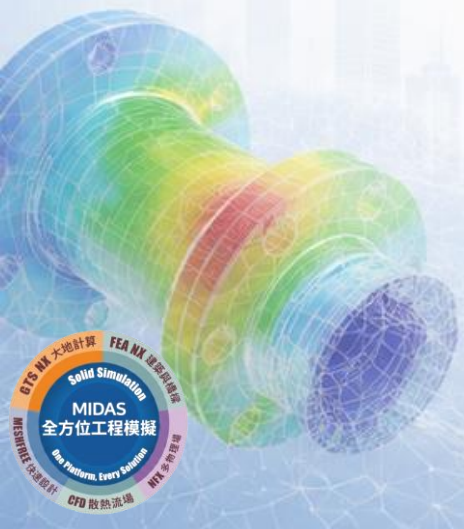
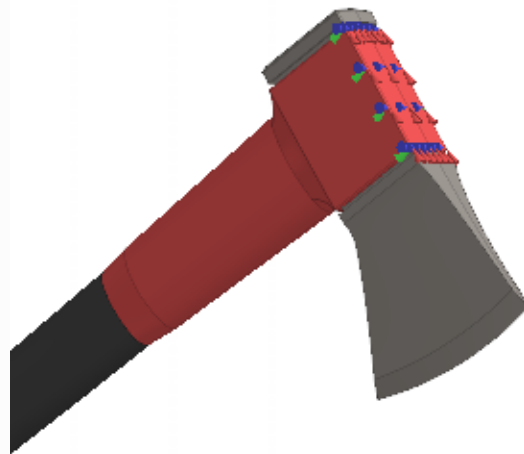


手工具分析 非線性分析



案例概述



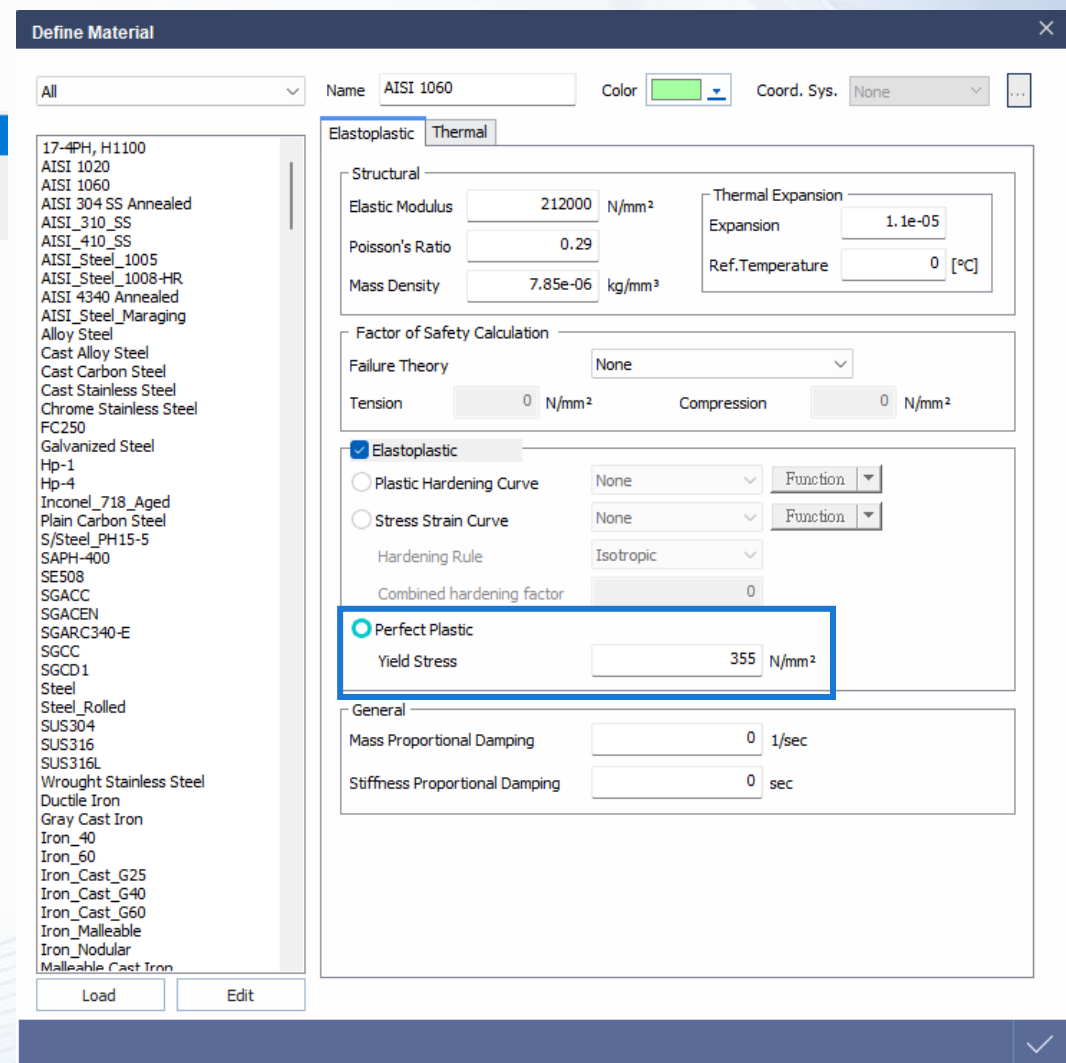
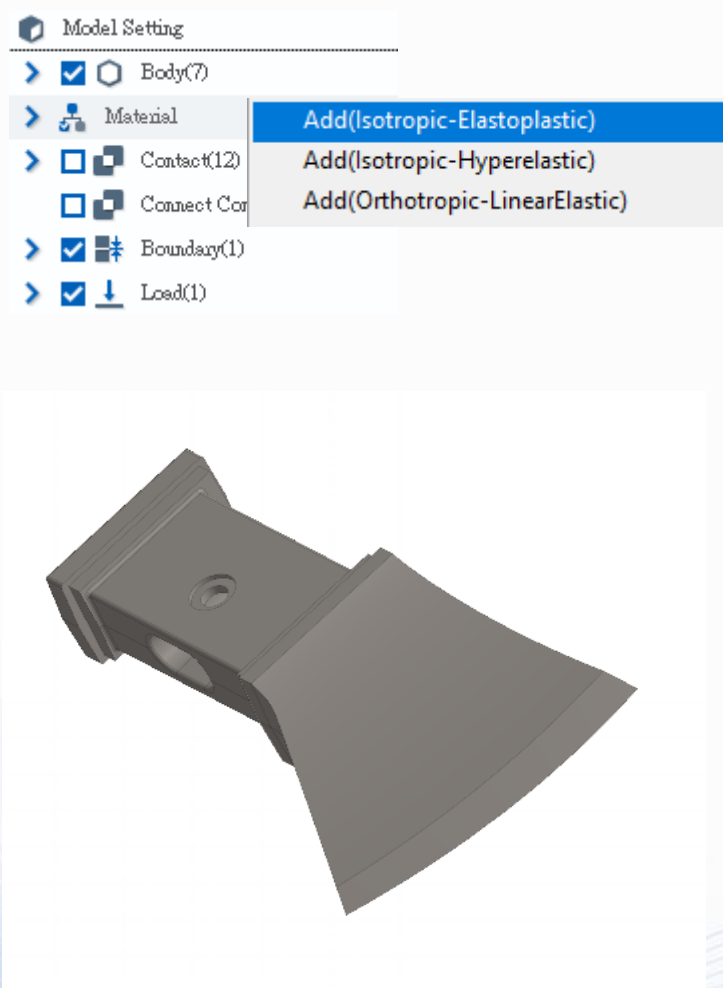
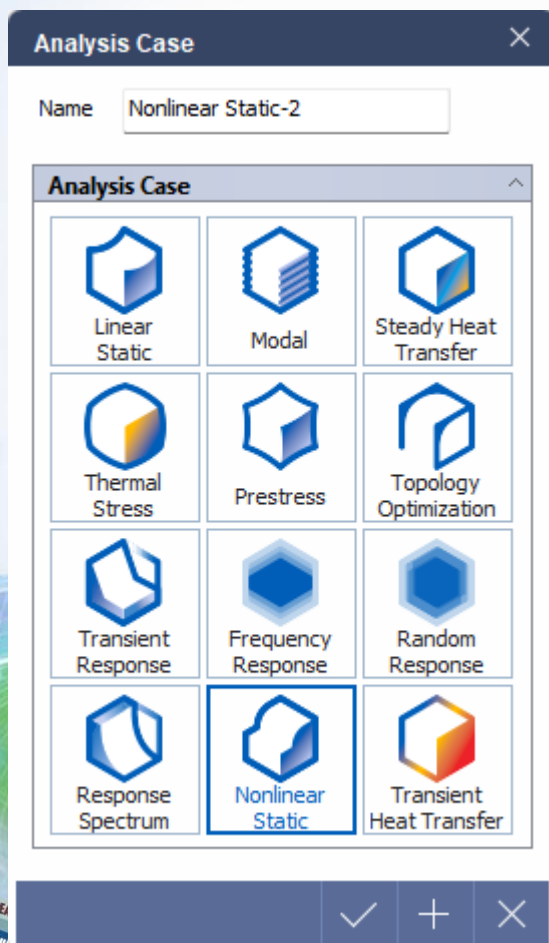
Case Analysis: Non linear Analysis

Constraint: Fixed Support

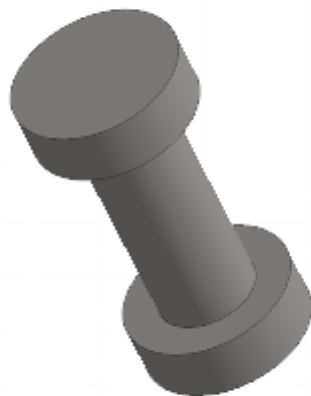
Material: AISI 1060, AISI 304, Polypropylene, FRP, TPR

Load: Force

幾何模型 – 分析案例與材料 (AISI 1060)



幾何模型 – 材料 (AISI 1060)



Define Material

All Name AISI 304 SS Annealed Color Coord. Sys. None

Elastoplastic Thermal

Structural

Elastic Modulus 197000 N/mm²

Poisson's Ratio 0.27

Mass Density 7.955e-06 kg/mm³

Thermal Expansion

Expansion 1.7e-05

Ref. Temperature 0 [°C]

Factor of Safety Calculation

Failure Theory None

Tension 0 N/mm² Compression 0 N/mm²

☒ Elastoplastic

☐ Plastic Hardening Curve None Function

☐ Stress Strain Curve None Function

Hardening Rule Isotropic

Combined hardening factor 0

☒ Perfect Plastic

Yield Stress 215 N/mm²

General

Mass Proportional Damping 0 1/sec

Stiffness Proportional Damping 0 sec

Load Edit

幾何模型 – 材料 (Polypropylene)



Define Material

All Name PP Color Coord. Sys. None

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
SGCD1
Steel
Steel_Rolled
SUS304
SUS316
SUS316L
Wrought Stainless Steel
Ductile Iron
Gray Cast Iron
Iron_40
Iron_60
Iron_Cast_G25
Iron_Cast_G40
Iron_Cast_G60
Iron_Malleable
Iron_Nodular
Malleable Cast Iron

Load Edit

Elastoplastic Thermal

Structural

Elastic Modulus 1180 N/mm²

Poisson's Ratio 0.402

Mass Density 8.9e-07 kg/mm³

Thermal Expansion

Expansion 0

Ref. Temperature 0 [°C]

Factor of Safety Calculation

Failure Theory None

Tension 0 N/mm² Compression 0 N/mm²

☒ Elastoplastic

☐ Plastic Hardening Curve None Function

☐ Stress Strain Curve None Function

Hardening Rule Isotropic

Combined hardening factor 0

☒ Perfect Plastic

Yield Stress 15 N/mm²

General

Mass Proportional Damping 0 1/sec

Stiffness Proportional Damping 0 sec



幾何模型 – 材料 (FRP)



Define Material

Name: FRP Color: Coord. Sys.: None

Material List:

- 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
- SGCD1
- Steel
- Steel_Rolled
- SUS304
- SUS316
- SUS316L
- Wrought Stainless Steel
- Ductile Iron
- Gray Cast Iron
- Iron_40
- Iron_60
- Iron_Cast_G25
- Iron_Cast_G40
- Iron_Cast_G60
- Iron_Malleable
- Iron_Nodular
- Malleable Cast Iron

Properties:

Elastoplastic Thermal

Structural

Elastic Modulus: 30000 N/mm²

Poisson's Ratio: 0

Mass Density: 1.5e-06 kg/mm³

Thermal Expansion

Expansion: 0

Ref. Temperature: 0 [°C]

Factor of Safety Calculation

Failure Theory: None

Tension: 0 N/mm² Compression: 0 N/mm²

Elastoplastic

Plastic Hardening Curve: None Function

Stress Strain Curve: None Function

Hardening Rule: Isotropic

Combined hardening factor: 0

Perfect Plastic

Yield Stress: 600 N/mm²

General

Mass Proportional Damping: 0 1/sec

Stiffness Proportional Damping: 0 sec

Load Edit

幾何模型 – 材料 (TPR)



Define Material

All Name TPR Color  Coord. Sys. None

Elastoplastic Thermal

Structural

Elastic Modulus 10 N/mm²

Poisson's Ratio 0.49

Mass Density 8.9e-07 kg/mm³

Thermal Expansion

Expansion 0

Ref. Temperature 0 [°C]

Factor of Safety Calculation

Failure Theory None

Tension 0 N/mm² Compression 0 N/mm²

☐ Elastoplastic

☐ Plastic Hardening Curve None Function

☐ Stress Strain Curve None Function

Hardening Rule Isotropic

Combined hardening factor 0

☐ Perfect Plastic

Yield Stress 0 N/mm²

General

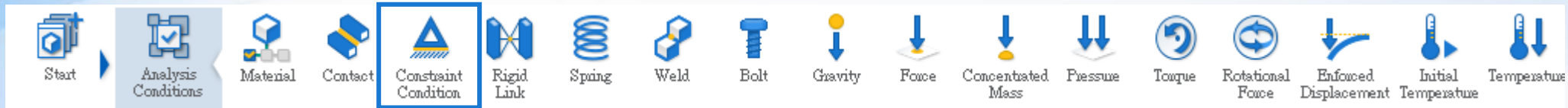
Mass Proportional Damping 0 1/sec

Stiffness Proportional Damping 0 sec

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
SGCD1
Steel
Steel_Rolled
SUS304
SUS316
SUS316L
Wrought Stainless Steel
Ductile Iron
Gray Cast Iron
Iron_40
Iron_60
Iron_Cast_G25
Iron_Cast_G40
Iron_Cast_G60
Iron_Malleable
Iron_Nodular
Malleable Cast Iron

Load Edit

分析工況 | 約束條件



Define Boundary Condition [X]



Name:

Select [^]
Face:

Reference Object [^]
Type:

Symmetry Condition [v]

DOF [^]
☒ Tx ☒ Ty ☒ Tz

[Reset] [OK] [Add] [Cancel]



分析工況 | 活載重



Define Force

Name

Force-1

Load Category

Load Type

Force

Total

Individual

?

Selected 2 Object(s)

Reference Object

Type

Global Coordinate System

Direction

X

0

N

Y

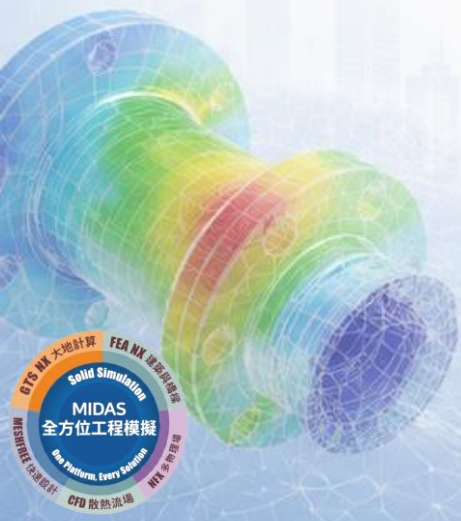
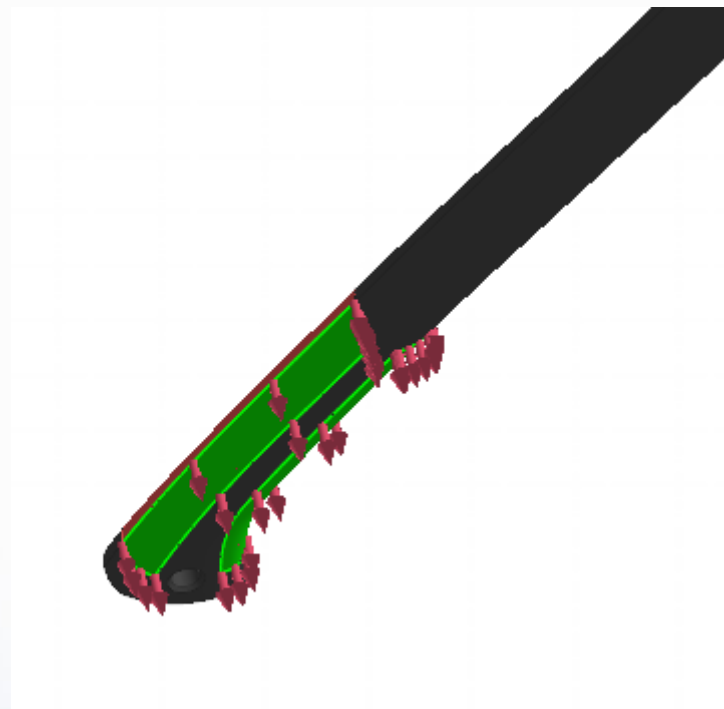
0

N

Z

-600

N



分析工況 | 接觸



Define Contact

Name

Select

Selected 7 Object(s)

Type

Welded Contact

Coefficient of friction0

Normal Stiffness factor0.1

Tangential Stiffness factor0.01

Search Range

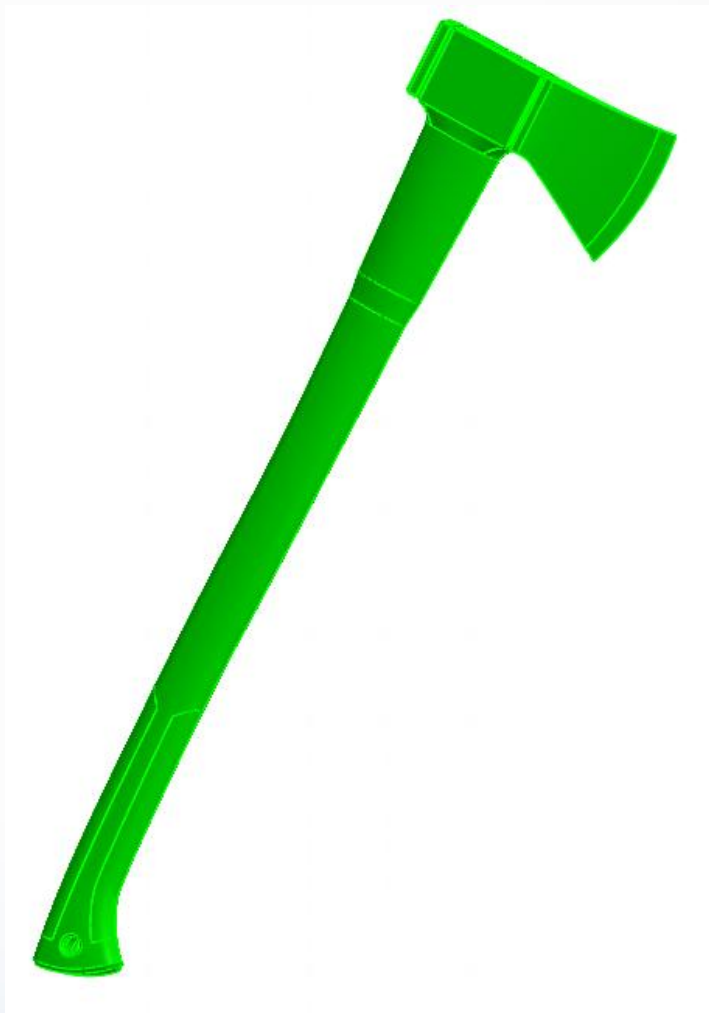
☒ Auto

0.745906 mm

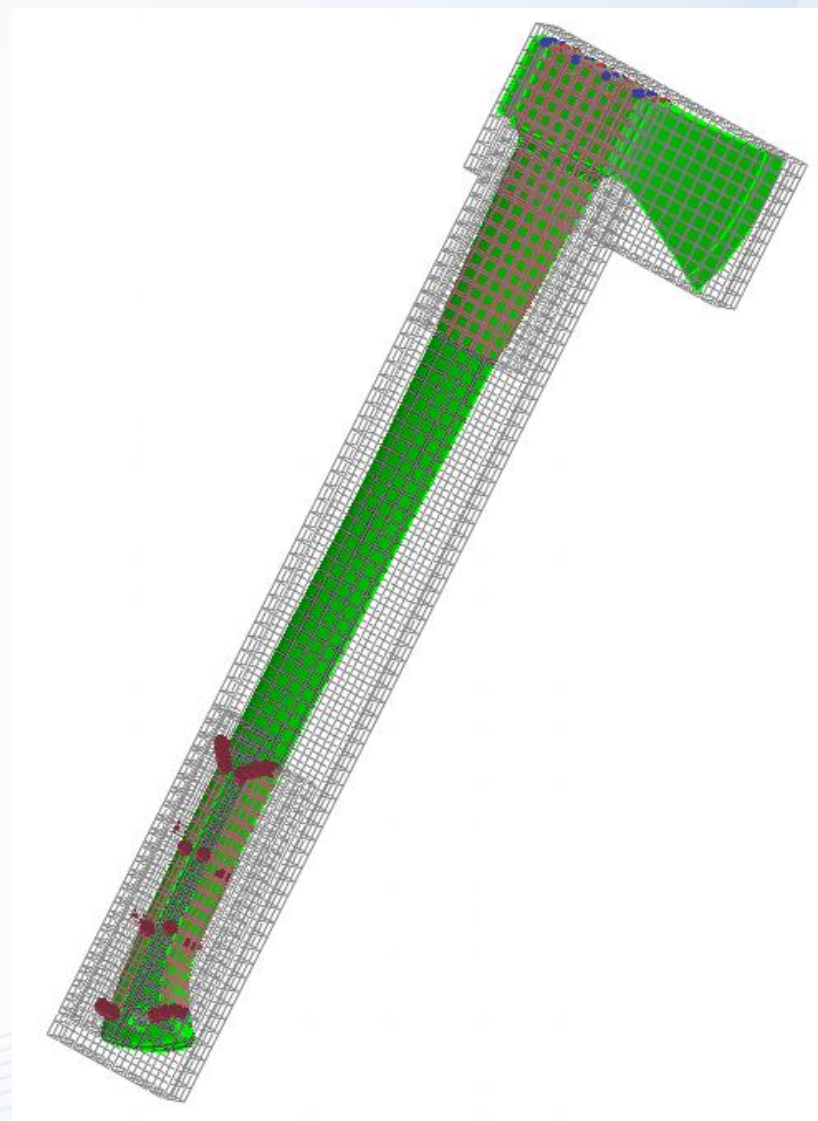
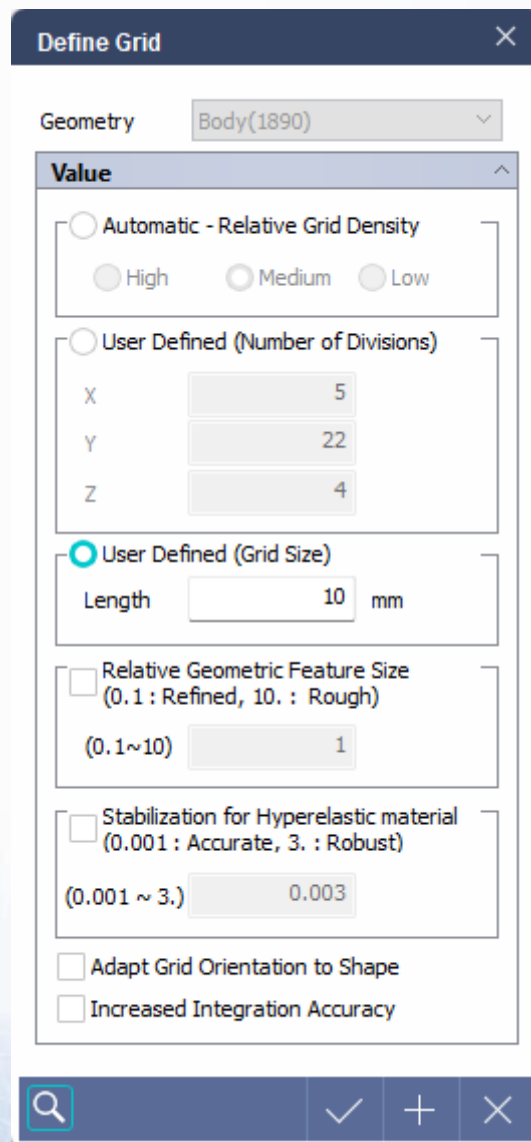
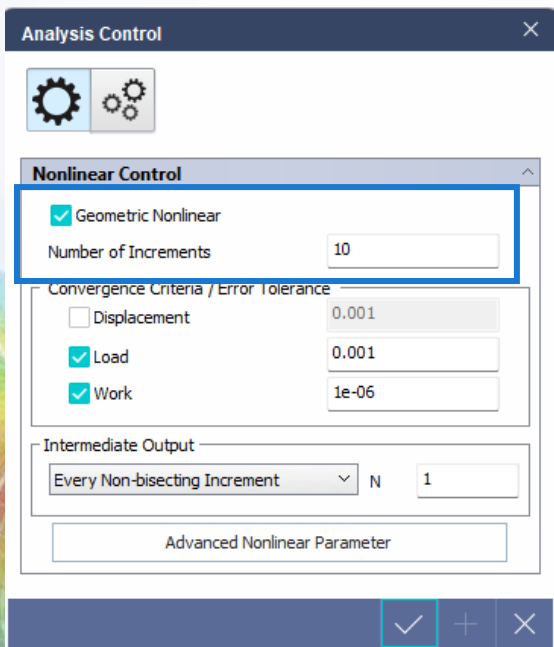
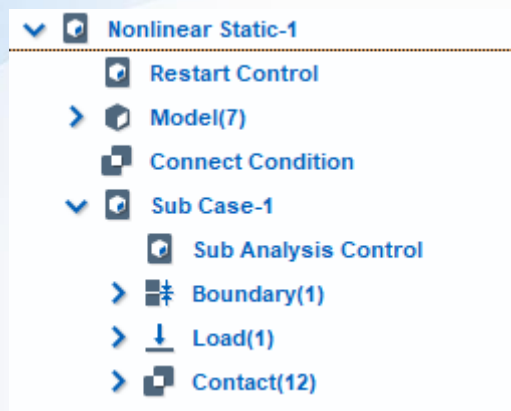
✓

+

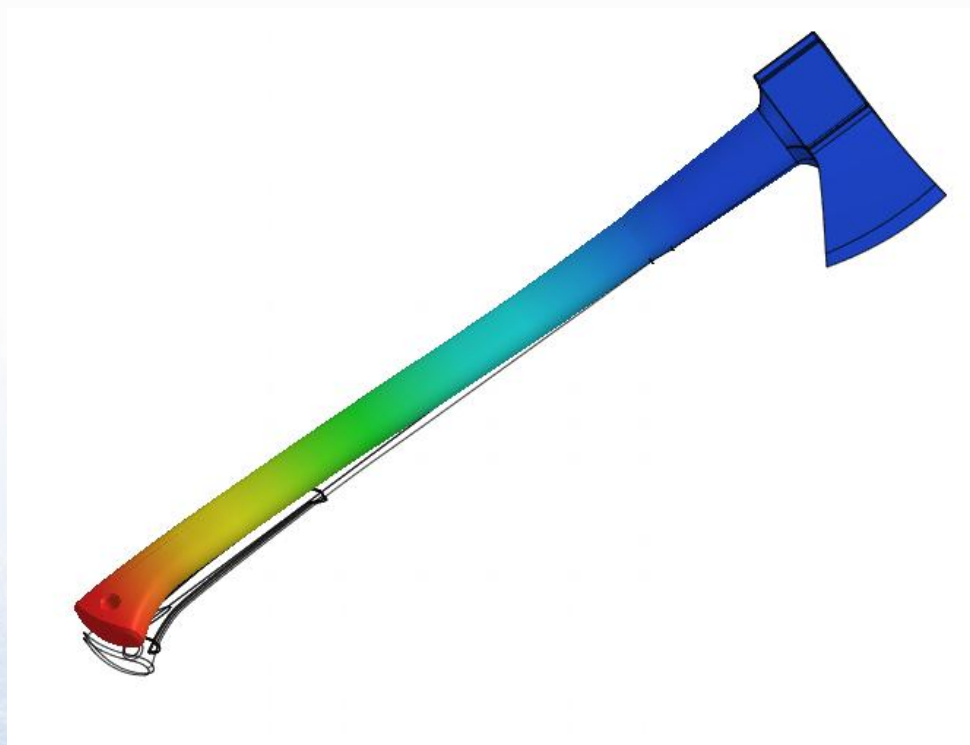
×



分析工況

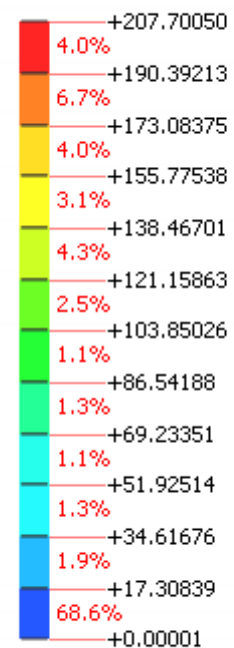


分析結果 | 變形



Deformations

DISPLACEMENT-XYZ



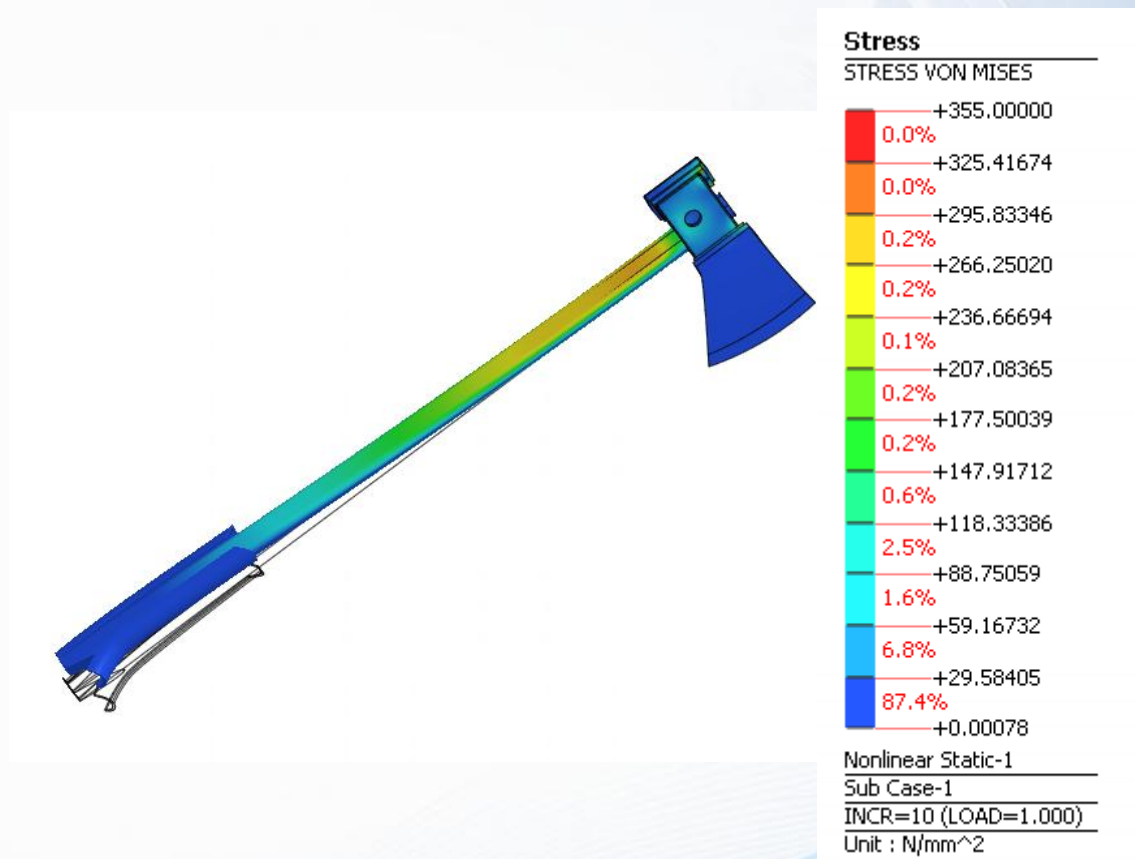
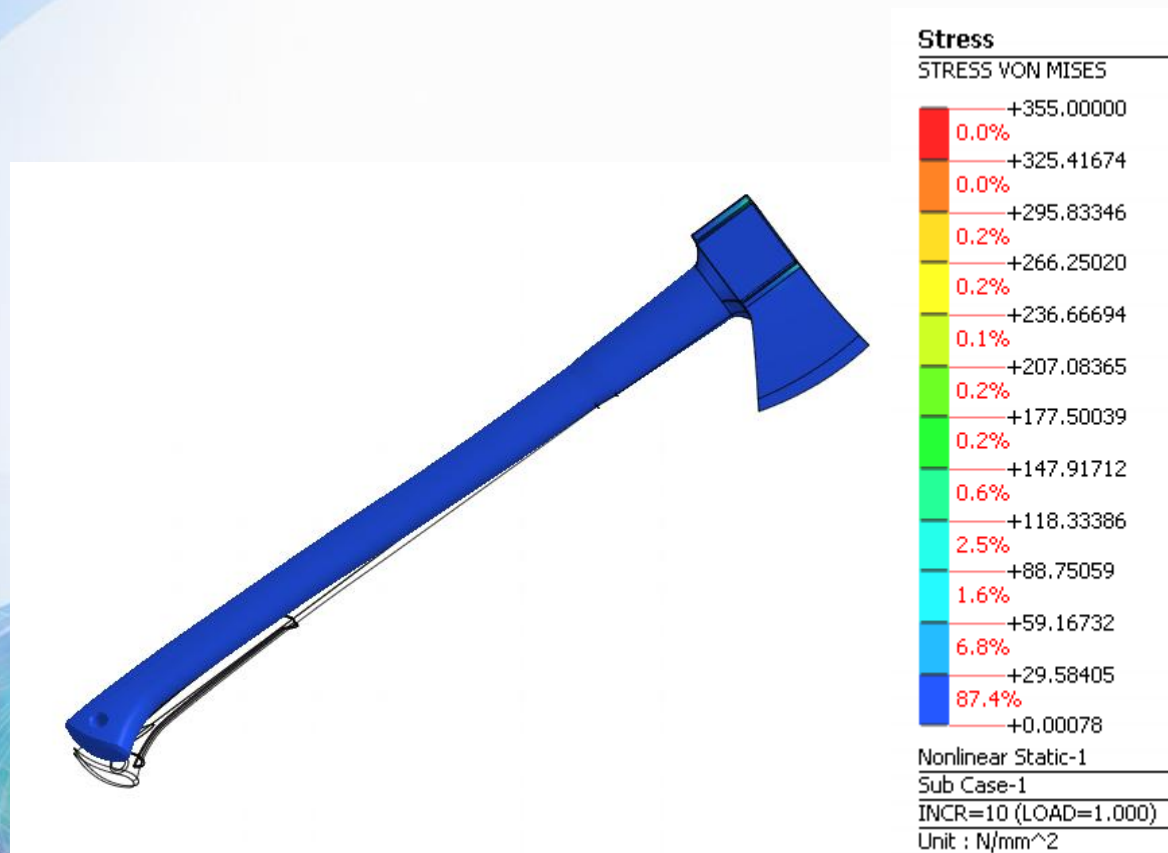
Nonlinear Static-1

Sub Case-1

INCR=10 (LOAD=1.000)

Unit : mm

分析結果 | STRESS VON MISES



分析結果 | STRESS VON MISES

