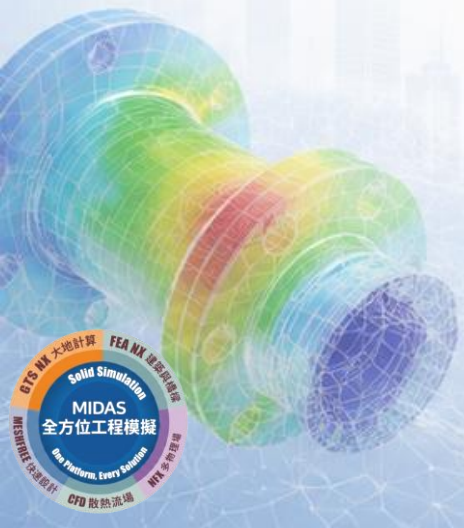
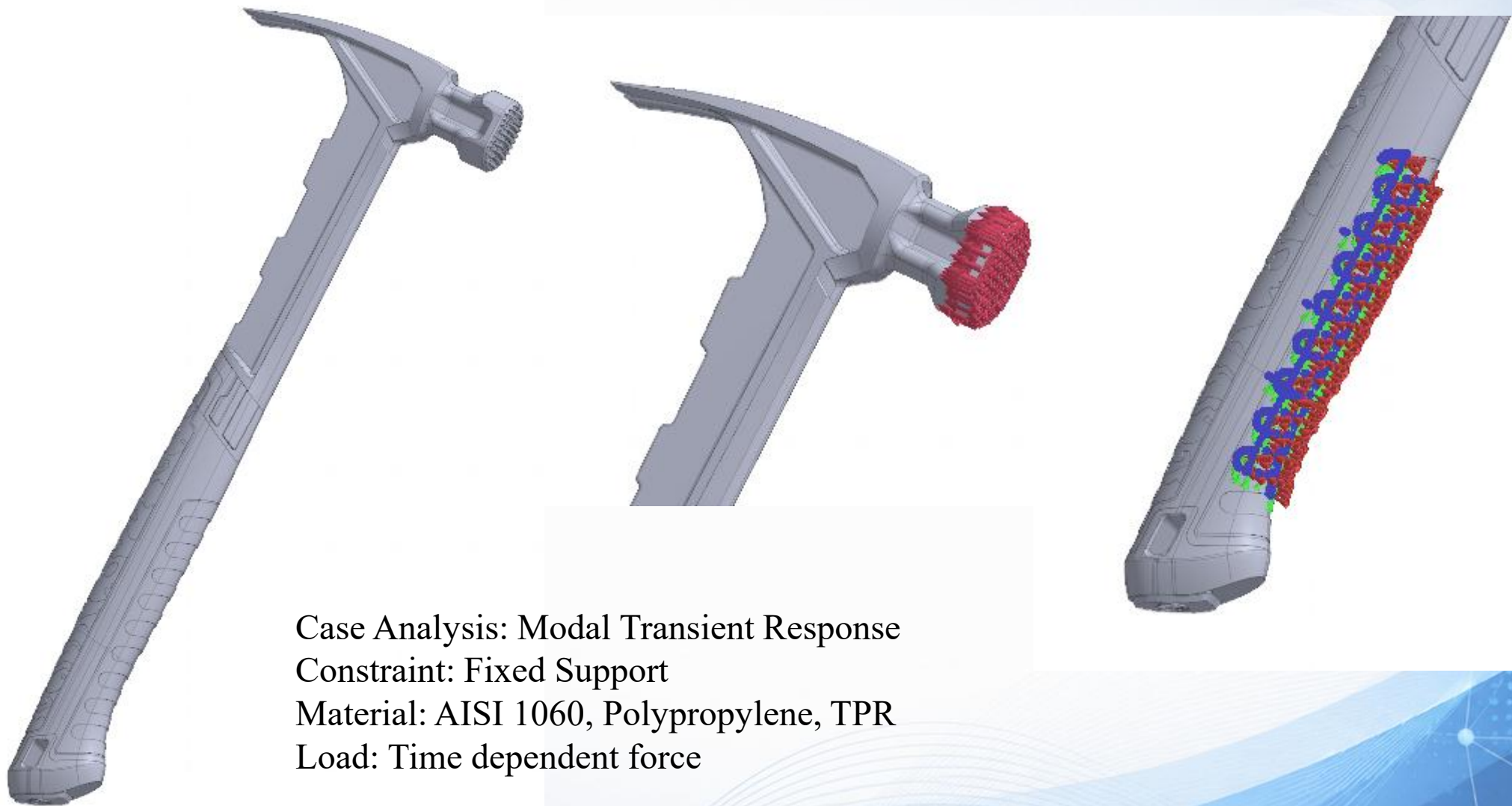


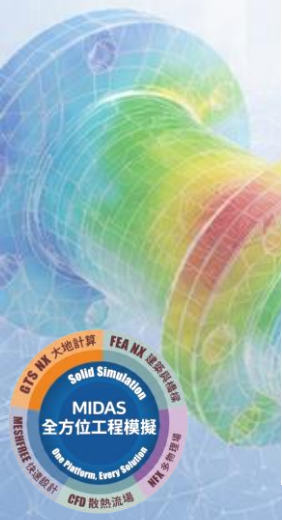
手工具分析 Wobble



案例概述



Case Analysis: Modal Transient Response
Constraint: Fixed Support
Material: AISI 1060, Polypropylene, TPR
Load: Time dependent force



幾何模型 – 分析案例與材料 (AISI 1060)



Define Material

All Name AISI1060 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
SGCD 1
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

Elastoplastic Thermal

Structural

Elastic Modulus 212000 N/mm²

Poisson's Ratio 0.29

Mass Density 7.85e-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

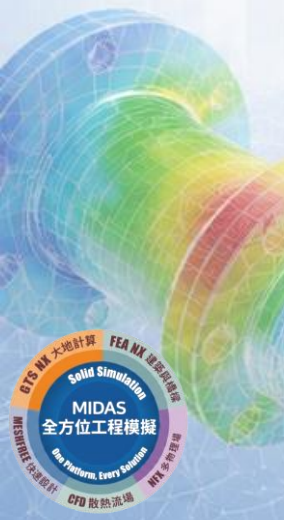
Yield Stress 355 N/mm²

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

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

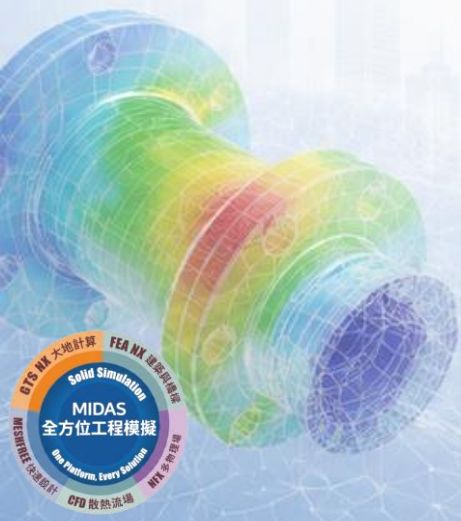
Yield Stress 15 N/mm²

General

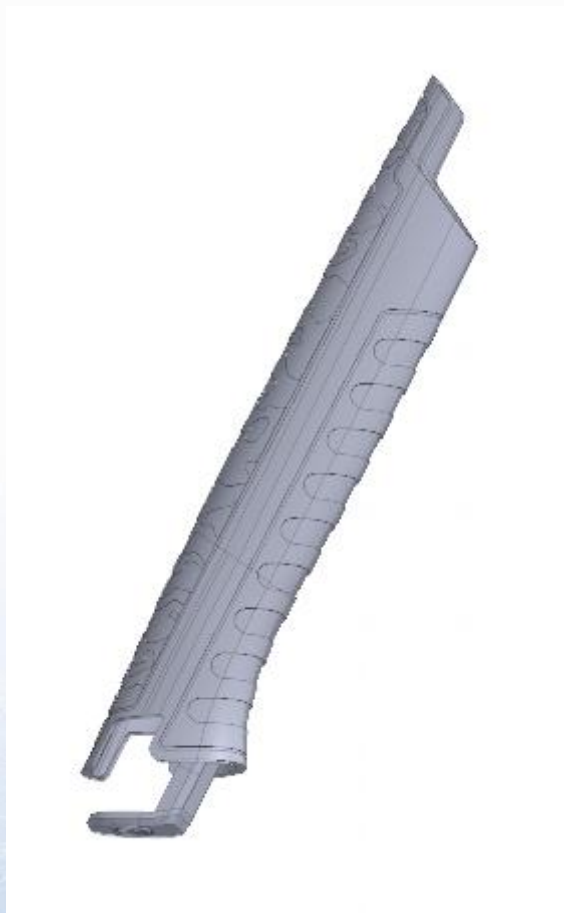
Mass Proportional Damping 0 1/sec

Stiffness Proportional Damping 0 sec

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

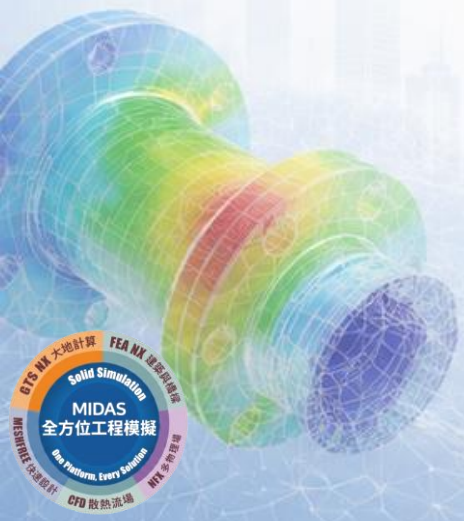
General

Mass Proportional Damping 0 1/sec

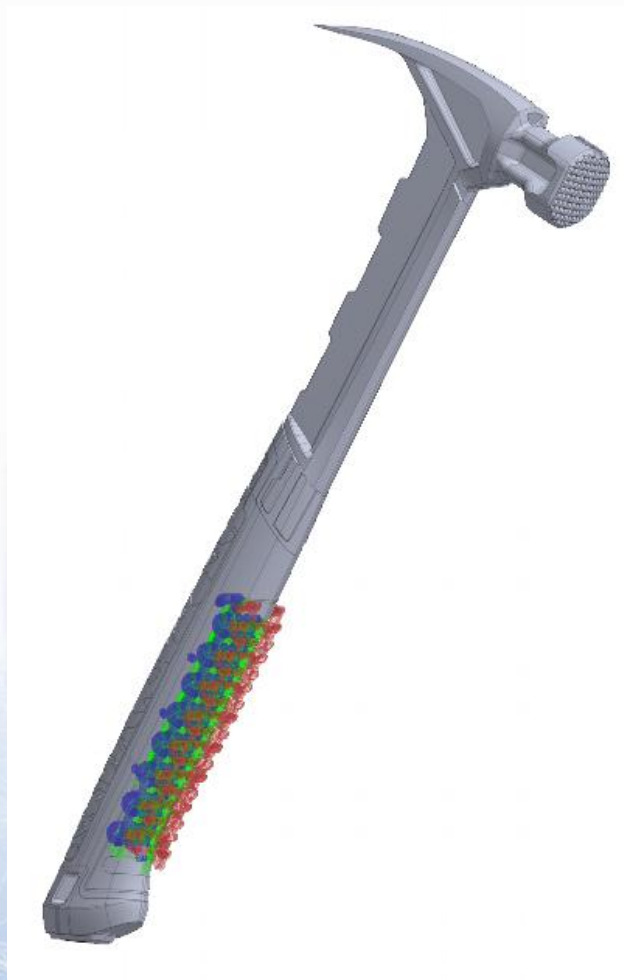
Stiffness Proportional Damping 0 sec

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

NameBoundary-1

Select

Face?Selected 130 Obj...

Reference Object

TypeGlobal Coordinate System

Symmetry Condition

DOF

☒Tx

☒Ty

☒Tz

分析工況 | 時間依存力



Time dependent load [X]

[Downward arrow with plus] [Downward arrow] [Downward arrow]

Name: Time Dependent Force-1

Load Category

Load Type: Force

☒ Total ☐ Individual

? Selected 332 Object(s)

Reference Object

Type: Global Coordinate System

Direction

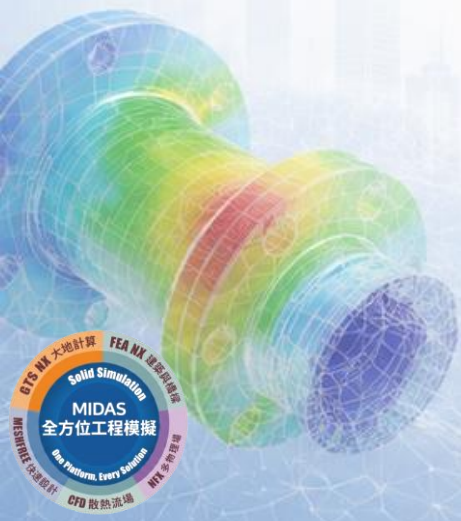
X	200	lbf
Y	0	lbf
Z	0	lbf

Time dependency

☒ Constant 1

☐ User Defined None [Icon]

[Undo] [OK] [Cancel]



分析工況 | 接觸



Define Contact

Name

Select

Selected 4 Object(s)

Type

Welded Contact

Coefficient of friction

0

Normal Stiffness factor

0.1

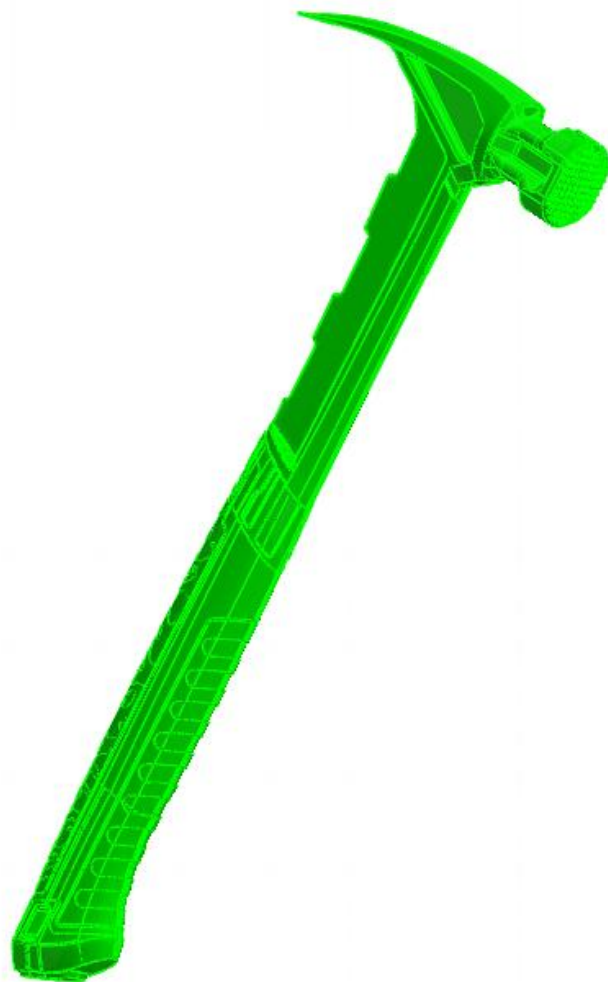
Tangential Stiffness factor

0.01

Search Range

Auto

0.433959 mm



- Contact
- Body(5565)-Bo.. Welded
- Body(5565)-Bo.. Welded
- Body(7538)-Bo.. Welded
- Body(12771)-B.. Welded
- Body(12771)-B.. Welded

分析工況

- Analysis Case
 - Modal Transient Response-1
 - Analysis Control
 - Model(4)
 - Contact(5)
 - Connect Condition
 - Boundary(1)
 - Load(1)

Analysis Control



Damping

☐ Uniform Structural Damping

Uniform Structural Damping

Dominant Frequency cycle/sec

☐ cycle/sec ☐ rad/sec

Modal

Number of Modes

Frequency Range of Interest

☒ Lowest ☐ Highest

Unit: cycle/sec

Modal Damping

☐ Sturm Sequence Check

☐ Import Restart File

Time Steps

Summary

Total Duration

Total Number of Time Steps

Create/Change Function

Modal Damping Function

Name

Constant



Damping unit

Define Time Step

Name

Total Time sec

Number of Time Steps

Intermediate Output (Every Nth Time Step)

No.	Name	Time Dura...	Time Steps	Inter. Output
1	step	0.5	200	1

分析工況

Define Grid

GeometryBody(12771)

Value

☐ Automatic - Relative Grid Density

☐ High ☐ Medium ☐ Low

☐ User Defined (Number of Divisions)

X5

Y24

Z3

☒ User Defined (Grid Size)

Length10mm

☐ Relative Geometric Feature Size
(0.1 : Refined, 10. : Rough)

(0.1~10)1

☐ Stabilization for Hyperelastic material
(0.001 : Accurate, 3. : Robust)

(0.001 ~ 3.)0.003

☐ Adapt Grid Orientation to Shape

☐ Increased Integration Accuracy

Q

✓

+

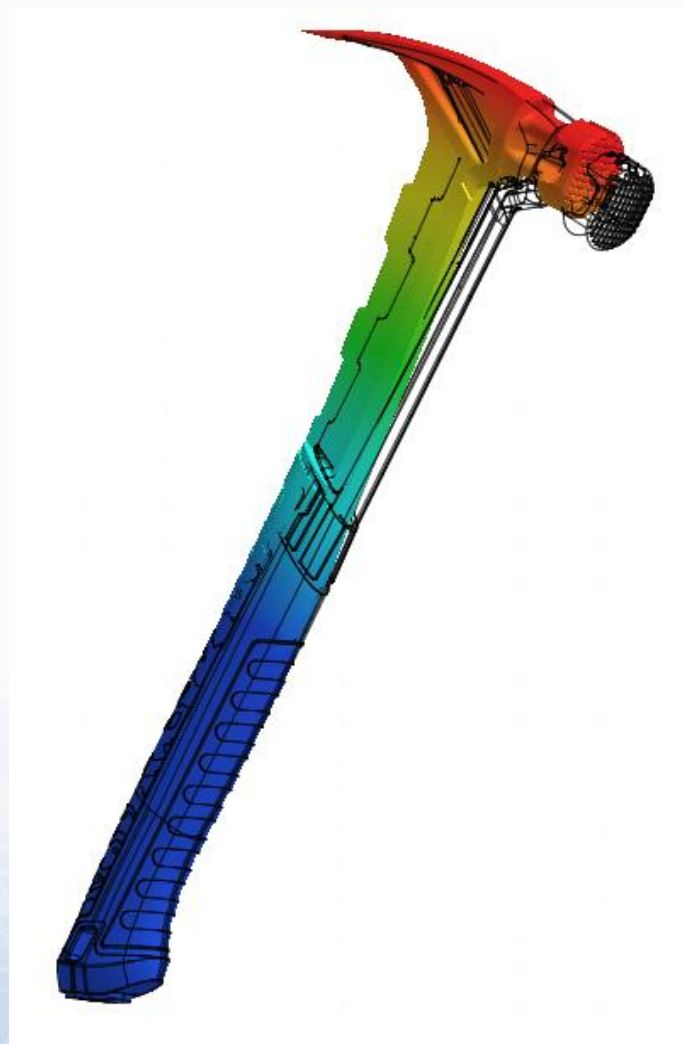
×

A 3D perspective view of a mechanical component, possibly a hammer head or a similar tool, rendered in a bright green color. The component is surrounded by a white wireframe grid that represents the finite element mesh used for simulation. The mesh is denser in certain areas, particularly around the edges and the head of the tool, indicating a higher level of detail or stress concentration in those regions. The background is a plain white surface.

A 3D perspective view of a mechanical component, possibly a hammer head or a similar tool, rendered in a bright green color. The component is surrounded by a white wireframe grid that represents the finite element mesh used for simulation. The mesh is denser in certain areas, particularly around the edges and the head of the tool, indicating a higher level of detail or stress concentration in those regions. The background is a plain white surface.

GT5 大地計算 FEA 有限元分析
Solid Simulation
MIDAS 全方位工程模擬
MEMBER 公認設計
CFD 散熱流場

分析結果 | 變形



Deformations

DISPLACEMENT-XYZ

	+6.44063e+00
13.0%	
	+5.90391e+00
7.5%	
	+5.36719e+00
4.3%	
	+4.83047e+00
1.4%	
	+4.29375e+00
1.3%	
	+3.75703e+00
1.1%	
	+3.22031e+00
1.0%	
	+2.68360e+00
0.4%	
	+2.14688e+00
5.6%	
	+1.61016e+00
6.6%	
	+1.07344e+00
7.3%	
	+5.36719e-01
50.8%	
	+5.07201e-07

Modal Transient Response-1

Modal Transient Response

INCR=200 (TIME=5.000e-01)

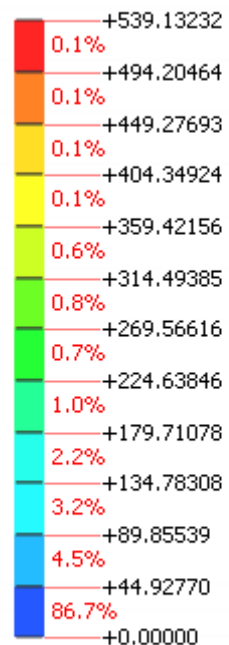
Unit : mm

分析結果 | STRESS VON MISES



Stress

STRESS VON MISES

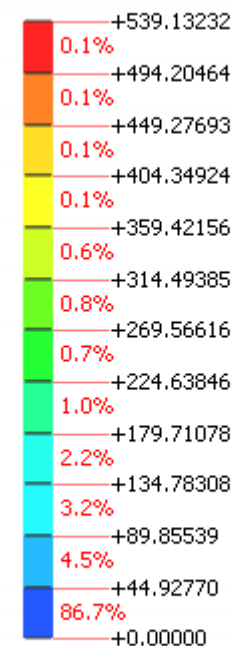


Modal Transient Response-1
Modal Transient Response
INCR=200 (TIME=5.000e-01)
Unit : N/mm²



Stress

STRESS VON MISES



Modal Transient Response-1
Modal Transient Response
INCR=200 (TIME=5.000e-01)
Unit : N/mm²

分析結果 | STRESS VON MISES



Analysis Result Tag

Results

Coordinate 221.231, -150.332, -52.34

Show	Position	Value
☒	112.722, 7.91678, 4.1057	6.07863

Step

Step Name Value

Multi Step Result table

Multi Step Result Graph

Step : Result

- ☒ Modal Transient Response : INCR=0 (TIME=0.000e+00)
- ☒ Modal Transient Response : INCR=1 (TIME=2.500e-03)
- ☒ Modal Transient Response : INCR=2 (TIME=5.000e-03)
- ☒ Modal Transient Response : INCR=3 (TIME=7.500e-03)
- ☒ Modal Transient Response : INCR=4 (TIME=1.000e-02)
- ☒ Modal Transient Response : INCR=5 (TIME=1.250e-02)
- ☒ Modal Transient Response : INCR=6 (TIME=1.500e-02)
- ☒ Modal Transient Response : INCR=7 (TIME=1.750e-02)

