

Lampiran



Mesin Molding Frame Analysis Report



Analyzed File:	Frame 1719999612560.iam
Version:	2021 (Build 250183000, 183)
Creation Date:	30/10/2024, 14:54
Simulation Author:	Satria
Summary:	

Project Info (iProperties)

Summary

Author	Satria Putra Pratama
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Project

Part Number	Frame 1719999612560
Designer	Satria Putra Pratama
Cost	Rp0
Date Created	03/07/2024

Status

Design Status	WorkInProgress
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Physical

Mass	25,957 kg
Area	16753,108 mm ²
Volume	3306,645 mm ³
Center of Gravity	x=-12,429 mm y=9,568 mm z=-145,884 mm

ANALISIS RANGKA MESIN MOLDING

General objective and settings:

Simulation Type	Static Analysis
Last Modification Date	30/10/2024, 14:50

Material(s)

Name	Steel, Mild	
General	Mass Density	7,850 g/cm ³
	Yield Strength	207,000 MPa
	Ultimate Tensile Strength	345,000 MPa
Stress	Young's Modulus	220,000 GPa
	Poisson's Ratio	0,275 ul
Part Name(s)	ISO 657-1 L40x40x4 1719999614188.ipt ISO 657-1 L40x40x4 1719999614271.ipt ISO 657-1 L40x40x4 1719999614352.ipt ISO 657-1 L40x40x4 1719999614434.ipt ISO 657-1 L40x40x4 1719999660657.ipt ISO 657-1 L40x40x4 1719999660738.ipt ISO 657-1 L40x40x4 1719999679356.ipt ISO 657-1 L40x40x4 1719999700702.ipt ISO 657-1 L40x40x4 1719999734064.ipt ISO 657-1 L40x40x4 1719999744026.ipt ISO 657-1 L40x40x4 1719999744110.ipt ISO 657-1 L40x40x4 1719999744205.ipt ISO 657-1 L40x40x4 1719999764601.ipt ISO 657-1 L40x40x4 1719999783642.ipt ISO 657-1 L40x40x4 1719999798675.ipt ISO 657-1 L40x40x4 1719999798758.ipt	

Cross Section(s)

Geometry Properties	Section Area (A)	307,863 mm ²
	Section Width	40,000 mm
	Section Height	40,000 mm
	Section Centroid (x)	11,196 mm
	Section Centroid (y)	11,196 mm
Mechanical Properties	Moment of Inertia (I _x)	44729,781 mm ⁴

	Moment of Inertia (I_y)	44729,781 mm ⁴
	Torsional Rigidity Modulus (J)	1828,294 mm ⁴
	Section Modulus (W_x)	1552,907 mm ³
	Section Modulus (W_y)	1552,907 mm ³
	Torsional Section Modulus (W_z)	289,604 mm ³
	Reduced Shear Area (A_x)	111,482 mm ²
	Reduced Shear Area (A_y)	111,482 mm ²
Part Name(s)	ISO 657-1 L40x40x4 1719999614188.ipt ISO 657-1 L40x40x4 1719999614271.ipt ISO 657-1 L40x40x4 1719999614352.ipt ISO 657-1 L40x40x4 1719999614434.ipt ISO 657-1 L40x40x4 1719999660657.ipt ISO 657-1 L40x40x4 1719999660738.ipt ISO 657-1 L40x40x4 1719999679356.ipt ISO 657-1 L40x40x4 1719999700702.ipt ISO 657-1 L40x40x4 1719999734064.ipt ISO 657-1 L40x40x4 1719999744026.ipt ISO 657-1 L40x40x4 1719999744110.ipt ISO 657-1 L40x40x4 1719999744205.ipt ISO 657-1 L40x40x4 1719999764601.ipt ISO 657-1 L40x40x4 1719999783642.ipt ISO 657-1 L40x40x4 1719999798675.ipt ISO 657-1 L40x40x4 1719999798758.ipt	

Operating conditions

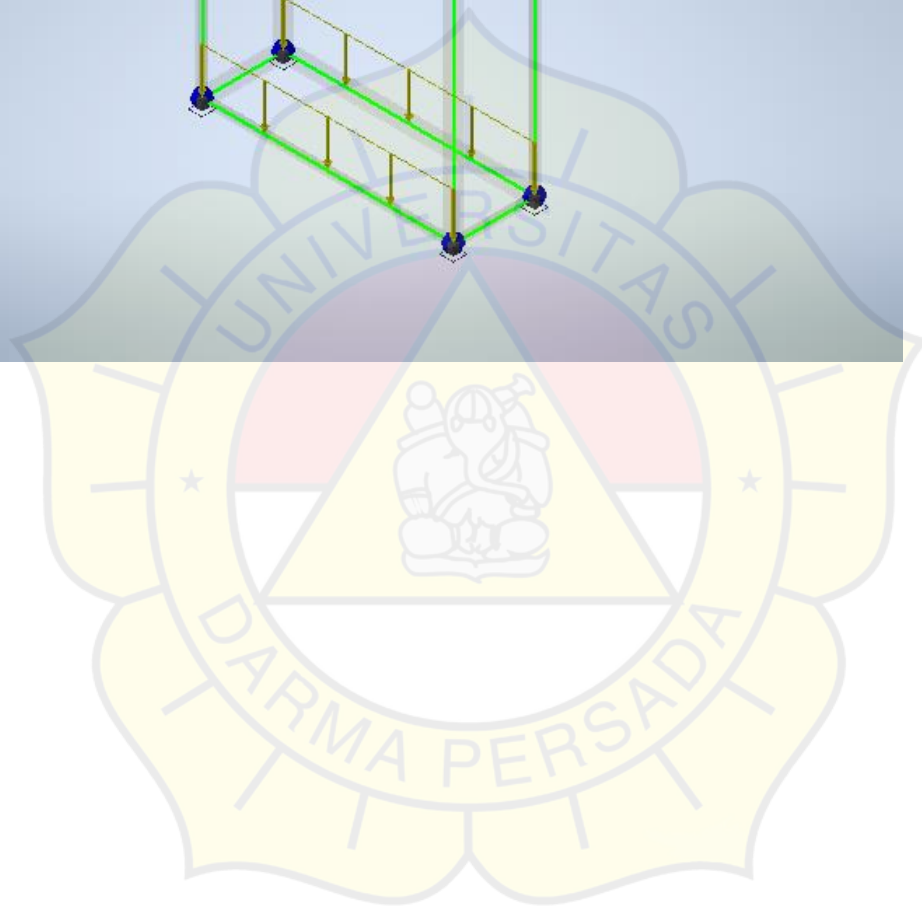
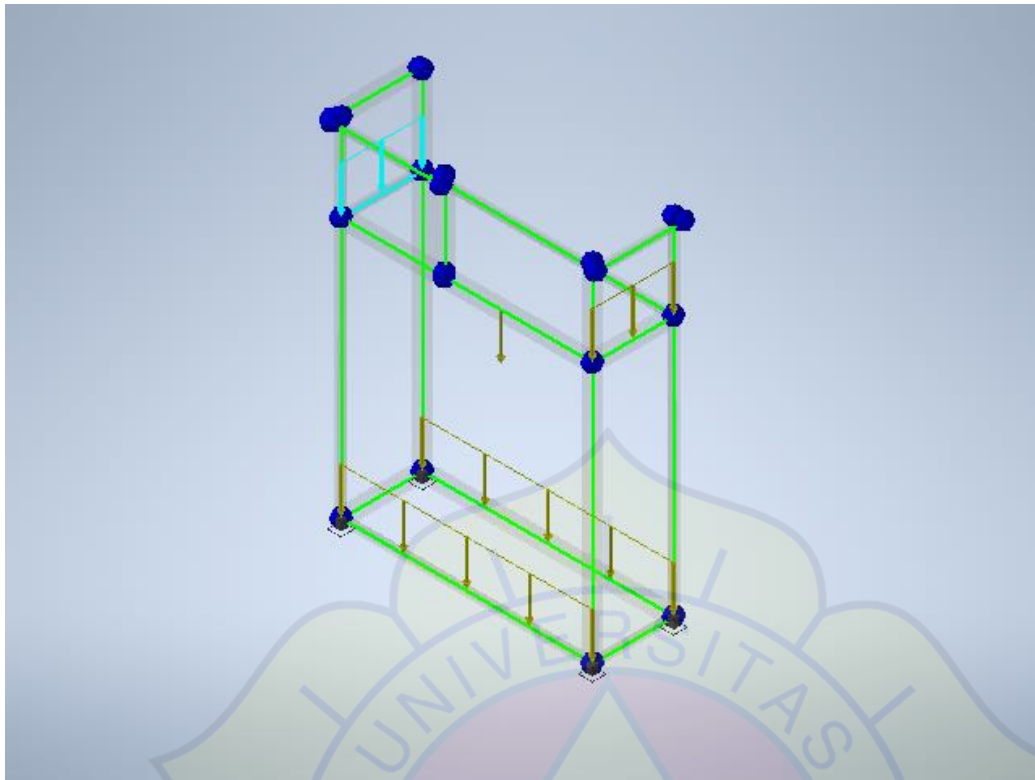
Gravity

Load Type	Gravity
Magnitude	9810,000 mm/s ²
Direction	Y-

Continuous Load:1

Load Type	Continuous Load
Magnitude	1,442 N/mm
Beam Coordinate System	No
Angle of Plane	270,00 deg
Angle in Plane	90,00 deg
Qx	0,000 N/mm
Qy	-1,442 N/mm
Qz	0,000 N/mm
Offset	0,000 mm
Length	289,608 mm
End Magnitude	1,442 N/mm

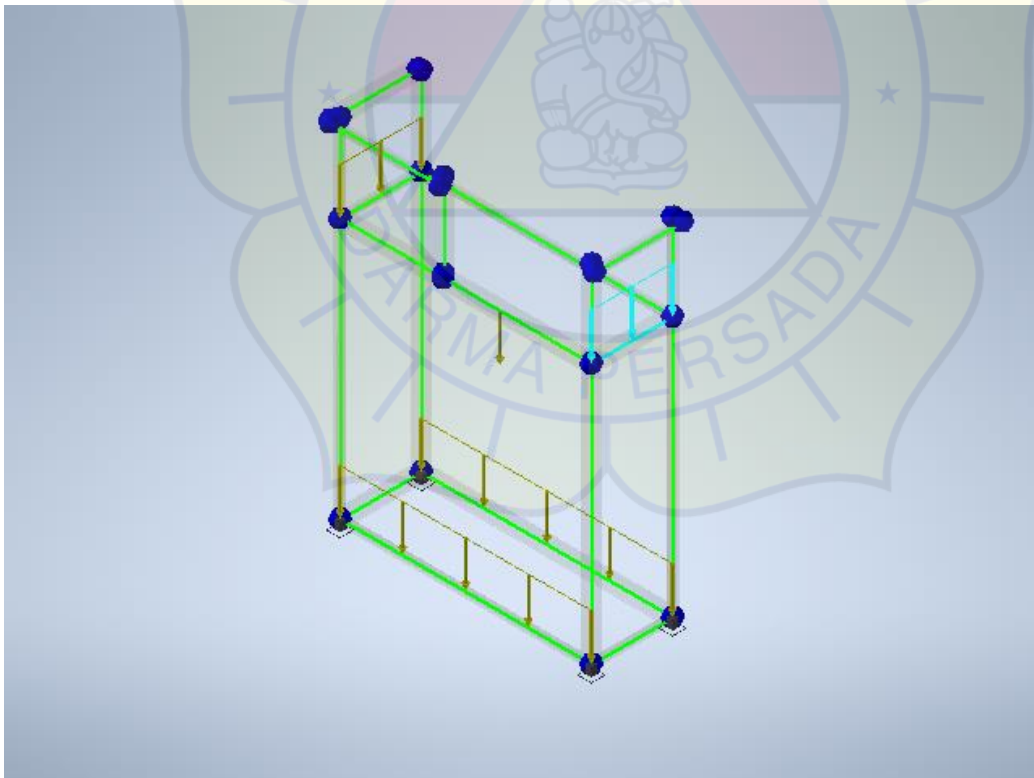
Selected Reference(s)



Continuous Load:2

Load Type	Continuous Load
Magnitude	1,442 N/mm
Beam Coordinate System	No
Angle of Plane	270,00 deg
Angle in Plane	90,00 deg
Qx	0,000 N/mm
Qy	-1,442 N/mm
Qz	0,000 N/mm
Offset	0,000 mm
Length	289,608 mm
End Magnitude	1,442 N/mm

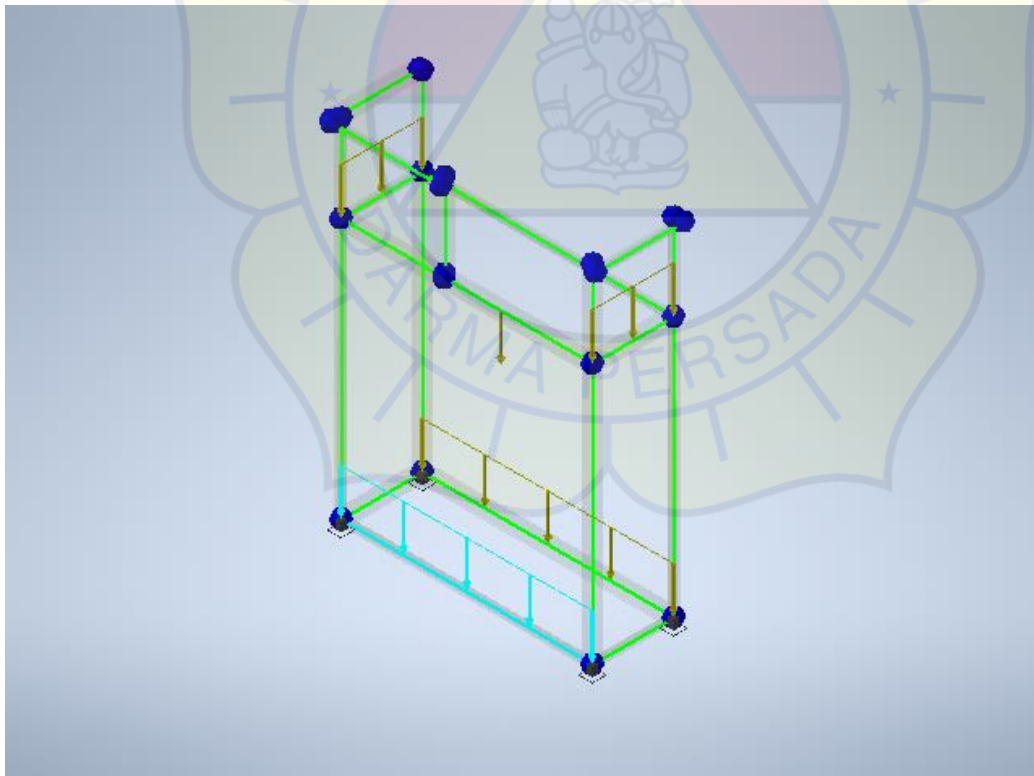
Selected Reference(s)



Continuous Load:3

Load Type	Continuous Load
Magnitude	0,408 N/mm
Beam Coordinate System	No
Angle of Plane	270,00 deg
Angle in Plane	90,00 deg
Qx	0,000 N/mm
Qy	-0,408 N/mm
Qz	0,000 N/mm
Offset	0,000 mm
Length	895,672 mm
End Magnitude	0,408 N/mm

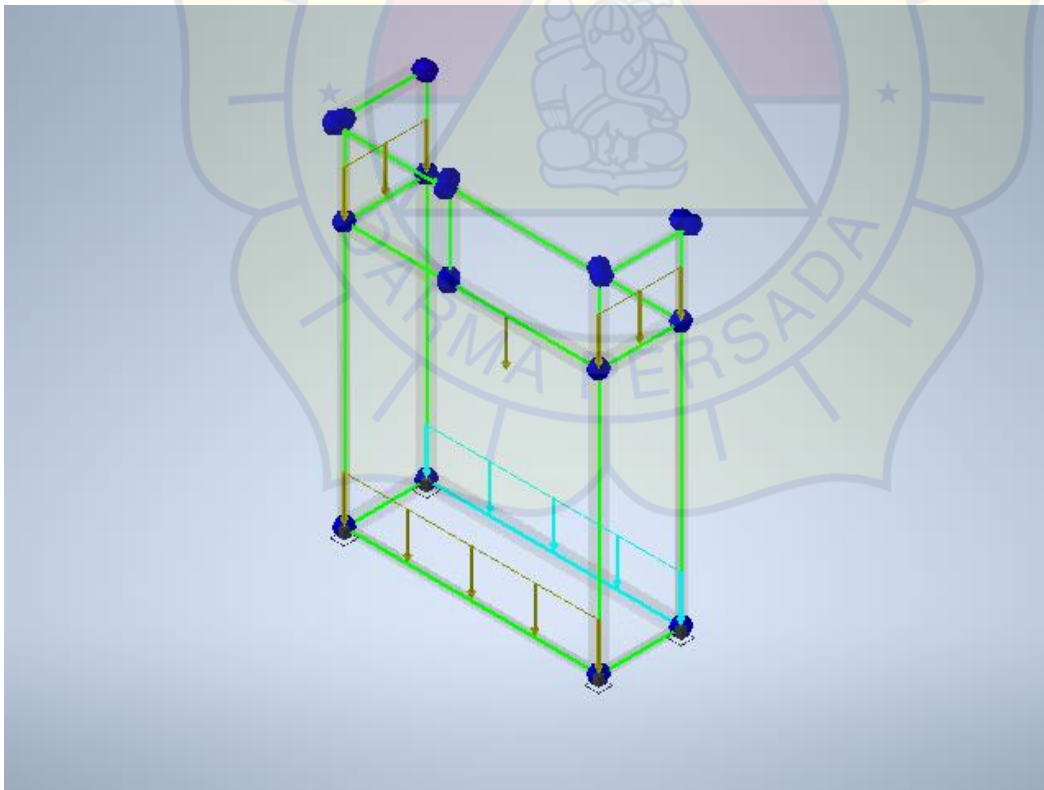
Selected Reference(s)



Continuous Load:4

Load Type	Continuous Load
Magnitude	0,408 N/mm
Beam Coordinate System	No
Angle of Plane	270,00 deg
Angle in Plane	90,00 deg
Qx	0,000 N/mm
Qy	-0,408 N/mm
Qz	0,000 N/mm
Offset	0,000 mm
Length	895,672 mm
End Magnitude	0,408 N/mm

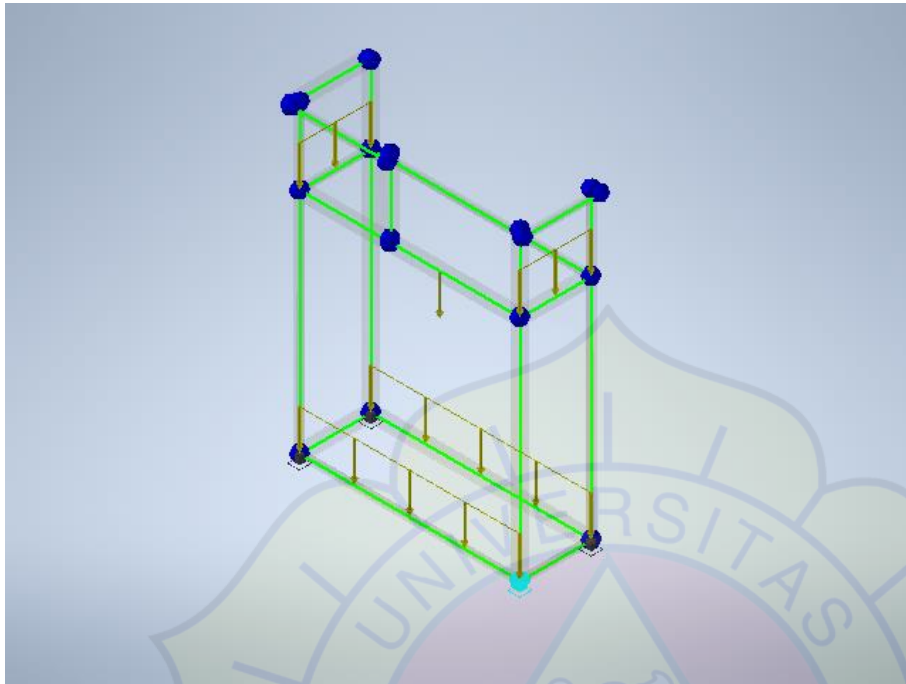
Selected Reference(s)



Fixed Constraint:1

Constraint Type	Fixed
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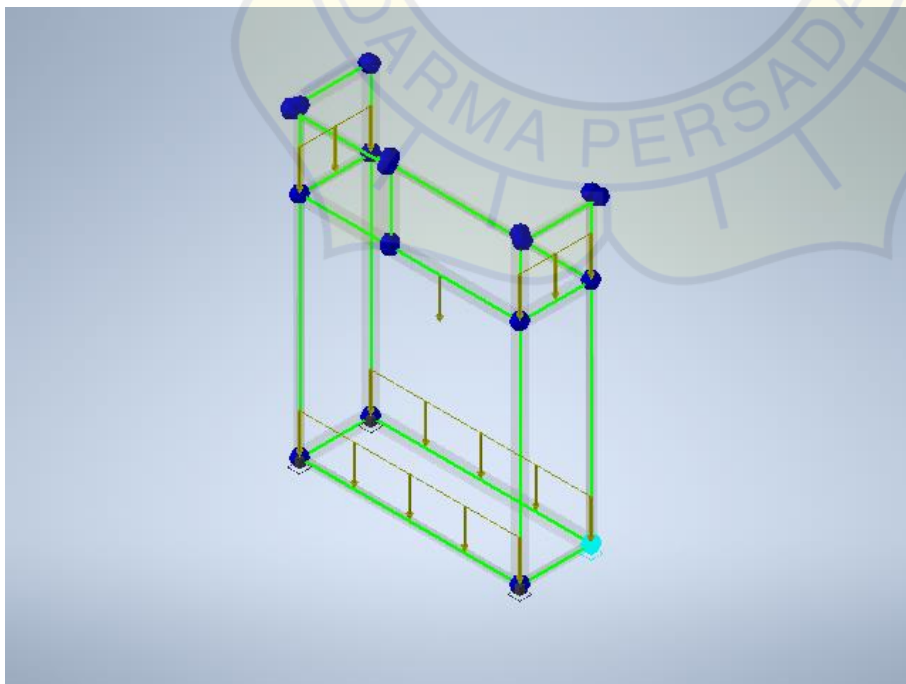
Selected Reference(s)



Fixed Constraint:2

Constraint Type	Fixed
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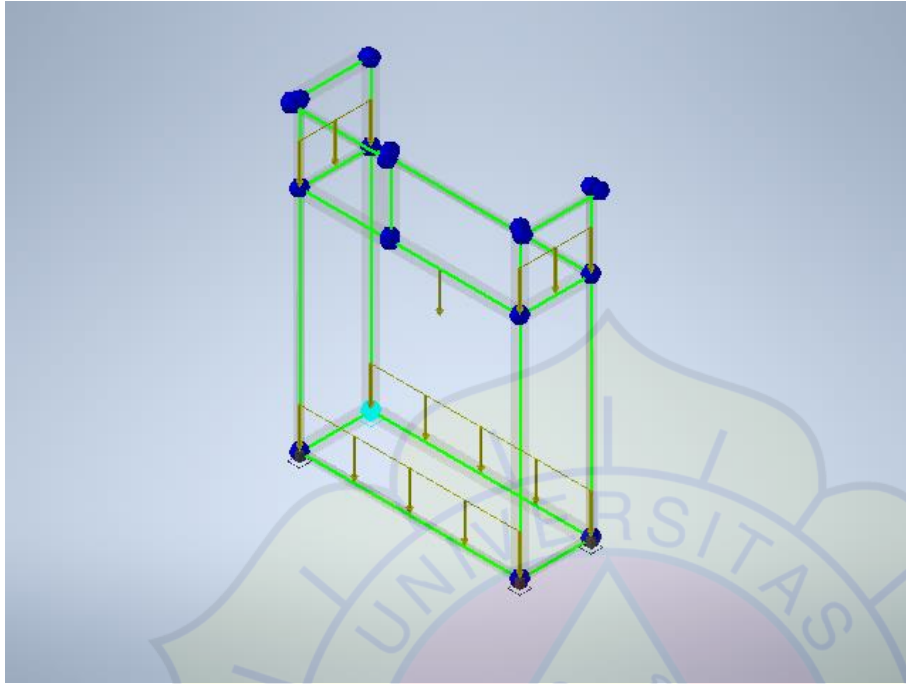
Selected Reference(s)



Fixed Constraint:3

Constraint Type	Fixed
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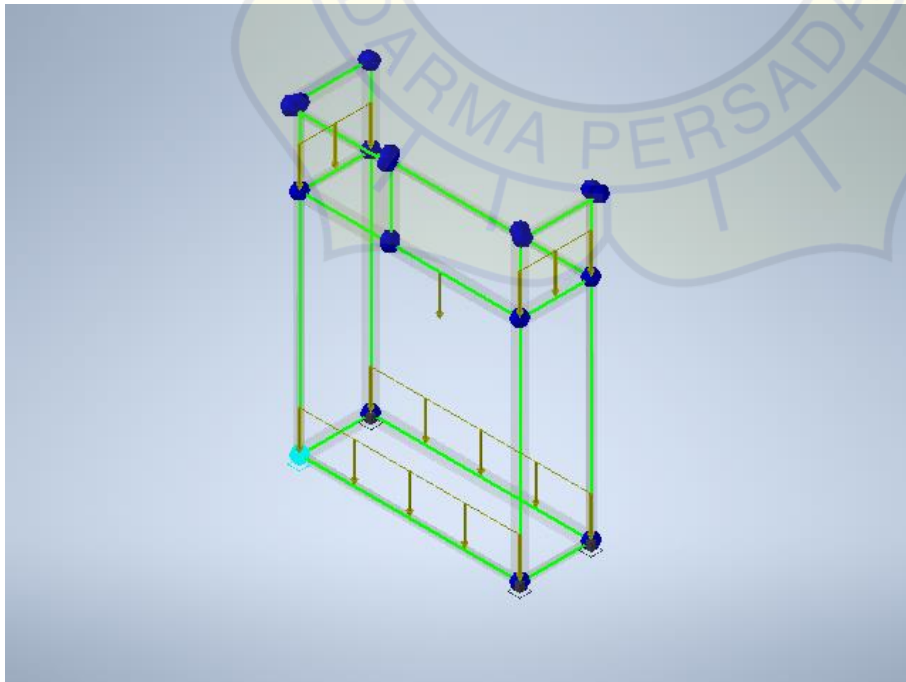
Selected Reference(s)



Fixed Constraint:4

Constraint Type	Fixed
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Selected Reference(s)



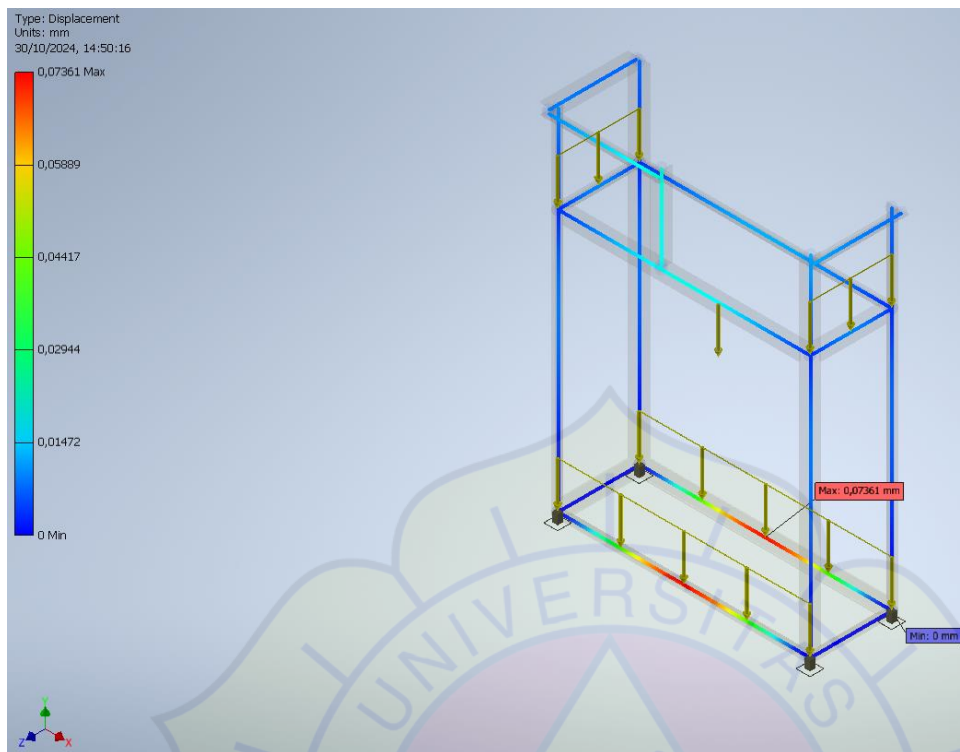
Results

Static Result Summary

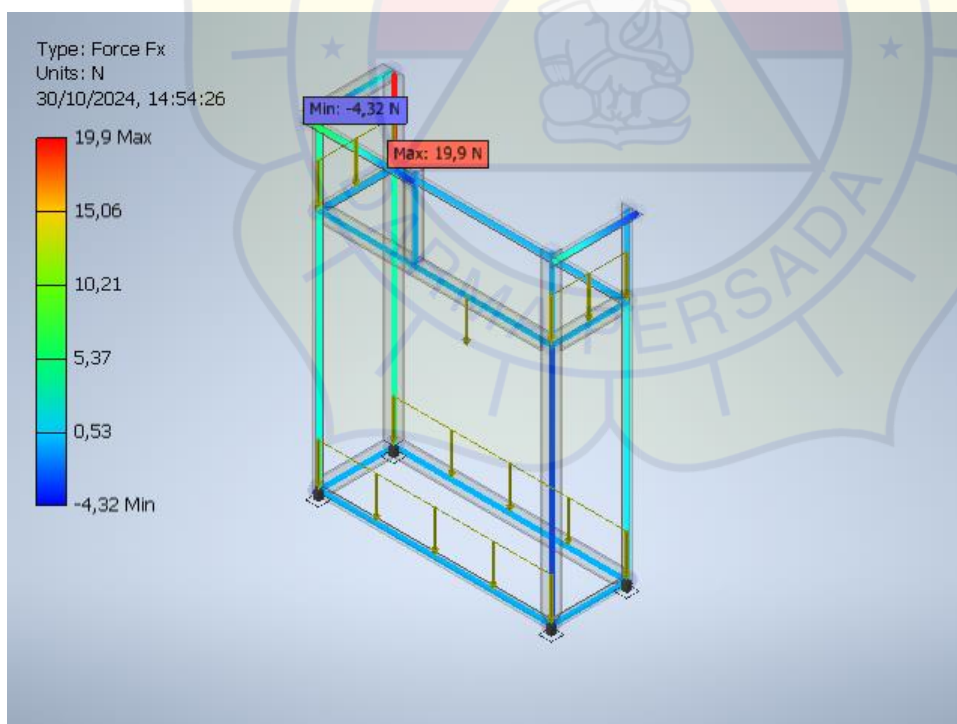
Name		Minimum	Maximum
Displacement		0,000 mm	0,074 mm
Forces	Fx	-4,317 N	19,901 N
	Fy	-212,389 N	212,331 N
	Fz	-17,085 N	268,039 N
Moments	Mx	-28893,913 N mm	14446,957 N mm
	My	-1982,171 N mm	4758,181 N mm
	Mz	-11,778 N mm	12,825 N mm
Normal Stresses	Smax	-0,832 MPa	18,606 MPa
	Smin	-9,303 MPa	-0,002 MPa
	Smax(Mx)	0,000 MPa	18,606 MPa
	Smin(Mx)	-9,303 MPa	-0,000 MPa
	Smax(My)	-0,000 MPa	3,064 MPa
	Smin(My)	-1,276 MPa	0,000 MPa
	Saxial	-0,871 MPa	0,055 MPa
Shear Stresses	Tx	-0,179 MPa	0,039 MPa
	Ty	-1,905 MPa	1,905 MPa
Torsional Stresses	T	-0,044 MPa	0,041 MPa

Figures

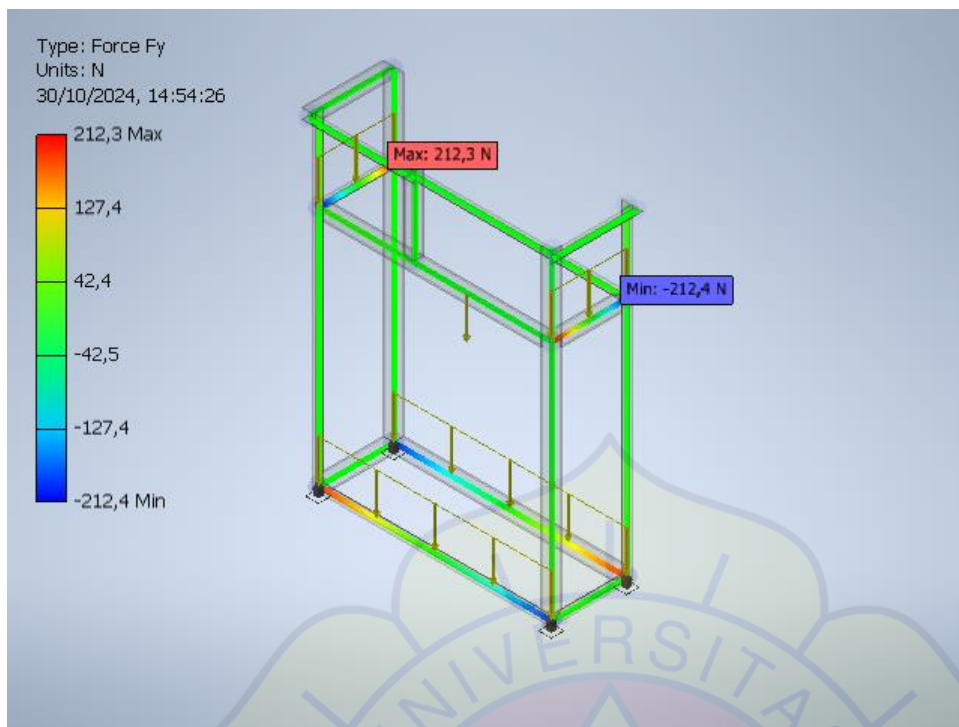
Displacement



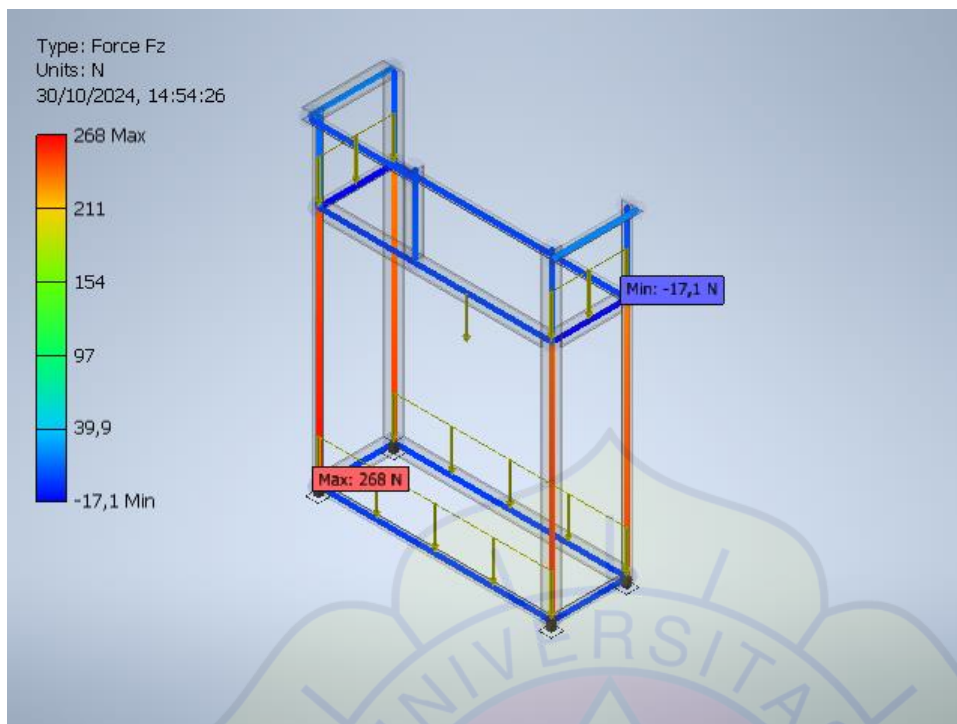
Fx



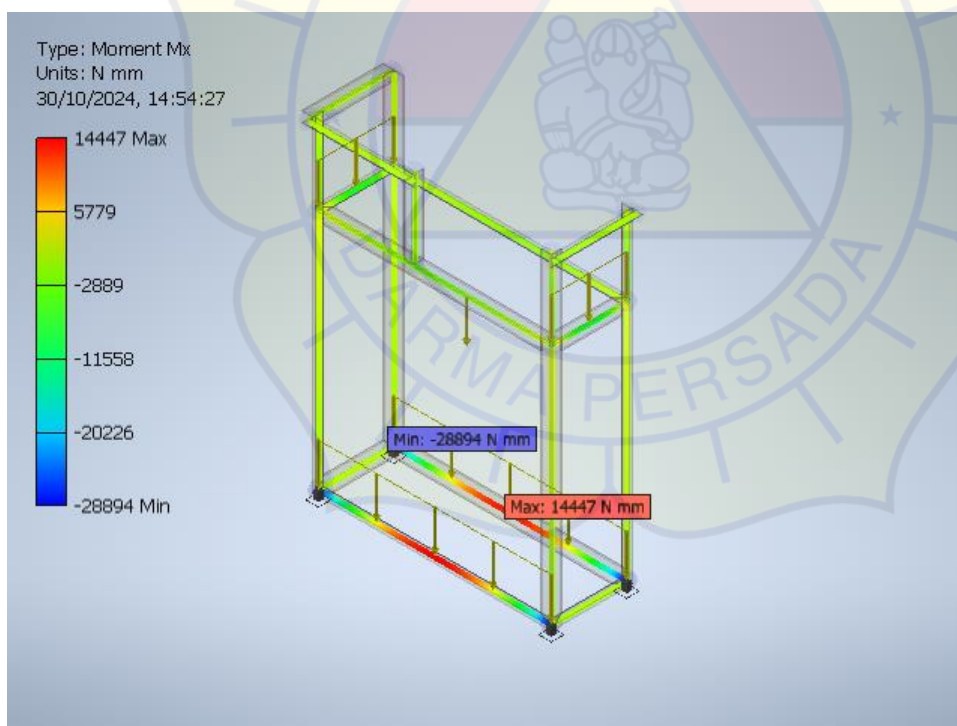
Fy



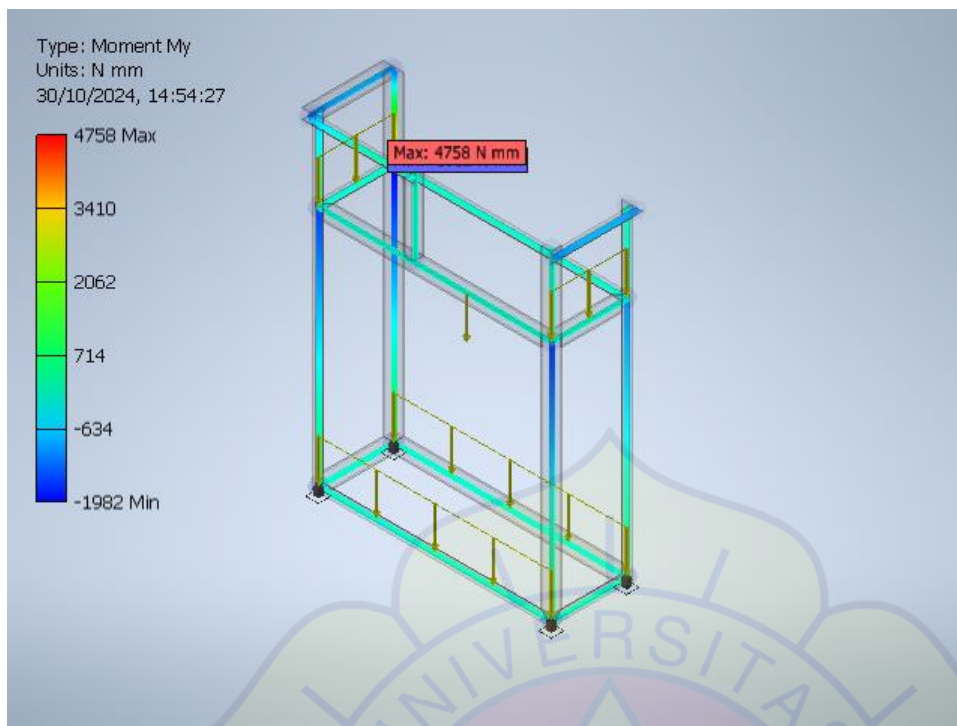
Fz



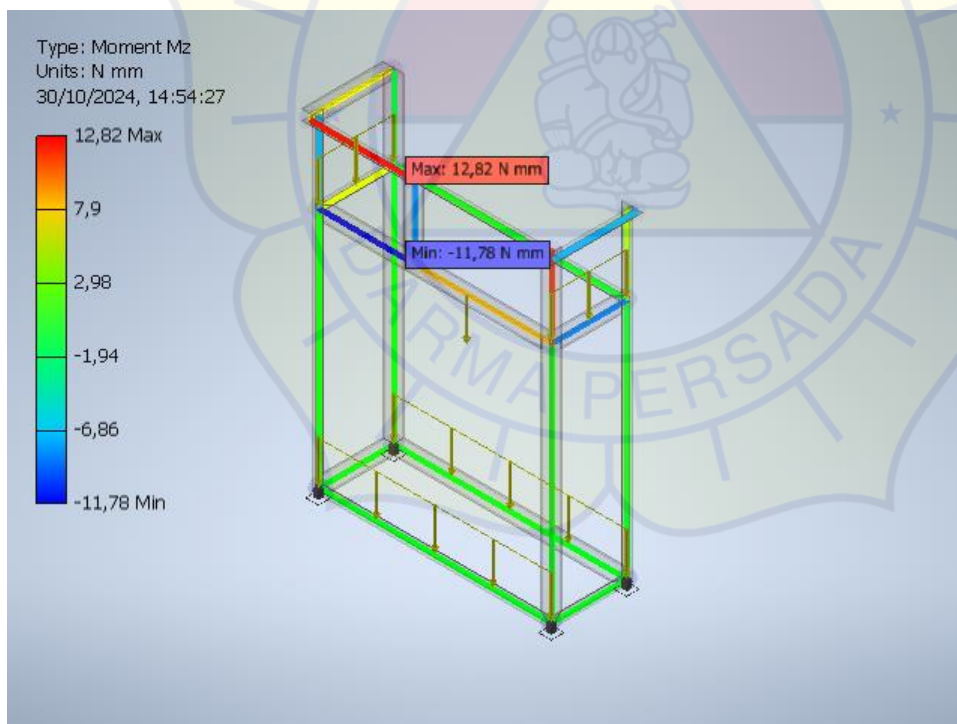
Mx



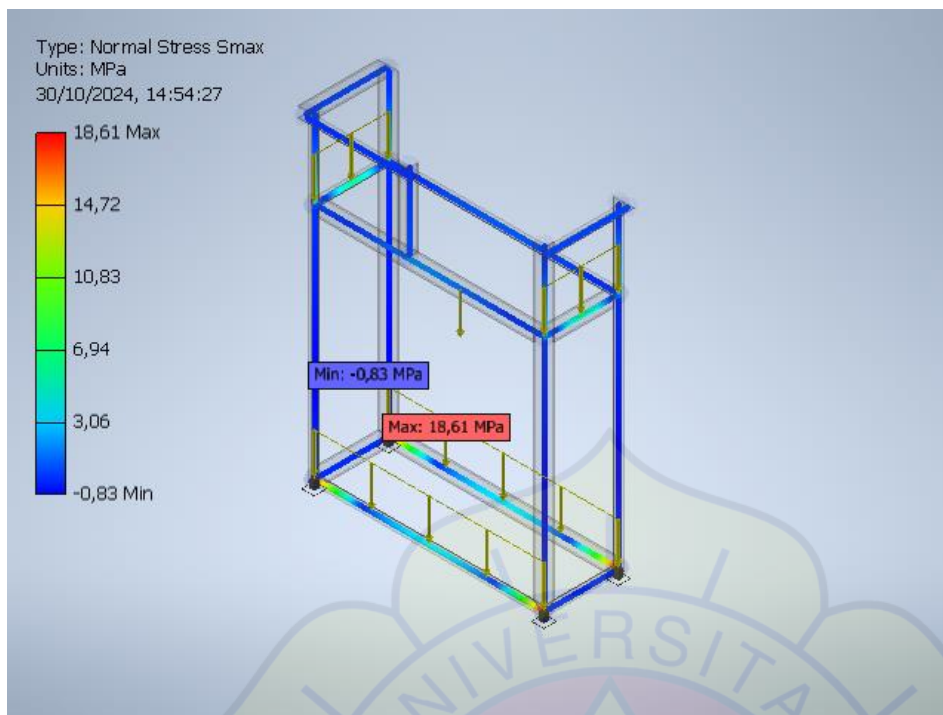
My



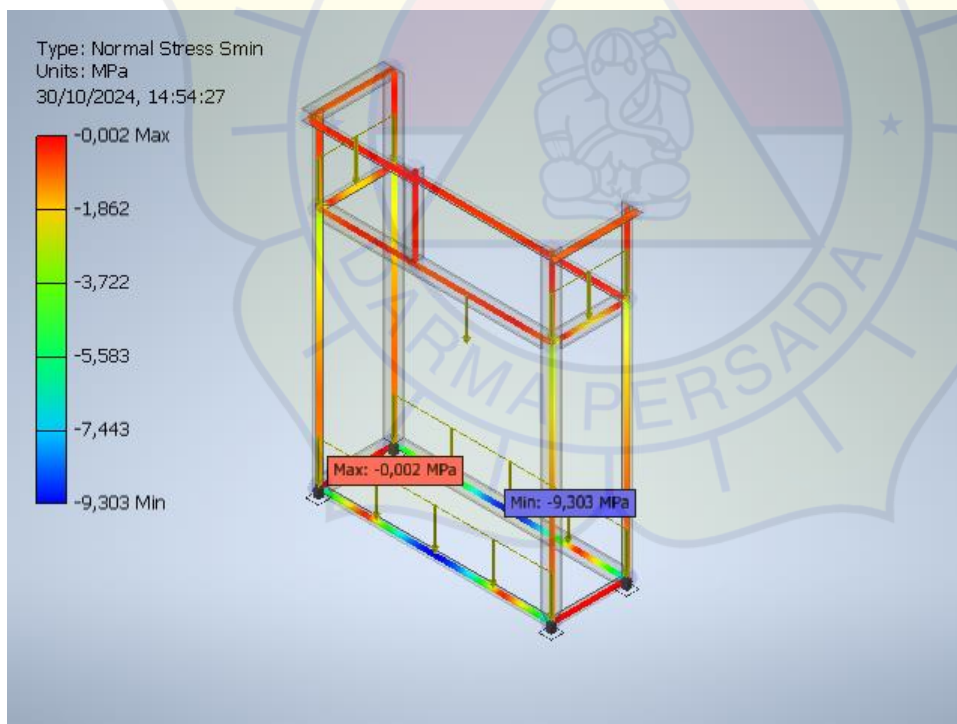
Mz



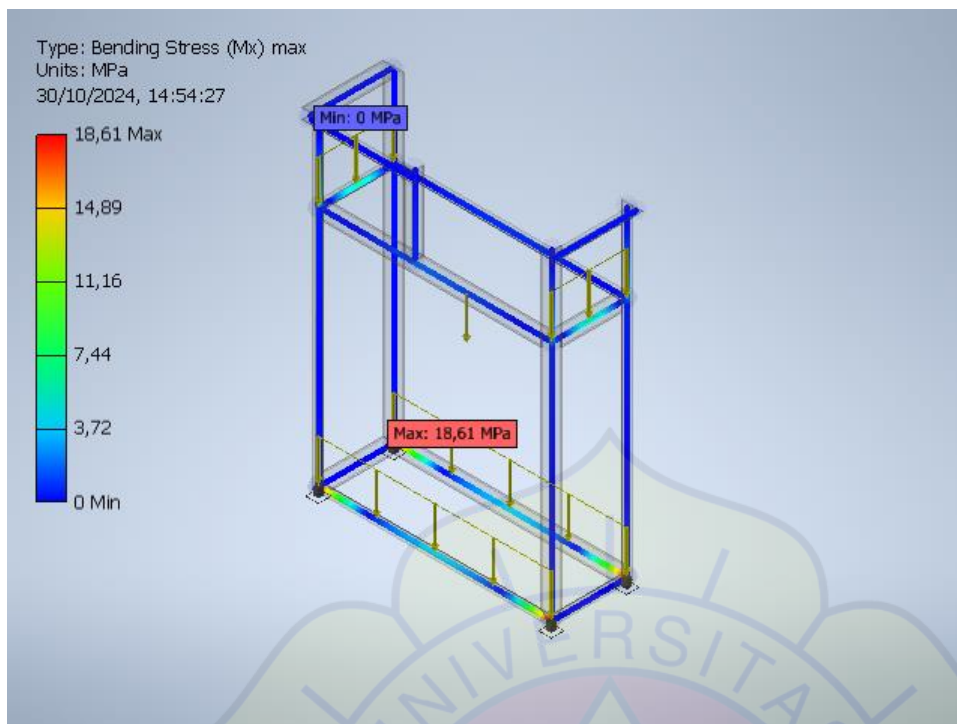
Smax



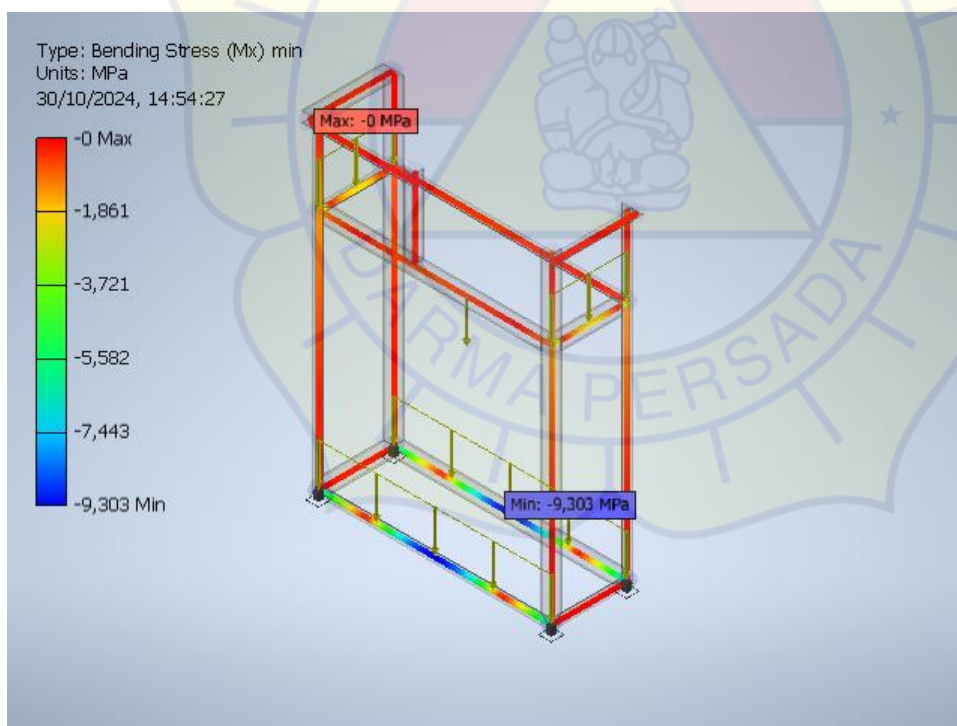
Smin



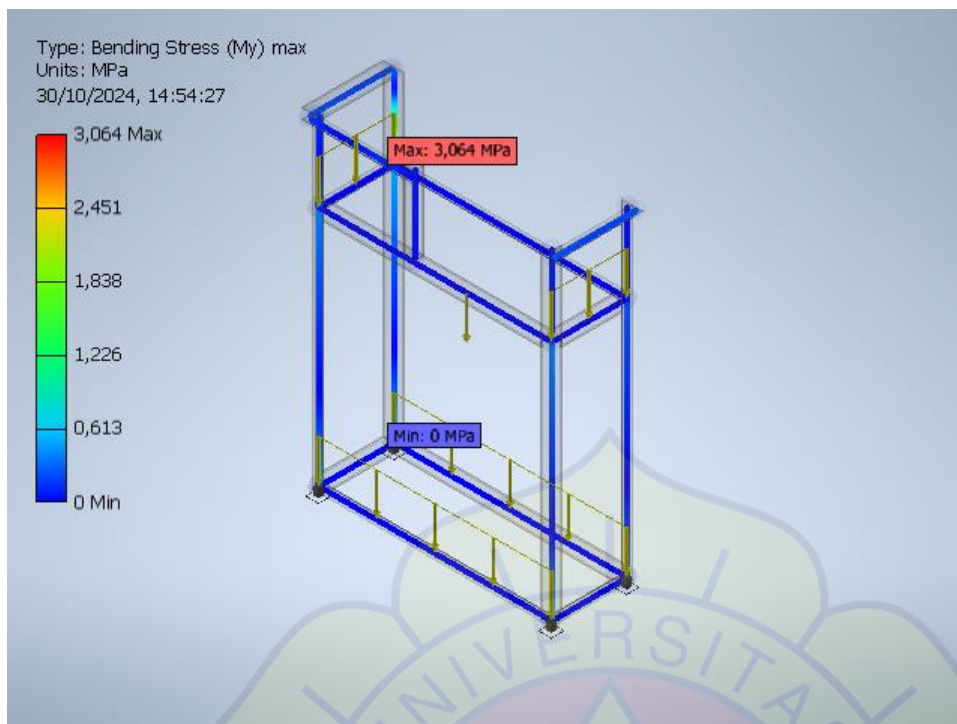
Smax(Mx)



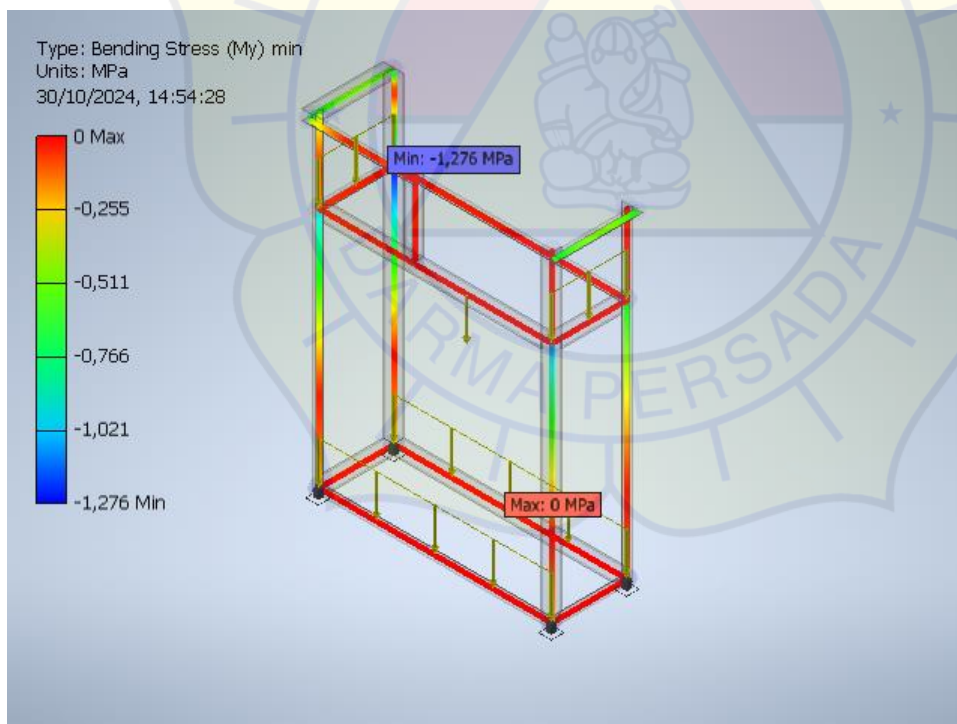
Smin(Mx)



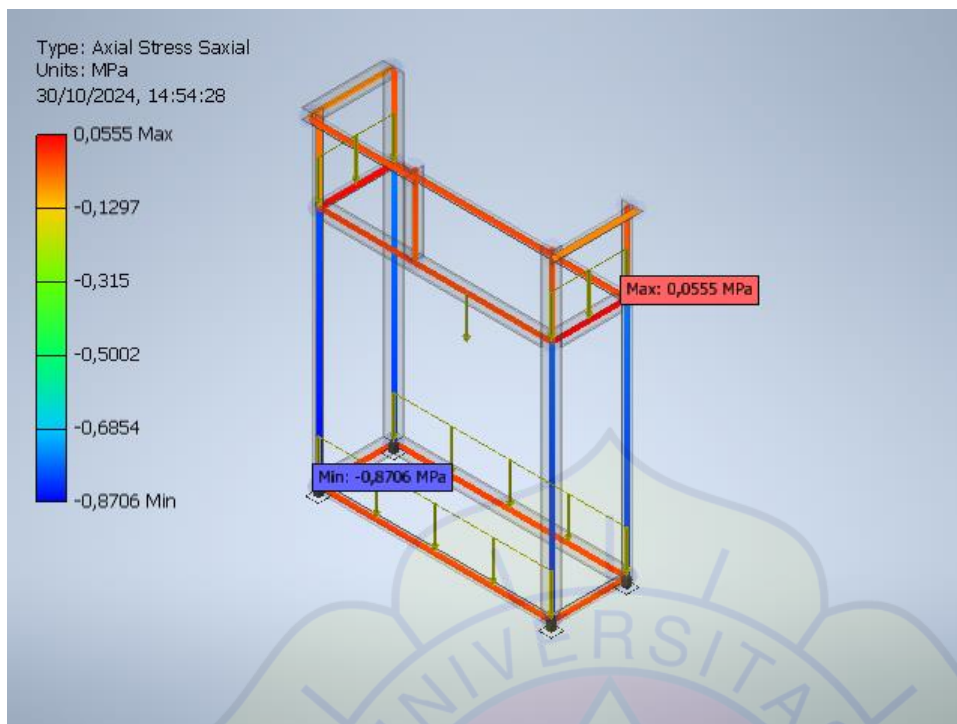
Smax(My)



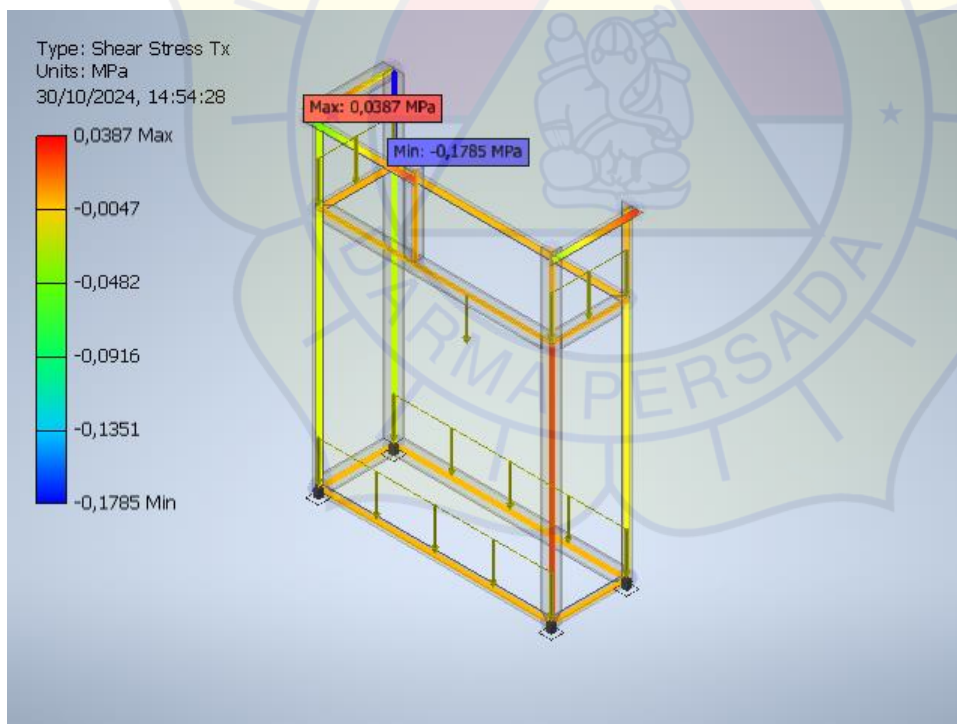
Smin(My)



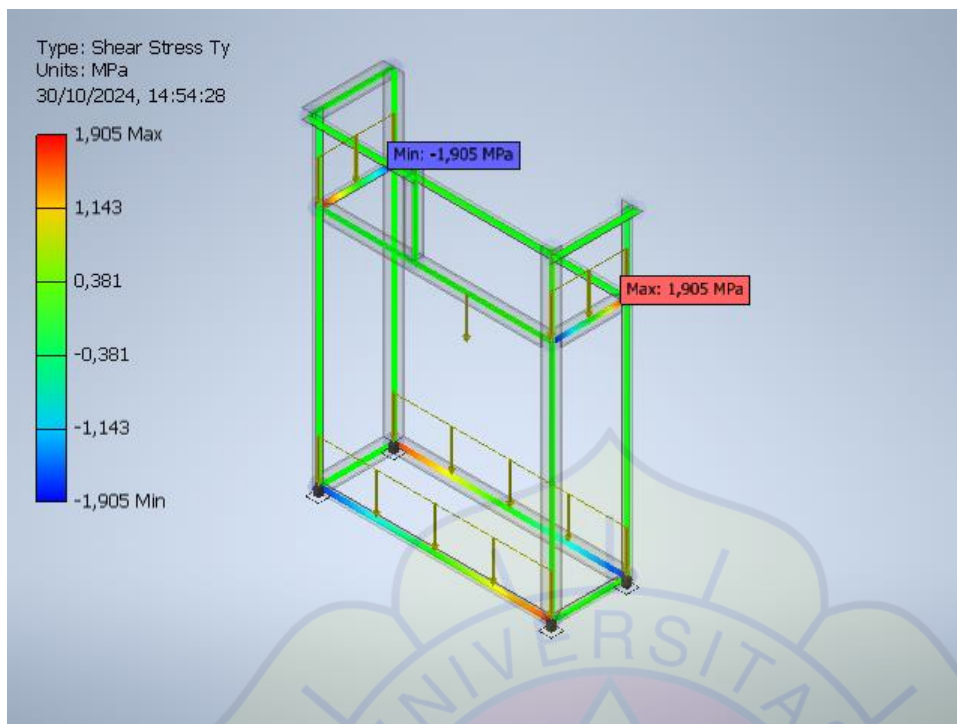
Saxial



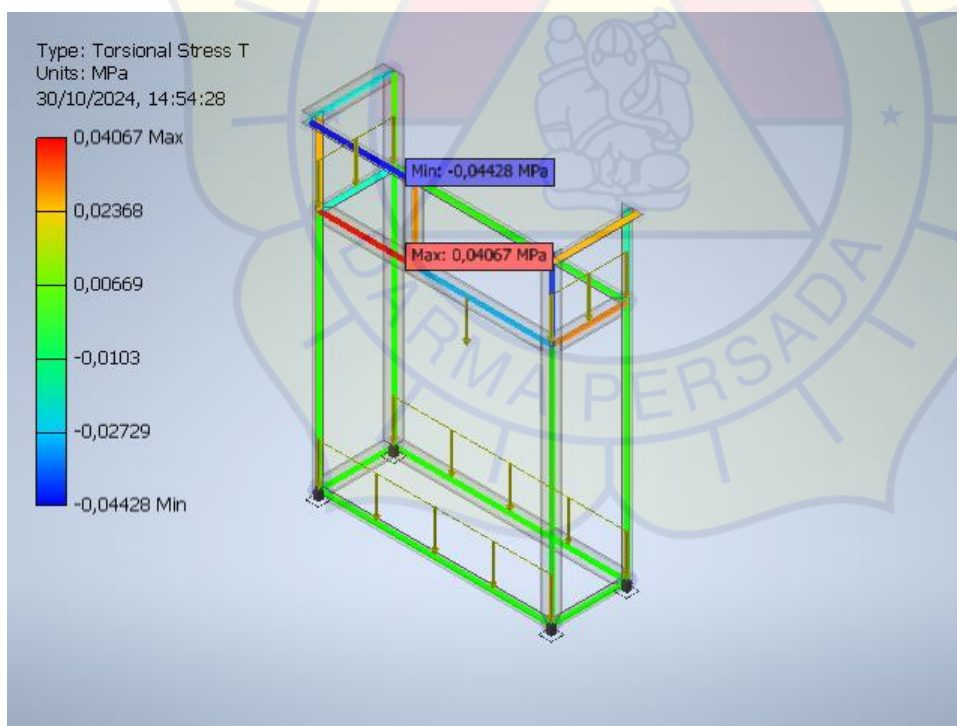
Tx



Ty



T



C:\Users\LAB-MD-21\Pictures\LAPORAN KP & SKRIPSI\SKRIPSI\GENAP 2023-2024\SATRIA\DESAIN\MESIN INJECTION MOLDING\FRAME\FRAME ASSY\FRAME ASSY\FRAME\FRAME 1719999612560.iam

Stress Analysis Report



Analyzed File:	Frame 1719999612560.iam
Autodesk Inventor Version:	2021 (Build 250183000, 183)
Creation Date:	30/10/2024, 15:26
Study Author:	Satria
Summary:	

Project Info (iProperties)

Summary

Author	Satria Putra Pratama
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Project

Part Number	Rangka Mesin Molding
Designer	Satria Putra Pratama
Cost	Rp0
Date Created	03/07/2024

Status

Design Status	WorkInProgress
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Physical

Mass	25,9572 kg
Area	1675310 mm ²
Volume	3306650 mm ³
Center of Gravity	x=-12,4289 mm y=9,56759 mm z=-145,884 mm

Note: Physical values could be different from Physical values used by FEA reported below.

Static Analysis:1

General objective and settings:

Design Objective	Single Point
Study Type	Static Analysis
Last Modification Date	30/10/2024, 15:23
Detect and Eliminate Rigid Body Modes	No
Separate Stresses Across Contact Surfaces	No
Motion Loads Analysis	No

Mesh settings:

Avg. Element Size (fraction of model diameter)	0,1
Min. Element Size (fraction of avg. size)	0,2
Grading Factor	1,5
Max. Turn Angle	30 deg
Create Curved Mesh Elements	No
Use part based measure for Assembly mesh	Yes

Material(s)

Name	Generic	
General	Mass Density	1 g/cm ³
	Yield Strength	0 MPa
	Ultimate Tensile Strength	0 MPa
Stress	Young's Modulus	0,0000001 GPa
	Poisson's Ratio	0 ul
	Shear Modulus	0,00000005 GPa
Part Name(s)	Reference Skeleton	
Name	Steel, Mild	
General	Mass Density	7,85 g/cm ³

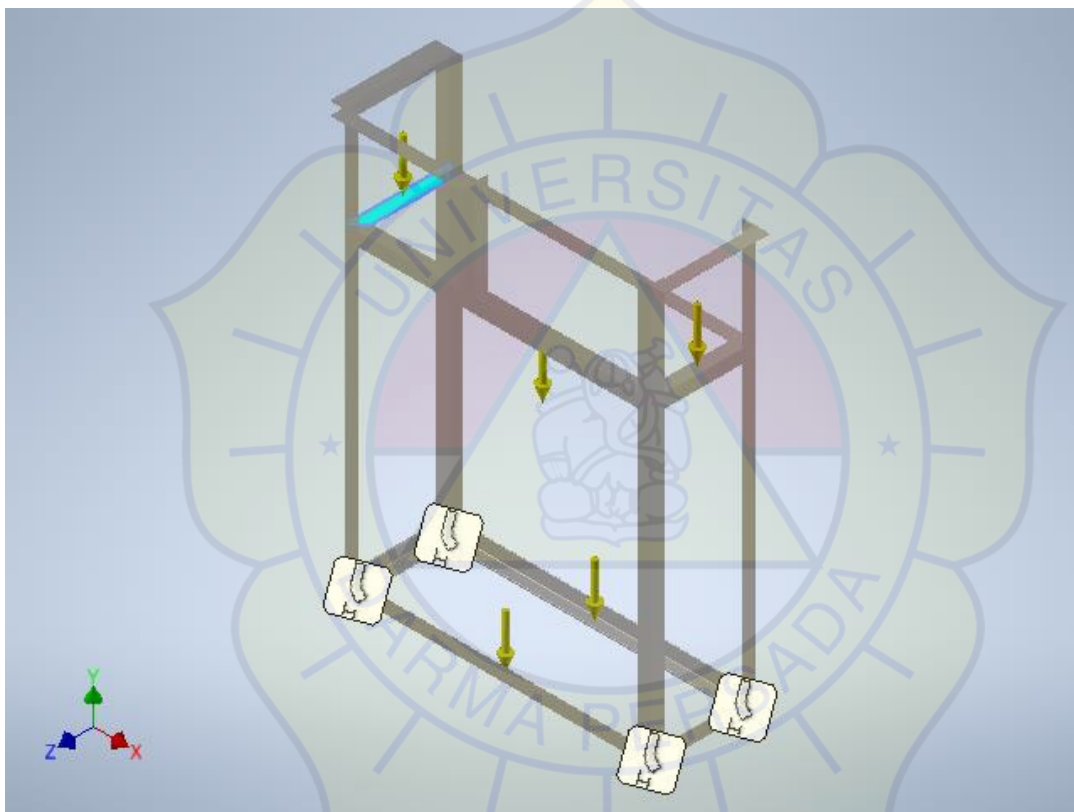
	Yield Strength	207 MPa
	Ultimate Tensile Strength	345 MPa
Stress	Young's Modulus	220 GPa
	Poisson's Ratio	0,275 ul
	Shear Modulus	86,2745 GPa
Part Name(s)	ISO 657-1 L40x40x4 - 918.06 ISO 657-1 L40x40x4 - 312 ISO 657-1 L40x40x4 - 918.06 ISO 657-1 L40x40x4 - 312 ISO 657-1 L40x40x4 - 1247.75 ISO 657-1 L40x40x4 - 1247.75 ISO 657-1 L40x40x4 - 1250 ISO 657-1 L40x40x4 - 1250 ISO 657-1 L40x40x4 - 906,55 ISO 657-1 L40x40x4 - 300,49 ISO 657-1 L40x40x4 - 906,55 ISO 657-1 L40x40x4 - 300,49 ISO 657-1 L40x40x4 - 300 ISO 657-1 L40x40x4 - 312 ISO 657-1 L40x40x4 - 390 ISO 657-1 L40x40x4 - 312	

Operating conditions

Force:1

Load Type	Force
Magnitude	400,000 N
Vector X	-0,000 N
Vector Y	-400,000 N
Vector Z	0,000 N

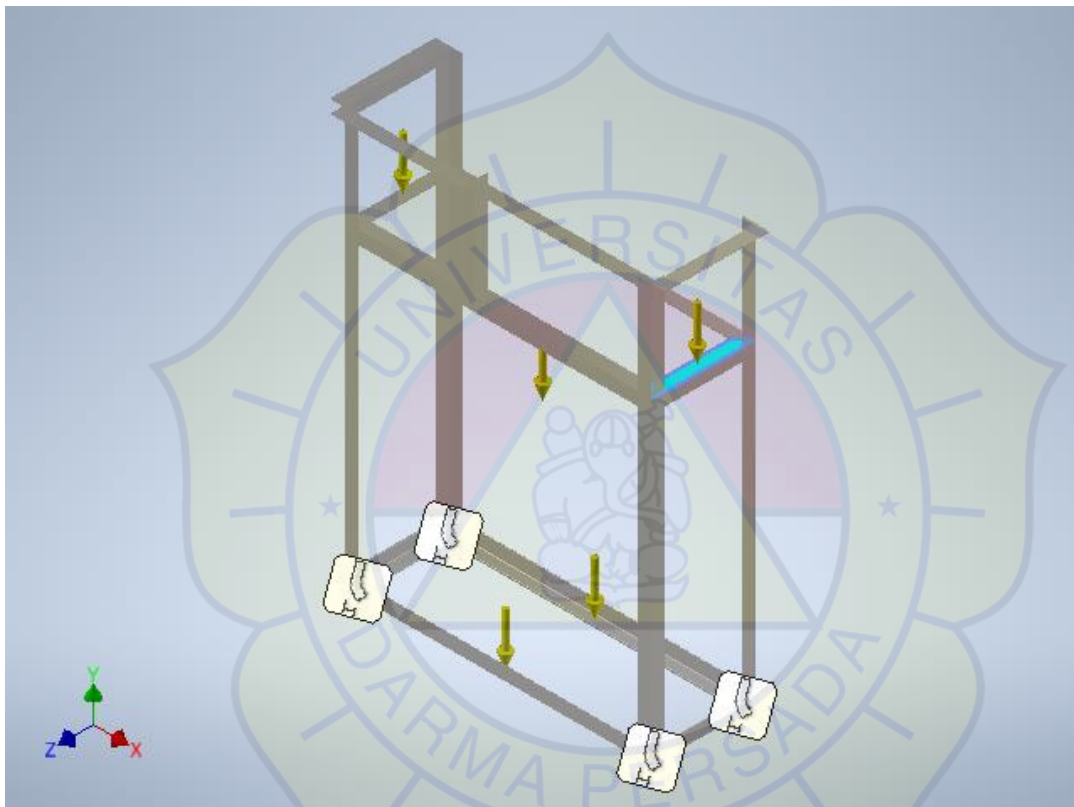
Selected Face(s)



Force:2

Load Type	Force
Magnitude	400,000 N
Vector X	0,000 N
Vector Y	-400,000 N
Vector Z	0,000 N

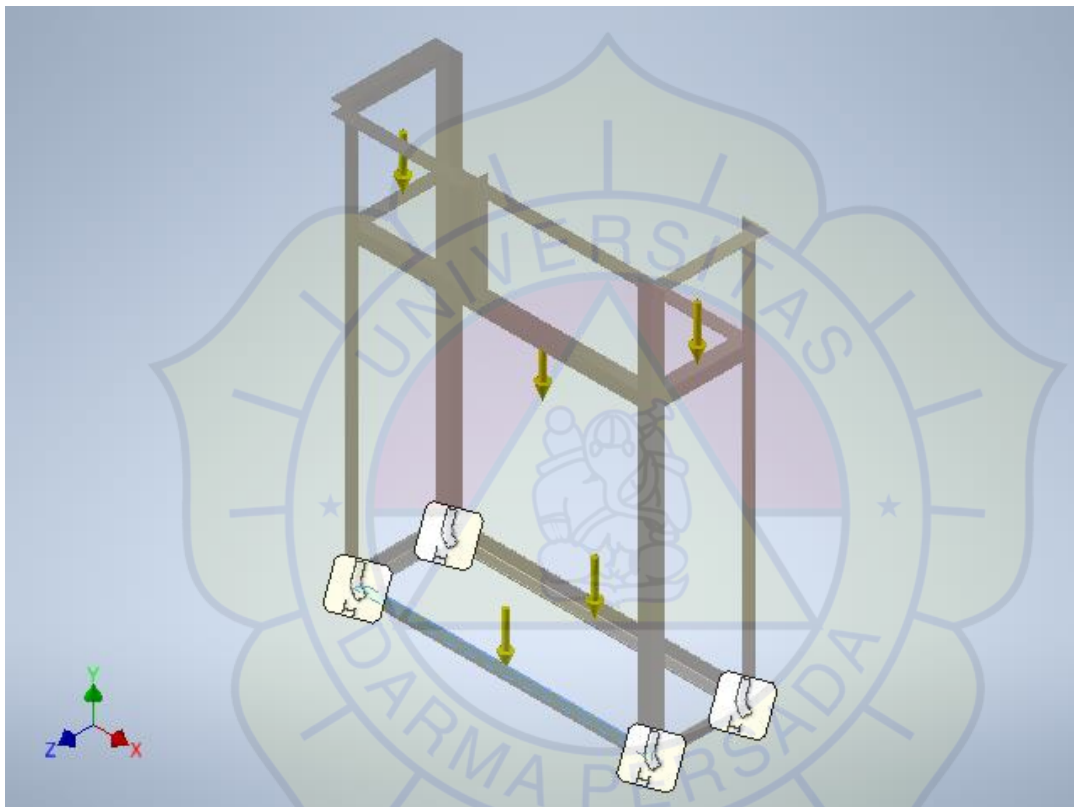
Selected Face(s)



Force:3

Load Type	Force
Magnitude	375,000 N
Vector X	0,000 N
Vector Y	-375,000 N
Vector Z	0,000 N

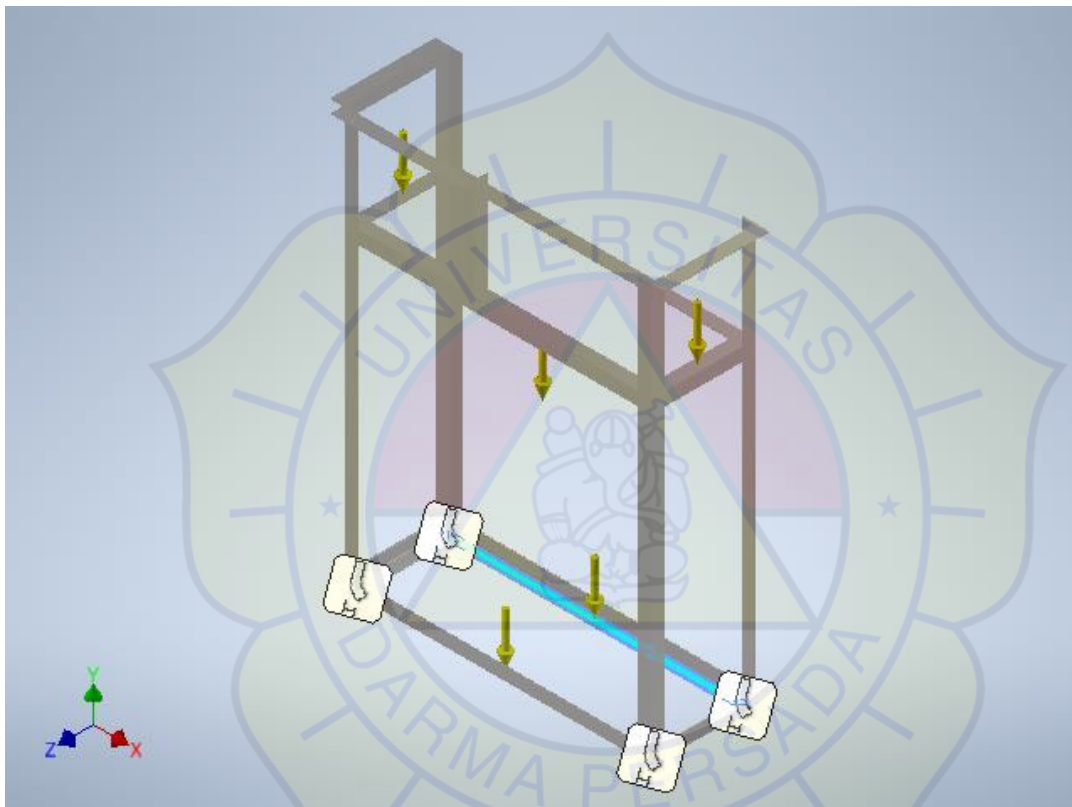
Selected Face(s)



Force:4

Load Type	Force
Magnitude	375,000 N
Vector X	0,000 N
Vector Y	-375,000 N
Vector Z	0,000 N

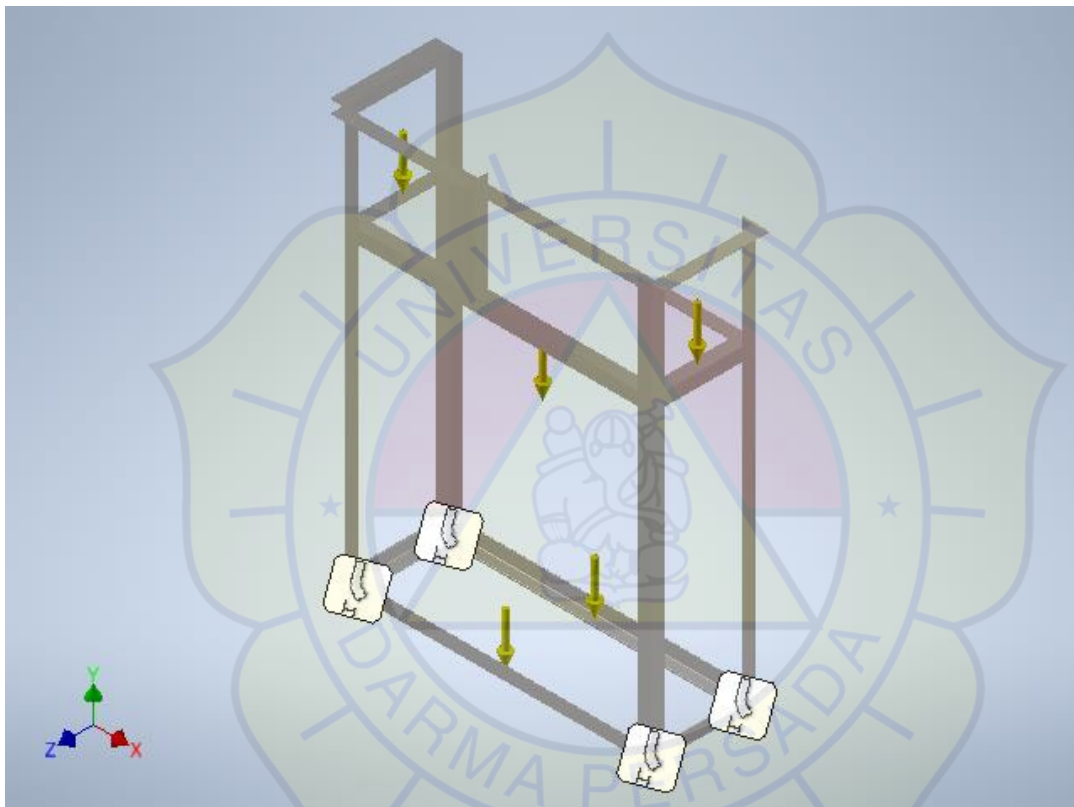
Selected Face(s)



Gravity

Load Type	Gravity
Magnitude	9810,000 mm/s ²
Vector X	0,000 mm/s ²
Vector Y	-9810,000 mm/s ²
Vector Z	0,000 mm/s ²

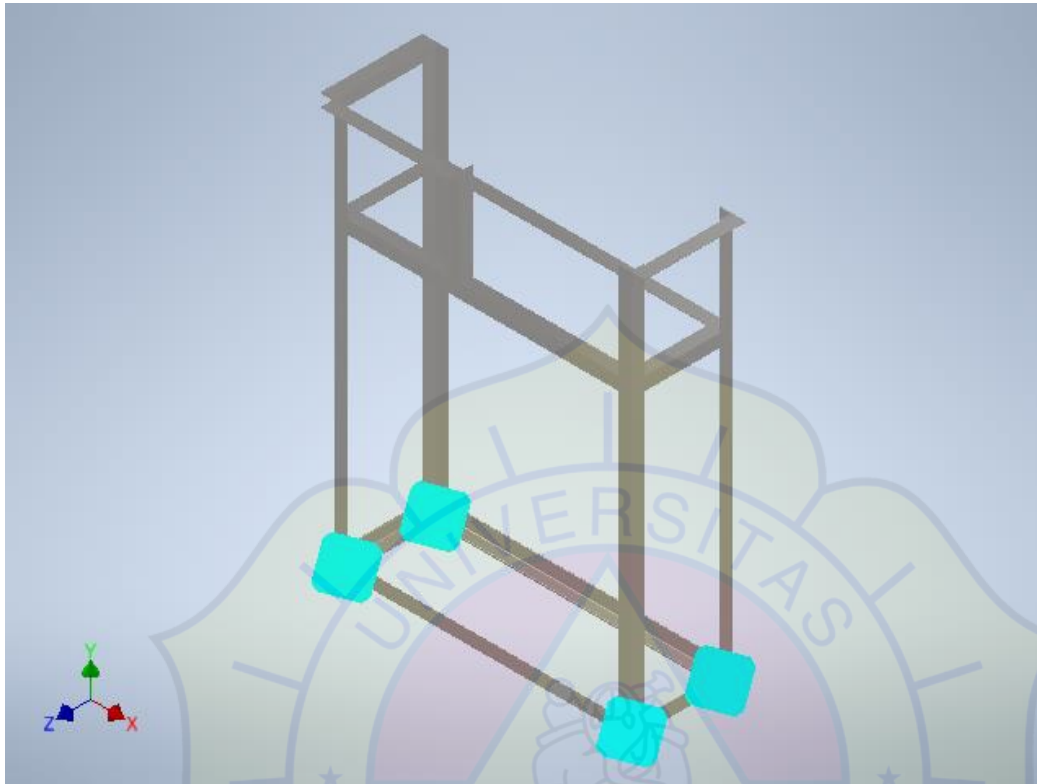
Selected Face(s)



Fixed Constraint:1

Constraint Type	Fixed Constraint
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Selected Face(s)



Results

Reaction Force and Moment on Constraints

Constraint Name	Reaction Force		Reaction Moment	
	Magnitude	Component (X,Y,Z)	Magnitude	Component (X,Y,Z)
Fixed Constraint:1	1801,88 N	0 N	3,69954 N m	-2,54576 N m
		1801,88 N		0 N m
		0 N		-2,68434 N m

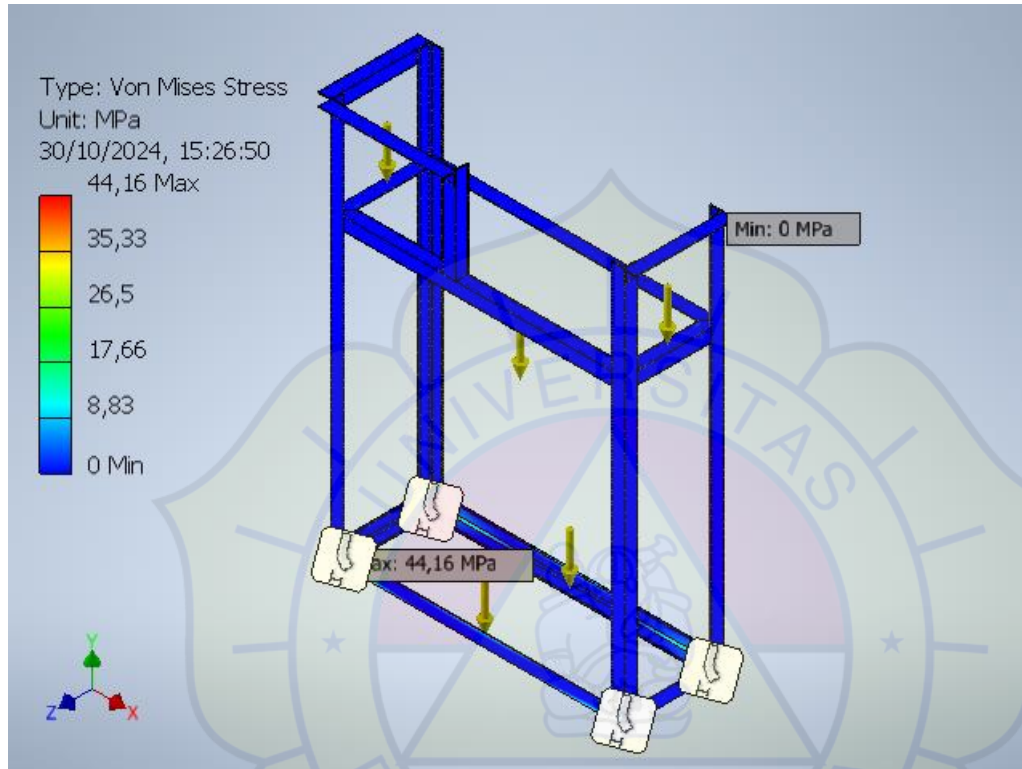
Result Summary

Name	Minimum	Maximum
Volume	3306650 mm ³	
Mass	25,9572 kg	
Von Mises Stress	0,000674373 MPa	44,1598 MPa
1st Principal Stress	-5,26616 MPa	52,6889 MPa

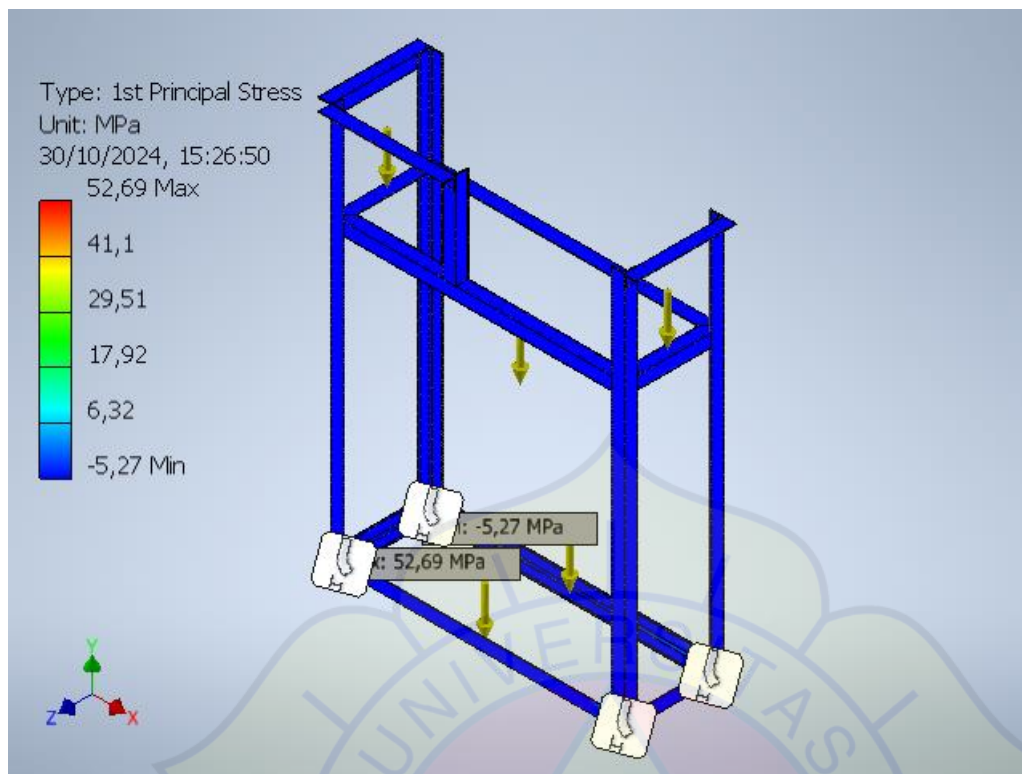
3rd Principal Stress	-24,5889 MPa	9,65845 MPa
Displacement	0 mm	0,34477 mm
Safety Factor	4,68752 ul	15 ul

Figures

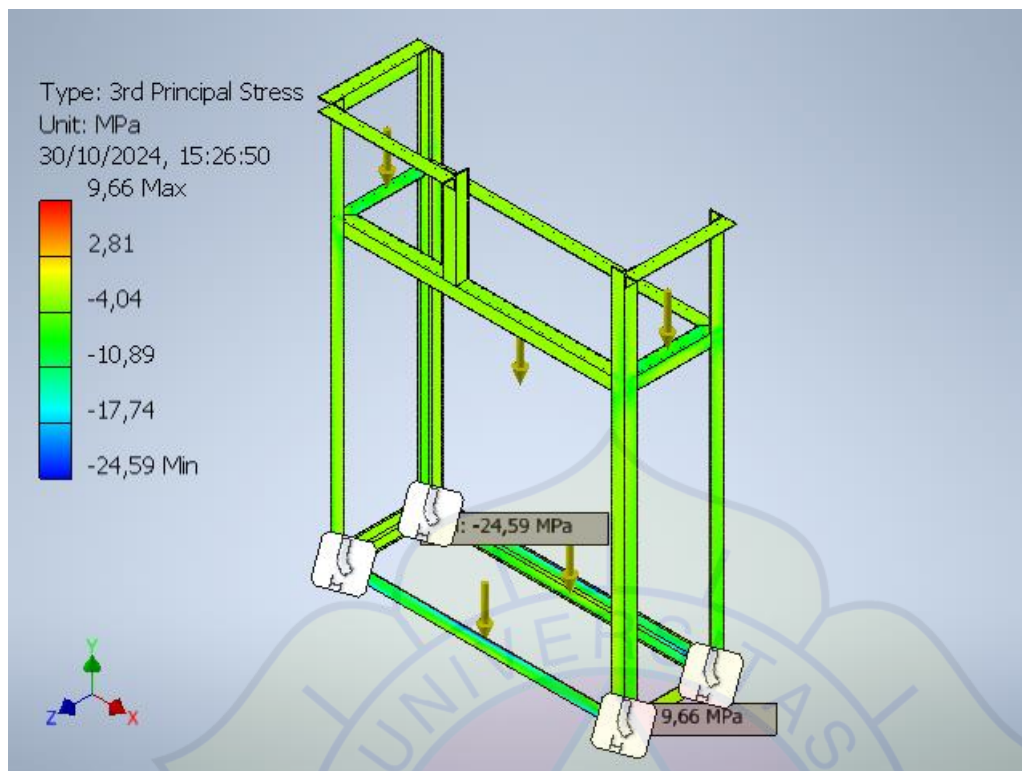
Von Mises Stress



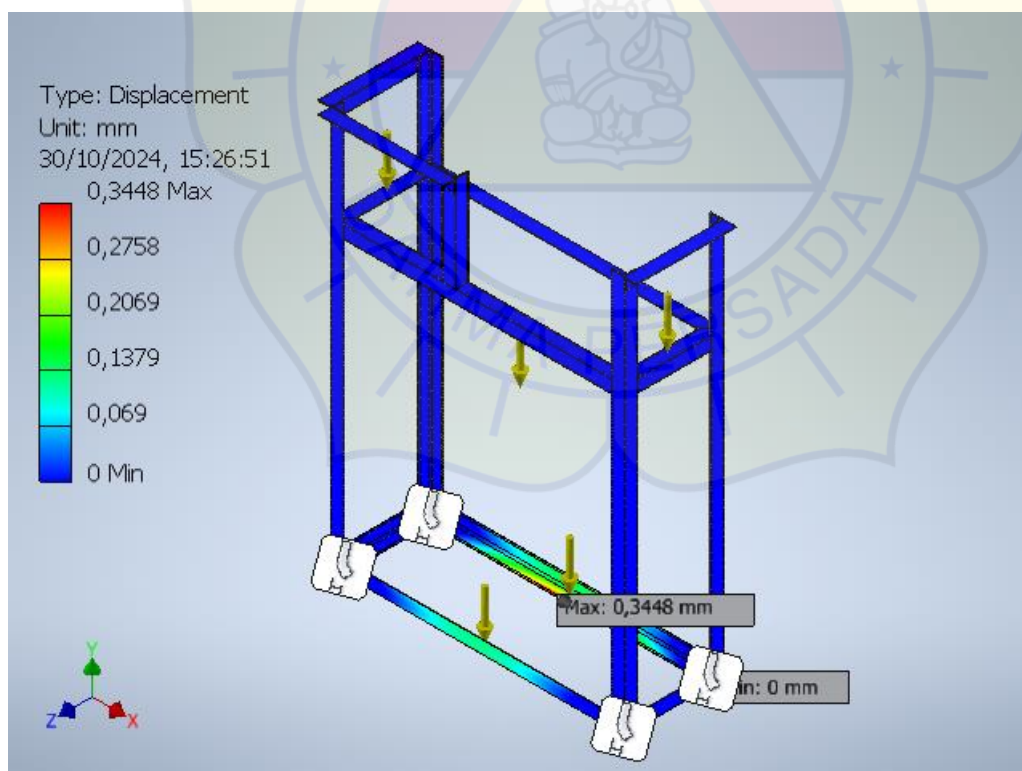
1st Principal Stress



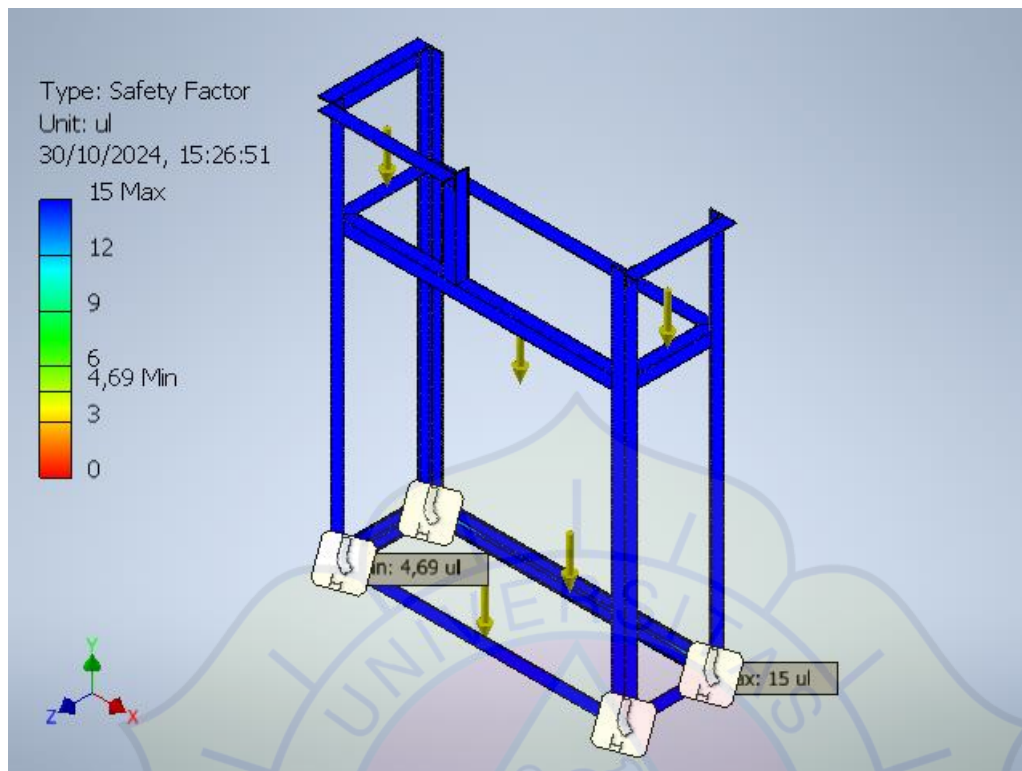
3rd Principal Stress



Displacement



Safety Factor



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