Stress Analysis Report

Analyzed File:	Viga_I_Variável.iam
Autodesk Inventor Version:	2017.2 (Build 212233000, 233)
Creation Date:	10/12/2016, 18:50
Study Author:	Walter A. Kapp
Summary:	

⊟ Project Info (iProperties)

⊟ Summary

Title	Auto financiado
Subject	Robo EngeMOVI serial de 7 juntas
Author	Walter A. Kapp
Manager	Walter A. Kapp
Company	EngeMOVI

⊟ Project

Part Number	Viga_I_Variável
Project	RES
Designer	Walter A. Kapp
Engineer	Walter A. Kapp
Cost	R$ 0,00

⊟ Status

Design Status	WorkInProgress

⊟ Physical

Mass	125,608 kg
Area	3179150 mm^2
Volume	16020700 mm^3
Center of Gravity	x=3,62026 mm y=62,7973 mm z=-54,5285 mm

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

⊟ Static Analysis:2

General objective and settings:

Design Objective	Single Point
Study Type	Static Analysis
Last Modification Date	10/12/2016, 18:46
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	60 deg
Create Curved Mesh Elements	No
Use part based measure for Assembly mesh	Yes

⊟ Material(s)

Name	Aço ABNT1020~1030	
General	Mass Density	7,84 g/cm^3
	Yield Strength	245 MPa
	Ultimate Tensile Strength	441 MPa

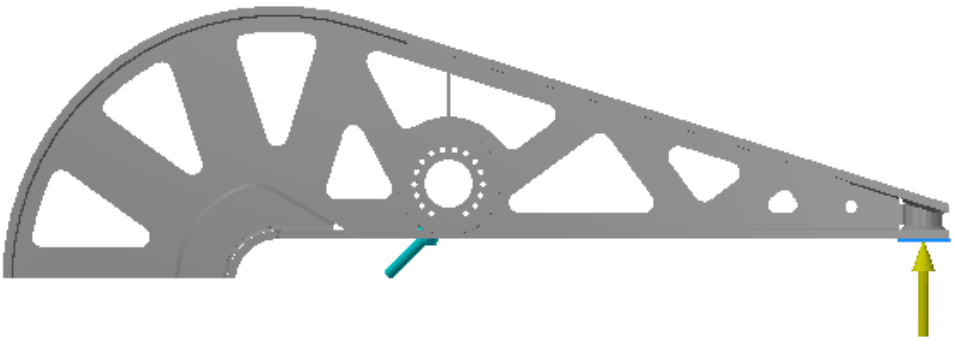
Stress	Young's Modulus	207 GPa
	Poisson's Ratio	0,295 ul
	Shear Modulus	79,9228 GPa
Part Name(s)	alma Longarina_interna Longarina Externa Longarina_interna Raiz curva Reforço raiz Nervura Flange 2 Tubo Ferramenta Tubo Ferramenta	
Name	Aço ABNT1025~1040	
General	Mass Density	7,84 g/cm^3
	Yield Strength	300 MPa
	Ultimate Tensile Strength	450 MPa
Stress	Young's Modulus	207 GPa
	Poisson's Ratio	0,295 ul
	Shear Modulus	79,9228 GPa
Part Name(s)	Flange_robô	

Operating conditions

Force:1

Load Type	Force
Magnitude	15000,000 N
Vector X	0,000 N
Vector Y	15000,000 N
Vector Z	0,000 N

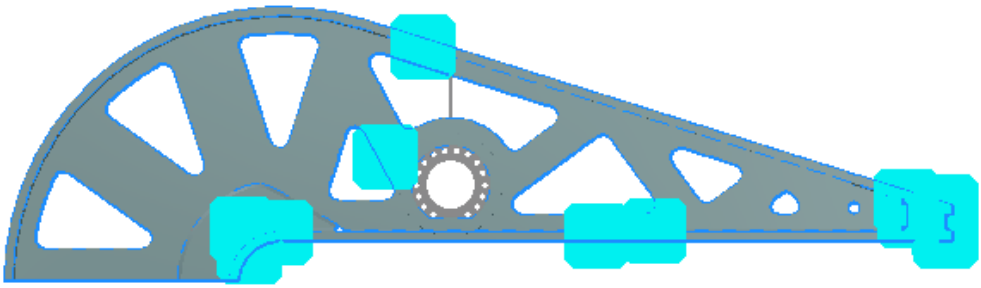
Selected Face(s)



Frictionless Constraint:1

Constraint Type	Frictionless Constraint

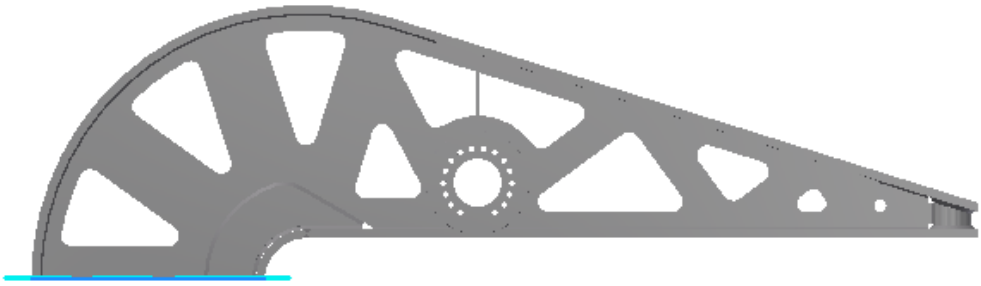
Selected Face(s)



⊟ Frictionless Constraint:2

Constraint Type	Frictionless Constraint

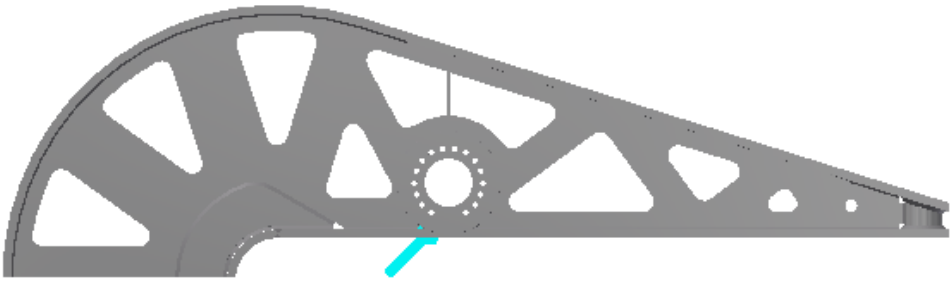
⊟ Selected Face(s)



⊟ Fixed Constraint:1

Constraint Type	Fixed Constraint
Vector X	0,000 mm

⊟ Selected Face(s)



Results

Reaction Force and Moment on Constraints

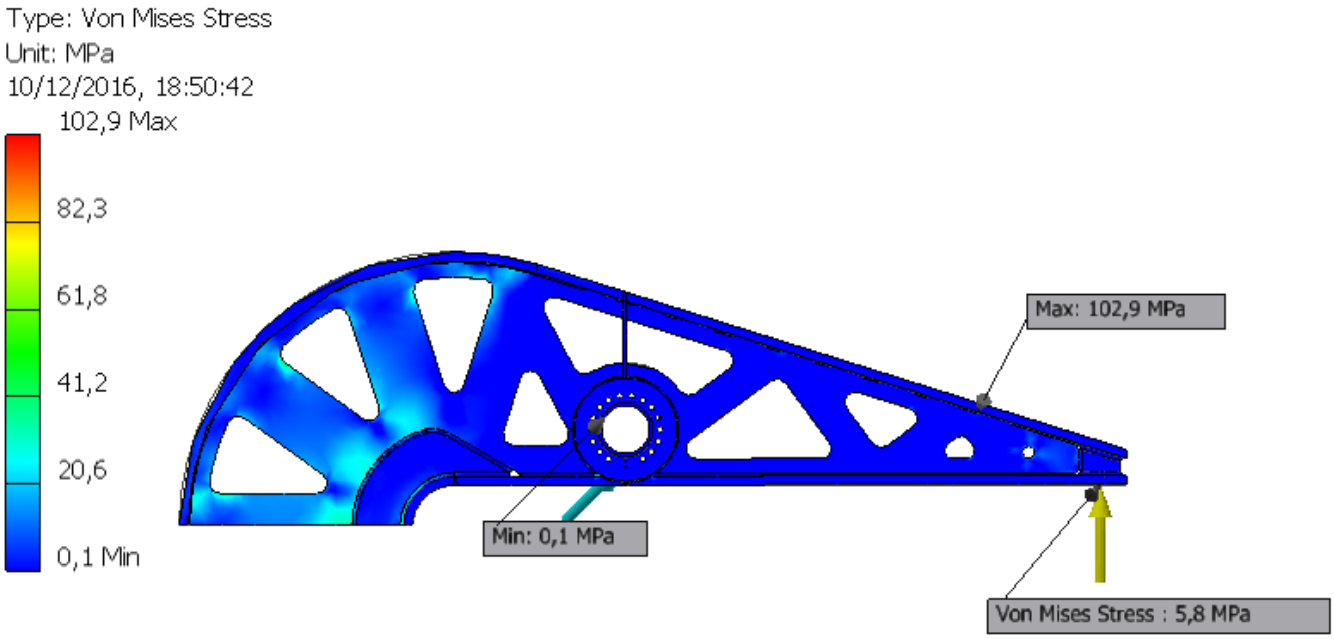
Constraint Name	Reaction Force		Reaction Moment	
	Magnitude	Component (X,Y,Z)	Magnitude	Component (X,Y,Z)
Frictionless Constraint:1	3239,08 N	76,3349 N	9473,32 N m	-7267,76 N m
		2479,34 N		5252,79 N m
		-2082,94 N		-3054,77 N m
Frictionless Constraint:2	24356 N	96,8858 N	834,576 N m	-512,889 N m
		-24278,8 N		-71,2779 N m
		1935,07 N		-654,508 N m
Fixed Constraint:1	0,128022 N	0,121603 N	0,438415 N m	0,000236024 N m
		0,0192738 N		0,438415 N m
		0,0350824 N		0 N m

Result Summary

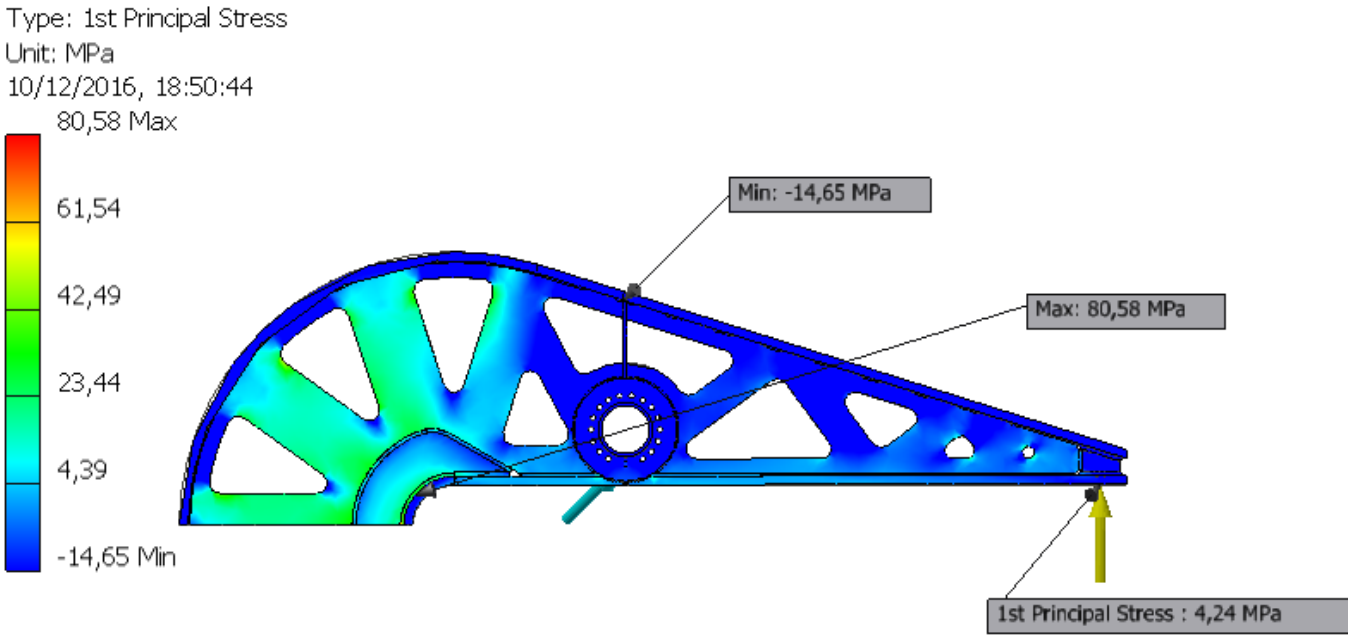
Name	Minimum	Maximum
Volume	16020700 mm^3	
Mass	125,608 kg	
Von Mises Stress	0,0811463 MPa	102,869 MPa
1st Principal Stress	-14,6548 MPa	80,5834 MPa
3rd Principal Stress	-91,2271 MPa	16,4484 MPa
Displacement	0,000195846 mm	1,87733 mm
Safety Factor	3,04299 ul	15 ul
Stress XX	-54,2107 MPa	72,3934 MPa
Stress XY	-26,2428 MPa	44,7094 MPa
Stress YY	-67,9729 MPa	65,7321 MPa
Y Displacement	-0,0432094 mm	1,87191 mm

Figures

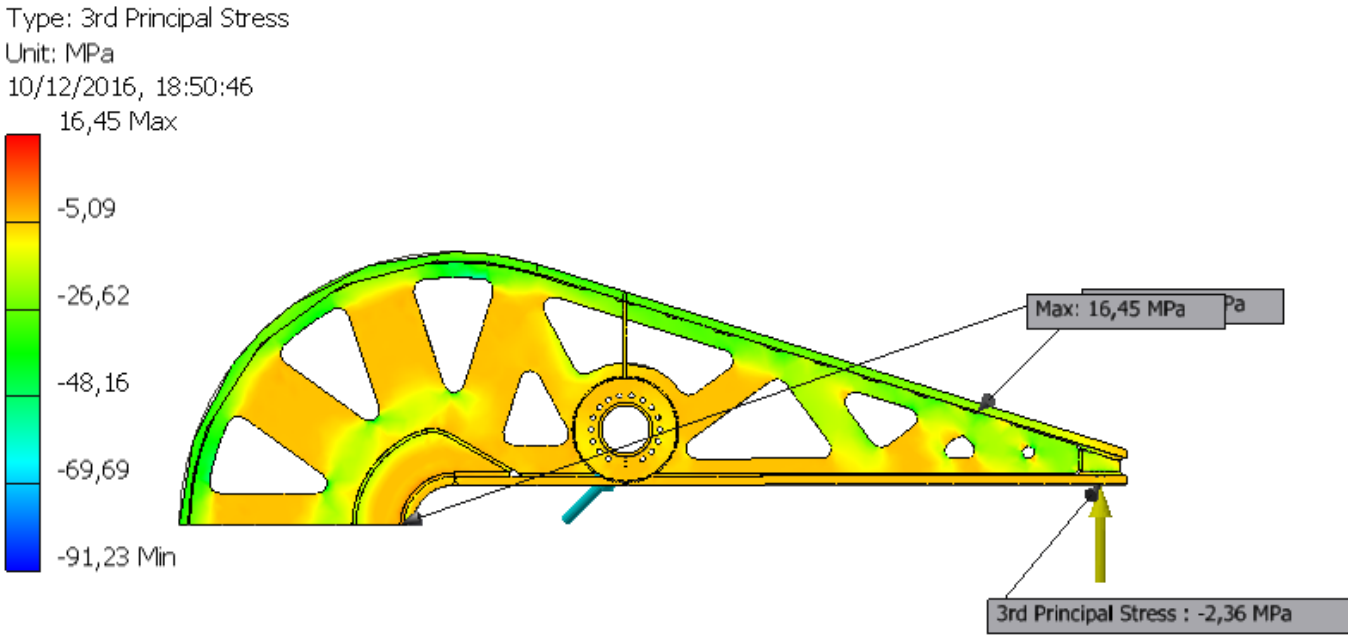
Von Mises Stress



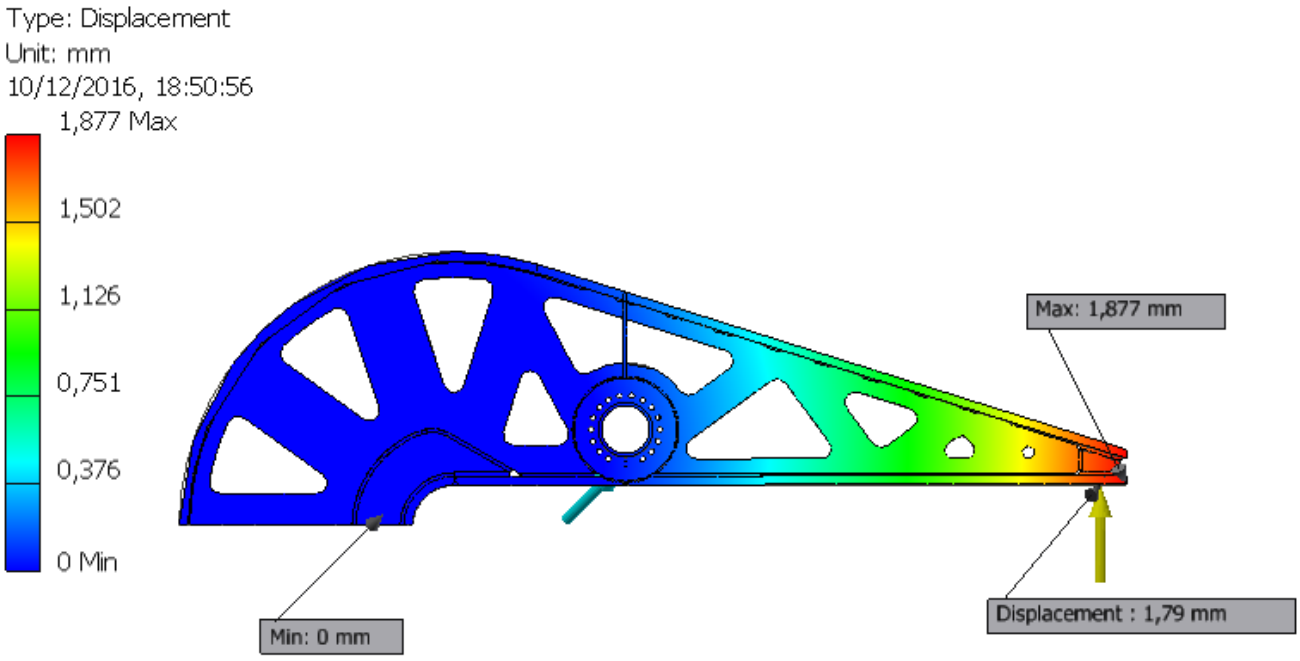
⊟ 1st Principal Stress



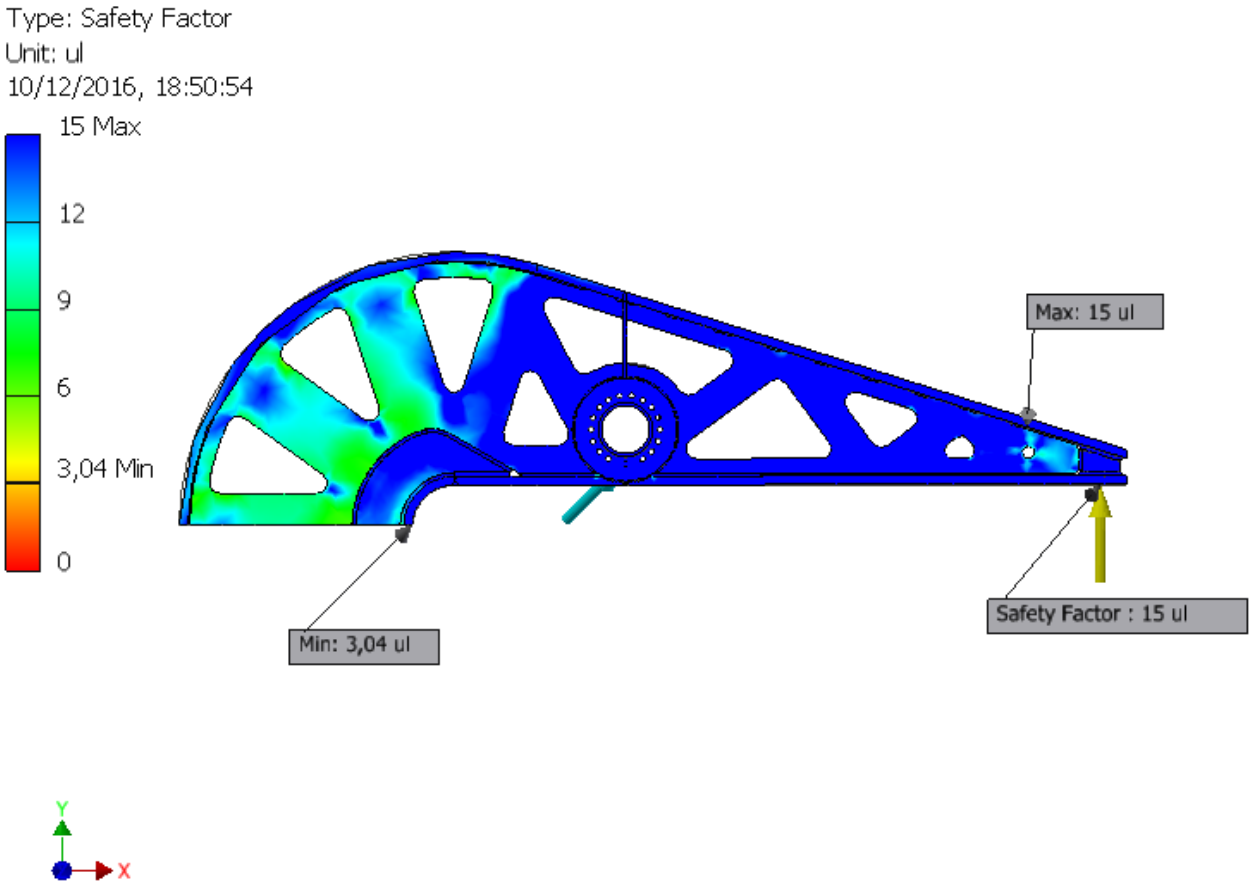
⊟ 3rd Principal Stress



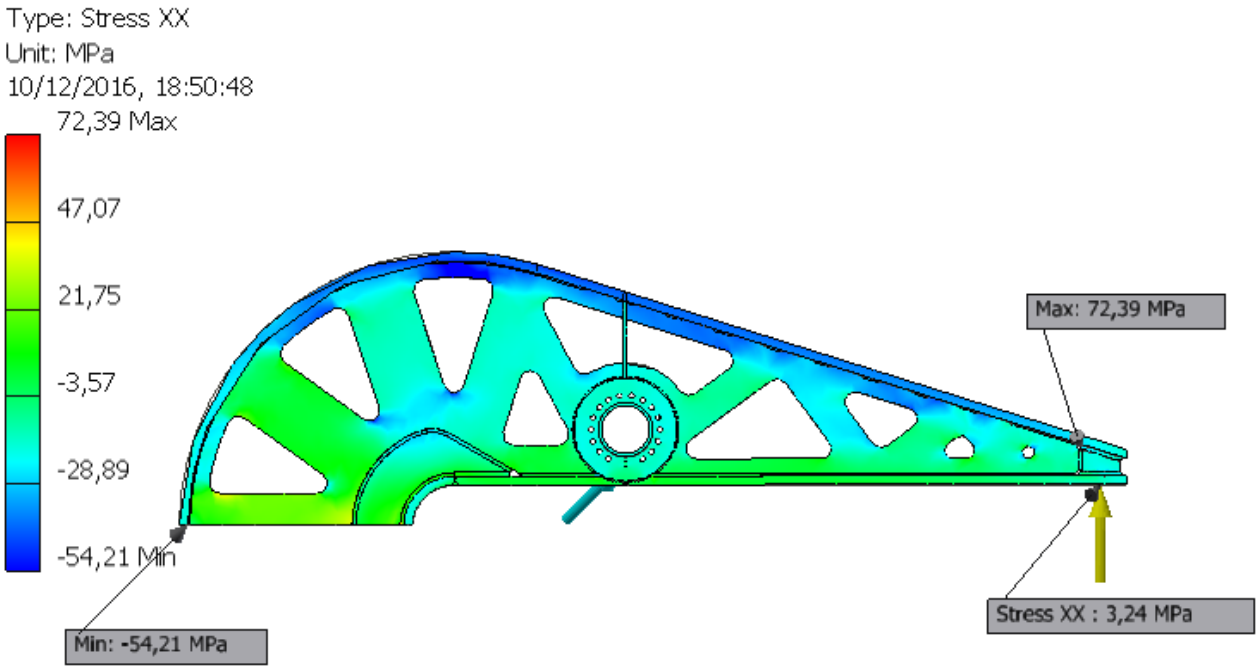
⊟ **Displacement**



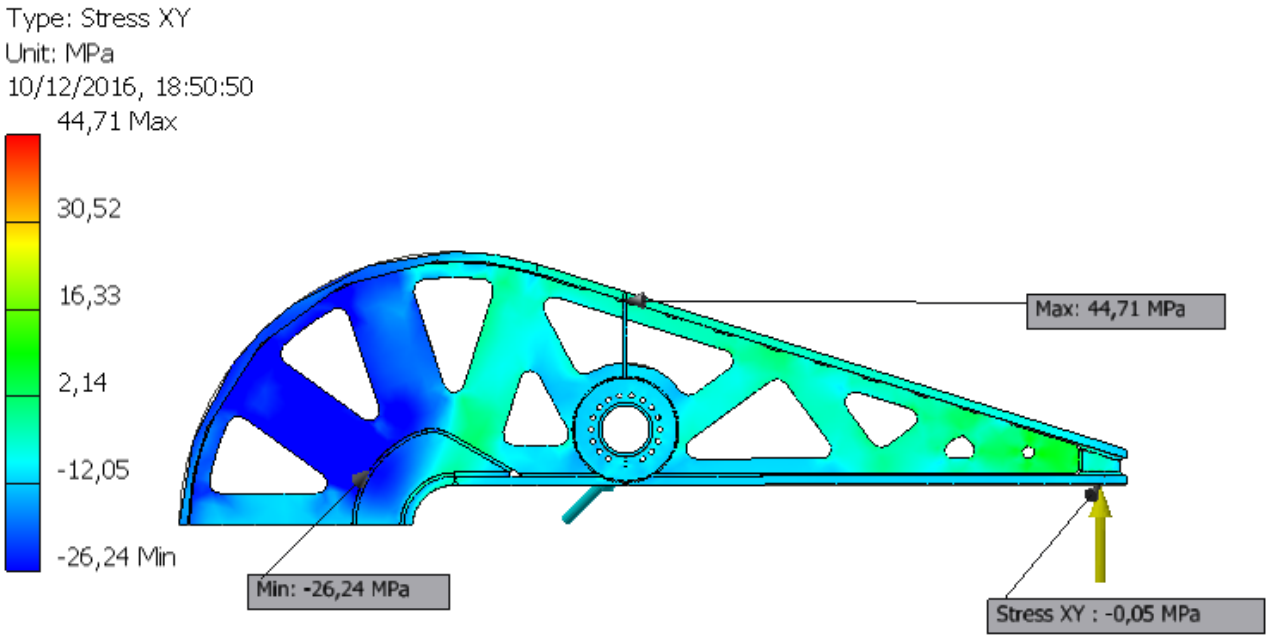
⊟ **Safety Factor**


Type: Safety Factor
Unit: ul
10/12/2016, 18:50:54
15 Max
12
9
6
3,04 Min
0
Max: 15 ul
Min: 3,04 ul
Safety Factor : 15 ul
Y
X

⊟ **Stress XX**

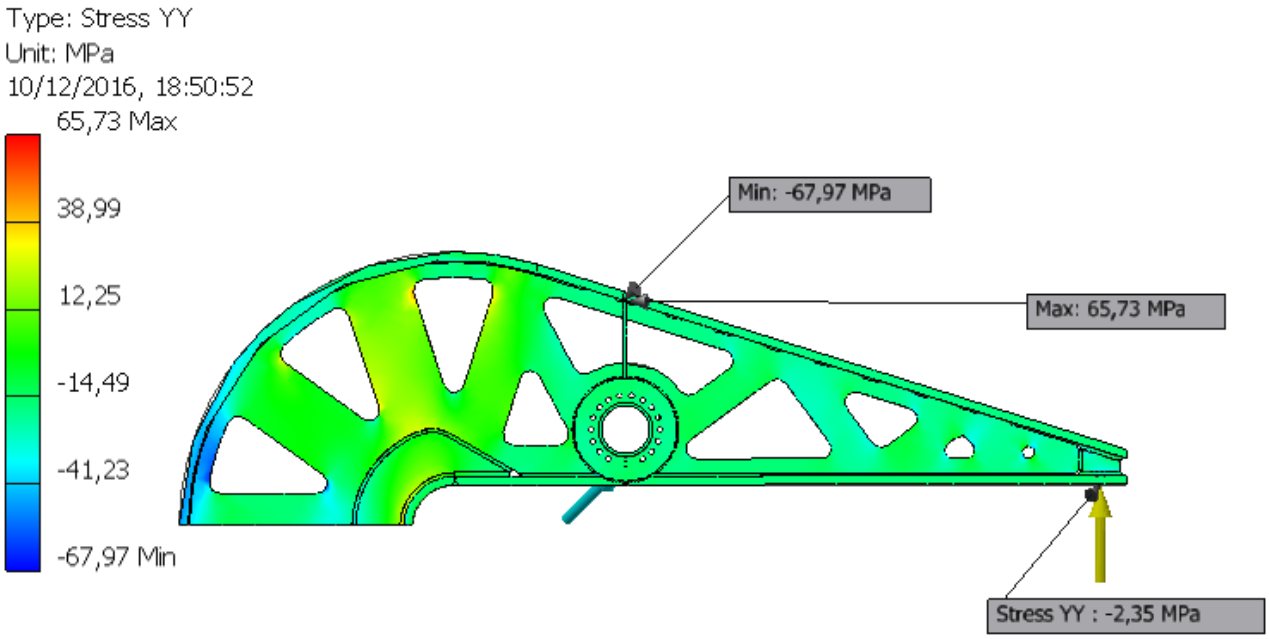

Type: Stress XX
Unit: MPa
10/12/2016, 18:50:48
72,39 Max
47,07
21,75
-3,57
-28,89
-54,21 Min
Max: 72,39 MPa
Stress XX : 3,24 MPa
Min: -54,21 MPa
Y
X

Stress XY

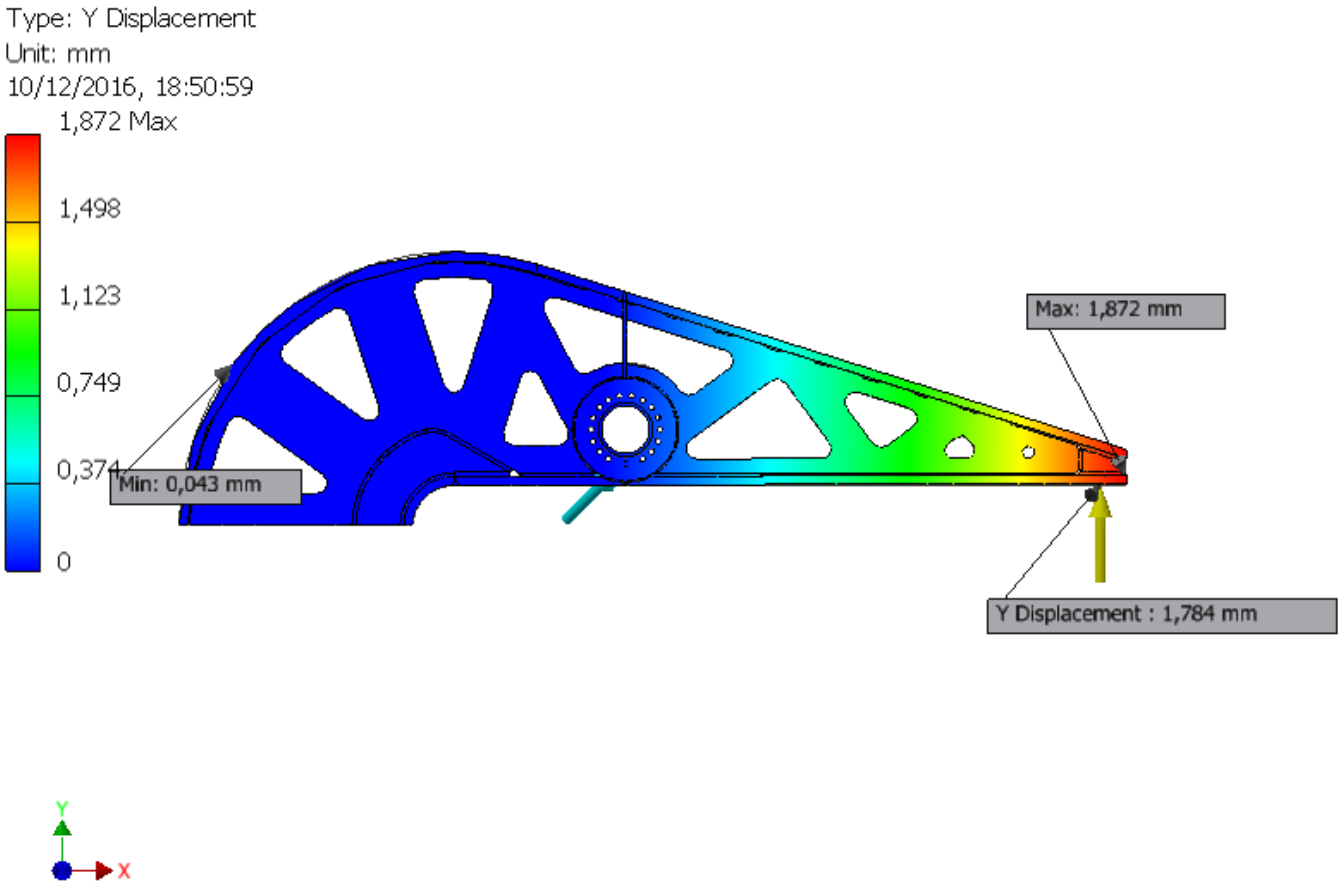

Type: Stress XY
Unit: MPa
10/12/2016, 18:50:50
44,71 Max
30,52
16,33
2,14
-12,05
-26,24 Min
Max: 44,71 MPa
Min: -26,24 MPa
Stress XY : -0,05 MPa


Y
X

⊟ **Stress YY**



⊟ Y Displacement



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