



MIDAS

MESH FREE

結構疲勞
心軸扭力疲勞分析

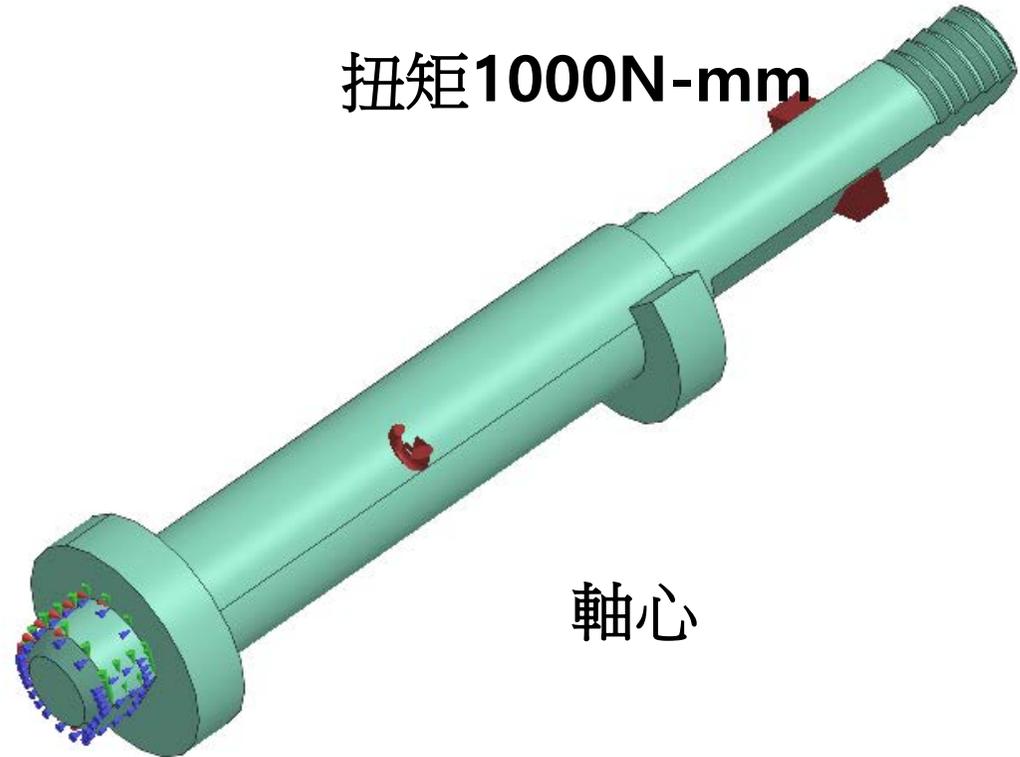
Simple, but Everything.





施加扭矩位置

扭矩1000N-mm



軸心

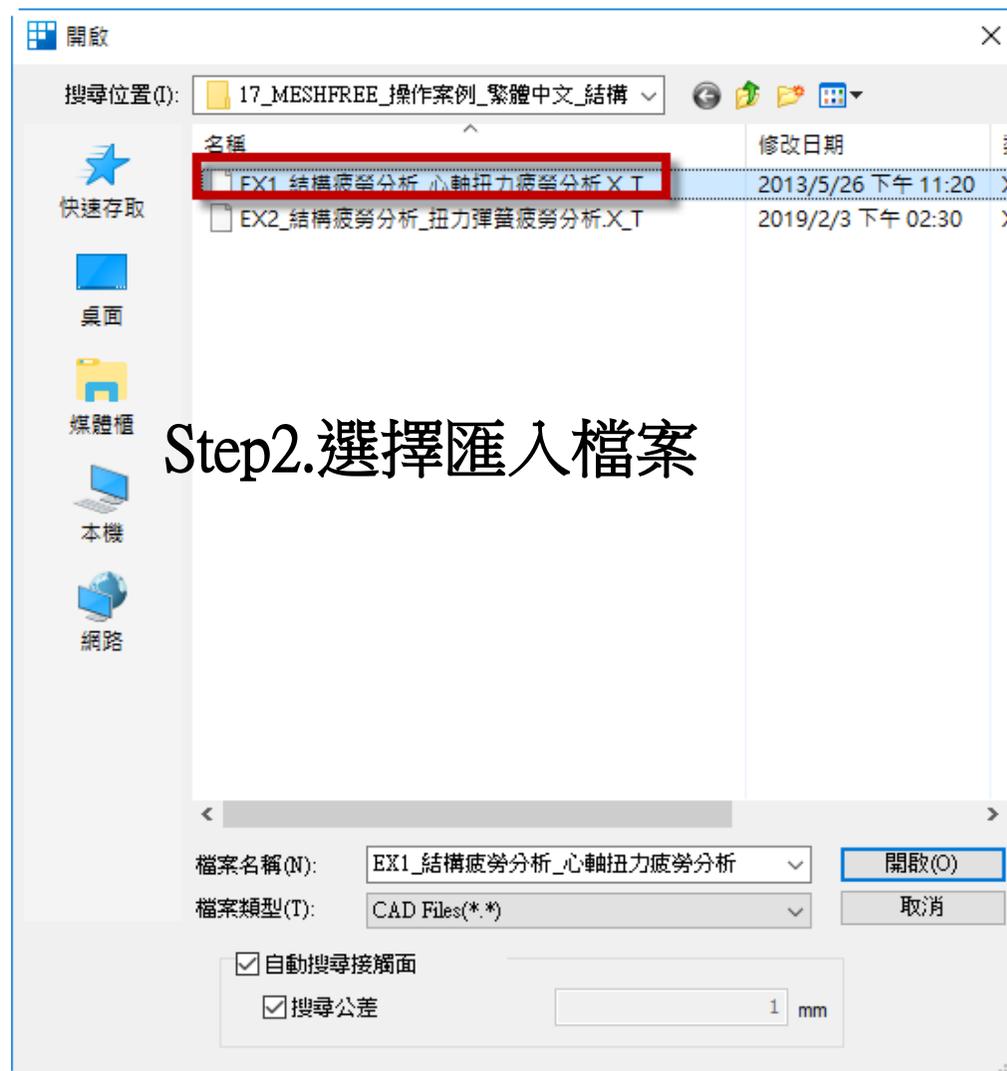
固定X,Y,Z



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

新增AISI 1144材質

材料定義

Steel 名稱 AISI 1144 顏色

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

載入 編輯

線性 彈塑性

結構

彈性模量 200000 N/mm²

泊松比 0.29

質量密度 7.87e-006 kg/mm³

屈服應力 420 N/mm²

熱膨脹

熱膨脹係數 0

參考溫度 0 [°C]

熱

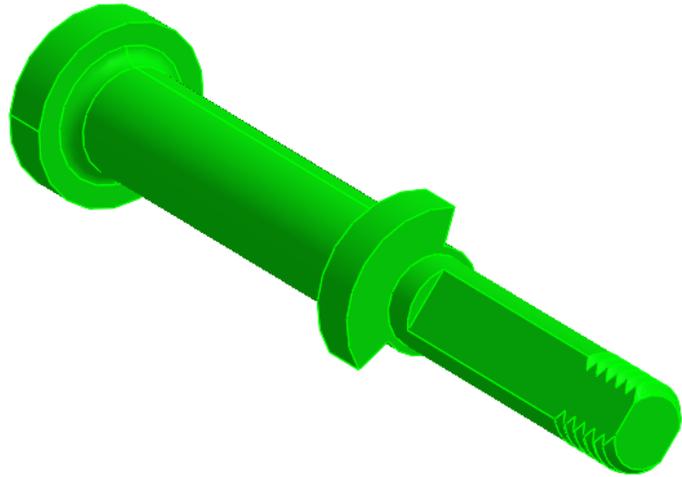
熱傳導係數 0 W/(mm·[°C])

比熱 0 J/(kg·[°C])

發熱係數 0

Physical Properties	Metric
Density	7.87 g/cc
Mechanical Properties	
Hardness, Brinell	212
Hardness, Knoop	235
Hardness, Rockwell B	94
Hardness, Rockwell C	16
Hardness, Vickers	223
Tensile Strength, Ultimate	705 MPa
Tensile Strength, Yield	420 MPa
Elongation at Break	21 %
Reduction of Area	41 %
Modulus of Elasticity	200 GPa
Bulk Modulus	160 GPa
Poissons Ratio	0.29
Shear Modulus	80.0 GPa
Izod Impact	43.0 J
	53.0 J
	65.0 J

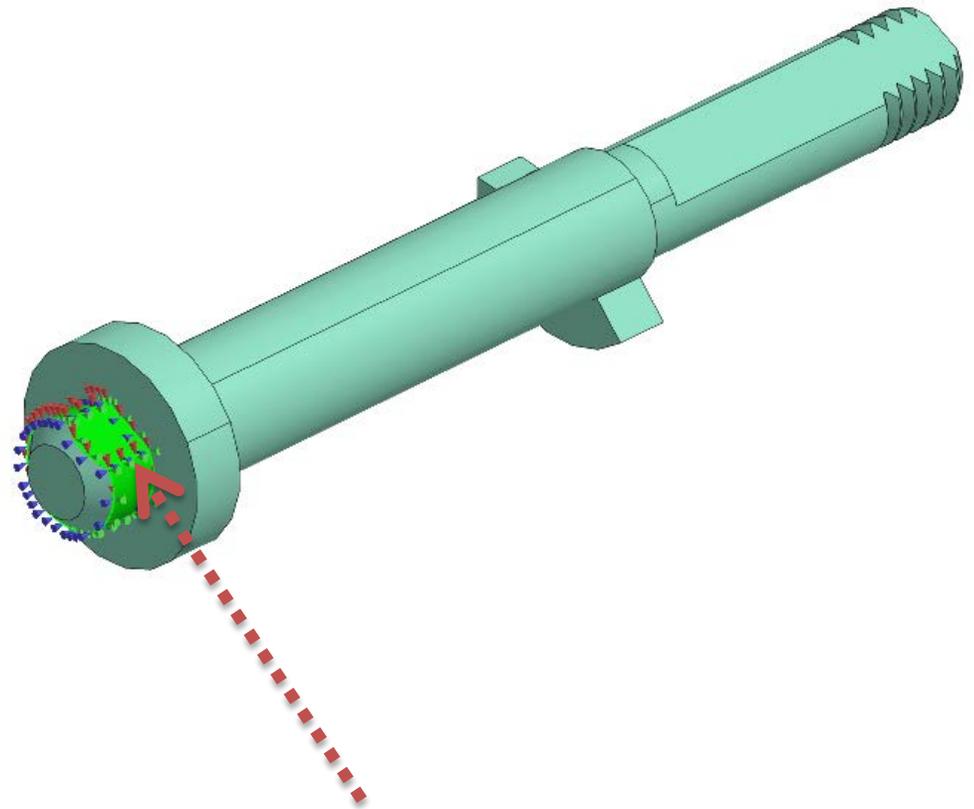
註: AISI 1144材質參考 www.matweb.com



滑鼠右鍵,材料定義



模型樹顯示指定材料



選取特徵拘束



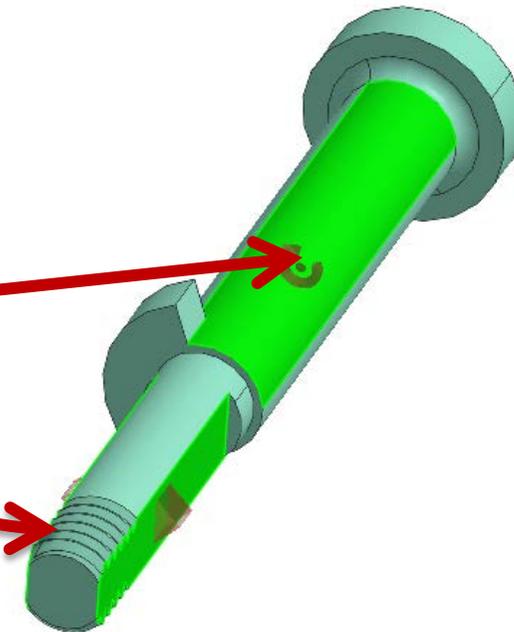
載荷

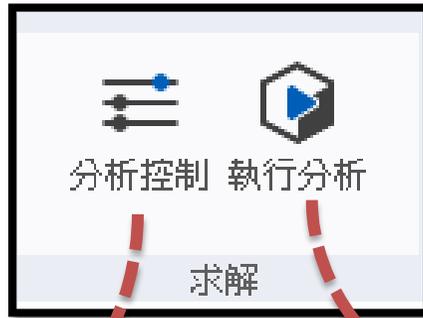
選擇特徵-自動判斷軸心



扭矩1000N-mm

施加扭矩位置





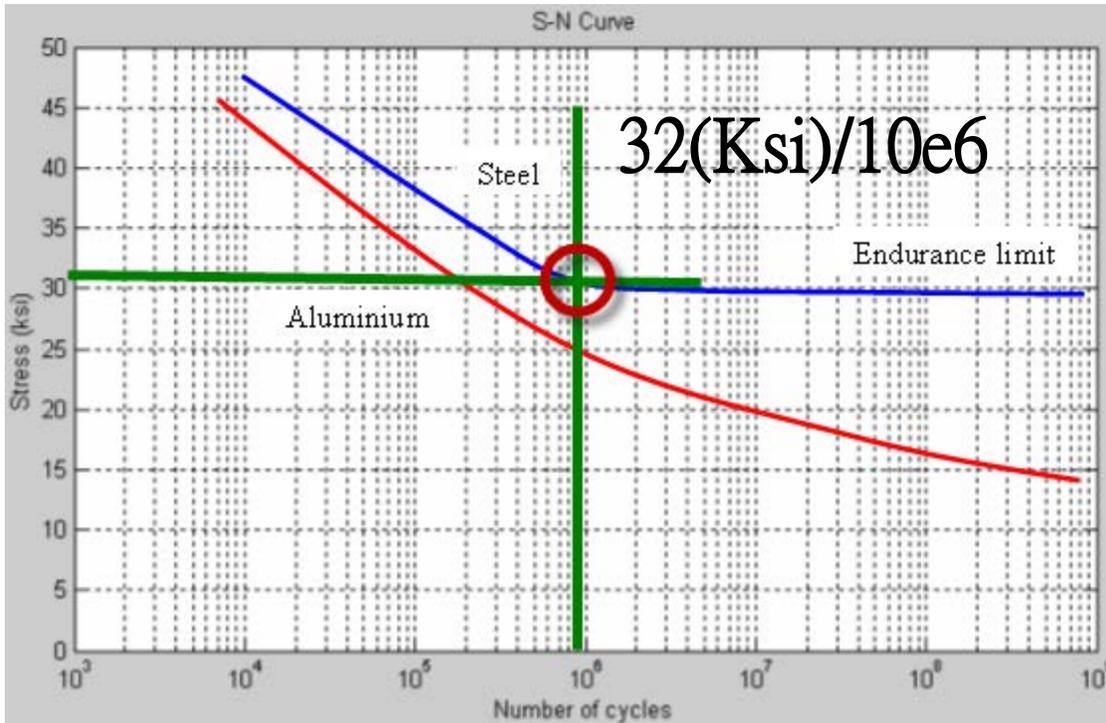
記憶體大小
1.計算速度
2.分析準確性

The screenshot displays the MIDAS MeshFree software interface. The main window shows a 3D model of a bolt with a green thread and a red nut. A dialog box titled "求解程序 [1/1]" (Solving Program [1/1]) is open in the center, indicating the progress of the solving process. The dialog box contains the following options:

- 自動網點計算 (Automatic Mesh Point Calculation)
- 網點創建 (Mesh Point Creation)
- 接觸搜索 (Contact Search)
- 設置 (Settings)
- 系統矩陣計算 (System Matrix Calculation)
- 求解 (Solve)
- 分析結果 (Analysis Results)

A progress indicator shows 14% completion. A "取消" (Cancel) button is located at the bottom of the dialog box. The background interface includes a toolbar with various analysis tools, a left sidebar with model settings (e.g., "模型設置", "材料", "分析"), and a bottom status bar with system information.

Steel & Aluminum S-N Curve

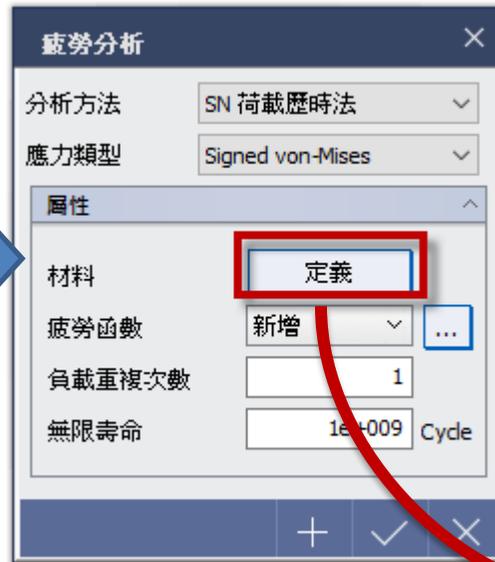


=>220(MPa)/10e6

平方英寸 [ksi]	↔	兆帕 [MPa]
32	=	220.68965517241



線性分析點擊
滑鼠右鍵

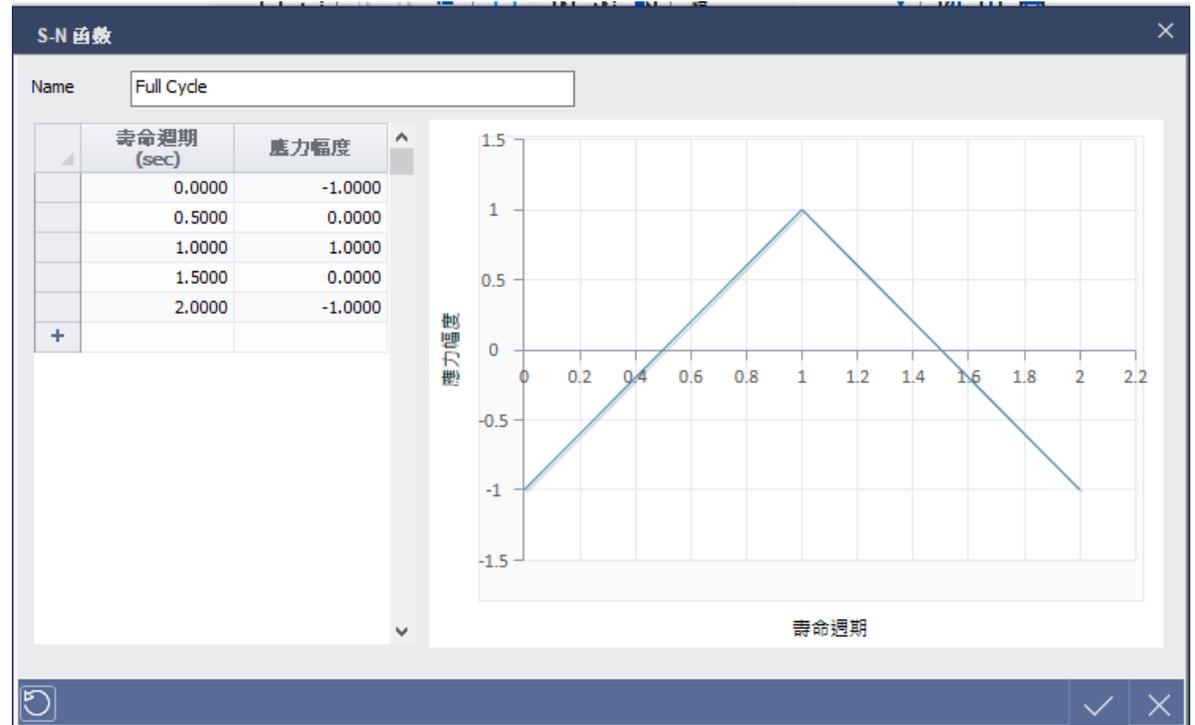
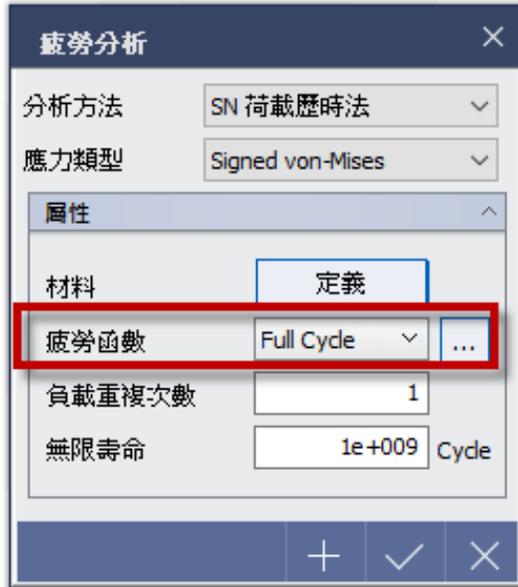


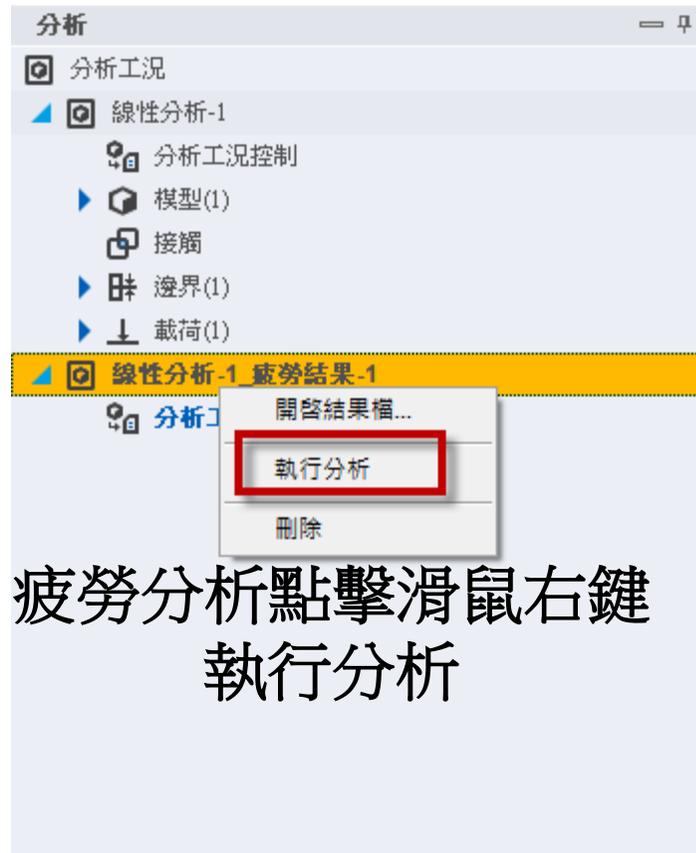
定義材料疲勞參數



選擇AISI 1144

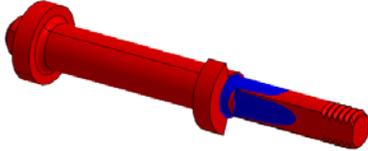
選擇疲勞函數(可自訂)



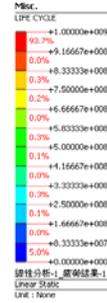


疲勞分析點擊滑鼠右鍵
執行分析

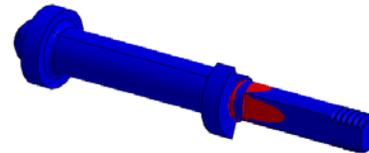
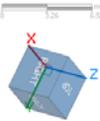
分析類型 線性分析-1_疲勞結果-1
結果 LIFE CYCLE(GOODMAN)



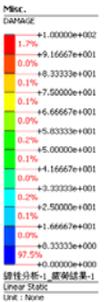
使用壽命



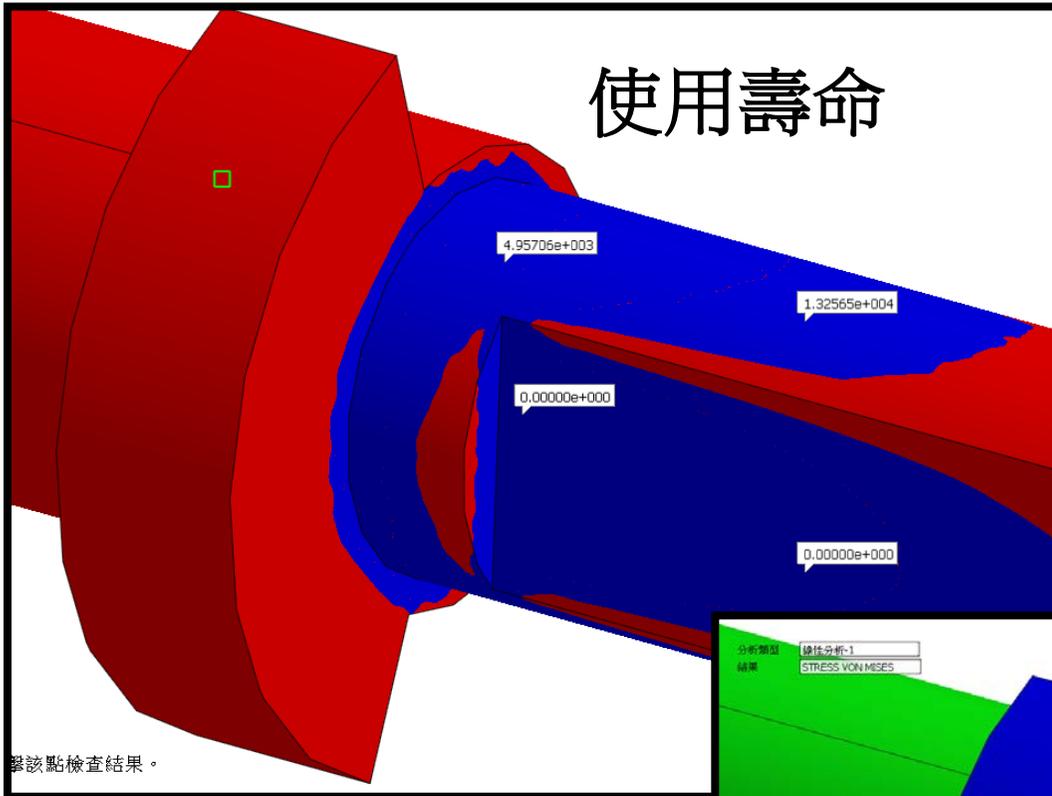
分析類型 線性分析-1_疲勞結果-1
結果 DAMAGE(GOODMAN)



損傷位置



使用壽命



該點檢查結果。

Yield Stress:420MPa

