" & "Chordal Error Ratio", you can compare the mesh result and the effect of them.



Gradation Factor: 2 & Chordal Error Ratio: 0.1
- Nodes: 460
- Element: 1119



Gradation Factor: 2 & Chordal Error Ratio: 0.01
- Nodes: 1052
- Element: 2789



Gradation Factor: 0.5 & Chordal Error Ratio: 0.01
- Nodes: 1876
- Element: 5981



Gradation Factor: 0.1 & Chordal Error Ratio: 0.01
- Nodes: 5057
- Element: 19391

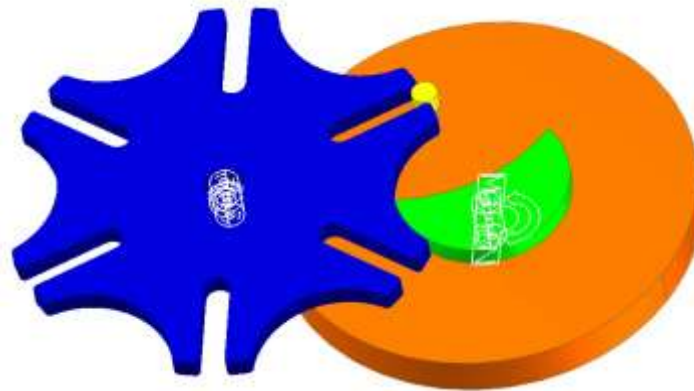
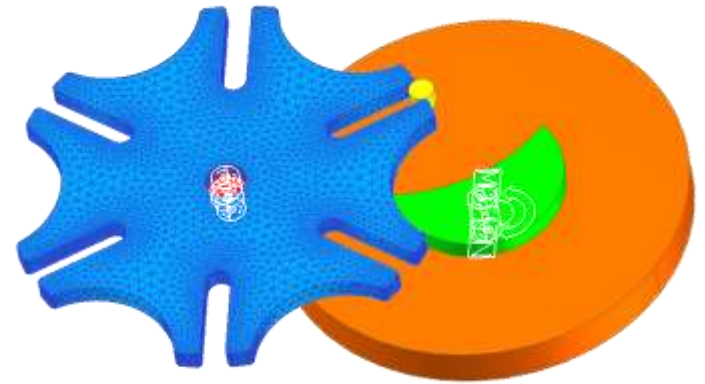
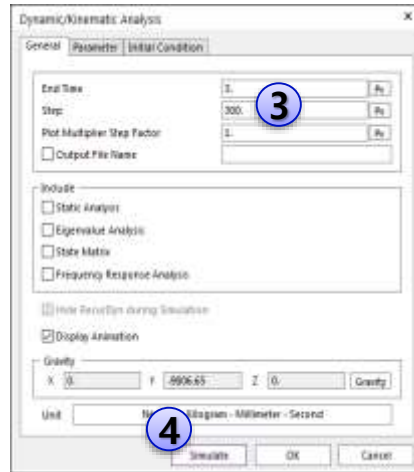
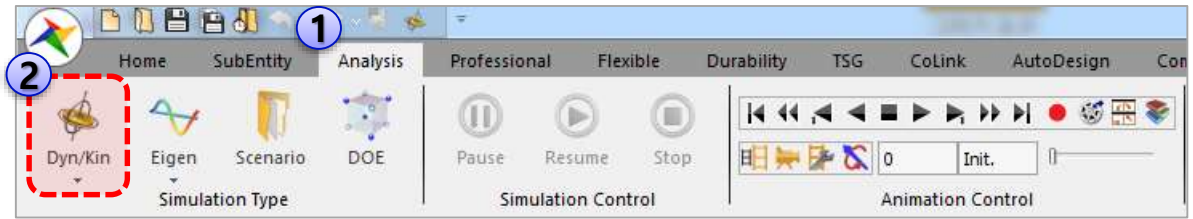


Step 07 – Dynamic Analysis

Steps

► Run the simulation

- ① [Analysis]-[Simulation Type]-[Dyn/Kin]
- ② End time = 3 & Step = 300
- ③ Click the “Simulate” button
- ④ You can review the simulation result after simulation is completed.



V9R1 New Mesher 튜토리얼

1. Remove Edge
2. Keep the Connector/Contact
3. Auto Mesh (Max/Min size, Gradation Factor, Chordal Error Ratio)
4. Run Simulation

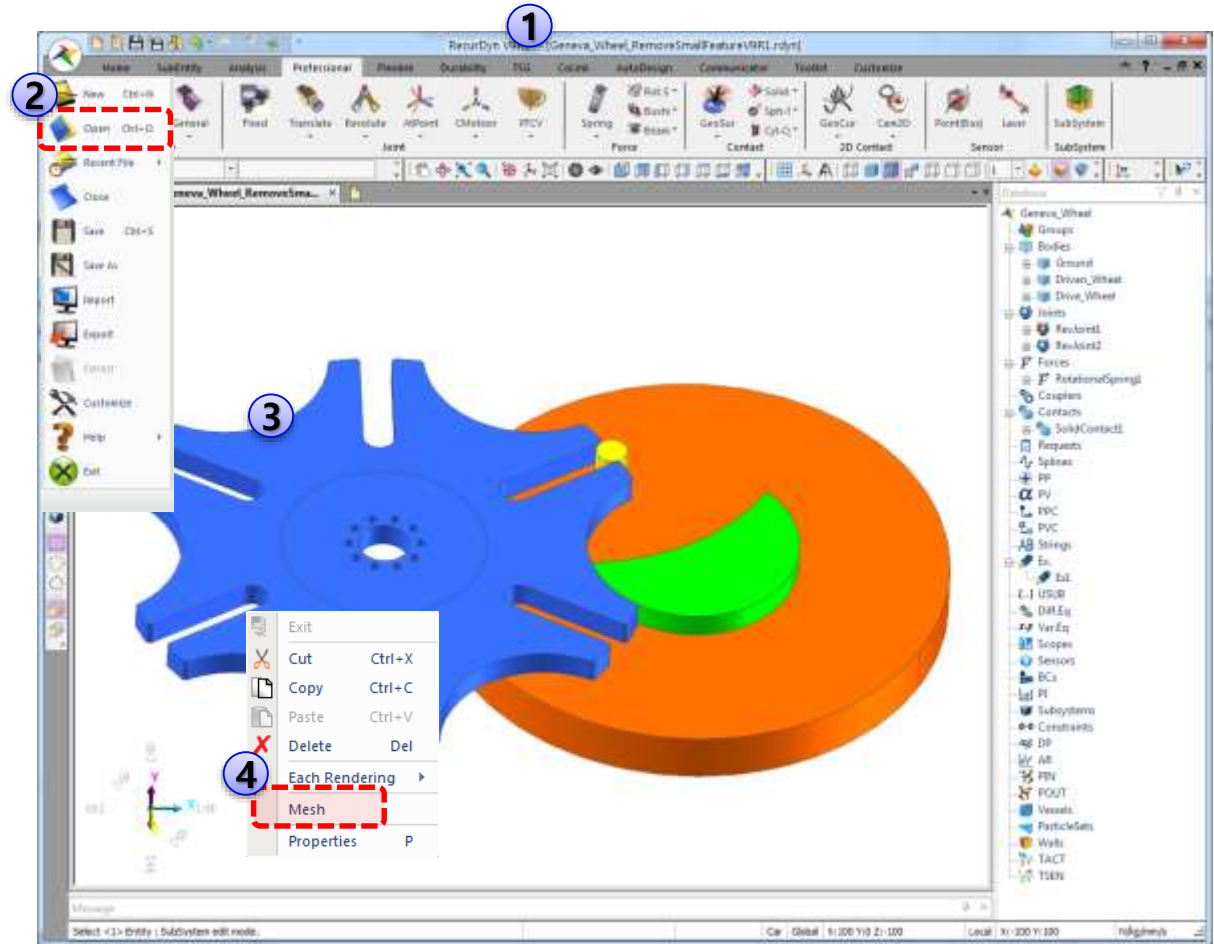
English

한국어

Step 01 – Enter the Mesh Mode

Steps

- ① RecurDyn V9R1 실행
- ② "Geneva_Wheel.rdyn"을 오픈
- ③ "Geneva" 바디 선택
- ④ "Geneva" 선택 후, 팝업메뉴에서 "Mesh" 선택

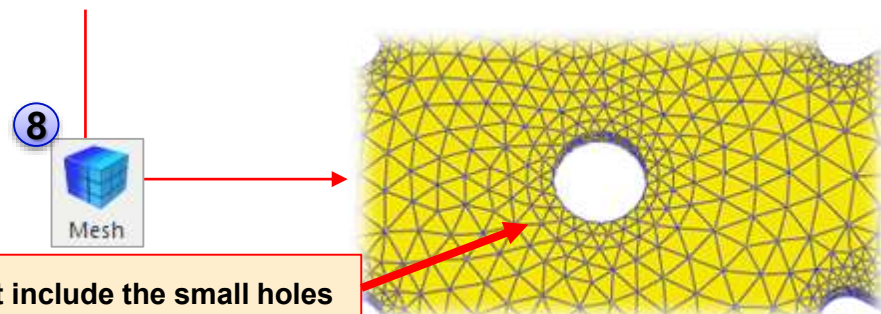
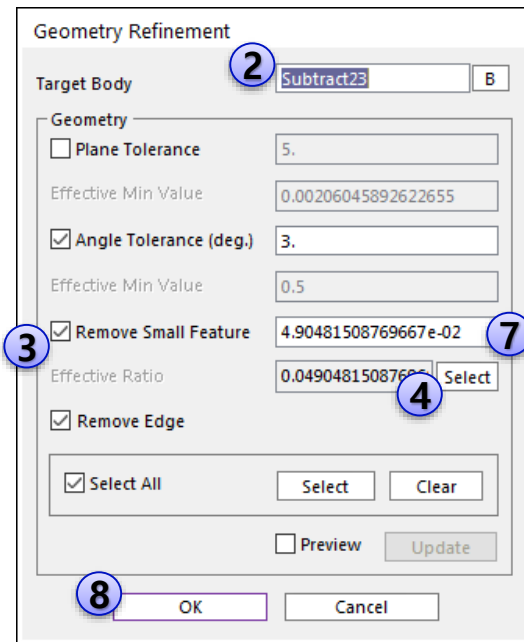
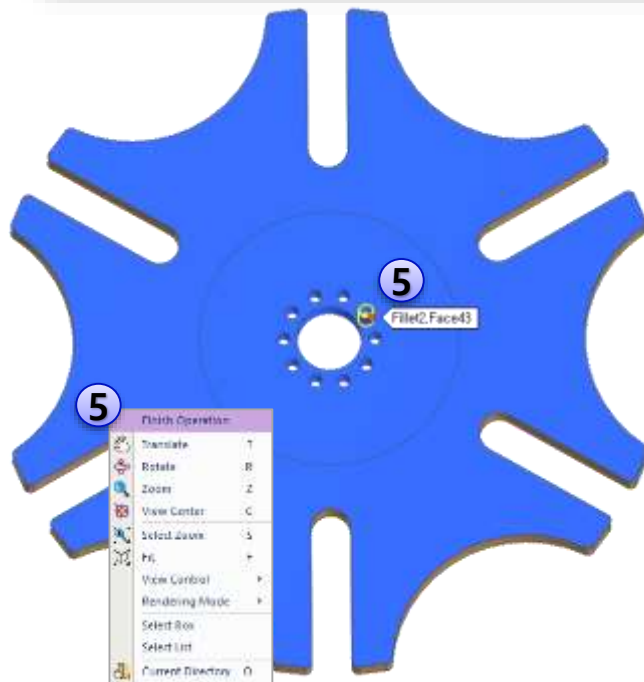
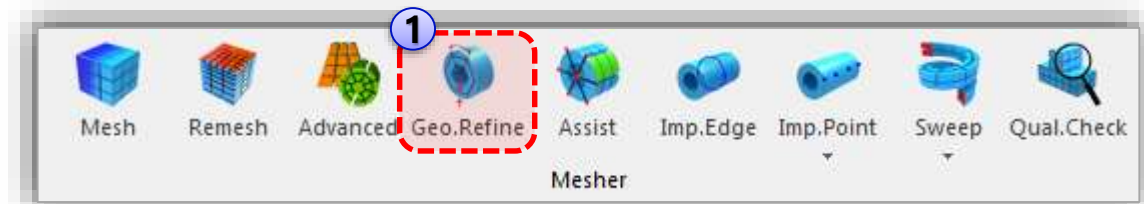


Step 02 – Geo. Refinement(1)

Steps

▶ Remove Edge

- ① “Geometry Refinement” 실행
- ② ‘Subtract23’ 를 Target 바디로 선택
- ③ “Remove Small Feature” 옵션 체크
- ④ “Select” 버튼 클릭
- ⑤ 우측 이미지와 같이 작은 홀을 하나 선택
- ⑥ 팝업메뉴를 띄워 “Finish Operation” 선택
- ⑦ Effective Ratio가 업데이트되면(약 0.049...) 그 값을 복사하여 “Remove Small Feature” 우측 입력창에 붙여넣기 (혹은 비슷한 값을 직접 입력)
- ⑧ “OK” 버튼 클릭
- ⑨ 아래의 설정값으로 Mesh 실행:
 - Mesh Type: Shell3 (Tria3)
 - Property: PShell1
 - Max: 10
 - Min: 1
 - Gradation Factor: 0.1
 - Chordal Error Tolerance: - Relative & 0.01



You can see that the mesh doesn't include the small holes

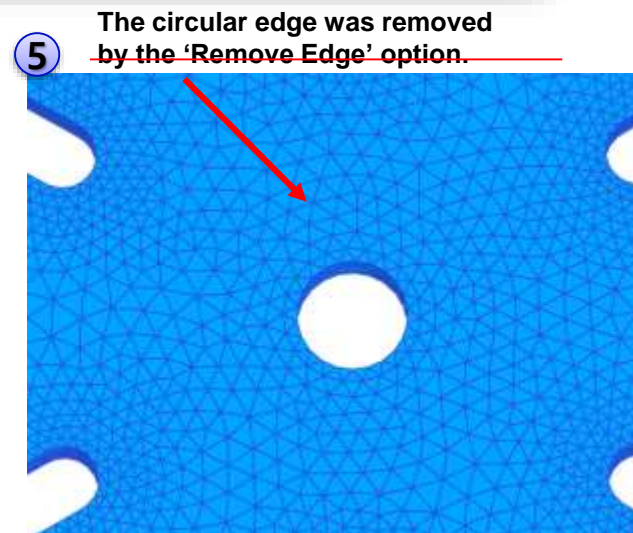
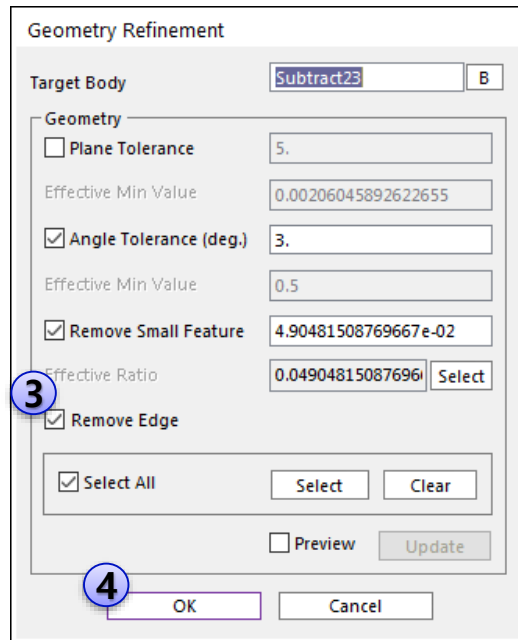
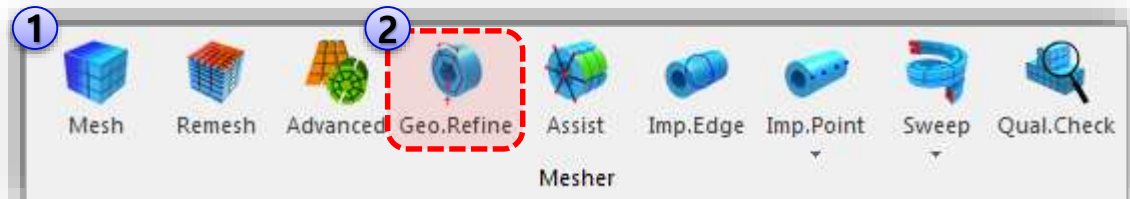
Step 03 – Geo. Refinement(2)

Steps

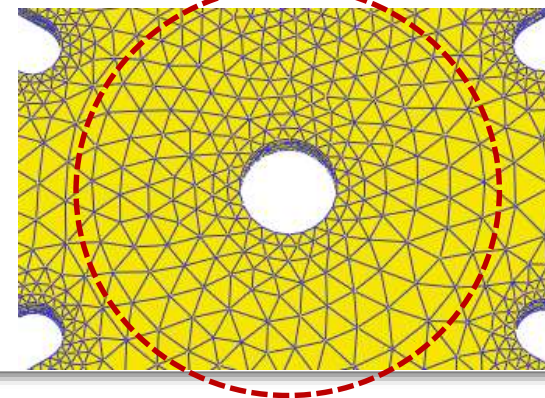
► Remove Edge

- ① Mesh dialog 다이얼로그에서 **Revert** 실행.
- ② **Geometry Refinement** 를 실행
- ③ **Remove Edge** 옵션을 체크한 후, **Select All** 옵션도 체크 (혹은 **Select** 버튼을 눌러서 개별 형상을 선택할 수도 있음)
- ④ **OK** 버튼 클릭
- ⑤ **Mesh** 를 다시 수행

원형 Edge가 무시된 채 메시가 생성된 것을 확인할 수 있음



The circular edge is conserved when meshed without the 'Remove Edge' option

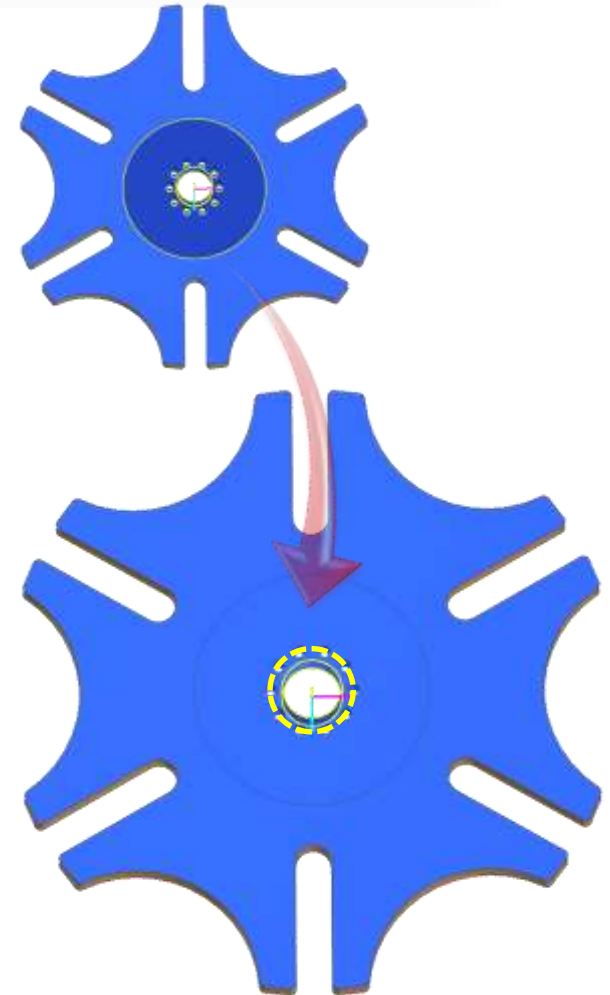
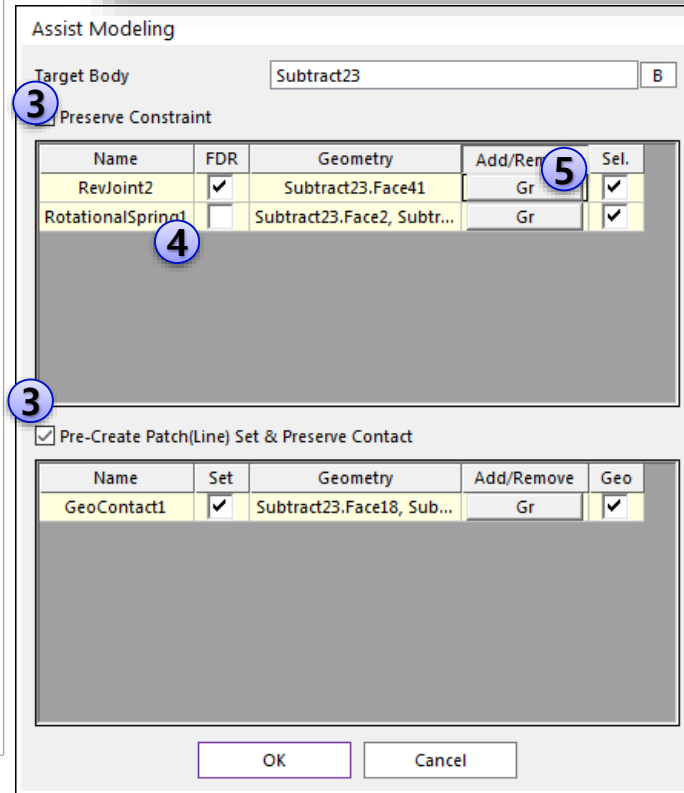
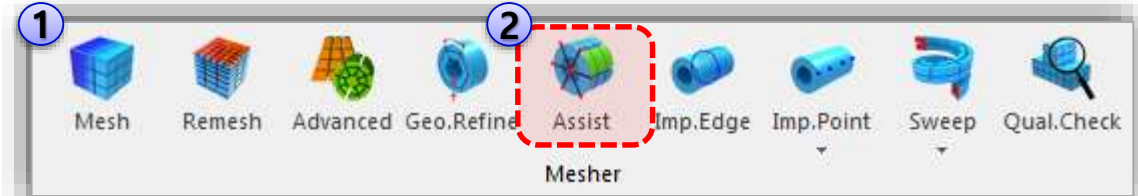


Step 04 – Assist Modeling

Steps

▶ Connector/Contact 유지

- ① 메시 다이얼로그에서 **Revert** 수행
- ② “Assist Modeling” 실행
- ③ “Preserve Constraint” 와 “Pre-Create Patch (Line) Set & Preserve Contact” 옵션 체크
- ④ “RotationalSpring1”의 FDR 항목의 체크를 끄 (RevJoint2와 동일한 위치이므로)
- ⑤ RevJoint2의 Gr버튼을 누른 후, 형상의 중앙에 있는 큰 구멍의 안쪽면을 선택
- ⑥ GeoSurContact의 Set, Geo항목이 체크되어 있는지 확인
- ⑦ OK 클릭

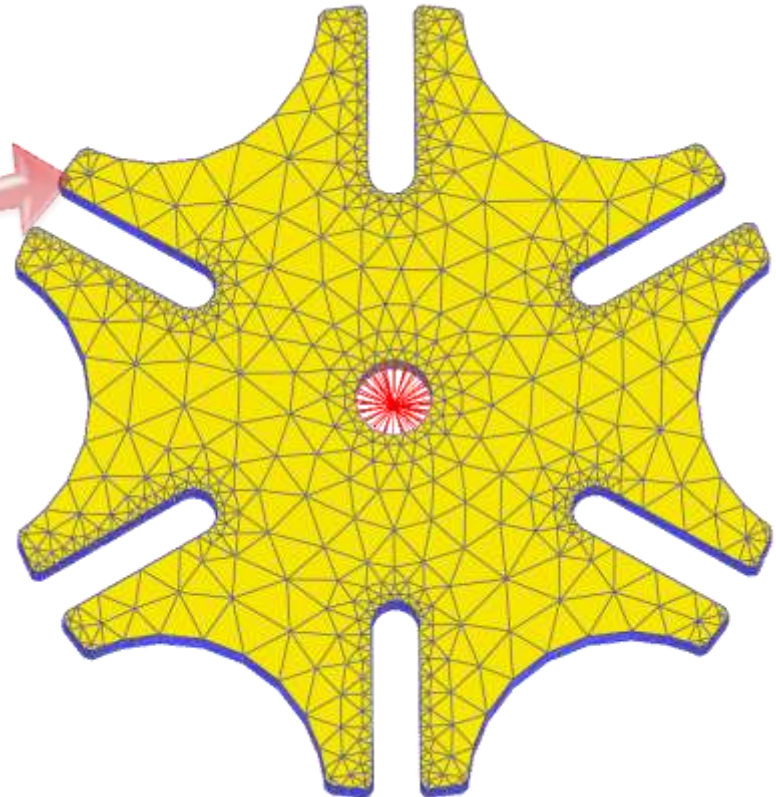
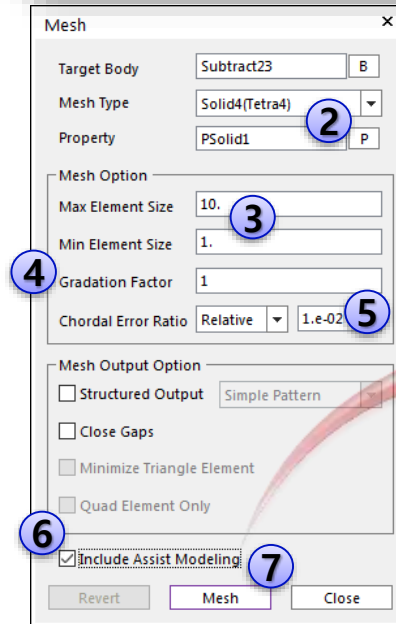
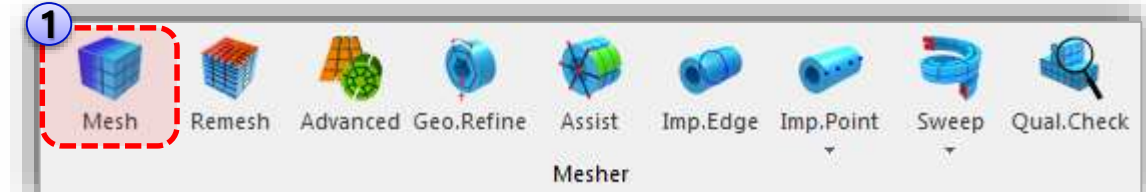


Step 05 – Auto Mesh(1)

Steps

▶ mesh 수행

- ① "Mesh" 아이콘 클릭
- ② 메시 타입은 "Solid4 (Tetra4)" ,
Property는 "PSolid1" 선택
- ③ Max/Min size 로 각각 "10" 과
"1"을 입력
- ④ "Gradation Factor" = "1"
- ⑤ "Chordal Error Ratio" = "0.01"
(Relative)
- ⑥ "Include Assist Modeling" 옵션
체크
- ⑦ "Mesh" 버튼 클릭



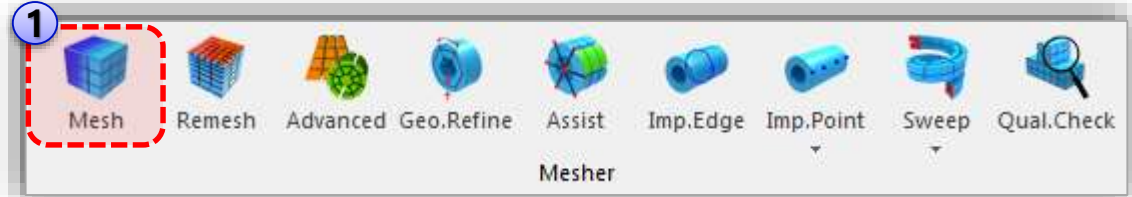
Step 06 – Auto Mesh(2)

Steps

▶ 다양한 설정으로 Mesh 수행

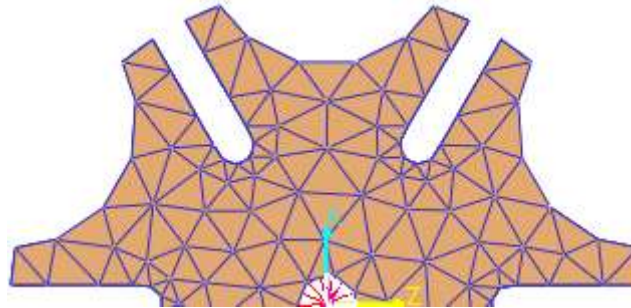
- ① “Mesh” 아이콘 클릭
- ② 오른쪽과 같이 여러 옵션으로 다양하게 메시 생성 가능

※ 특히 “Gradation Factor” 옵션과 “Chordal Error Ratio” 옵션에 따라 어떻게 메시 결과물이 달라지는 지 확인



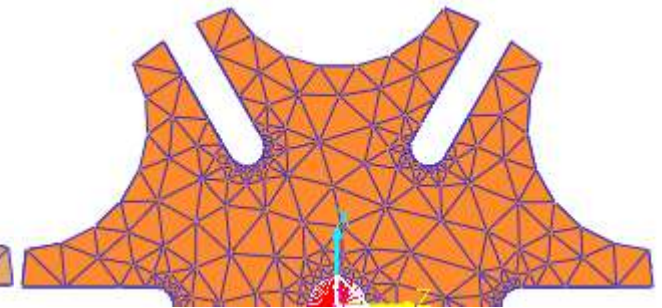
Gradation Factor: 2 & Chordal Error Ratio: 0.1

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- Element: 1119



Gradation Factor: 2 & Chordal Error Ratio: 0.01

- Nodes: 1052
- Element: 2789



Gradation Factor: 0.5 & Chordal Error Ratio: 0.01

- Nodes: 1876
- Element: 5981



Gradation Factor: 0.1 & Chordal Error Ratio: 0.01

- Nodes: 5057
- Element: 19391



Step 07 – Dynamic Analysis

Steps

▶ 시뮬레이션

- ① [Analysis]-[Simulation Type]-
[Dyn/Kin]
- ② End time = 3 & Step = 300
- ③ “Simulate” 버튼 클릭
- ④ 해석이 끝난 후, 애니메이션과
Plot 확인

