

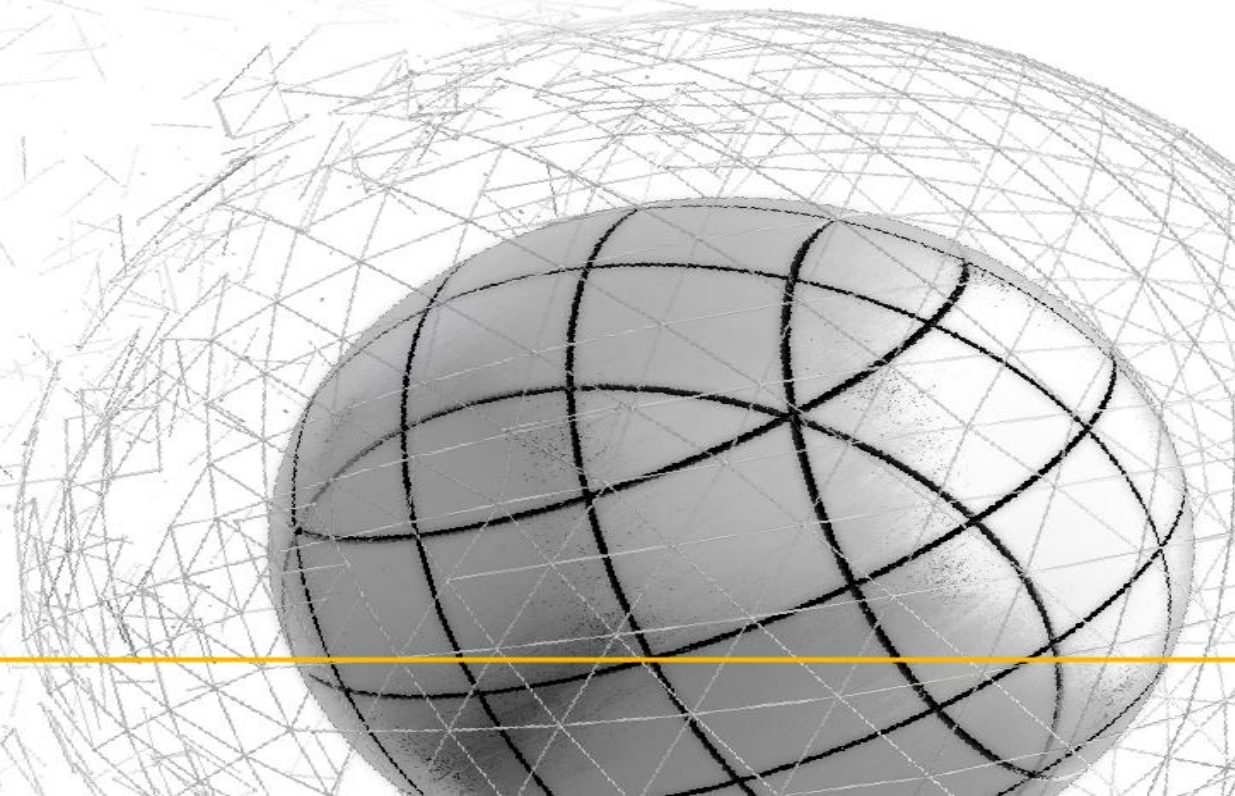


MIDAS MESH FREE

沈約翰

support@midasuser.com.tw

Simple, but Everything.



CASE 3 : SOLAR PANEL SYSTEM

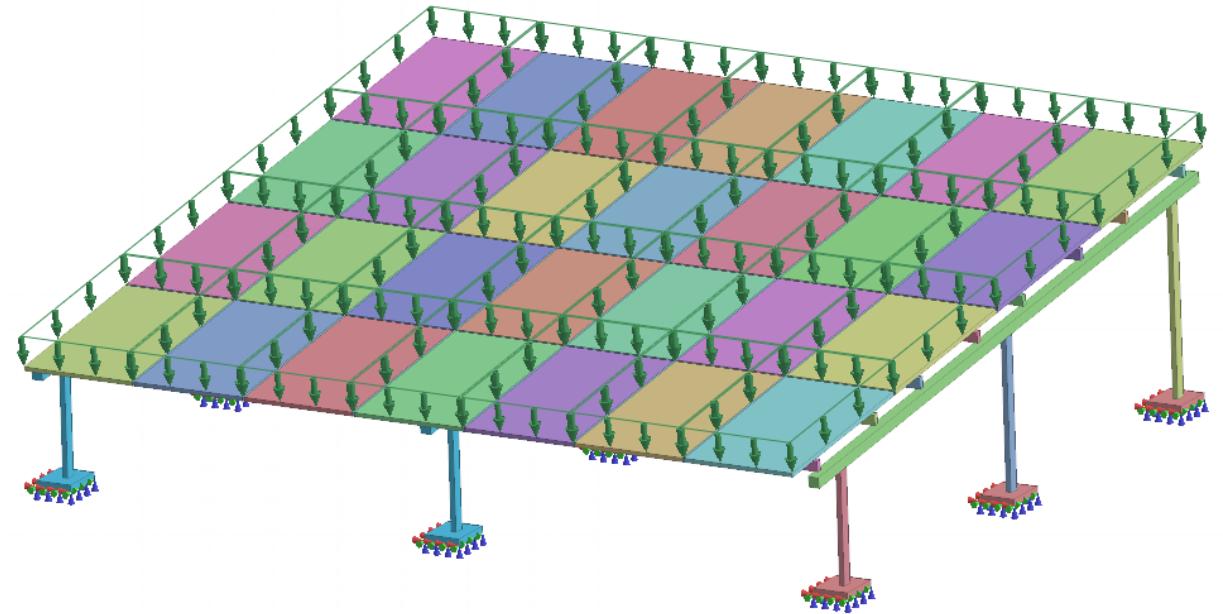
Analysis Case: Linear Analysis

Material: Aluminum 6063 and Glass

Boundary Condition: Fixed support at the columns

Load: Gravity and wind force

Contact: Welded at all contact points



GEOMETRY - MATERIAL

Define Material

Aluminum Alloys

Name

Al 6063

Color

Coord. Sys.

None

1060 Alloy

1345 Alloy

1350 Alloy

2014 Alloy

2018 Alloy

2024 Alloy

3003 Alloy

3003 Alloy

6061 Alloy

7049 Alloy

7079 Alloy

Al 6061-T6

Al 6063

ALDC 12

Aluminum_5085

Aluminum_A356

Elastoplastic

Thermal

Structural

Elastic Modulus

71250

N/mm²

Poisson's Ratio

0.33

Mass Density

2.69e-06

kg/mm³

Thermal Expansion

Expansion

2.35e-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

0

N/mm²

General

Mass Proportional Damping

0

1/sec

Stiffness Proportional Damping

0

sec

Load

Edit

Define Material

All

Name

Glass

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

70000

N/mm²

Poisson's Ratio

0.215

Mass Density

2.5e-06

kg/mm³

Thermal Expansion

Expansion

9.1e-06

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

Load

Edit



www.midasuser.com.tw

GEOMETRY - MATERIAL

Define Material

Aluminum Alloys
Name: Al 6063
Color:
Coord. Sys.: None

1060 Alloy
1345 Alloy
1350 Alloy
2014 Alloy
2018 Alloy
2024 Alloy
3003 Alloy
3003 Alloy
6061 Alloy
7049 Alloy
7079 Alloy
Al 6061-T6
Al 6063
ALDC 12
Aluminum_5085
Aluminum_A356

Elastoplastic Thermal

Structural

Elastic Modulus: 71250 N/mm²
Poisson's Ratio: 0.33
Mass Density: 2.69e-06 kg/mm³

Thermal Expansion
Expansion: 2.35e-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: 0 N/mm²

General

Mass Proportional Damping: 0 1/sec
Stiffness Proportional Damping: 0 sec

Load Edit

A 3D perspective view of a structural model. It consists of a rectangular grid of horizontal beams supported by vertical columns. The beams are color-coded in a repeating pattern of blue, green, yellow, and red. The columns are also color-coded, with blue and red ones visible. The model is shown from an isometric perspective, highlighting its spatial structure.

MIDAS

www.midasuser.com.tw

GEOMETRY - MATERIAL

Define Material

All

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

Name

Glass

Color

Coord. Sys.

None

Elastoplastic

Thermal

Structural

Elastic Modulus

70000

N/mm²

Poisson's Ratio

0.215

Mass Density

2.5e-06

kg/mm³

Thermal Expansion

Expansion

9.1e-06

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

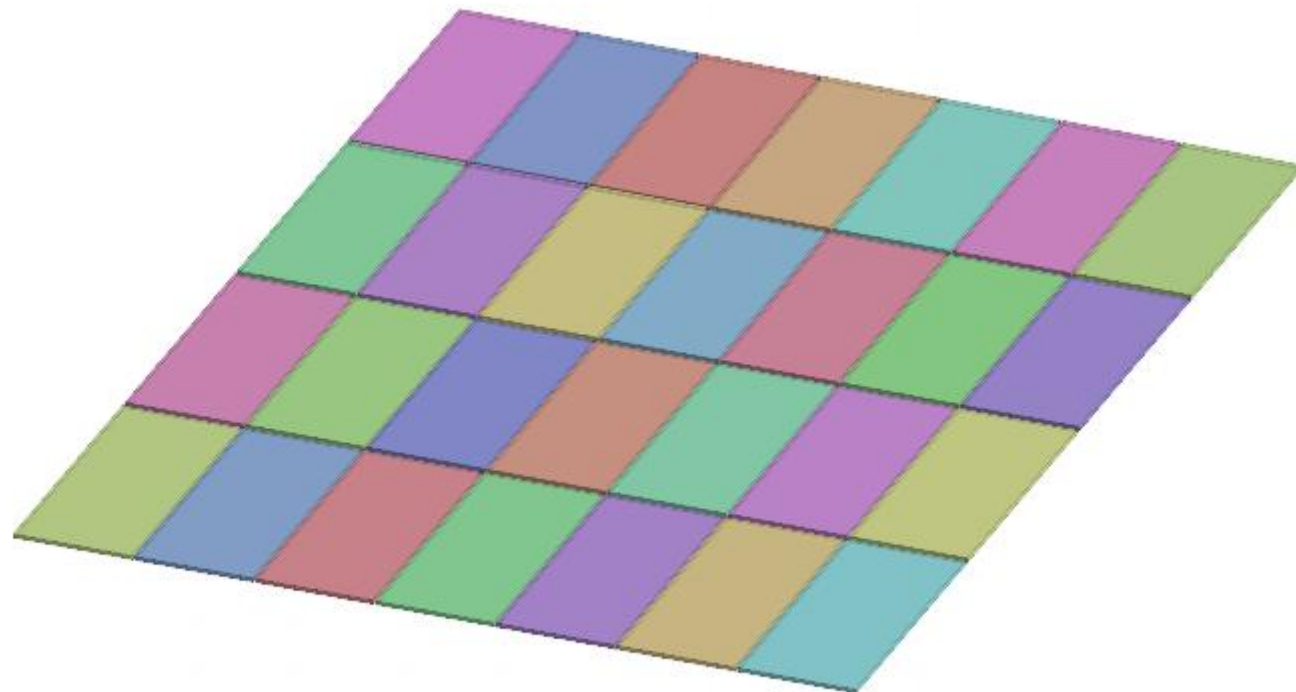
0

1/sec

Stiffness Proportional Damping

0

sec



ANALYSIS CONDITIONS | CONSTRAINT



Define Boundary Condition



Name Boundary-1

Select

Face ? Selected 9 Objec...

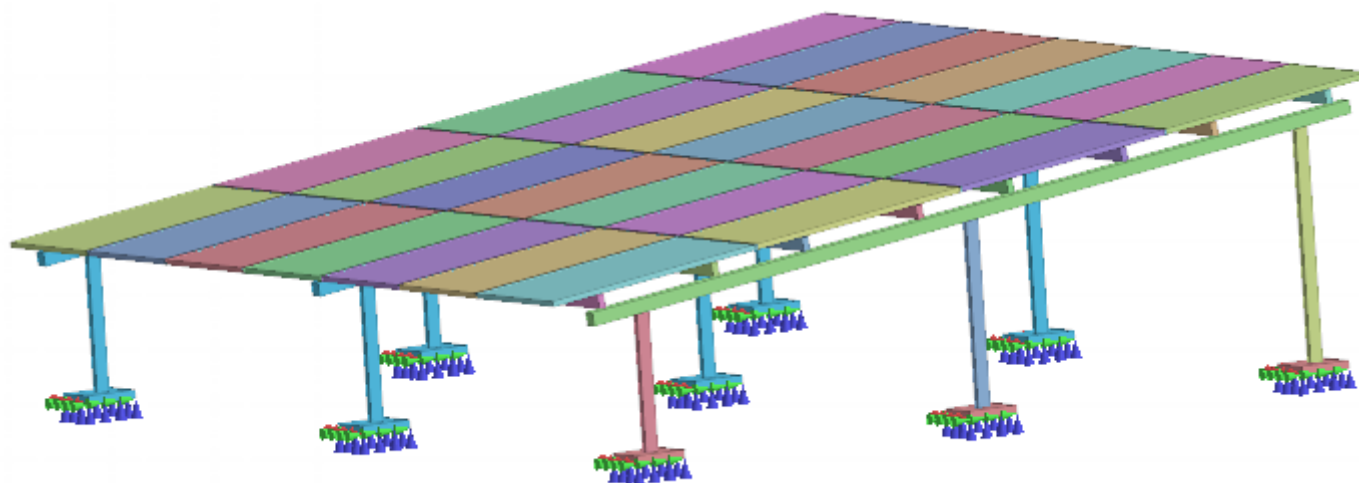
Reference Object

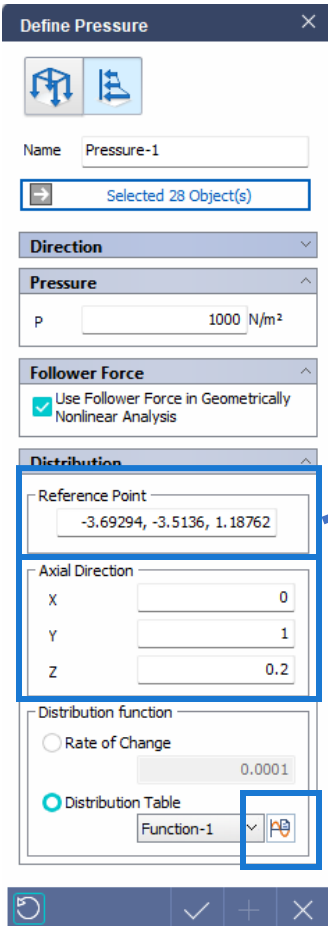
Type Global Coordinate System

Symmetry Condition

DOF

☒ Tx ☒ Ty ☒ Tz





Table

X (m)	Pressure (N/mm^2)
0	800
1.5	900
3.5	1000
5.5	1080
7	1150

NOTE: Wind load is based on a simple computation using the area of each panel, the slope, and an average 3-second gust with a wind speed of ~180kph on an open terrain.

ANALYSIS CONDITIONS | LOAD



Define Gravity

Name Gravity-1

Value	
Gx	0 mm/sec ²
Gy	0 mm/sec ²
Gz	-9806 mm/sec ²



ANALYSIS CONDITIONS | CONTACT



Define Contact

Name

Select

Selected 58 Object(s)

Type

Welded Contact

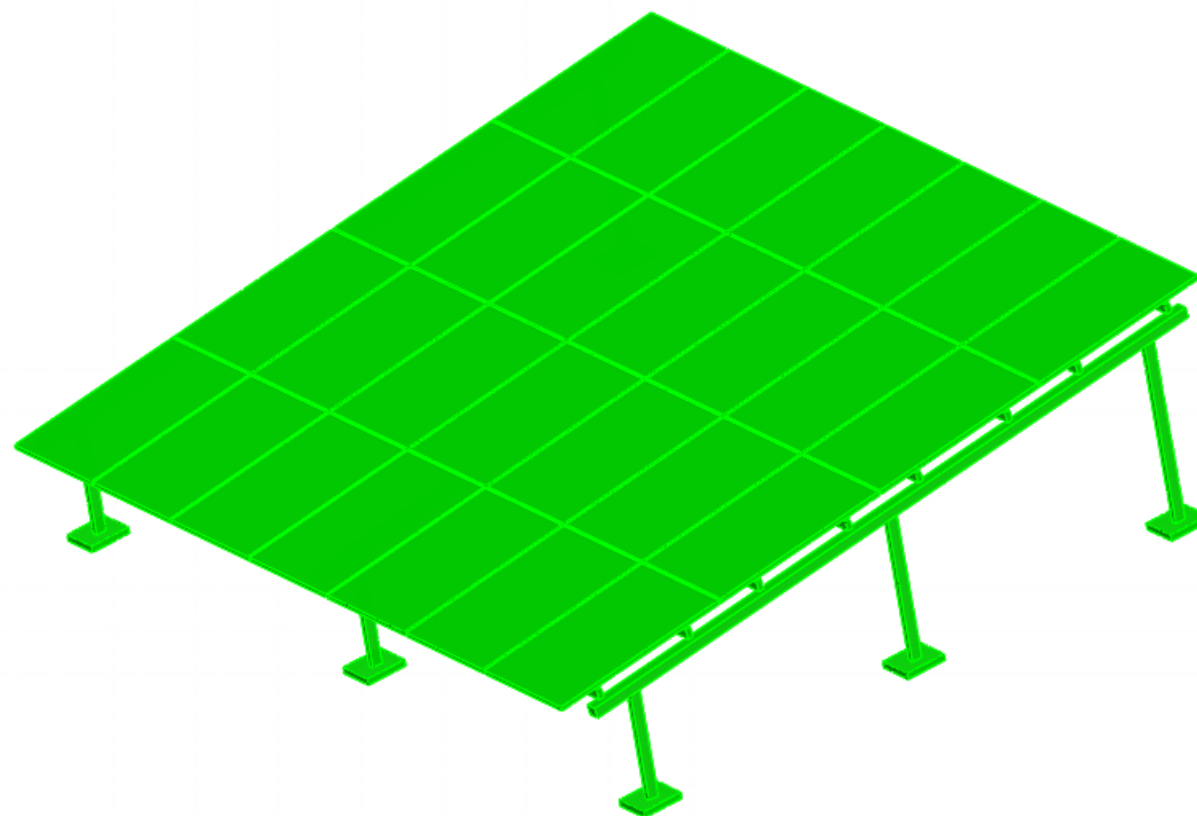
Coefficient of friction
0

Normal Stiffness factor
0.1

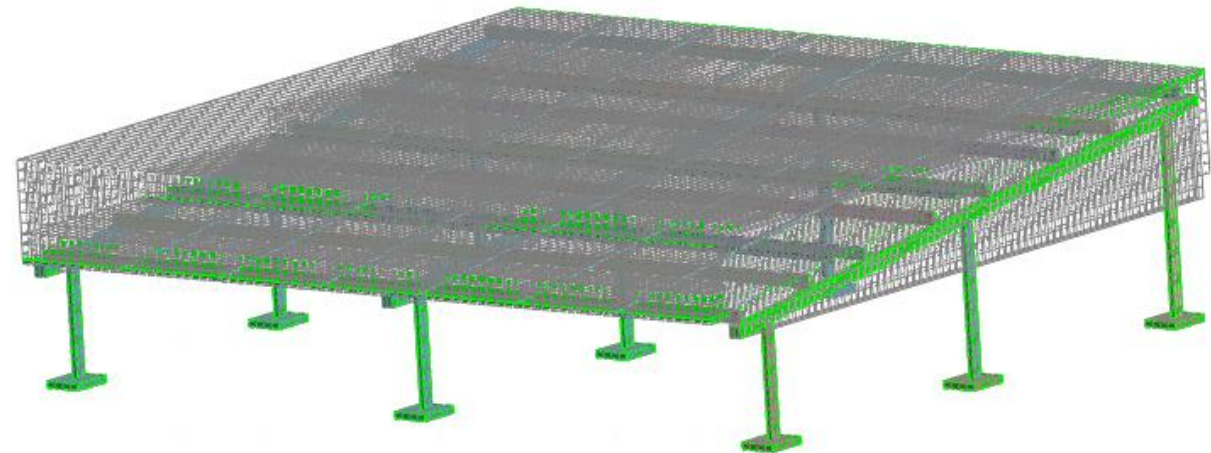
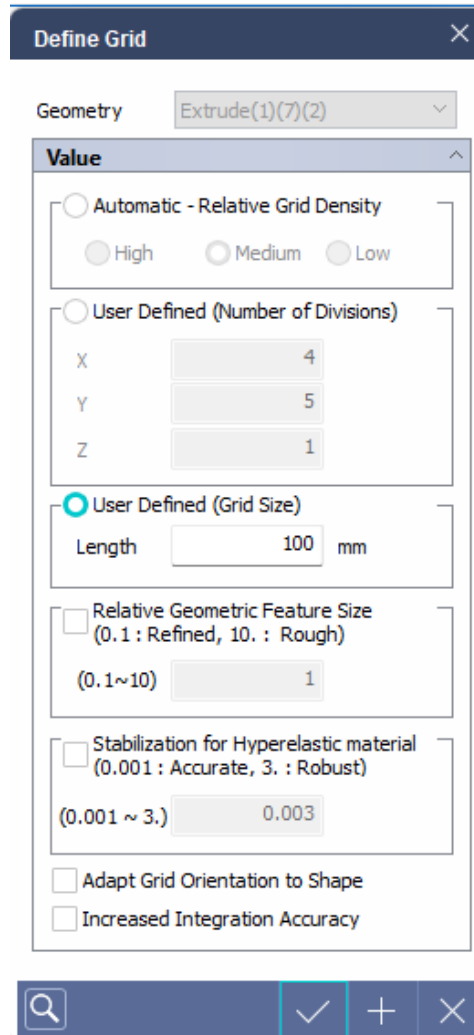
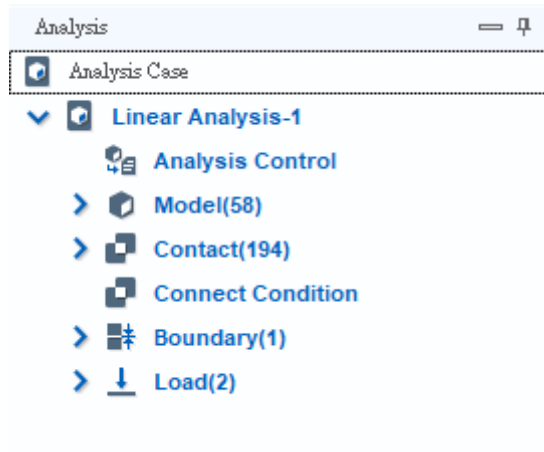
Tangential Stiffness factor
0.01

Search Range

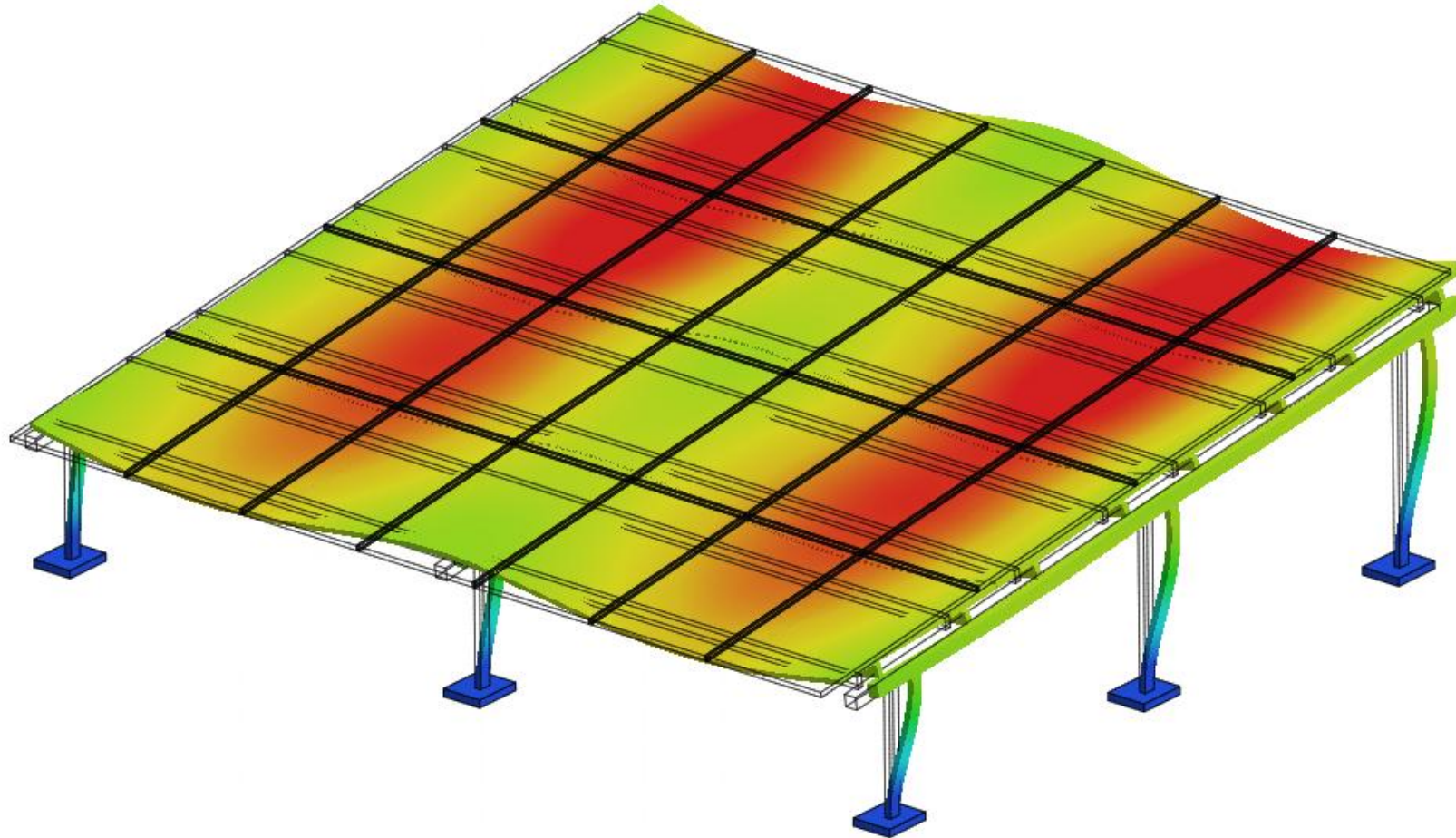
☒ Auto
0.010705 m



ANALYSIS CONDITIONS

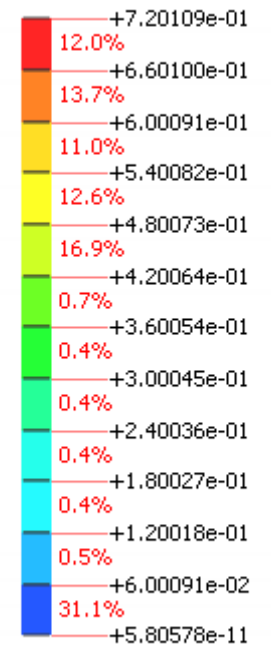


RESULT – DEFORMATION



Deformations

DISPLACEMENT-XYZ

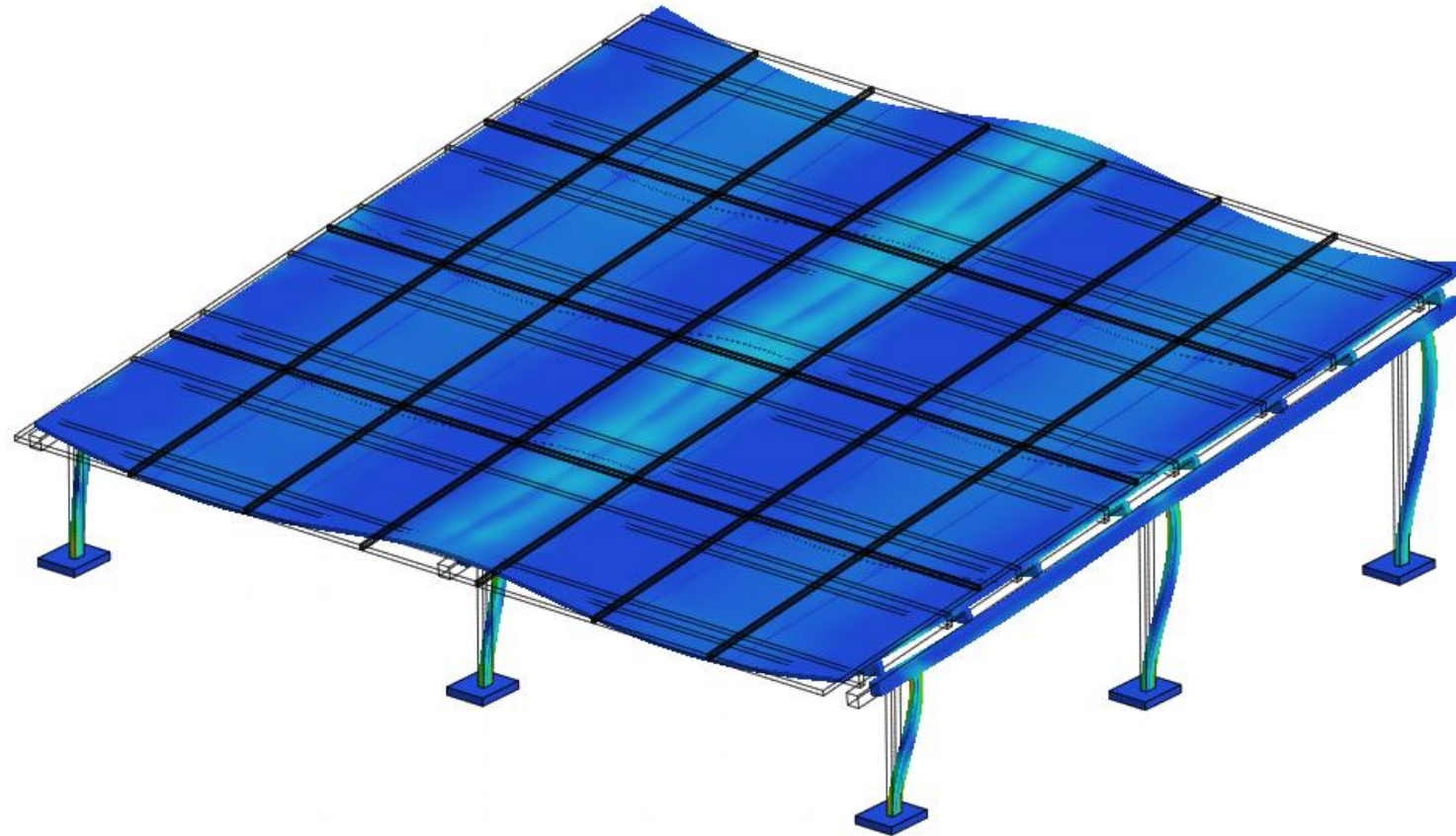


Linear Analysis-1

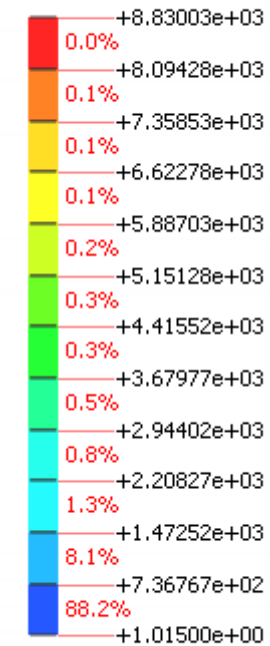
Linear Static

Unit : m

RESULT – STRESS VON MISES



Stress
STRESS VON MISES



Linear Analysis-1

Linear Static

Unit : N/mm²