



MIDAS

MESH FREE

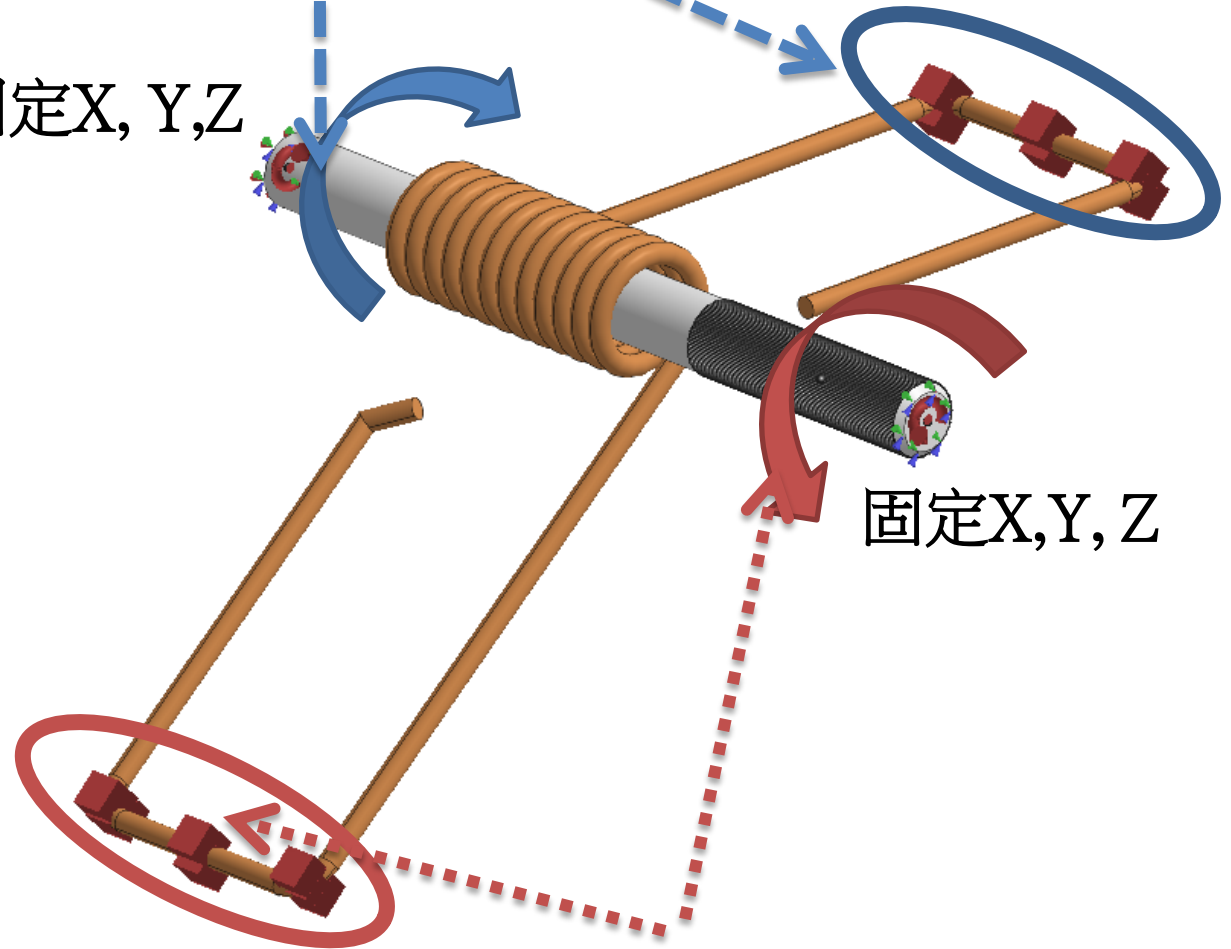
扭力彈簧&心軸-扭矩分析

Simple, but Everything.



10Nt-mm(順時針方向)

固定X, Y, Z



固定X, Y, Z

10Nt-mm(逆時針方向)

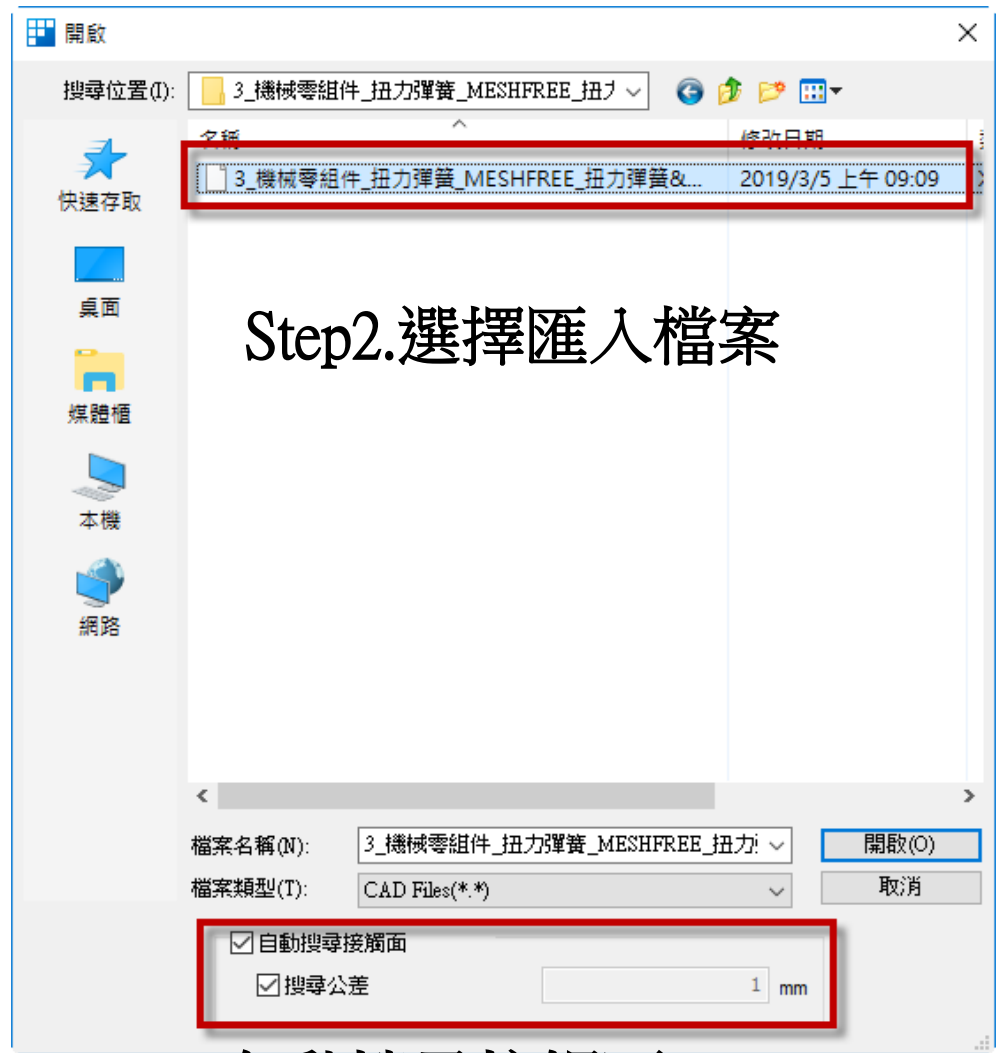




Step1.匯入3D 模型

MeshFree支援各類CAD 格式

- Parasolid (9 - 29) Files (*.x_t;*.xmt_txt;*.x_b;*.xmt_bin)
- ACIS (R1 - 2017 1.0) Files (*.sat;*.sab;*.asat;*.asab)
- STEP (AP203, AP214, AP242) Files (*.stp;*.step)
- IGES (Up to 5.3) Files (*.igs;*.iges)
- Pro-E (16 - Creo 3.0) Files (*.prt;*.prt.*;*.asm;*.asm.*)
- CATIA V4 (CATIA 4.1.9 - 4.2.4) Files (*.model;*.exp;*.session)
- CATIA V5 (V5R8 - V5-6R2016) Files (*.CATPart;*.CATProduct)
- Solid Works (98 - 2017) Files (*.sldprt;*.sldasm)
- Unigraphics (11 - NX11) Files (*.prt)
- Inventor Part (V6 - V2017) Files (*.ipt)
- Inventor Assembly (V11 - V2017) Files (*.iam)
- Solid Edge (V18 - ST9) Files (*.par;*.asm;*.psm)



Step2.選擇匯入檔案

Step3.自動搜尋接觸面



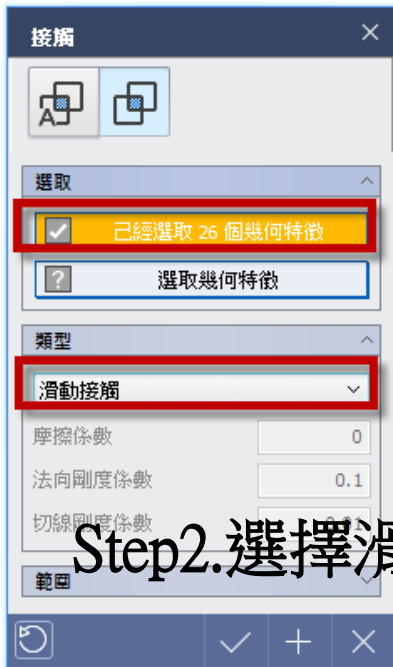
匯入模型由於間隙過大,搜尋不到接觸特徵
=>改由手動定義接觸

操作選項

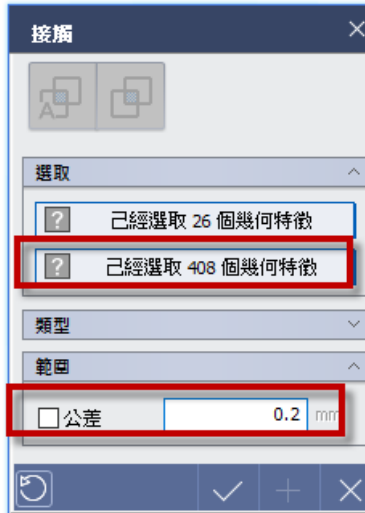
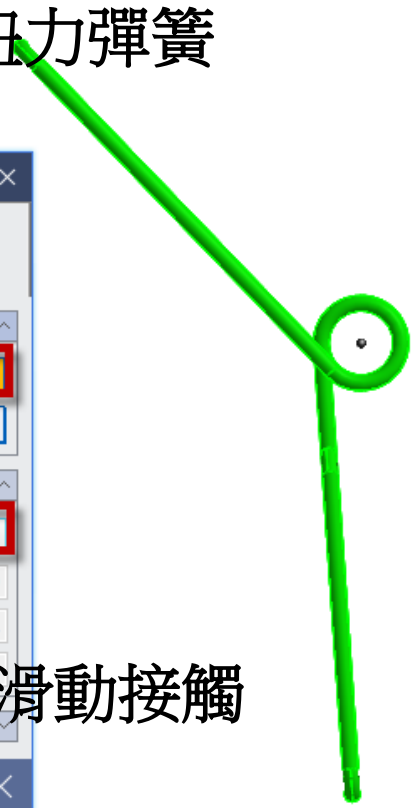
工具



Step1.框選扭力彈簧

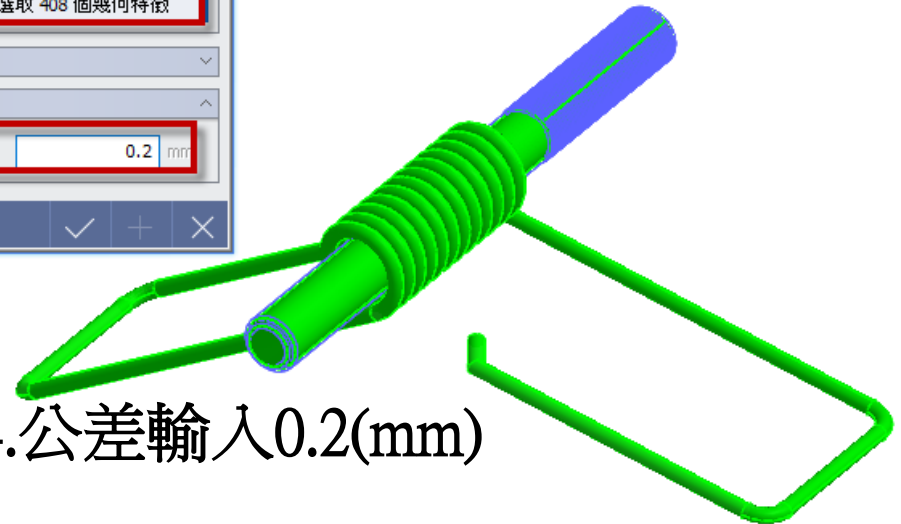


Step2.選擇滑動接觸



Step3.框選心軸

Step4.公差輸入0.2(mm)



新增 Alloy Steel 彈塑性材料

材料定義
✕

Steel ▾

- 17-4PH, H1100
- AISI 1020
- AISI 1060
- AISI 304 SS Annealed
- AISI_310_SS
- AISI_410_SS
- AISI_Steel_1005
- AISI_Steel_1008-HR
- AISI 4340 Annealed
- AISI_Steel_Maraging
- Alloy Steel
- Cast Alloy Steel
- Cast Carbon Steel
- Cast Stainless Steel
- Chrome Stainless Steel
- FC250
- Galvanized Steel
- Hp-1
- Hp-4
- Inconel_718_Aged
- Plain Carbon Steel
- S/Steel_PH15-5
- SAPH-400
- SE508
- SGACC
- SGACEN
- SGARC340-E
- SGCC

名稱 Alloy Steel NL

顏色 ▾

線性 彈塑性

結構

| | | |
|------|--|-------------------------------------|
| 彈性模量 | <input type="text" value="210000"/> N/mm ² | 熱膨脹 |
| 泊松比 | <input type="text" value="0.28"/> | 熱膨脹係數 |
| 質量密度 | <input type="text" value="7.7e-006"/> kg/mm ³ | 參考溫度 |
| | | <input type="text" value="0"/> [°C] |

塑性硬化曲線 無 ▾ 函數 ▾

應力-應變曲線 無 ▾ 函數 ▾

硬化法則 等向性 ▾

綜合硬化因子(0.0-1.0)

理想塑性

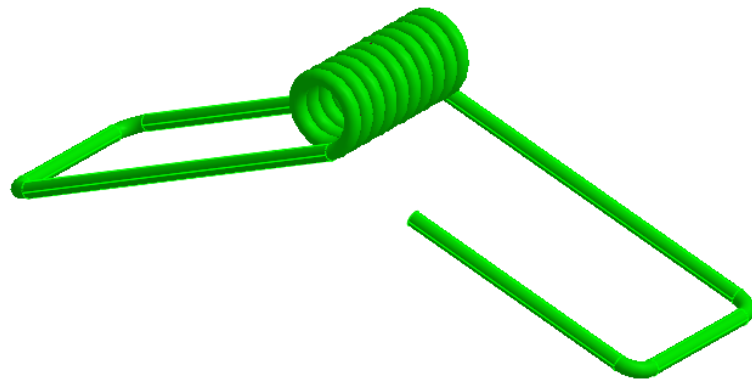
屈服應力 N/mm²

熱

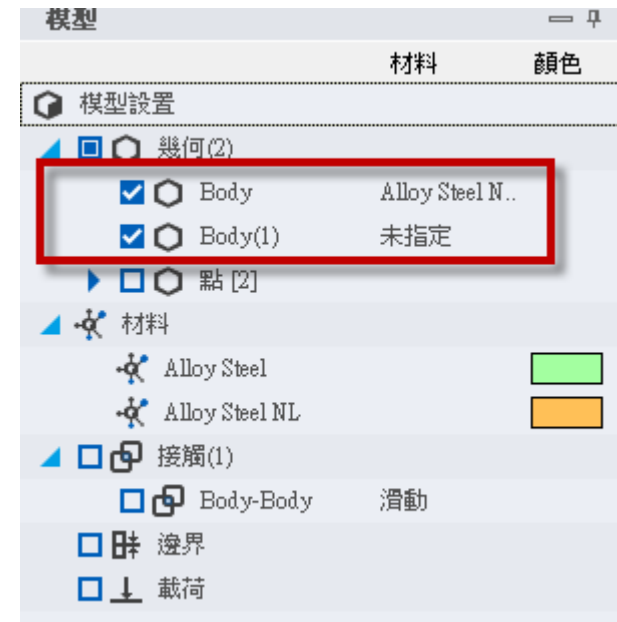
| | |
|-------|---|
| 熱傳導係數 | <input type="text" value="0.05"/> W/(mm·[°C]) |
| 比熱 | <input type="text" value="460"/> J/(kg·[°C]) |
| 發熱係數 | <input type="text" value="1"/> |

載入
編輯

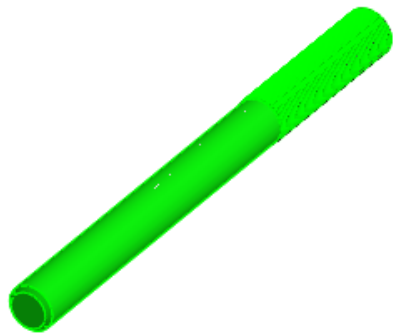
✓



滑鼠右鍵,材料定義



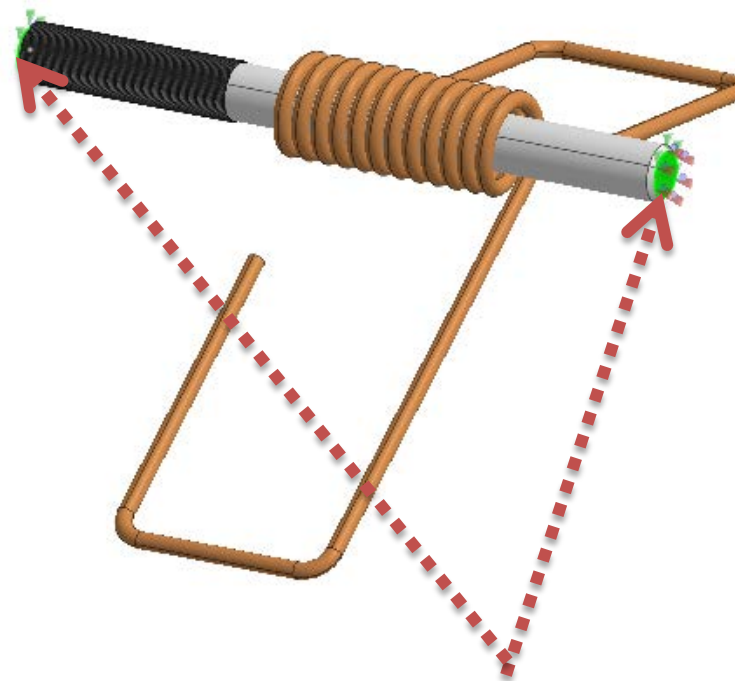
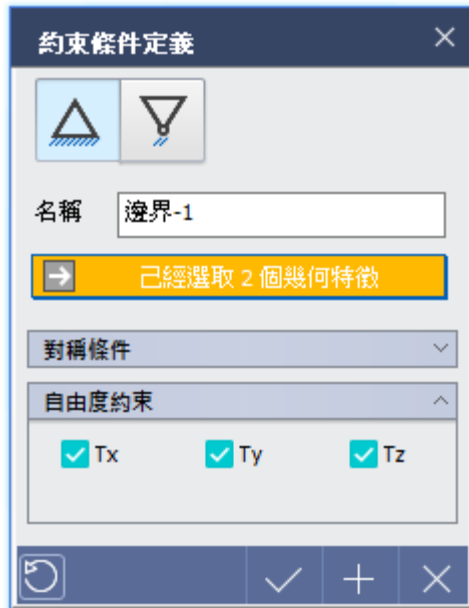
模型樹顯示指定材料



滑鼠右鍵,材料定義



模型樹顯示指定材料



選取特徵拘束(TX/TY/TZ)



載荷

扭矩 ✕

名稱

單位 ^

合計 個別

☑ 已經選取 6 個幾何特徵

參考方向 ^

類型 v

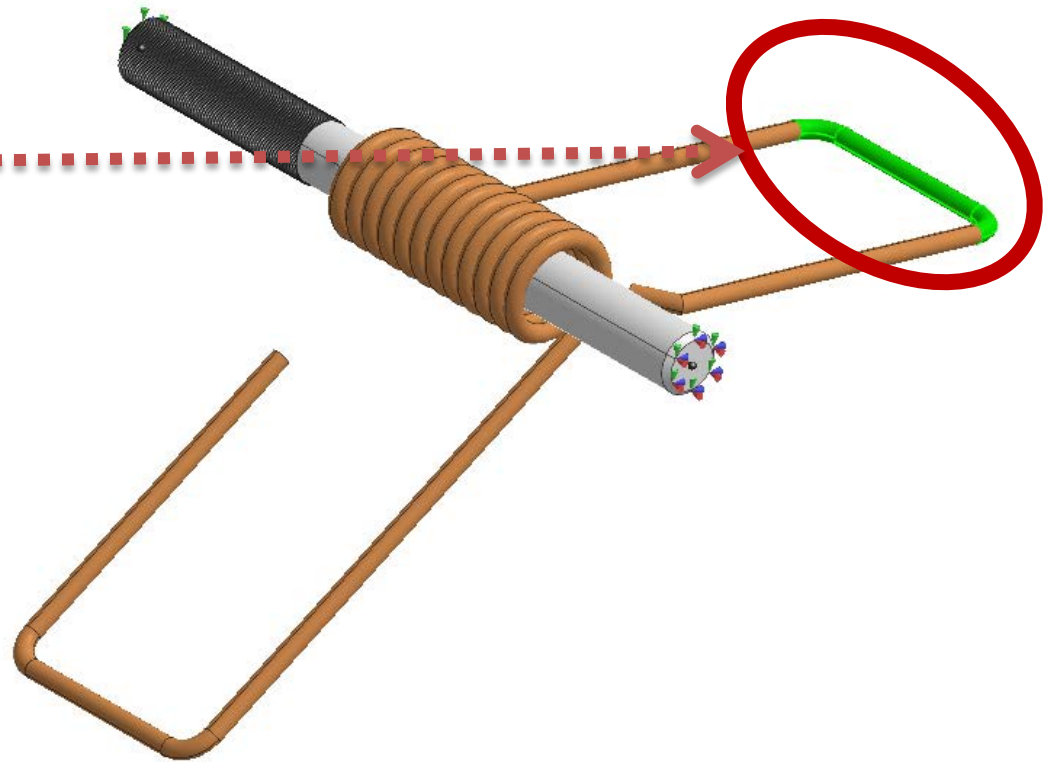
起點

終點

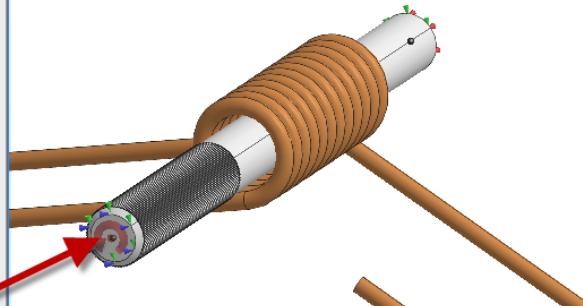
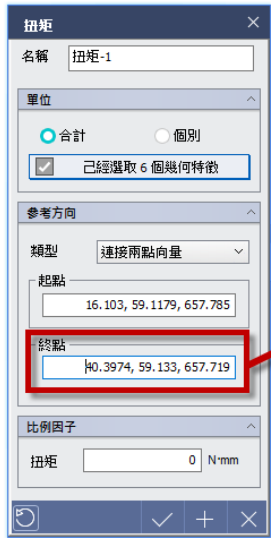
比例因子 ^

扭矩 N·mm

選取扭矩施加特徵

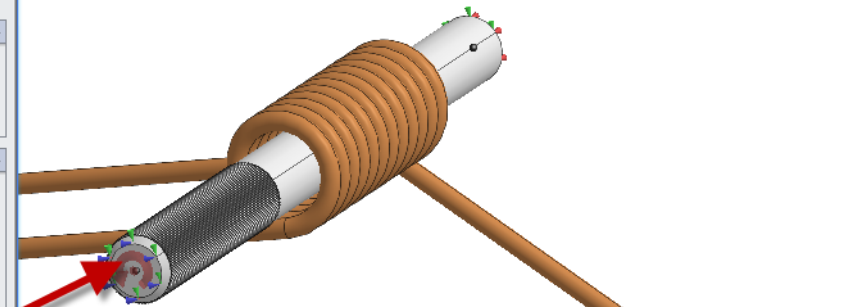
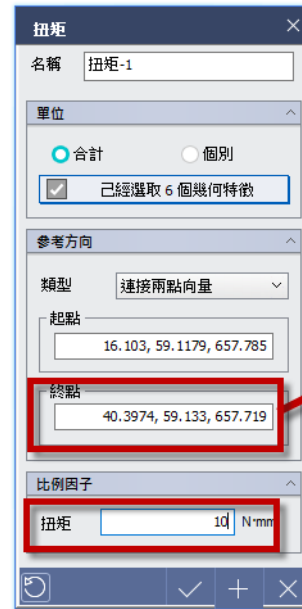


參考方向-連接兩點向量



選取point1

採用右手定則判斷斷扭矩方向



選取point2

施加10N-mm



載荷

扭矩 [X]

名稱

單位 [v]

合計 個別

已經選取 6 個幾何特徵

參考方向 [v]

類型

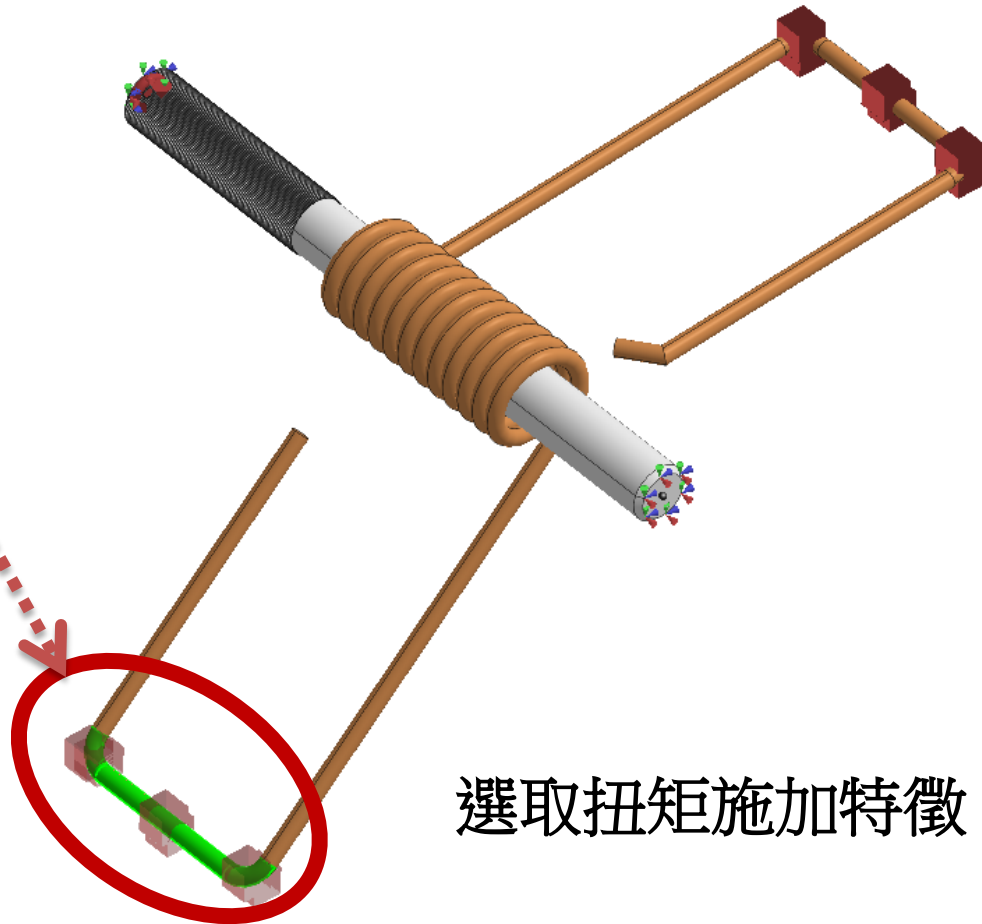
起點

終點

比例因子 [v]

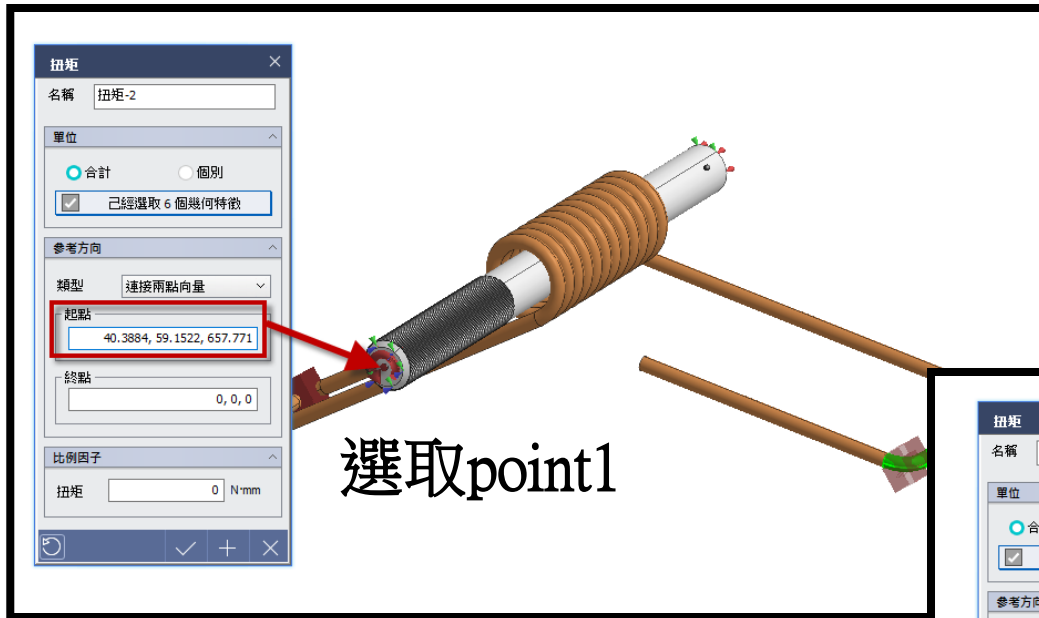
扭矩 N·mm

[Refresh] [OK] [Add] [Close]

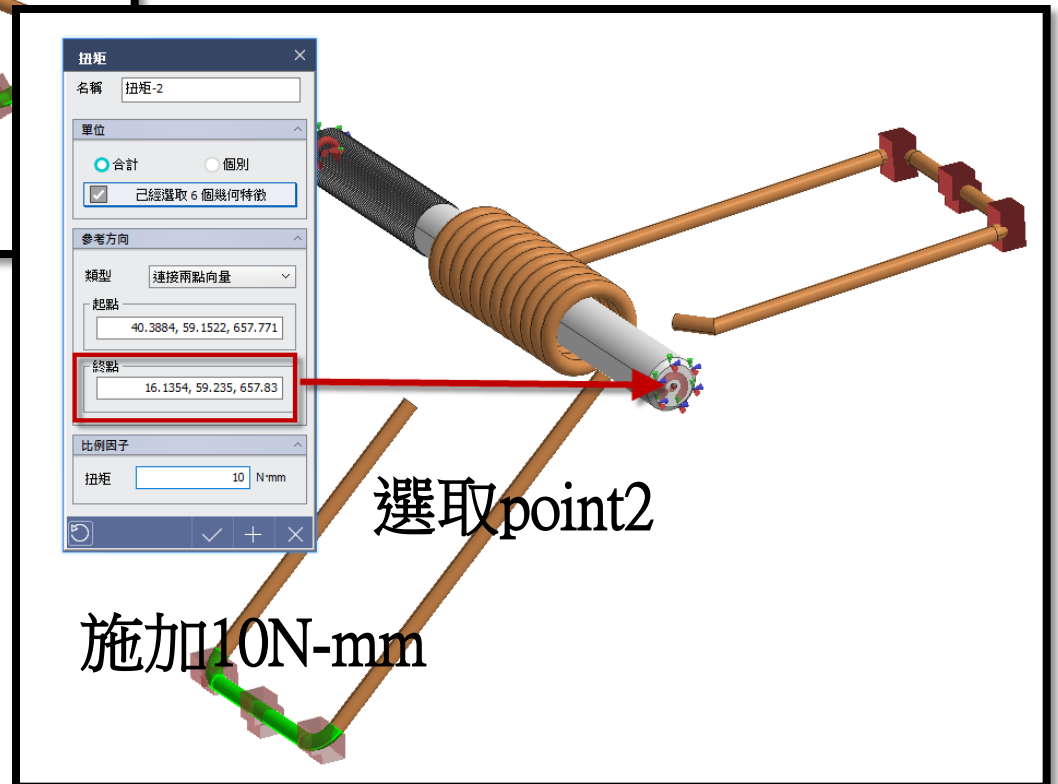


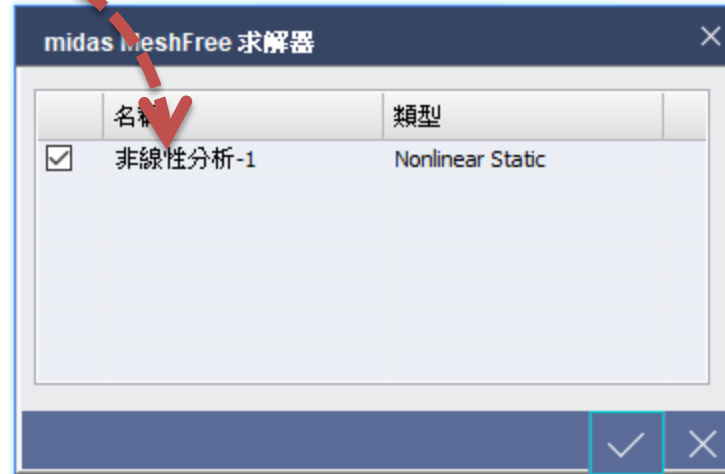
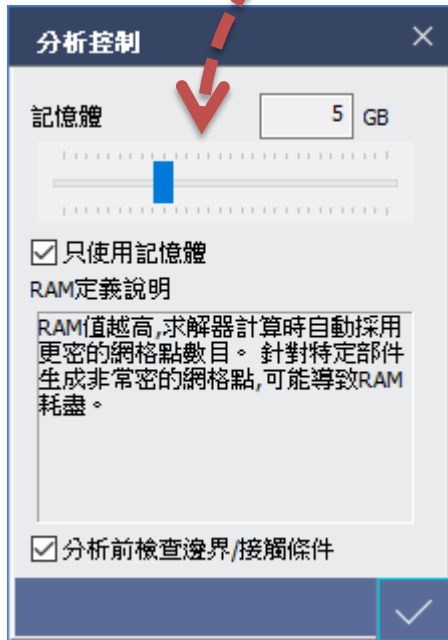
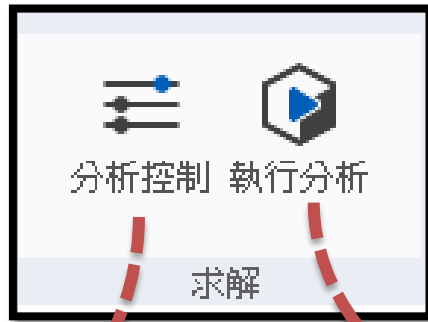
選取扭矩施加特徵

參考方向-連接兩點向量



採用右手定則判斷扭矩方向





記憶體大小

- 1.計算速度
- 2.分析準確性

The screenshot displays the MIDAS MeshFree software interface for a torsion analysis. The main window shows a 3D model of a mechanical component with a red torque arrow. Two graphs are overlaid on the model:

- Maximum Displacement vs. Load Scale Factor:** A line graph showing a linear relationship between load scale factor and maximum displacement.
- Maximum Rotation vs. Load Scale Factor:** A line graph showing a constant maximum rotation across different load scale factors.

A progress dialog box titled "求解程序 [1/1]" (Solving Program [1/1]) is displayed in the center, showing 80% completion. The dialog includes the following options:

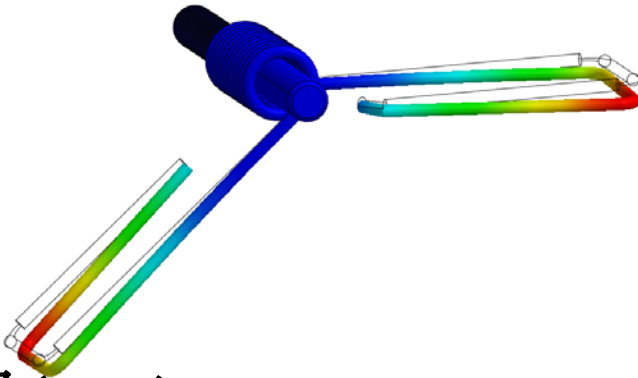
- 自動網點計算 (Automatic Meshing Calculation)
- 網點創建 (Mesh Creation)
- 接觸搜索 (Contact Search)
- 設置 (Settings)
- 迭代計算 (Iterative Calculation)

The bottom status bar shows the following text: "RESULT SUMMARY" and "MAXIMUM TRANSLATION : 5.0626E-001 (T2.22294), MAXIMUM ROTATION : 0.0000E+000 (R3.0)".

分析類型 非線性分析-1
Step [NCR=10 (LOAD=1.000)]
結果 DISPLACEMENT-XYZ

Navigation icons

2.05 3.31



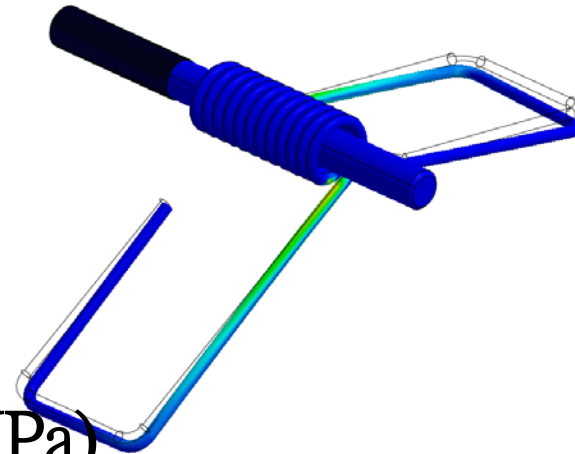
變形量(mm)



分析類型 非線性分析-1
Step [NCR=10 (LOAD=1.000)]
結果 STRESS VON MISES

Navigation icons

2.05 3.31



應力(MPa)

