



MIDAS

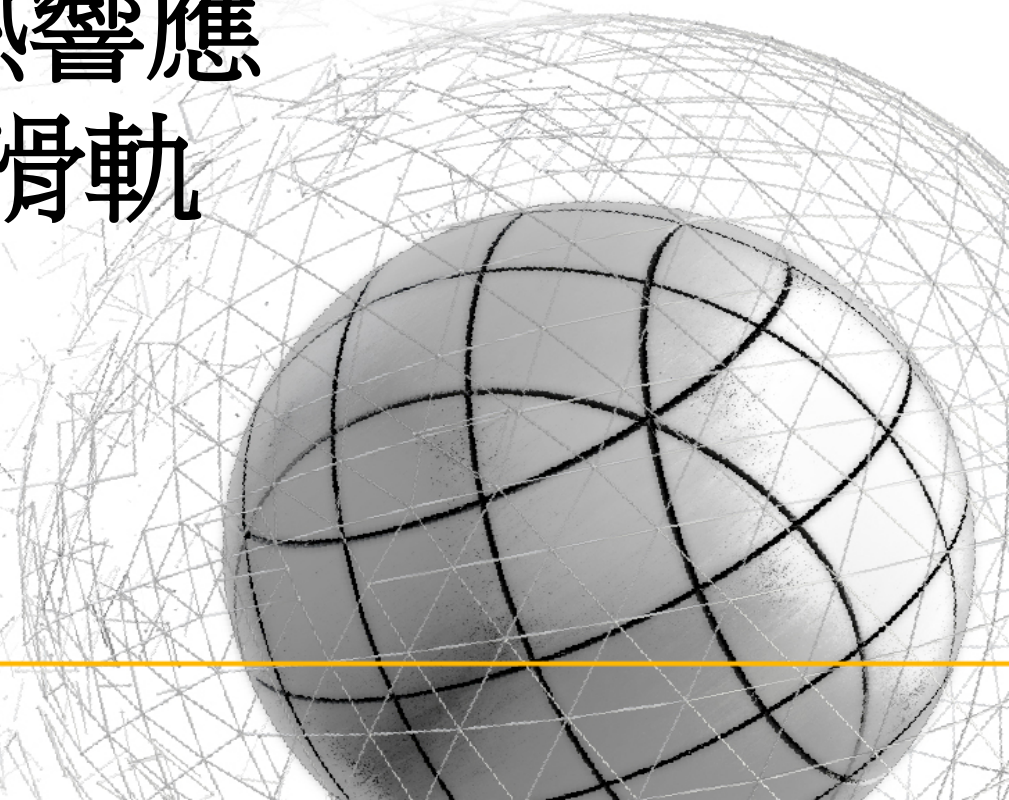
MESH FREE

瞬態熱響應

EX1.滑軌

Simple, but Everything.

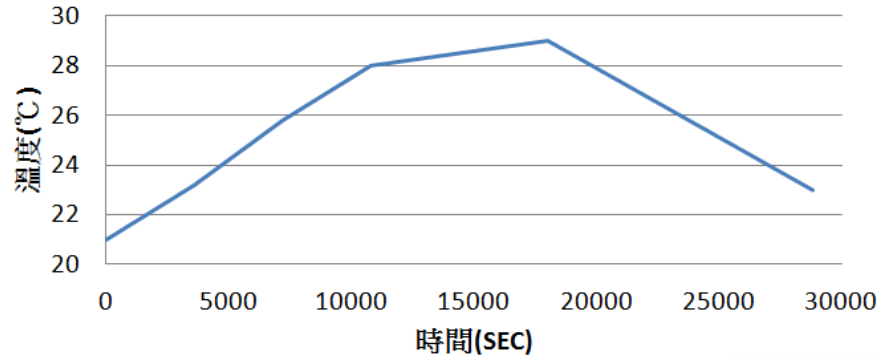
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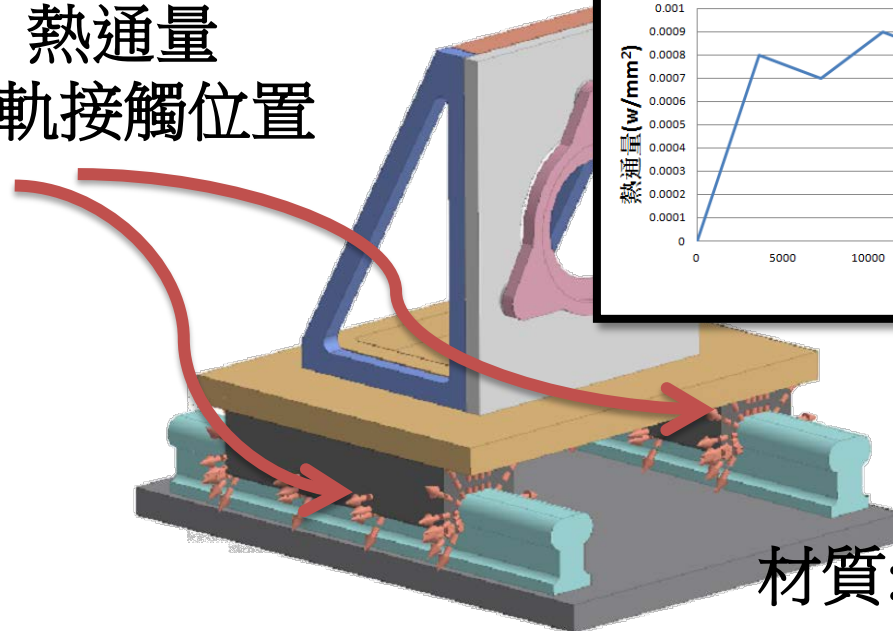
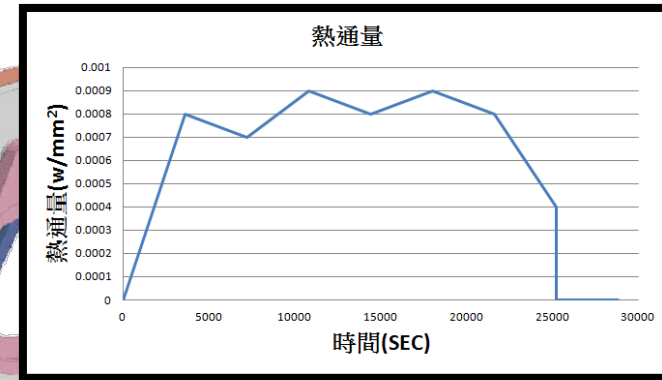
初始溫度: 20 °C

空氣熱對流係數:  $5 \times 10^{-5}$  (W/mm<sup>2</sup> °C)

環境溫度



熱通量  
滑軌接觸位置



材質: Alloy Steel



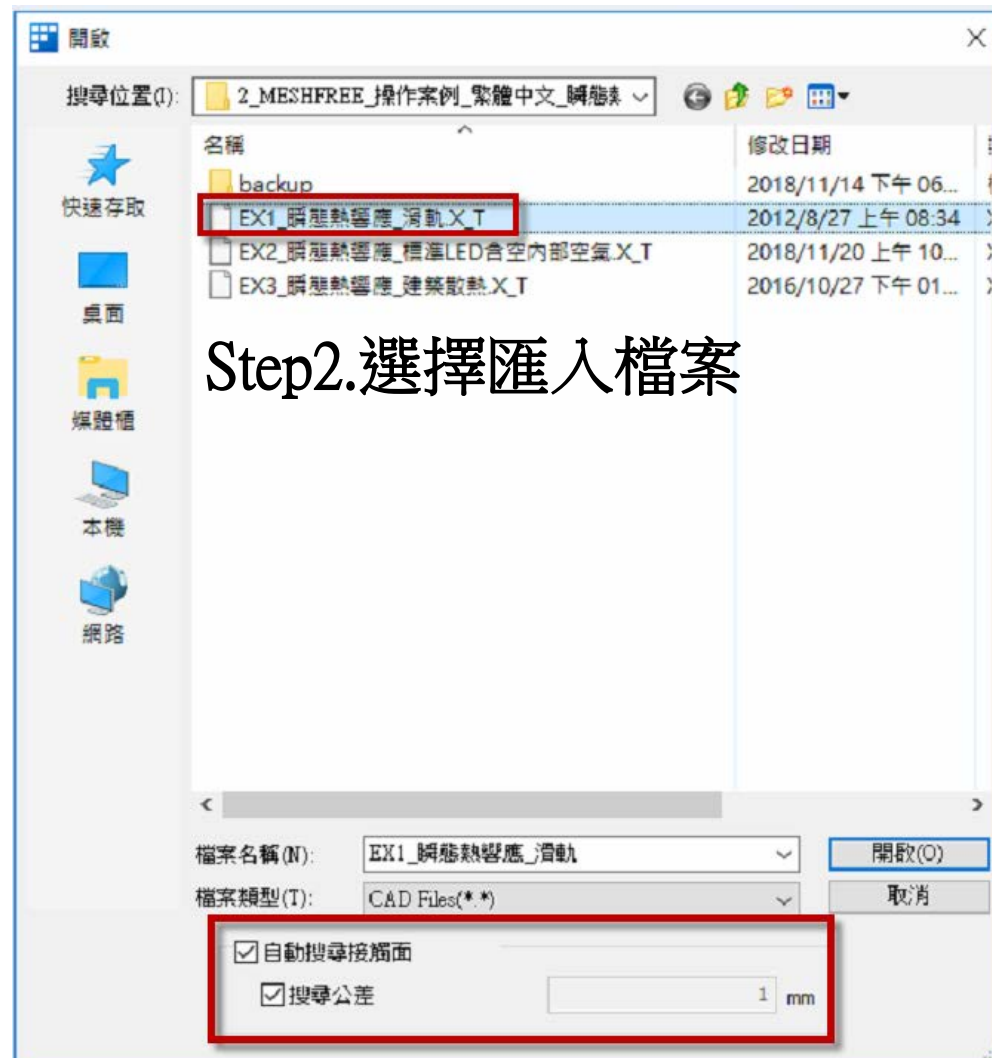
瞬態-熱



## Step1.匯入3D 模型

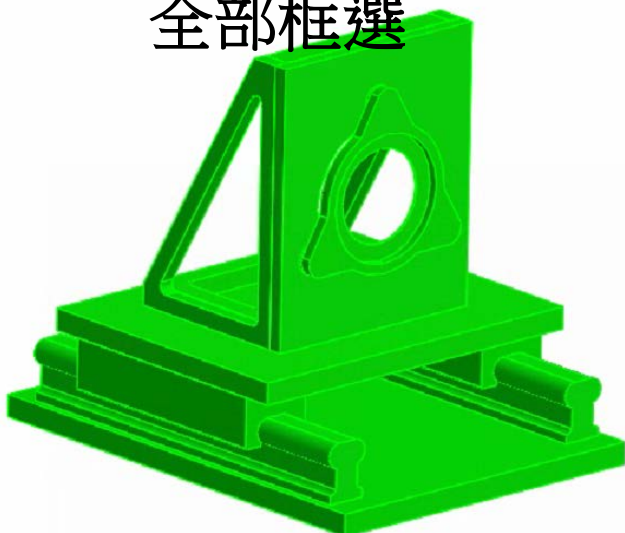
## MeshFree支援各類CAD 格式

Parasolid (9 - 29) Files (\*.x\_t;\*.xmt\_tbt;\*.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)



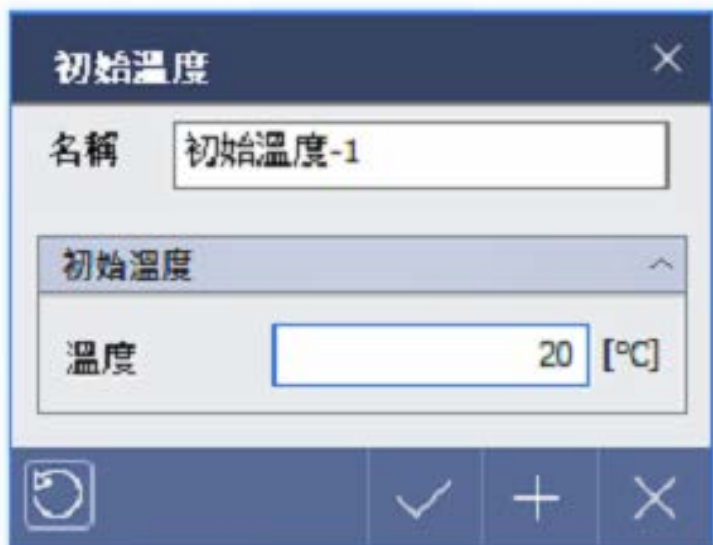
## Step3.開啓自動搜尋接觸面

# 全部框選

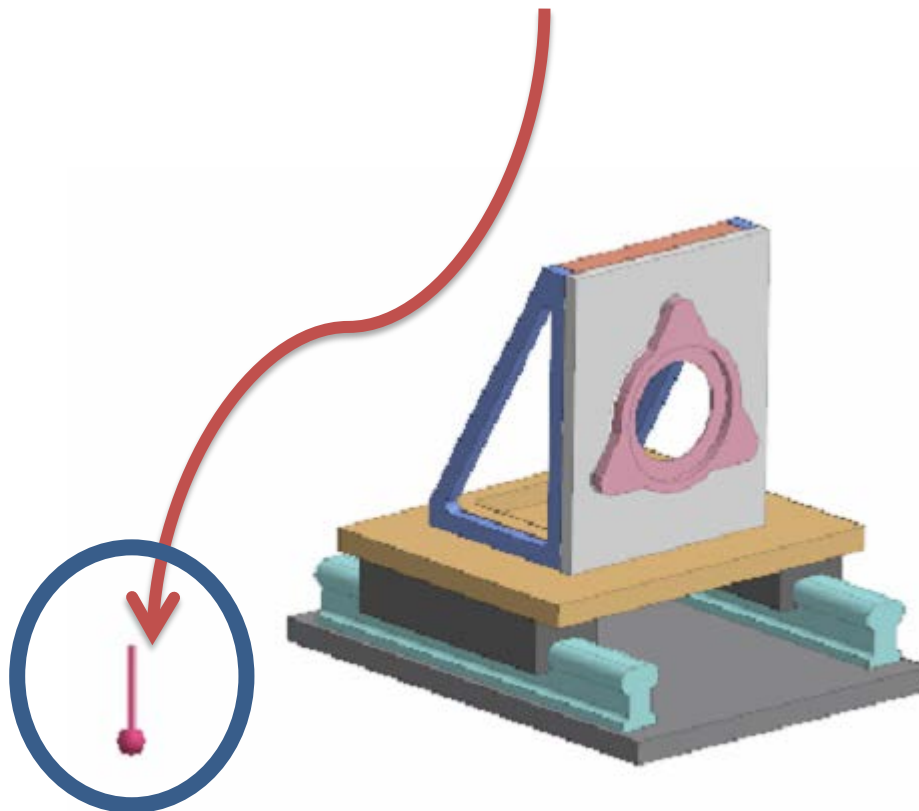


# 模型樹顯示指定材料





## Initial Temperature Definition Marker

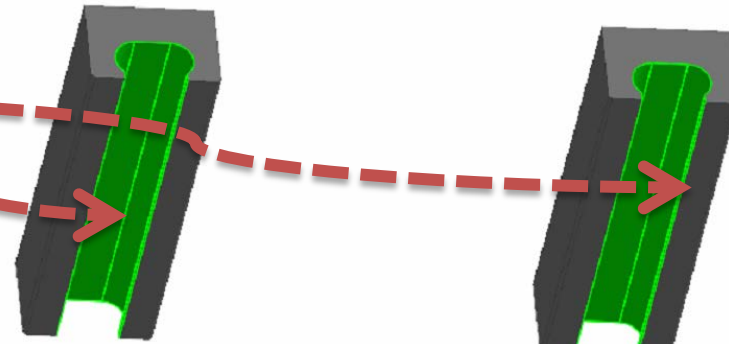


註: Initial Temperature is for the entire system, cannot specify the initial temperature of individual parts.





滑軌接觸位置



時間-熱通量=熱通量×時間函數



空氣熱對流係數:  $5 \times 10^{-5}$  (W/mm<sup>2</sup> °C)

載荷

熱對流

名稱 熱對流-1

已經選取 150 個幾何特徵

環境溫度

數值 1 [°C]

熱對流係數

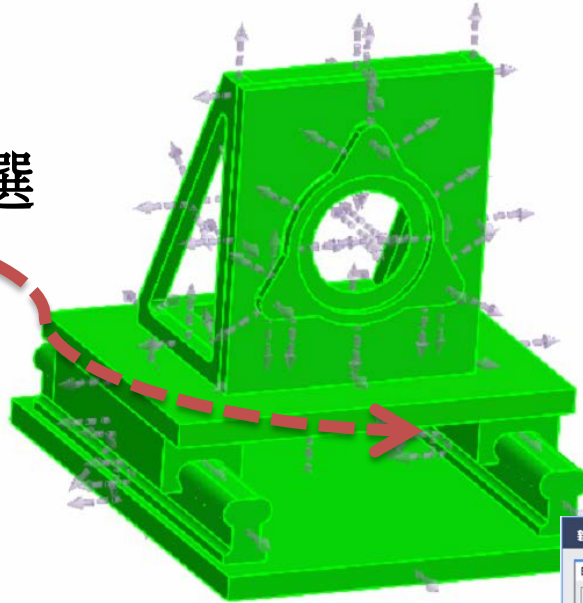
數值 5E-5 W/(mm<sup>2</sup>·[°C])

時間函數

常數 1

使用者定義 時間函數

全選



新增/修改 函數

時間函數

名稱 時間函數-2

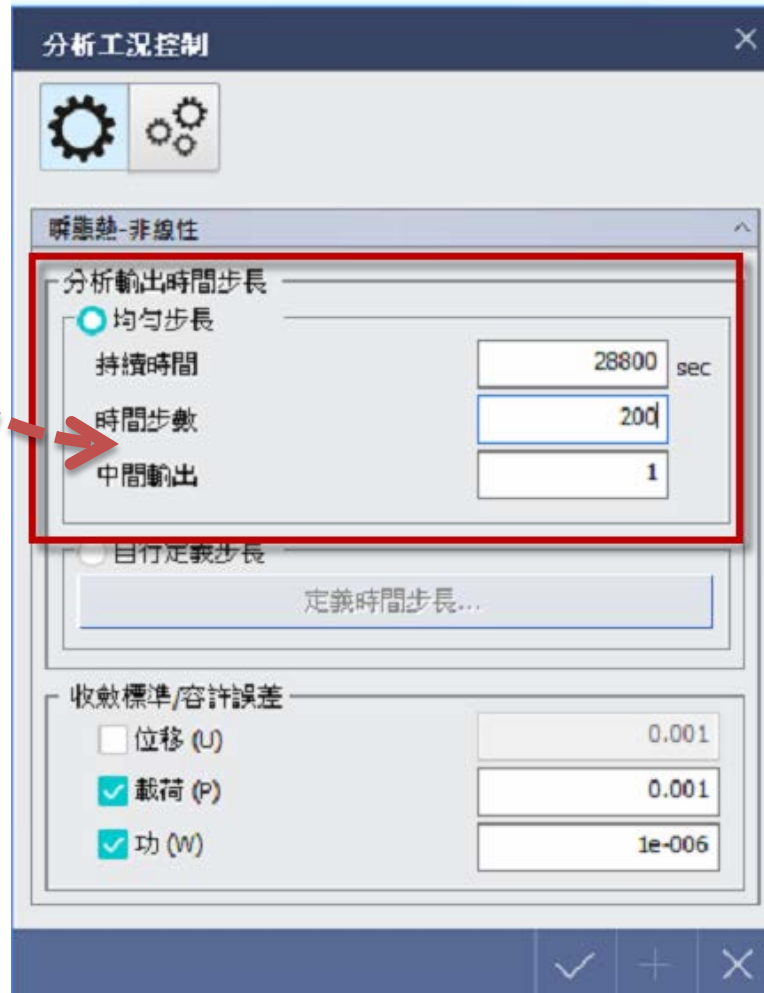
時間 (sec)	值
0.0000	21.0000
0.0100	21.0000
3600.0000	23.2000
3600.0100	23.2000
7200.0000	25.8000
7200.0100	25.8000
10800.0000	28.0000
10800.0100	28.0000
14400.0000	28.5000
14400.0100	28.5000
18000.0000	29.0000
18000.0100	29.0000
21600.0000	27.0000
21600.0100	27.0000

1 比例值

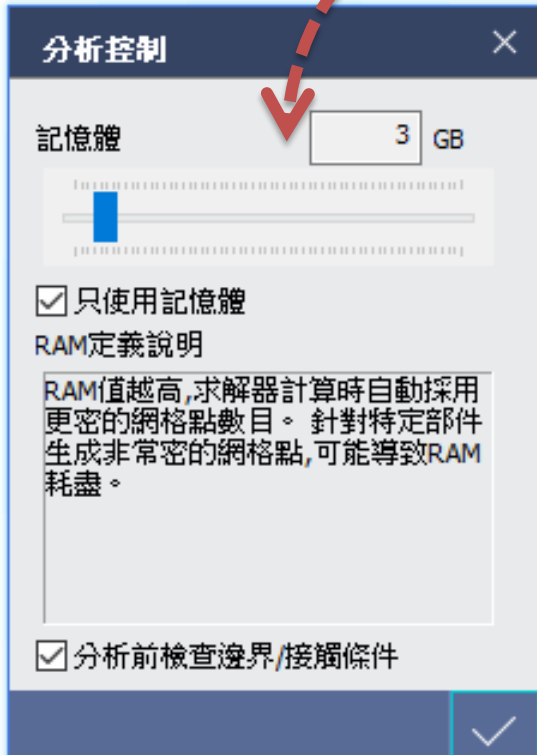
時間-熱對流溫度變化=環境溫度×時間函數



1. 計算8小時(28800sec)
2. 等分成200次計算(每144sec計算一次)







記憶體大小  
1.計算速度  
2.分析準確性

# 匯出計算資訊

Export Mec File

49%

匯出幾何數據...

取消

# 進行求解

求解程序 [1/1]

- 自動網元計算
- 網元生成
- 接觸控制
- 求解
- 迭代計算

20%

取消

操作環境 工具

開始 分析條件 屬性編輯 初始溫度 熱-溫度 熱-邊界 熱-對流 熱-對流 熱-對流 分析定制 執行分析 分析結果

模型

模型設置

- 條件 (11)
- 材料
- 接觸 (15)
- 邊界
- 屬性 (3)
  - 熱-溫度-1 初始溫度
  - 熱-邊界-1 熱邊界
  - 熱-對流-1 熱對流

分析

分析工具

- 解算器分析器-1
- 求解器分析器
- 後處理 (11)
- 接觸 (15)
- 邊界
- 屬性 (3)

MEMORY ESTIMATOR REAL = 1 TOTAL DOF = 4279  
MEMORY ESTIMATOR REAL = 2 TOTAL DOF = 56141

下午 01:04  
2018/1/20

The screenshot displays the MIDAS MeshFree software interface. The main window shows a simulation progress window titled "求解程序 [1/1]" (Solving Program [1/1]) with a progress indicator at 80%. A list of checked options includes: 自動網點計算 (Automatic Meshing), 網點創建 (Mesh Creation), 接觸搜索 (Contact Search), and 設置 (Settings). An unchecked option is 迭代計算 (Iterative Calculation). A "取消" (Cancel) button is visible at the bottom of the progress window.

To the right, a graph titled "Maximum Temperature vs. Global Time" shows the relationship between the two variables. The Y-axis is labeled "Maximum Temperature" and ranges from 0.00e+000 to 3.50e+001. The X-axis is labeled "Global Time" and ranges from 0.00e+000 to 2.00e+004. The graph shows a curve that starts at approximately (0, 2.1) and rises to about (1.5e4, 3.0).

The software interface includes a top menu bar with options like "動作" (Action), "檢視" (View), "音訊 / 視訊" (Audio / Video), "檔案傳輸" (File Transfer), and "其他" (Other). Below the menu is a toolbar with icons for "開始" (Start), "分析條件" (Analysis Conditions), "剛性連接" (Rigid Connection), "初始溫度" (Initial Temperature), "熱-溫度" (Thermal-Temperature), "熱通量" (Heat Flux), "熱對流" (Convection), "熱源" (Heat Source), "輻射熱" (Radiation), "分析控制" (Analysis Control), "執行分析" (Execute Analysis), and "分析結果" (Analysis Results).

The left sidebar contains a tree view for "模型" (Model) and "分析" (Analysis). Under "模型", there are sections for "材料" (Material) and "顏色" (Color). Under "分析", there is a section for "分析工況" (Analysis Conditions) with a sub-section for "瞬態熱分析-1" (Transient Thermal Analysis-1) containing "分析工況控制" (Analysis Conditions Control). Below this, there are sections for "模型 (11)", "接觸 (15)", "邊界" (Boundary), and "載荷 (3)".

The bottom status bar shows the following information:
 

- File: EX1\_瞬態熱響應\_運動
- Output: RESULT SUMMARY
- Value: MAXIMUM TEMPERATURE : 2.9875E+001(113482)
- Coordinates: -395.2929, 320.0468, 357.2824
- Units: mm, J
- System Time: 下午 01:07, 2018/11/20



分析結果

分析結果數值查詢

結果 INCR=200 (TIME=2.8809+004)

座標 TEMPERATURE -196.518, 52.3174, +23.37

顯示	位置	值
<input checked="" type="checkbox"/>	152, 133, 280	2.31616e+001
<input checked="" type="checkbox"/>	8.21, 112, 47	2.33093e+001
<input checked="" type="checkbox"/>	292, 110, 109	2.33008e+001
<input checked="" type="checkbox"/>	143, 14, 17.7	2.33244e+001

分析步

多分析步結果表

多分析步結果圖

分析步：結果

- Transient Heat Transfer : INCR=0 (TIME=0.000e+000)
- Transient Heat Transfer : INCR=1 (TIME=1.440e+002)
- Transient Heat Transfer : INCR=2 (TIME=2.880e+002)
- Transient Heat Transfer : INCR=3 (TIME=4.320e+002)
- Transient Heat Transfer : INCR=4 (TIME=5.760e+002)
- Transient Heat Transfer : INCR=5 (TIME=7.200e+002)
- Transient Heat Transfer : INCR=6 (TIME=8.640e+002)
- Transient Heat Transfer : INCR=7 (TIME=1.008e+003)

檢查選定點的數值，并點擊該點檢查結果

