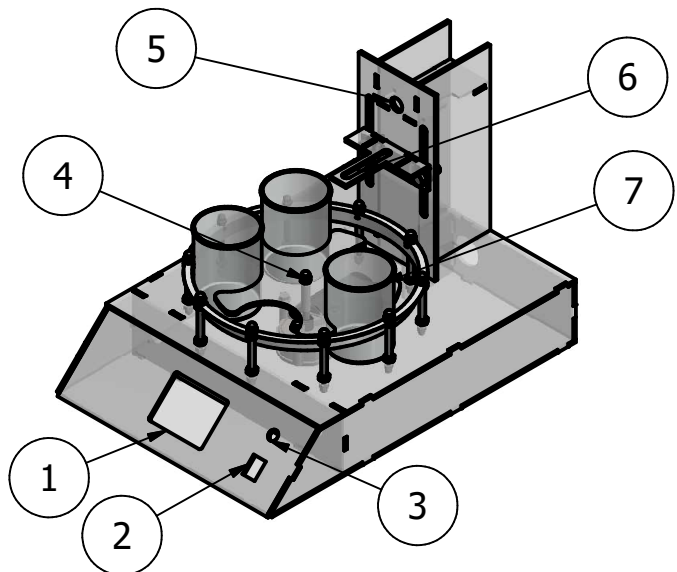
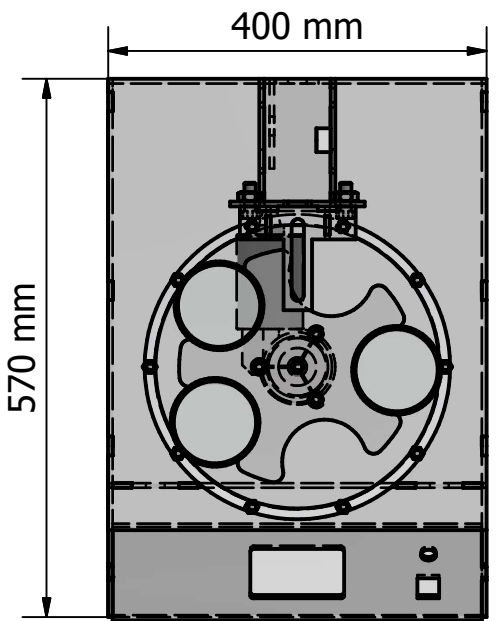
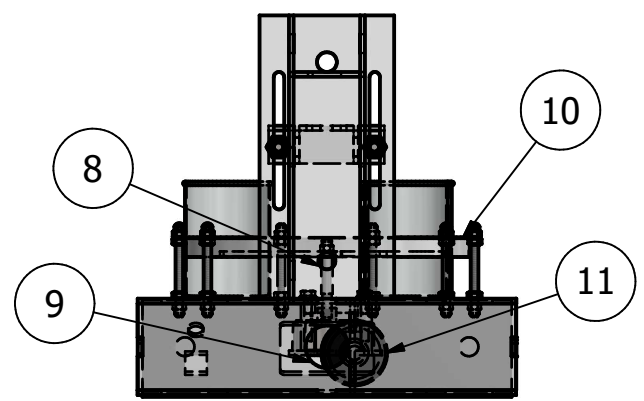
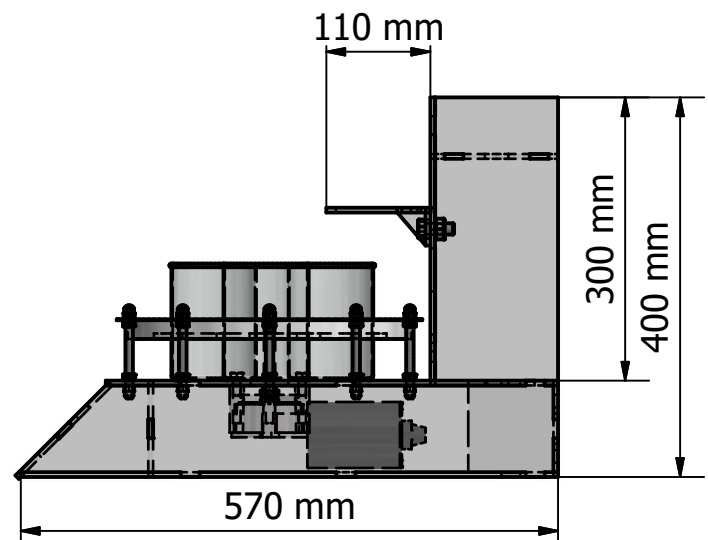
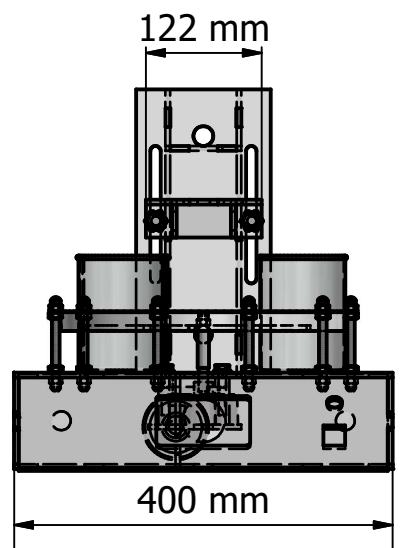


SEPEKIFIKASI KOMPONEN / ALAT

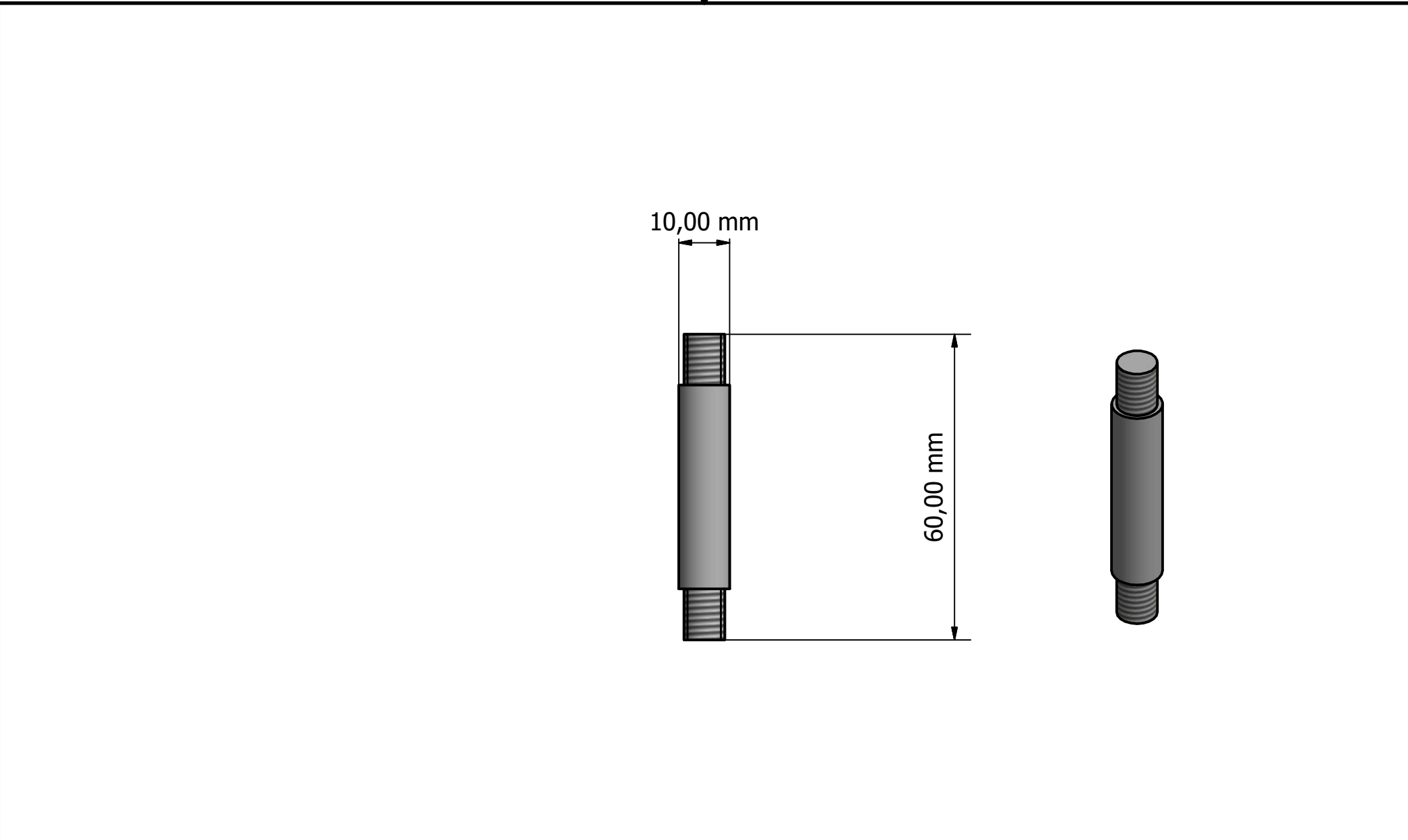
	Item	ZD2733 Wiper Motor	
	Tegangan	Motor DC 24v	
	Kecepatan tinggi	35 rpm	4.5a max
	Kecepatan rendah	29 rpm	2.5a max
	Berat	4950 gram	
	Daya	150 Watt	
	Item/material	Solenoid NC/metal + plastic	
	Tegangan	DC 12v	
	Arus	0.3A – 0.5A	
	Daya	8 Watt	
	Pressure	0.02 – 0.8 Mpa	
	Diameter	1/2 inch	
	Item/material	Flow Sensor 1-30L/min	
	Tegangan	DC 5 – 18v	
	Arus	15mA	
	Keakurasian	± 0.02 L	
	Diameter	1/2 inch	
	Item	Sensor Kapasitif LJ18A3-H-Z	
	Tipe Kabel	DC 3 (coklat,Hitam,Biru)	
	Mendeteksi jarak	1-10 mm	
	Tegangan	DC 6 – 36v	
	Suplai Daya	300mA	
	Diameter	18mm	
	Berat	85 gram	
	Item	Rilay Omron	Rilay Ewig
	Tegangan coil	DC 24v	DC 12v
	Jenis kaki	8 kaki	6 kaki
	Arus	10a	
	Item	Power Suplay S-1 50-24v	
	Tegangan input	110 - 220 VAC	
	Tegangan output	DC 24v	
	Arus	6.5 amper	
	Daya	156 Watt	
	Dimensi	20 x 10 x 4 cm	
	Item	Potensio	
	Tegangan	DC 4.5 – 35v	
	Daya	90 W max	
	Output	0 – 5A	
	Dimensi	30 x 26 x 14 mm	
	Item	ZJ-LCD-M	
	Tegangan input	DC 5 - 24v	
	Kuantitatif	0.01- 9999 L	
	Tekanan	1.75 Mpa	
	akurasi	±0.02 L	
	Kisaran suhu	-20 – 85°C	
	Item	Water Pump	
	Debit air	800 L/jam	
	Daya dorong	4-5 meter (vertical)	
	Daya/tegangan	22 watt / 24v	
	Dimensi	6,5 x 8 cm	
	Diameter	½ inch	



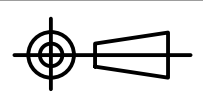
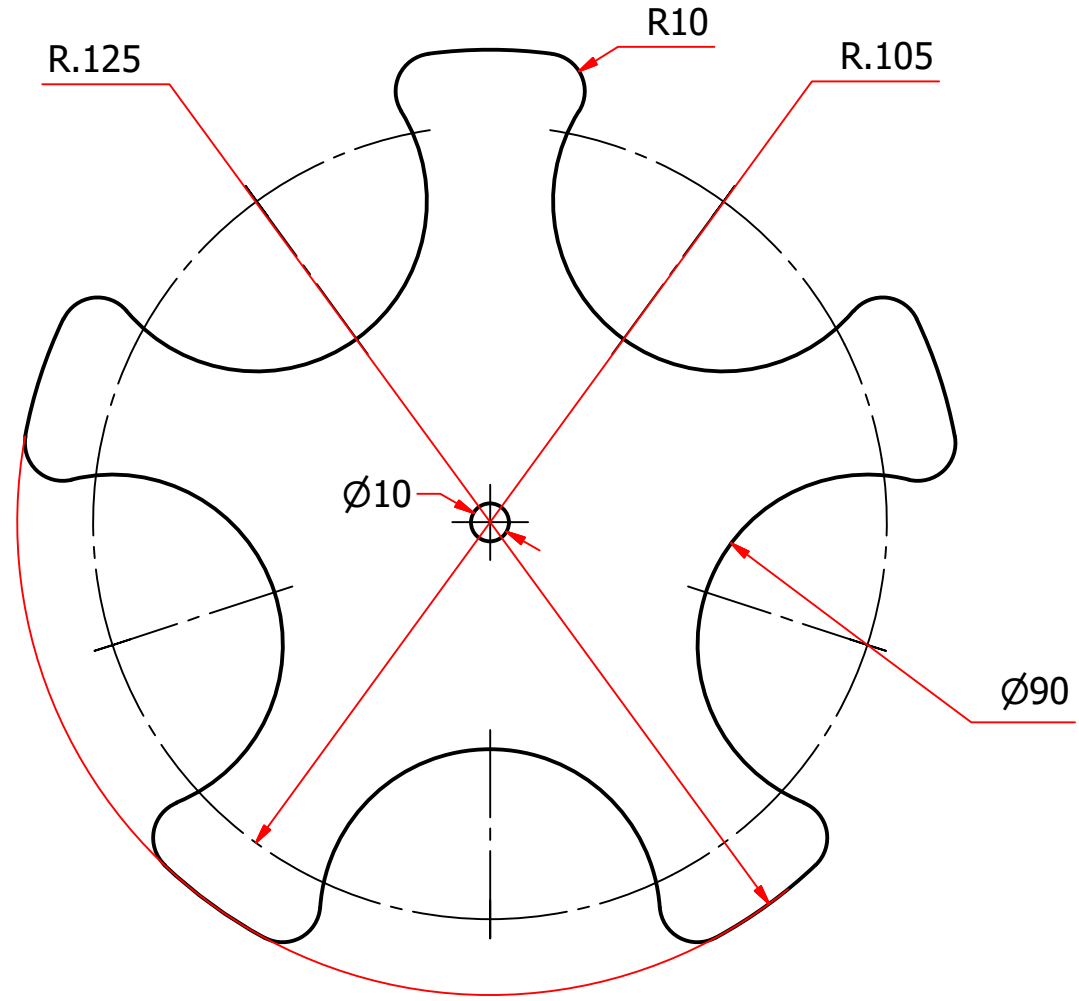
PARTS LIST	
ITEM	PAET NUMBER
1	LCD
2	saklar
3	lampu indikator
4	Poros
5	solenoid & flow meter
6	komponen injektor
7	Gelas bejana
8	sensorProximity kapasitif
9	pompa
10	Penahan bejana
11	motor listrik



	Skala: 1 : 8	Digambar: Fadli Nur Muchlis	Keterangan:		
	Satuan ukuran: mm	Nim: 20160130211			
	Tanggal: 01/11/2018	Dilihat: Dr.Bambang Riyanta,S.T.,M.T.			
<b>UMY</b>		<b>Pengisian Bejana</b>		No:	A4



	Skala: 1 : 1	Digambar: Fadli Nur Muchlis	Keterangan:	
	Satuan ukuran: mm	Nim: 20160130211		
	Tanggal: 27 / 11 / 2018	Dilihat:		
UMY	POROS	No:	A4	



Skala: 1 : 2  
 Satuan ukuran: mm  
 Tanggal: 01/11/2018

Digambar: Fadli Nur Muchlis  
 Nim: 20160130211  
 Dilihat: Dr.Bambang Riyanta,S.T.,M.T.

Keterangan:

UMY

Dudukan Gelas Bejana

No:

A4

# Stress Analysis Report



Analyzed File:	assembly Pengisian Bejana untuk keperluan Laboraturium.iam
Autodesk Inventor Version:	2016 (Build 200138000, 138)
Creation Date:	01/11/2018, 19:09
Simulation Author:	Fadli Nur Muchlis

## ☐ Project Info (iProperties)

### ☐ Summary

Title	assembly Pengisian Bejana untuk keperluan Laboraturium
Author	Fadli Nur Muchlis & M.Najid Pradana
Company	Univertas Muhammadiyah Yogyakarta

### ☐ Project

Part Number	assembly Pengisian Bejana untuk keperluan Laboraturium
Designer	Fadli Nur Muchlis
Engineer	Fadli Nur Muchlis & M.Najid Pradana
Cost Center	Rp 3.500.000 - Rp 4.000.000

### ☐ Status

Design Status	WorkInProgress
Checked by	Dr.Bambang Riyanta,S.T.,M.eng & Muhammad Budi Nur Rahman, S.T.,M.Eng

### ☐ Physical

Mass	10,4409 kg
Area	2113610 mm <sup>2</sup>
Volume	4886170 mm <sup>3</sup>
Center of Gravity	x=-1609,82 mm y=-108,832 mm z=-50,4076 mm

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

## ☐ **Simulation:1**

### **General objective and settings:**

Design Objective	Single Point
Simulation Type	Static Analysis
Last Modification Date	31/10/2018, 18:24
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	PMMA Plastic	
General	Mass Density	1,188 g/cm <sup>3</sup>
	Yield Strength	48,9 MPa
	Ultimate Tensile Strength	79,8 MPa
Stress	Young's Modulus	2,74 GPa
	Poisson's Ratio	0,355 ul
	Shear Modulus	1,01107 GPa
Part Name(s)	bagian bawah bagian belakang bagian samping bagian samping bagian tengah bagian belakang 2 bagian atas bagian depan dudukan sensor dudukan selenoid dan flow meter dudukan selenoid dan flow meter dudukan selenoid dan flow meter 1 dudukan katup 2 dudukan katup 1 dudukan katup 3 dudukan katup 3 dudukan bejana	



	baut perempuan 10 baut perempuan 10 baut perempuan 10	
Name	Aluminum 6061	
General	Mass Density	2,7 g/cm <sup>3</sup>
	Yield Strength	275 MPa
	Ultimate Tensile Strength	310 MPa
Stress	Young's Modulus	68,9 GPa
	Poisson's Ratio	0,33 ul
	Shear Modulus	25,9023 GPa
Part Name(s)	tahanan bejana lingkaran	
Name	Glass	
General	Mass Density	2,18 g/cm <sup>3</sup>
	Yield Strength	33 MPa
	Ultimate Tensile Strength	33 MPa
Stress	Young's Modulus	68 GPa
	Poisson's Ratio	0,19 ul
	Shear Modulus	28,5714 GPa
Part Name(s)	gelas bejana gelas bejana gelas bejana	

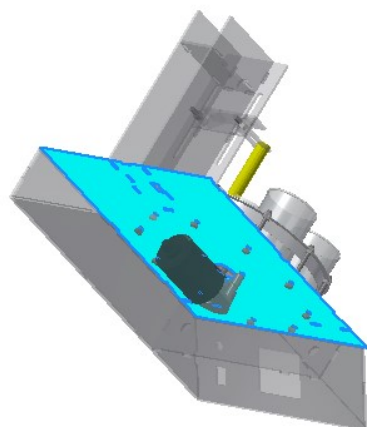
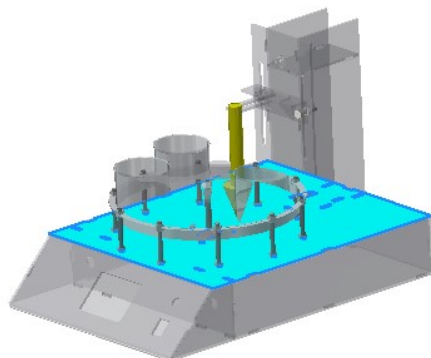
**Operating conditions**

**Force:1**

Load Type	Force
Magnitude	80,000 N
Vector X	-3,316 N
Vector Y	-31,003 N
Vector Z	-73,674 N

**Selected Face(s)**

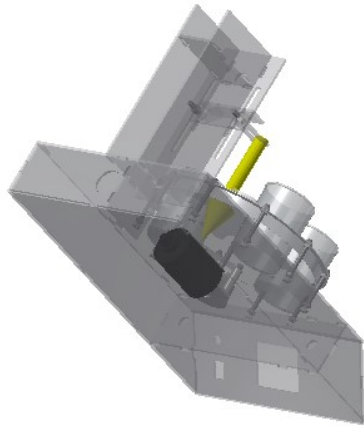
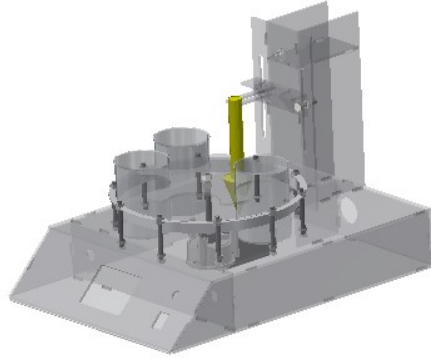




**Gravity**

Load Type	Gravity
Magnitude	9810,000 mm/s <sup>2</sup>
Vector X	-406,576 mm/s <sup>2</sup>
Vector Y	-3801,705 mm/s <sup>2</sup>
Vector Z	-9034,259 mm/s <sup>2</sup>

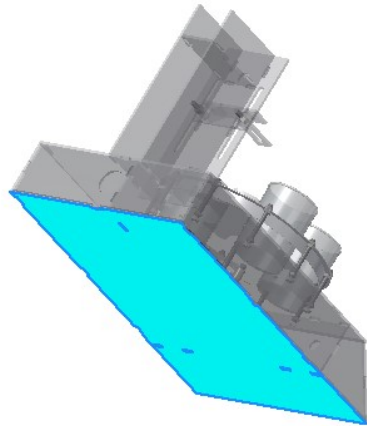
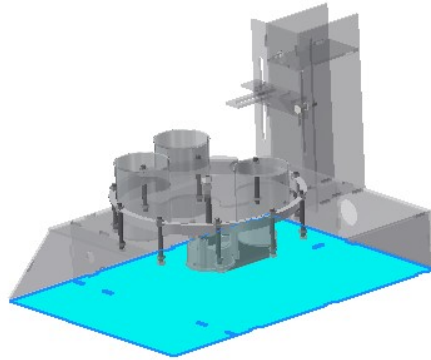
**Selected Face(s)**



**Fixed Constraint:1**

Constraint Type Fixed Constraint

**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	181,424 N	7,51911 N	0,471871 N m	0,187617 N m
		70,3077 N		-0,432969 N m
		167,077 N		0 N m

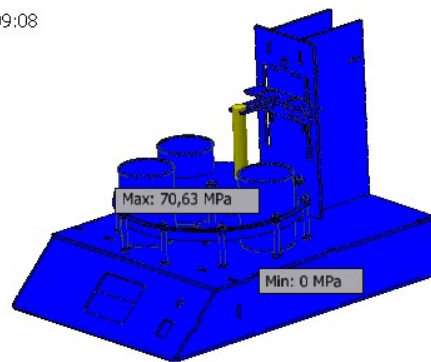
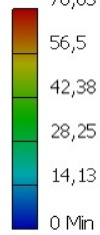
☐ **Result Summary**

Name	Minimum	Maximum
Volume	4886170 mm <sup>3</sup>	
Mass	10,4409 kg	
Von Mises Stress	0,00000139782 MPa	70,6302 MPa
1st Principal Stress	-39,3262 MPa	96,8531 MPa
3rd Principal Stress	-91,2677 MPa	30,183 MPa
Displacement	0 mm	0,930784 mm
Safety Factor	2,38264 ul	15 ul
Contact Pressure	0 MPa	129,083 MPa

☐ **Figures**

☐ **Von Mises Stress**

Type: Von Mises Stress  
 Unit: MPa  
 01/11/2018, 19:09:08  
 70,63 Max

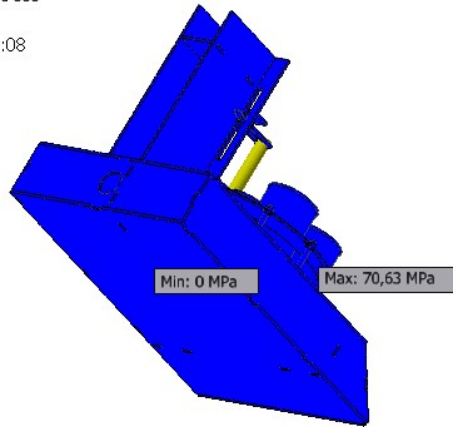
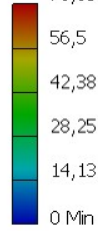


Type: Von Mises Stress

Unit: MPa

01/11/2018, 19:09:08

70,63 Max



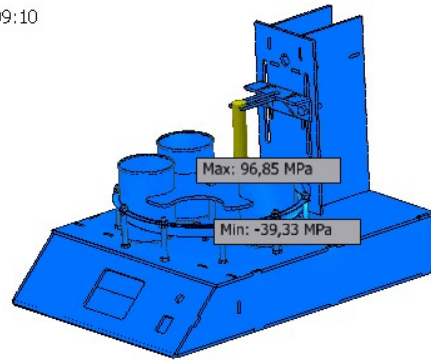
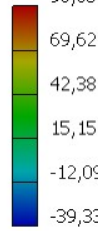
## 1st Principal Stress

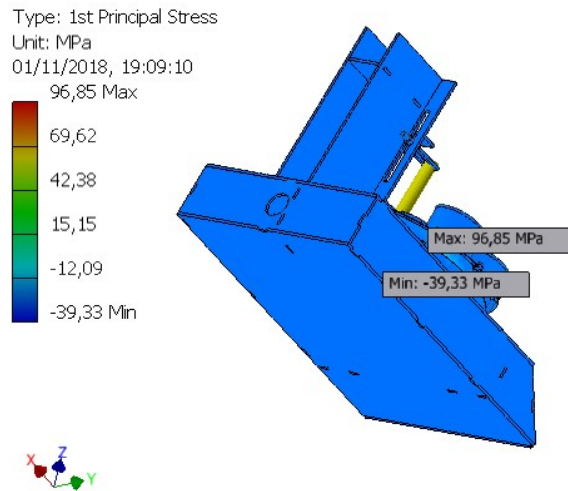
Type: 1st Principal Stress

Unit: MPa

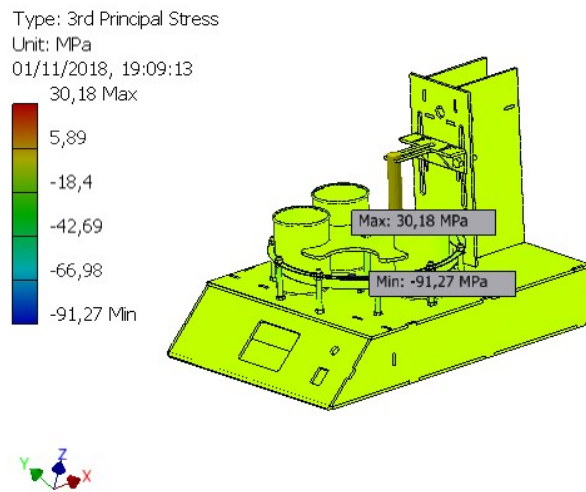
01/11/2018, 19:09:10

96,85 Max





## 3rd Principal Stress



Type: 3rd Principal Stress

Unit: MPa

01/11/2018, 19:09:13

30,18 Max

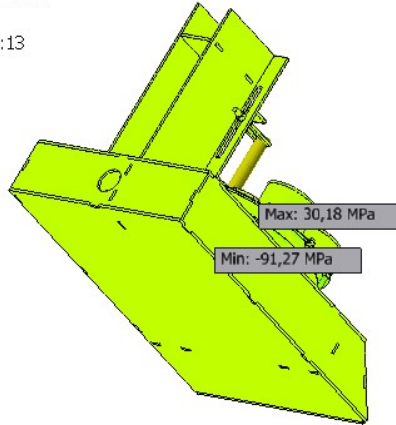
5,89

-18,4

-42,69

-66,98

-91,27 Min



## Displacement

Type: Displacement

Unit: mm

01/11/2018, 19:09:18

0,9308 Max

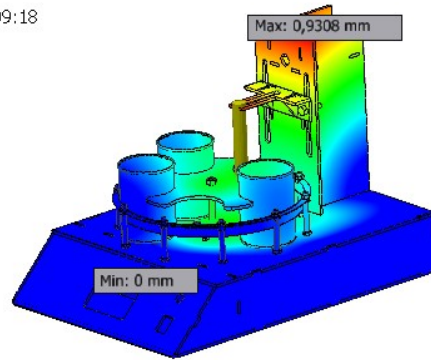
0,7446

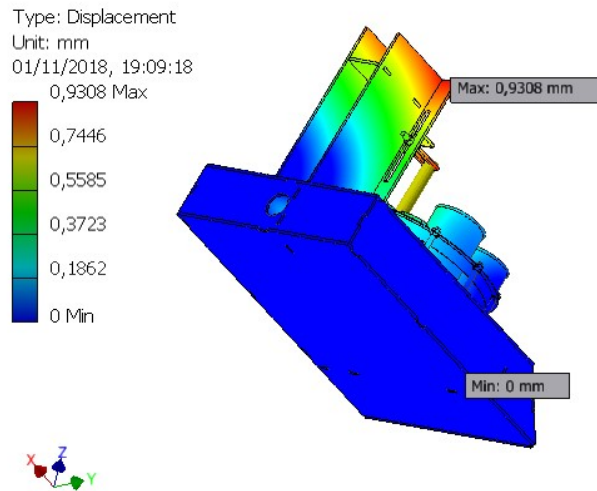
0,5585

0,3723

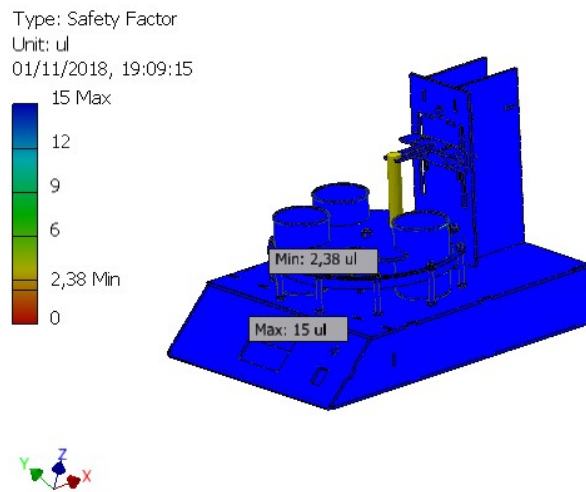
0,1862

0 Min



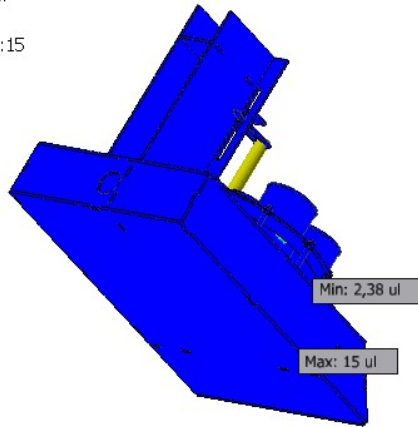
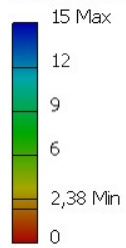


## ☐ Safety Factor



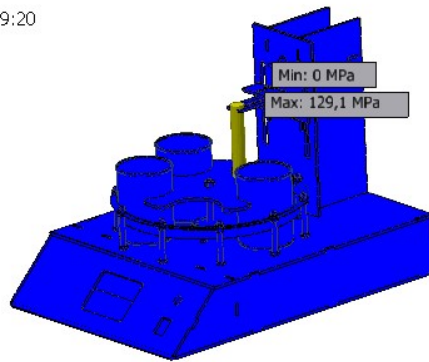
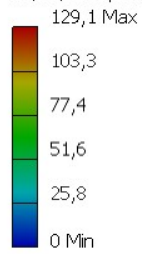


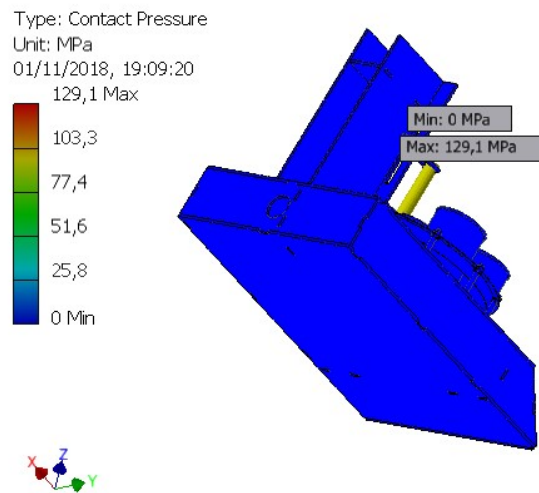
Type: Safety Factor  
Unit: ul  
01/11/2018, 19:09:15



## ☐ Contact Pressure

Type: Contact Pressure  
Unit: MPa  
01/11/2018, 19:09:20





D:\Folder Fadli\desain\desain alat TA 3D\desain Sekripsi\rakitan\assembly Pengisian Bejana untuk keperluan Laboratorium.iam