



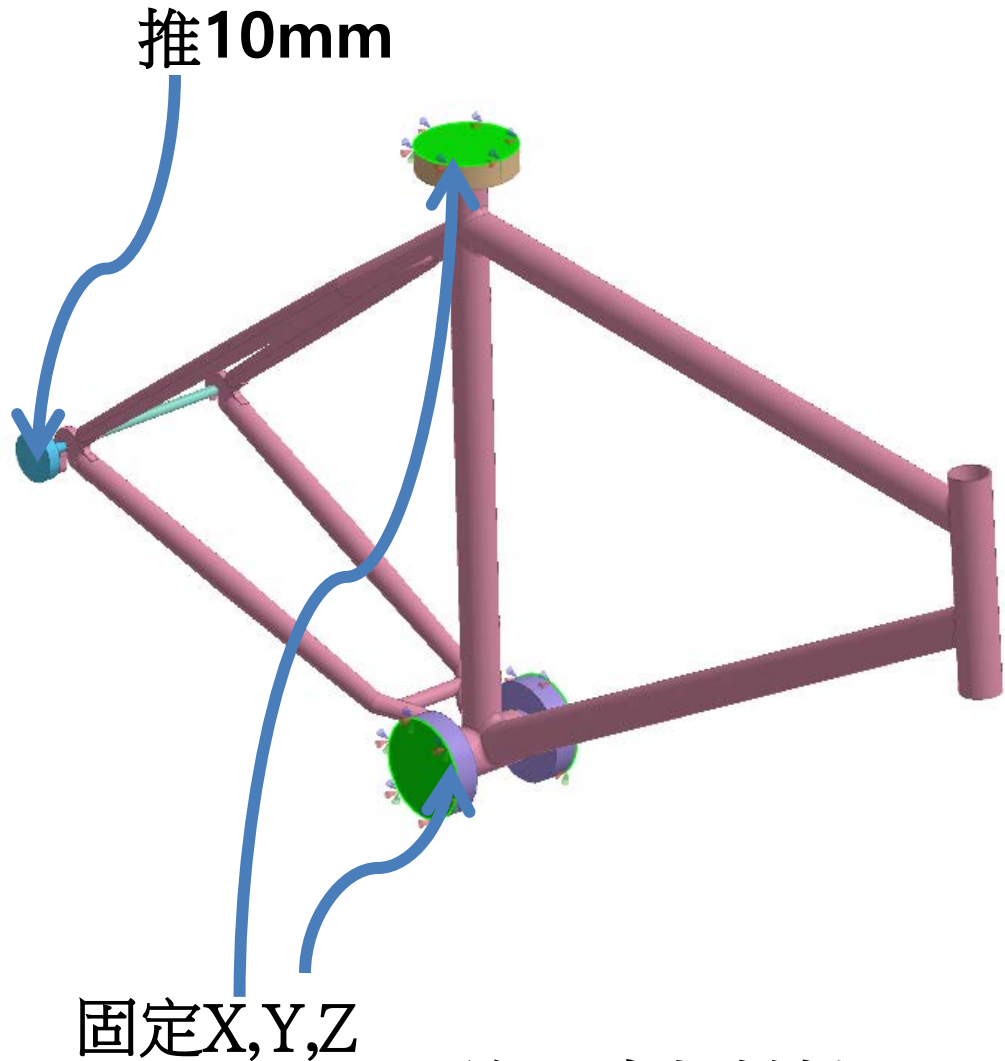
MIDAS

MESH FREE

車架\_雙向剛性  
(材料非線性/疲勞強度)

Simple, but Everything.

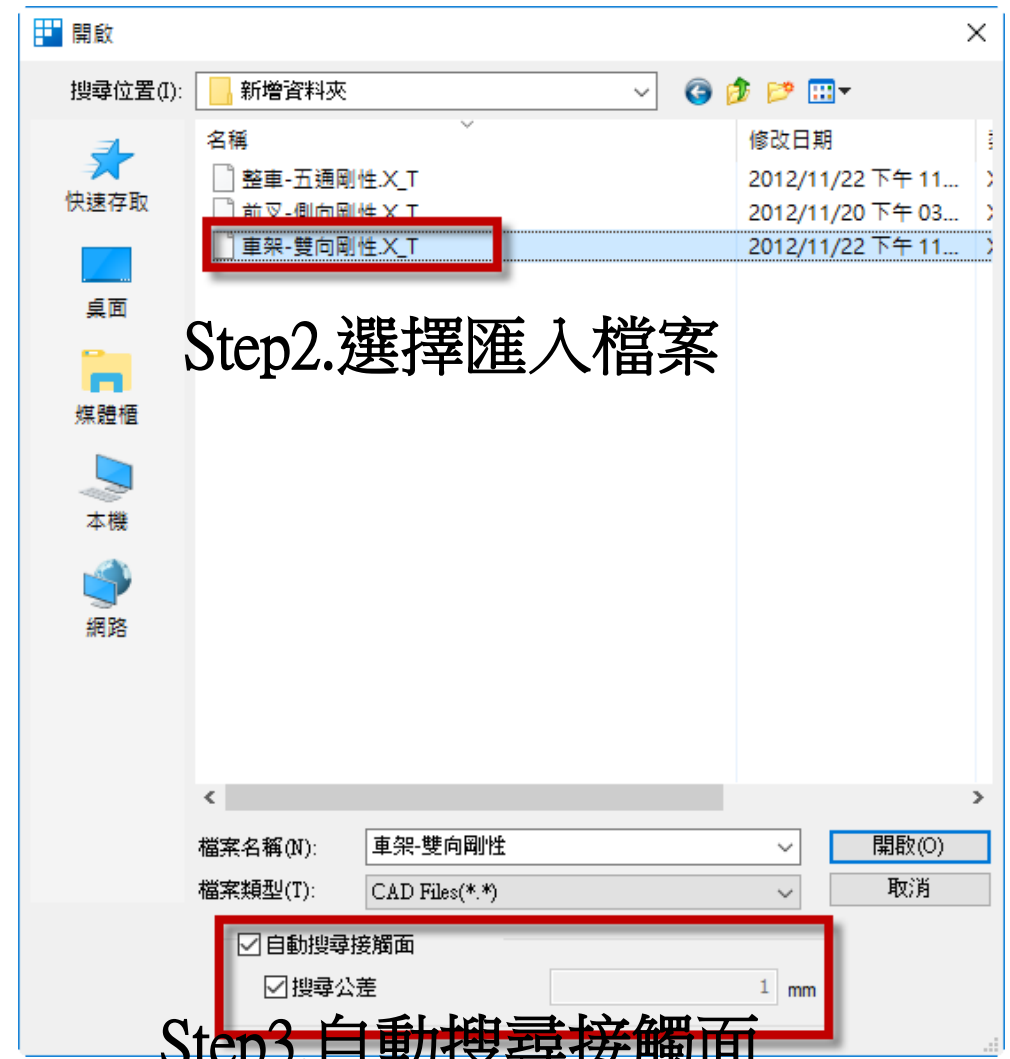
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前叉/車架材料: AL6061-T91



### Step1.匯入3D 模型



### Step2.選擇匯入檔案

### Step3.自動搜尋接觸面

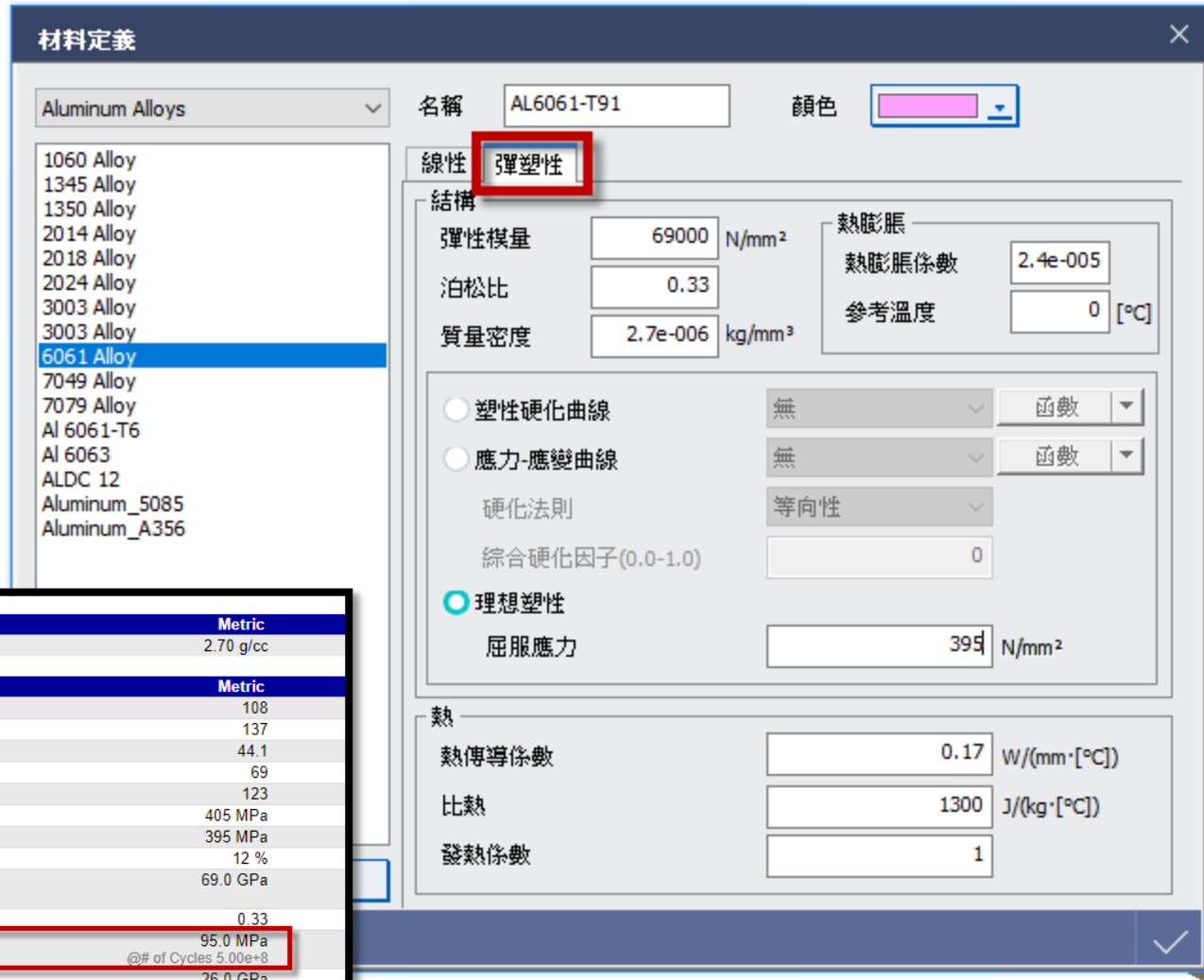
## MeshFree支援各類CAD 格式

- 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 - Cren 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)

註:預設接觸類型為焊接接觸



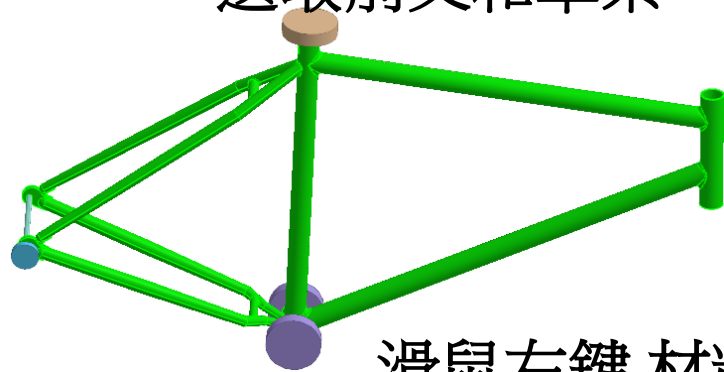
## 新增材料(AL6061-T91)



Physical Properties	Metric
Density	2.70 g/cc
Mechanical Properties	Metric
Hardness, Brinell	108
Hardness, Knoop	137
Hardness, Rockwell A	44.1
Hardness, Rockwell B	69
Hardness, Vickers	123
Tensile Strength, Ultimate	405 MPa
Tensile Strength, Yield	395 MPa
Elongation at Break	12 %
Modulus of Elasticity	69.0 GPa
Poissons Ratio	0.33
Fatigue Strength	95.0 MPa @# of Cycles 5.00e+8
Shear Modulus	26.0 GPa
Shear Strength	230 MPa

AL6061-T91材料係數\_參考 [www.matweb.com](http://www.matweb.com)

### 選取前叉和車架



Context menu for the bicycle frame and fork assembly:

- 僅顯示此部件
- 隱藏
- 編輯格點數量
- 刪除
- 初始溫度
- 重力
- 材料 (Material)

Material selection sub-menu:

- Alloy Steel
- AL6061-T91 (Selected)
- 添加: 材料

滑鼠右鍵,材料定義

### 其它部件



Context menu for other components:

- 僅顯示此部件
- 隱藏
- 編輯格點數量
- 刪除
- 初始溫度
- 重力
- 材料 (Material)

Material selection sub-menu:

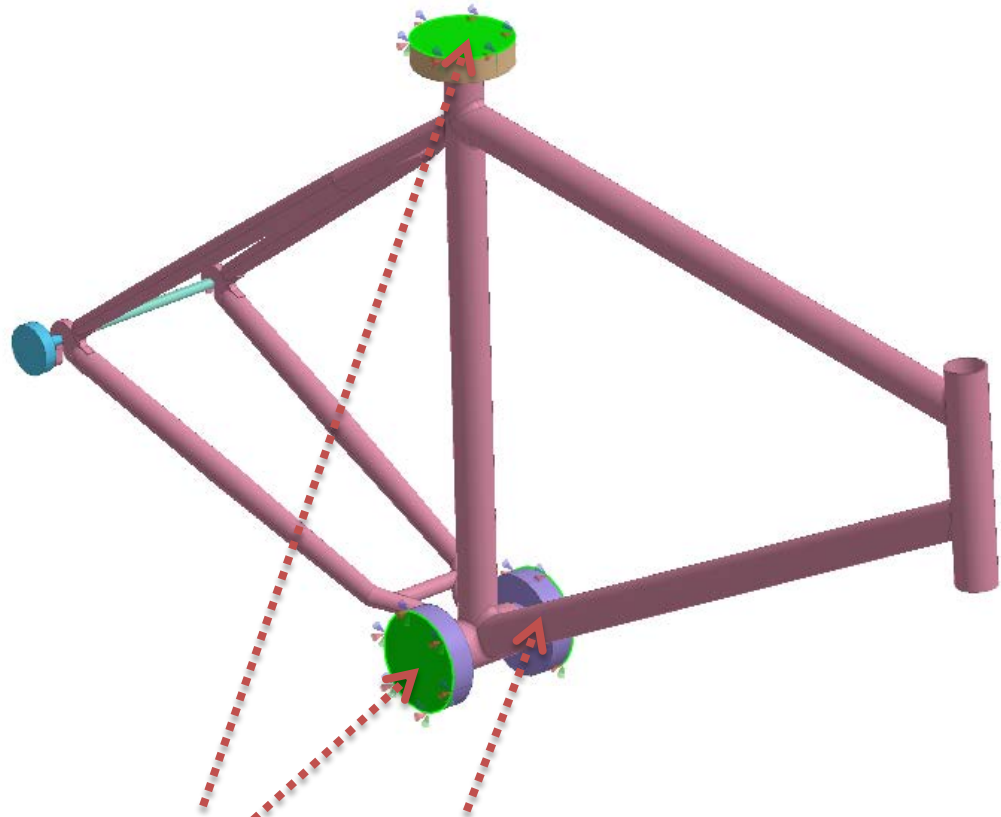
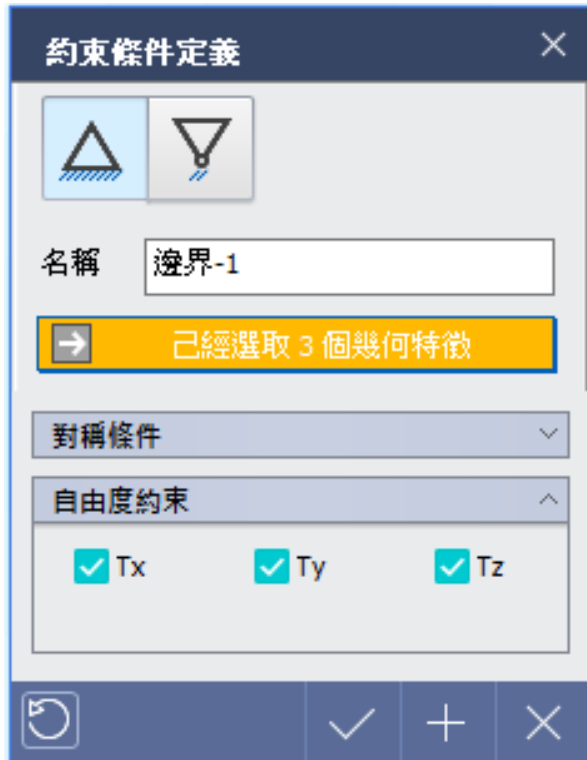
- Alloy Steel (Selected)
- AL6061-T91
- 添加: 材料

滑鼠右鍵,材料定義

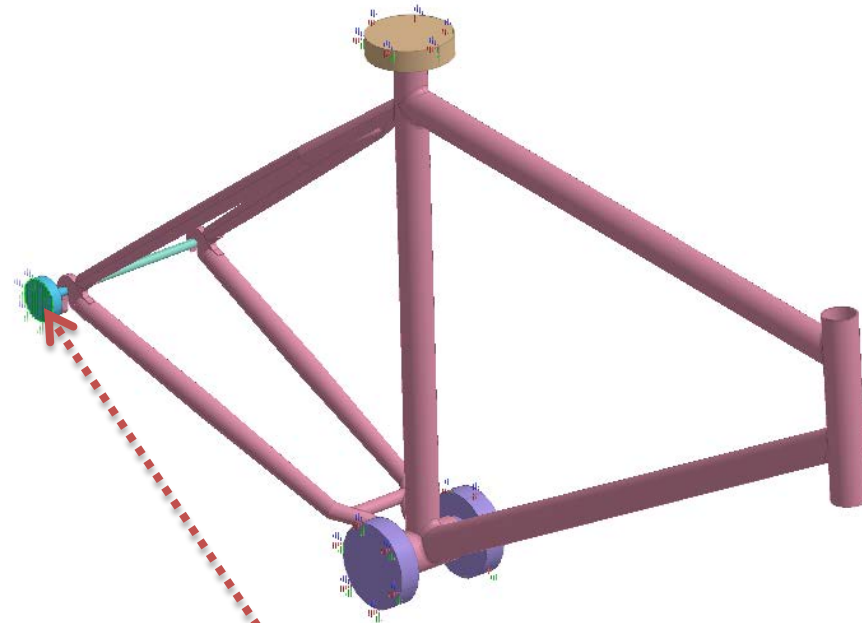
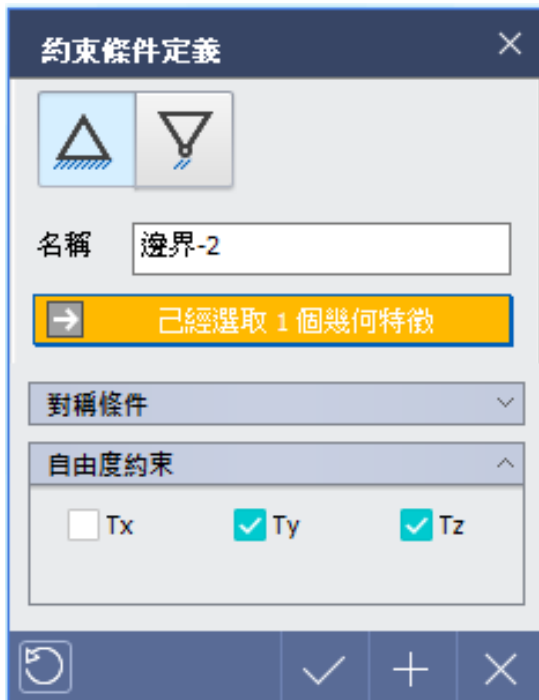
模型樹 (Model Tree) showing material assignments:

模型	材料	顏色
模型設置		
幾何(5)		
<input checked="" type="checkbox"/> BIKE_FRAME_...	AL6061-T91	
<input checked="" type="checkbox"/> PRT0038	Alloy Steel	
<input checked="" type="checkbox"/> PRT0040	Alloy Steel	
<input checked="" type="checkbox"/> PRT0035	Alloy Steel	
<input checked="" type="checkbox"/> Extrude(1)	Alloy Steel	
材料		
<input checked="" type="checkbox"/> Alloy Steel		
<input checked="" type="checkbox"/> AL6061-T91		
接觸(5)		
<input type="checkbox"/> 邊界		
<input type="checkbox"/> 載荷		

模型樹會顯示指定的材料



選取特徵拘束



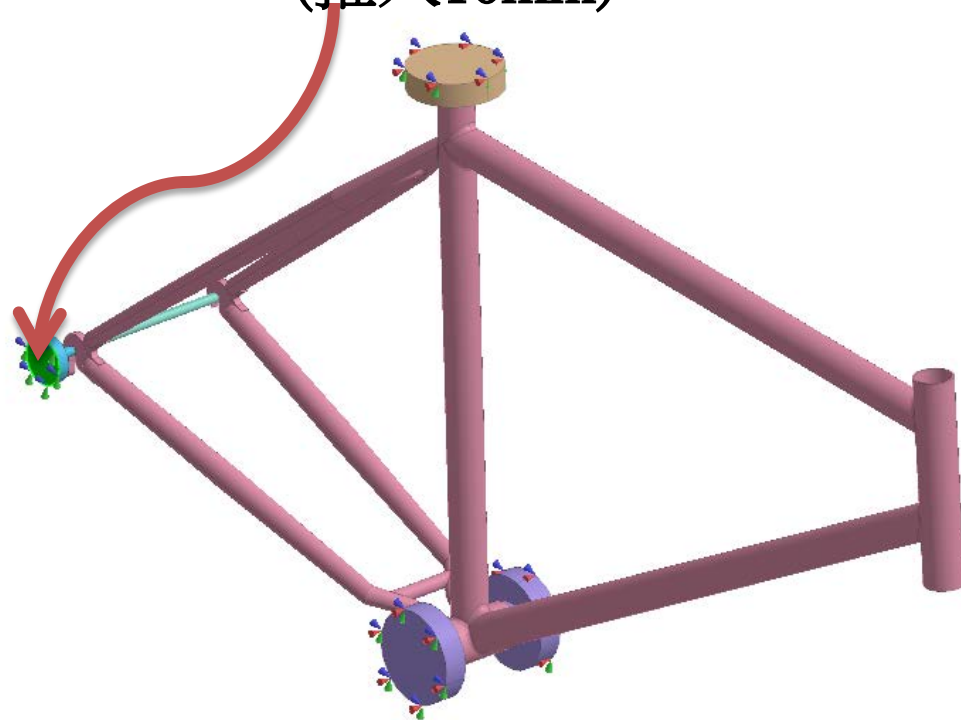
選取特徵拘束  
(只拘束 Y,Z方向由由度)



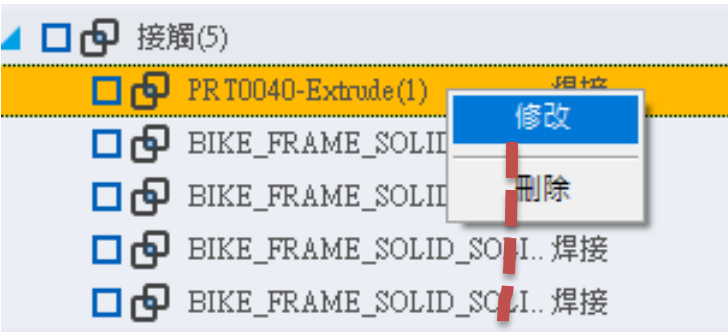
載荷



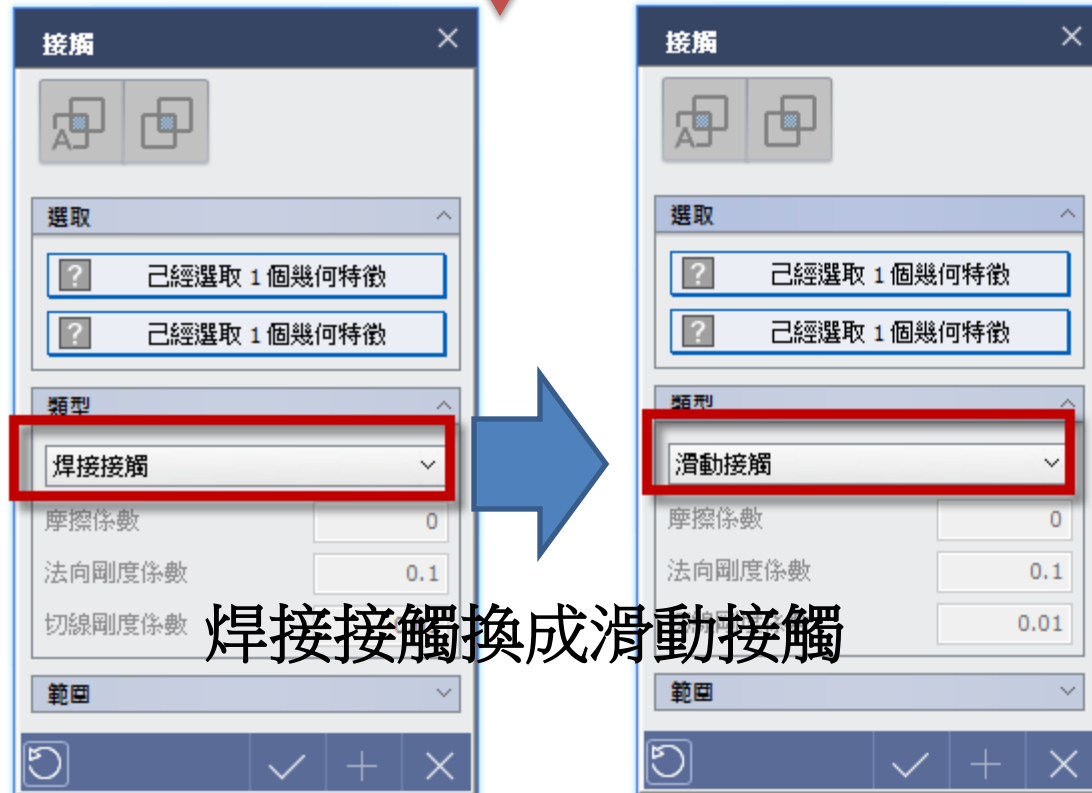
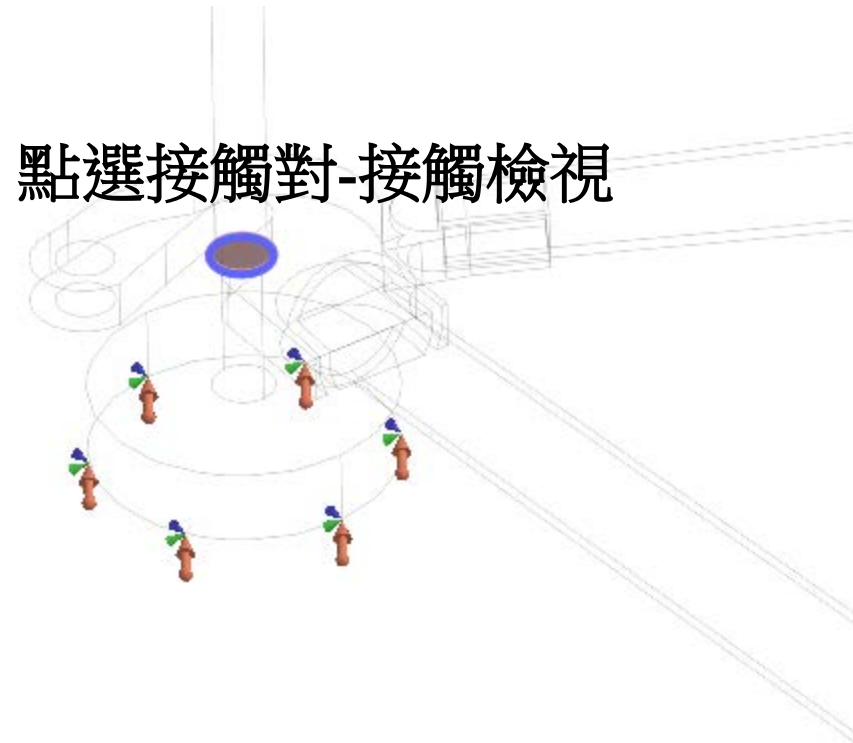
選取治具特徵面  
(推入10mm)



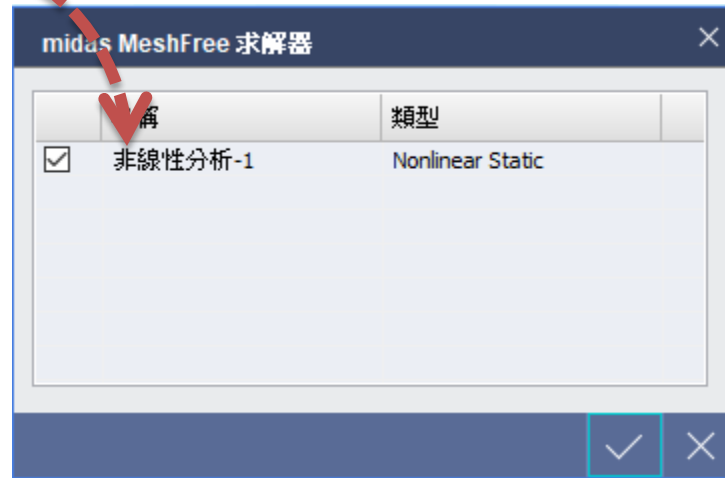
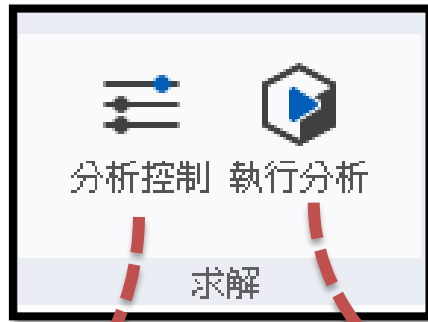




### 點選接觸對-接觸檢視



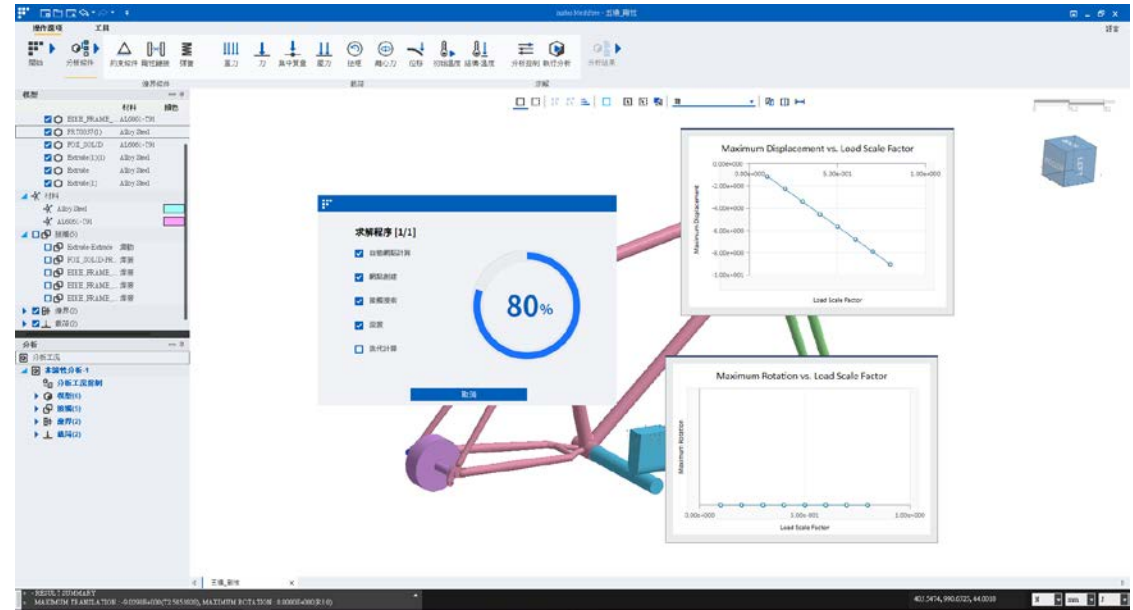
焊接接觸換成滑動接觸



記憶體大小

- 1.計算速度
- 2.分析準確性

分析時間433.775ec  
(採5G Ram)



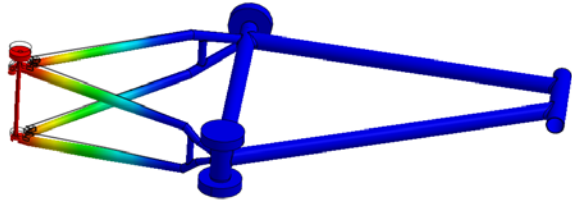
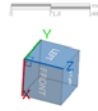
```

> ANALYSIS WALL CLOCK TIME : 393.771 sec
> ANALYSIS COMPLETED

> [SYSTEM INFO]
> NUMBER OF THREADS : 8
> MAXIMUM MEMORY USAGE : 6100 MB
> AVAILABLE MEMORY : 9366 MB
> TOTAL CPU TIME : 1565.3 sec
> WALL CLOCK TIME : 433.775 sec
> TOTAL WARNINGS : 0

> TOTAL WARNINGS : 0
    
```

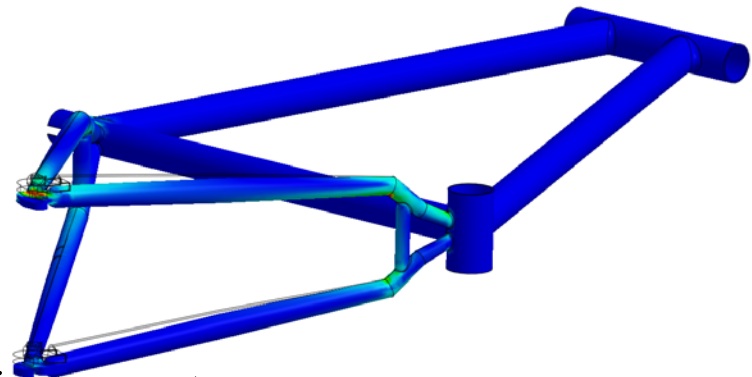
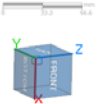
分析類型 非線性分析-1  
 Step INCR=10 (LOAD=1.000)  
 結果 DISPLACEMENT-XYZ



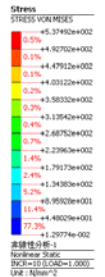
變形量(mm)

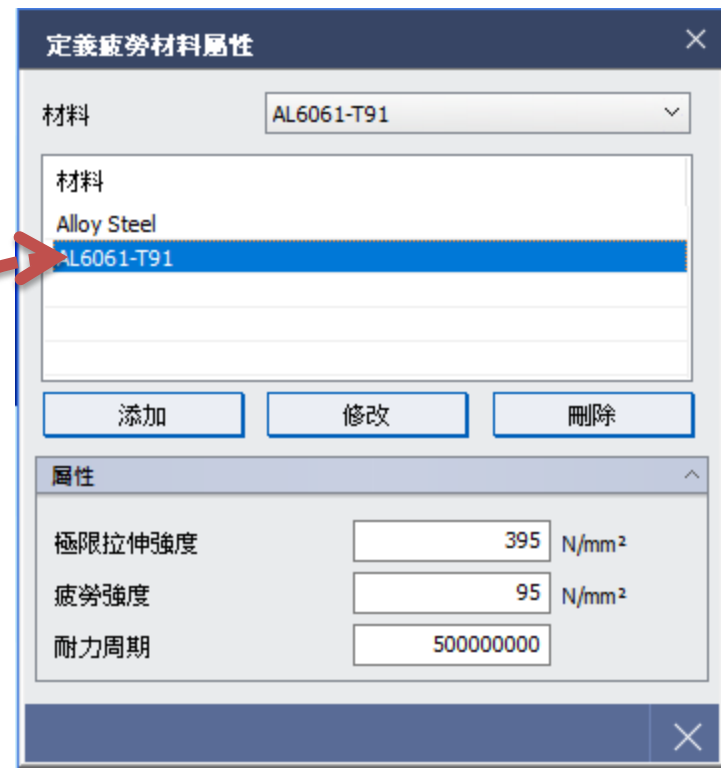
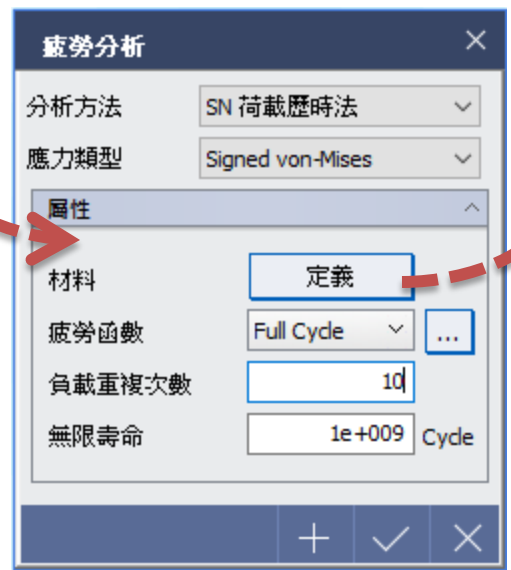
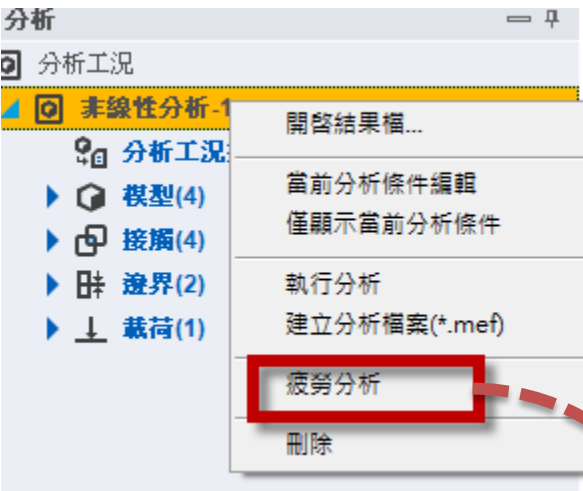


分析類型 非線性分析-1  
 Step INCR=10 (LOAD=1.000)  
 結果 STRESS VON MISES



應力(MPa)



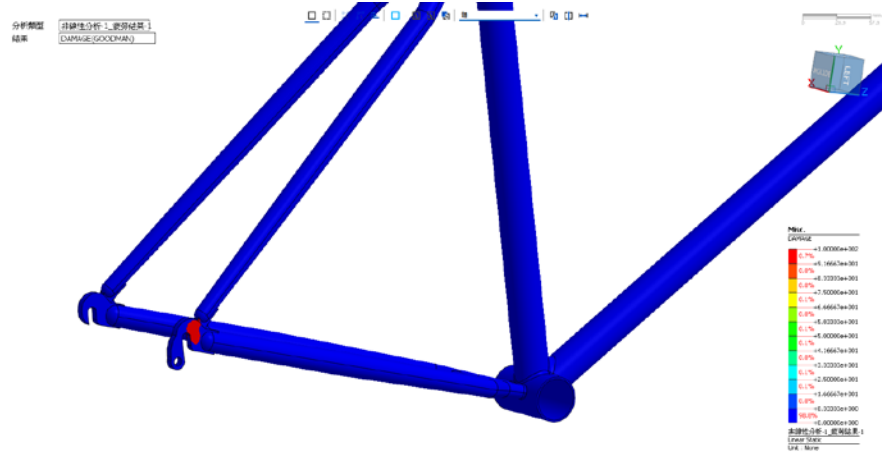


# AL6061-T91

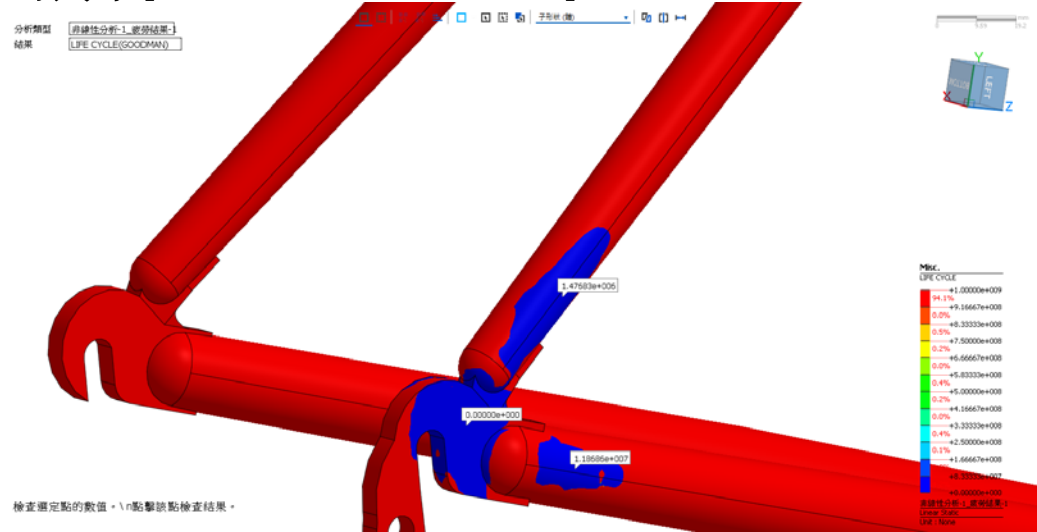
Fatigue Strength

95.0 MPa  
@# of Cycles 5.00e+8

# 損傷(GOODMAN)



# 周期(GOODMAN)



檢查選定點的數值，\n點擊該點檢查結果。

分析工況

- 非線性分析-1
  - 分析工況控制
  - 模型(4)
  - 接觸(4)
  - 邊界(2)
  - 載荷(1)

非線性分析-1\_疲勞結果-1

- 開啓結果檔...
- 執行分析
- 刪除