LAMPIRAN I
"TABEL STANDAR PERHITUNGAN"

A1. Temperatur Leleh Material *Thermoplastic*

Processing Temperature Rate		
Material	**˚C**	**˚F**
ABS	180 – 240	358 – 464
Acetal	185 – 225	365 – 437
Acrylic	180 – 250	356 – 482
Nylon	260 – 290	500 – 554
PC	280 – 310	536 – 590
LDPE	160 – 240	320 – 464
HDPE	200 – 280	392 – 536
PP	200 – 300	392 – 572
PS	180 – 260	356 – 500
PVC	160 – 180	320 – 365

	Melt temperature		*Stretch orientation temperature*		
Plastic	*℃*	*℉*	*℃*	*℉*	*Maximum stretch ratio*
PET	250	490	88–116	190–240	16
PVC	199	390	99–116	210–240	7
PAN	210	410	104–127	220–260	9
PP	168	334	121–136	250–280	6

A2. Tabel Lambang Toleransi Geometri

Tabel Lambang Toleransi Geometri

		Hal yang ditoleransi	Lambang
Toleransi bentuk		Kelurusan	—
		Kerataan	▱
		Bentuk bulat/lingkaran	○
		Bentuk silinder	⌭
		Bentuk lengkung suatu sisi	⌒
		Bentuk lengkung suatu permukaan	⌓
Toleransi posisi	Arah	Kesejajaran	//
		Ketegaklurusan	⊥
		Kedudukan sudut	∠
	Lokasi	Kedudukan	⌖
		Kesatusumbuan (konsentrisitas)	◎
		Kesimetrisan	⌯
	Putar	Penyimpangan putar tunggal	↗
		Penyimpangan putar total	⌰

A3. Tabel Toleransi Pemberian Lubang dan Poros pada Gambar Teknik

Satuan dalam µm
*) Dibagi dalam beberapa tingkatan

Lubang

Ukuran dasar	G7	H6	JS6	K6	G7	H7	JS7	K7	M7	P7	E8	H8	H9	P9
>3 - 6	+16 +4	+8 0	±4	+2 -6	+16 +4	+12 0	±6	+3 -9	0 -12	-8 -20	+38 +20	+18 0	+30 0	-12 -42
>6 - 10	+20 +5	+9 0	±4,5	+2 -7	+20 +5	+15 0	±7,5	+5 -10	0 -15	-9 -24	+47 +25	+22 0	+36 0	-15 -51
>10 - 18	+24 +6	+11 0	±5,5	+2 -9	+24 +6	+18 0	±9	+6 -12	0 -18	-11 -29	+59 +32	+27 0	+43 0	-18 -61
>18 - 30	+28 +7	+13 0	±6,5	+2 -11	+28 +7	+21 0	±10,5	+6 -15	0 -21	-14 -35	+73 +40	+33 0	+52 0	-22 -74
>30 - 50	+34 +9	+16 0	±8	+3 -13	+34 +9	+25 0	±12,5	+7 -18	0 -25	-17 -42	+89 +50	+39 0	+62 0	-26 -88
>50 - 80	+40 +10	+19 0	±9,5	+4 -15	+40 +10	+30 0	±15	+9 -21	0 -30	-21 -51	+106 +60	+46 0	+74 0	-32 -106
>80 - 120	+47 +12	+22 0	±11	+4 -18	+47 +12	+35 0	±17,5	+10 -25	0 -35	-24 -59	+126 +72	+54 0	+87 0	-37 -124
>120 - 180	+54 +14	+25 0	±12,5	+4 -21	+54 +14	+40 0	±20	+12 -28	0 -40	-28 -68	+148 +85	+63 0	+100 0	-43 -143

Poros

Ukuran dasar	n6	h5	js5	k5	g6	h6	js6	k6	m6	p6	s6	f7	e8	h9
> 3 - 6	+16 +8	0 -5	±2,5	+6 +1	-4 -12	0 -8	±4	+9 +1	+12 +4	+20 +12	+27 +19	-10 -22	-20 -38	0 -30
> 6 - 10	+19 +10	0 -6	±3	+7 +1	-5 -14	0 -9	±4,5	+10 +1	+15 +6	+24 +15	+32 +23	-13 -28	-25 -47	0 -36
> 10 - 18	+23 +12	0 -8	±4	+9 +1	-6 -17	0 -11	±5,5	+12 +1	+18 +7	+29 +18	+39 +28	-16 -34	-32 -59	0 -43
> 18 - 30	+28 +15	0 -9	±4,5	+11 +2	-7 -20	0 -13	±6,5	+15 +2	+21 +8	+35 +22	+48 +35	-20 -41	-40 -73	0 -52
> 30 - 50	+33 +17	0 -11	±5,5	+13 +2	-9 -25	0 -16	±8	+18 +2	+25 +9	+42 +26	+59 +43	-25 -50	-50 -89	0 -62
> 50 - 80	+39 +20	0 -13	±6,5	+15 +2	-10 -29	0 -19	±9,5	+21 +2	+30 +11	+51 +32	*)	-30 -60	-60 -106	0 -74
> 80 - 120	+45 +23	0 -15	±7,5	+18 +3	-12 -34	0 -22	±11	+25 +3	+35 +13	+59 +37		-36 -71	-72 -126	0 -87
>120 - 180	+52 +27	0 -18	±9	+21 +3	-14 -39	0 -25	±12,5	+28 +3	+40 +15	+68 +43		-43 -83	-85 -148	0 -100

‘

A4. Tabel Toleransi Umum Radius dan Chamfer

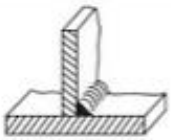
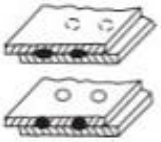
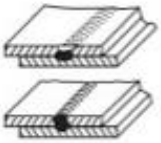
Tabel Toleransi Umum

Ukuran Nominal (mm)		>0,5-3	>3-6	>6-30	>30-120	>120-315	>315-1000	>1000-2000
Penyimpangan yang Diizinkan	Teliti	±0,05	±0,05	±0,1	±0,15	±0,2	±0,3	±0,5
	Sedang	±0,1	±0,1	±0,2	±0,3	±0,5	±0,8	±1,2
	Kasar	-	±0,2	±0,5	±0,8	±1,2	±2	±3

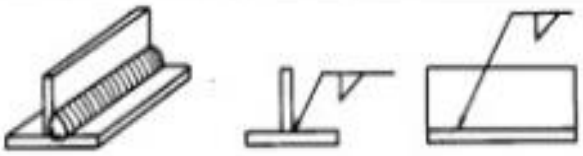
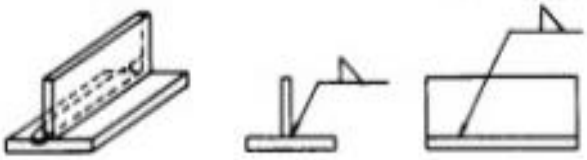
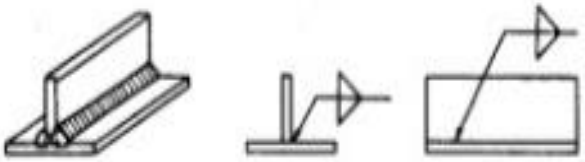
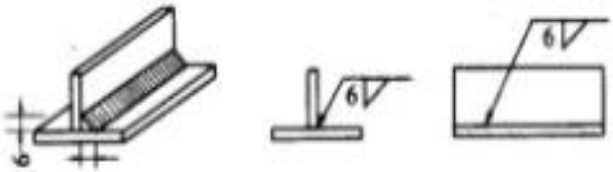
Tabel Toleransi Umum untuk Radius dan Chamfer

Ukuran Nominal (mm)		>0,5-3	>3-6	>6-30	>30-120	>120-315	>315-1000
Penyimpangan yang Diizinkan	Teliti, Sedang	±0,2	±0,5	±1	±2	±4	±8
	Kasar	±0,5	±1	±2	±4	±8	±16

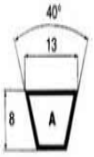
A5. Lambang dalam Pengelasan

No.	*Designation*	*Illustration*	*Symbol*
1.	Butt weld between plates with raised edges (the raised edges being melted down completely)		
2.	Square butt weld		
3.	Single-V butt weld		
4.	Single-bevel butt weld		
5.	Single-V butt weld with broad root face		
6.	Single-bevel butt weld with broad root face		
7.	Single-U butt weld (parallel or sloping sides)		
8.	Single-U butt weld		
9.	Backing run; back or backing weld		
10.	Fillet weld		
11.	Plug weld; plug or slot weld		
12.	Spot weld		
13.	Seam weld		

A6. Tabel Gambar dan Pemberian Ukuran dalam Pengelasan

Jenis lasan	Tanda gambar	Keterangan
Las sudut berlanjut		Segitiga siku-siku
Sisi panah		
Di balik panah		
Kodua sisi		
Panjang kaki 6 mm		
Panjang kaki tidak sama 6 dan 12 mm		

A7. Tabel Tipe dan Ukuran Sabuk *V-Belt*



A SECTION

Code	Internal length L_i (mm)	Code	Internal length L_i (mm)	Code	Internal length L_i (mm)	Code	Internal length L_i (mm)	Code	Internal length L_i (mm)	Code	Internal length L_i (mm)	Code	Internal length L_i (mm)	Code	Internal length L_i (mm)
A 15	382	A 28	710	A 36 1/2	925	A 43 3/4	1111	A 53 1/4	1355	A 70	1775	A 86	2187	A 107	2725	A 147	3737
A 18	457	A 28 1/2	724	A 37	942	A 44	1120	A 54	1372	A 71	1800	A 87	2212	A 108	2743	A 148	3750
A 19	480	A 29	737	A 37 1/4	946	A 44 1/2	1132	A 55	1400	A 72	1825	A 88	2240	A 110	2800	A 155	3937
A 20	508	A 29 1/2	750	A 37 1/2	950	A 45	1143	A 56	1422	A 73	1854	A 89	2267	A 112	2845	A 158	4000
A 21	535	A 30	767	A 38	965	A 45 1/2	1150	A 57	1450	A 74	1880	A 90	2286	A 113	2870	A 162	4115
A 22	560	A 30 1/2	775	A 38 1/2	975	A 46	1168	A 58	1475	A 75	1900	A 91	2311	A 114	2896	A 167	4250
A 23	587	A 31	787	A 39	992	A 46 1/2	1180	A 59	1500	A 76	1930	A 92	2337	A 116	2946	A 173	4394
A 23 1/2	600	A 31 1/2	800	A 39 1/2	1000	A 47	1200	A 60	1525	A 77	1956	A 93	2360	A 118	3000	A 180	4572
A 24	610	A 32	813	A 40	1016	A 48	1220	A 61	1550	A 78	1980	A 94	2388	A 120	3048	A 187	4750
A 24 1/2	620	A 32 1/2	825	A 40 1/2	1030	A 48 1/4	1225	A 62	1575	A 79	2000	A 95	2413	A 124	3150	A 197	5000
A 24 3/4	630	A 33	838	A 41	1041	A 49	1250	A 63	1600	A 80	2032	A 96	2438	A 128	3250	A 217	5477
A 25	637	A 33 1/4	847	A 41 1/2	1050	A 50	1270	A 64	1625	A 81	2060	A 97	2464	A 130	3302		
A 25 1/2	647	A 33 1/2	850	A 41 3/4	1060	A 51	1300	A 65	1650	A 82	2083	A 98	2500	A 132	3350		
A 26	660	A 34	867	A 42	1067	A 51 1/2	1307	A 66	1676	A 83	2100	A 100	2540	A 134	3404		
A 26 1/2	670	A 34 1/2	875	A 42 1/2	1075	A 52	1320	A 67	1700	A 83 1/2	2120	A 102	2591	A 136	3454		
A 27	686	A 35	900	A 43	1100	A 52 1/2	1337	A 68	1725	A 84	2134	A 104	2650	A 140	3550		
A 27 1/2	700	A 36	914	A 43 1/2	1105	A 53	1346	A 69	1750	A 85	2160	A 105	2667	A 144	3658		

A8. Tabel *Properties* Emisivitas Permukaan

TABLE A–18

Emissivities of surfaces
(*a*) Metals

Material	Temperature, K	Emissivity, ε
Aluminum		
Polished	300–900	0.04–0.06
Commercial sheet	400	0.09
Heavily oxidized	400–800	0.20–0.33
Anodized	300	0.8
Bismuth, bright	350	0.34
Brass		
Highly polished	500–650	0.03–0.04
Polished	350	0.09
Dull plate	300–600	0.22
Oxidized	450–800	0.6
Chromium, polished	300–1400	0.08–0.40
Copper		
Highly polished	300	0.02
Polished	300–500	0.04–0.05
Commercial sheet	300	0.15
Oxidized	600–1000	0.5–0.8
Black oxidized	300	0.78
Gold		
Highly polished	300–1000	0.03–0.06
Bright foil	300	0.07
Iron		
Highly polished	300–500	0.05–0.07
Case iron	300	0.44
Wrought iron	300–500	0.28
Rusted	300	0.61
Oxidized	500–900	0.64–0.78
Lead		
Polished	300–500	0.06–0.08
Unoxidized, rough	300	0.43
Oxidized	300	0.63
Magnesium, polished	300–500	0.07–0.13
Mercury	300–400	0.09–0.12
Molybdenum		
Polished	300–2000	0.05–0.21
Oxidized	600–800	0.80–0.82
Nickel		
Polished	500–1200	0.07–0.17
Oxidized	450–1000	0.37–0.57
Platinum, polished	500–1500	0.06–0.18
Silver, polished	300–1000	0.02–0.07
Stainless steel		
Polished	300–1000	0.17–0.30
Lightly oxidized	600–1000	0.30–0.40
Highly oxidized	600–1000	0.70–0.80
Steel		
Polished sheet	300–500	0.08–0.14
Commercial sheet	500–1200	0.20–0.32
Heavily oxidized	300	0.81
Tin, polished	300	0.05
Tungsten		
Polished	300–2500	0.03–0.29
Filament	3500	0.39
Zinc		
Polished	300–800	0.02–0.05
Oxidized	300	0.25

A9. Tabel *Properties* Konduktivitas Thermal dan Kalor Jenis

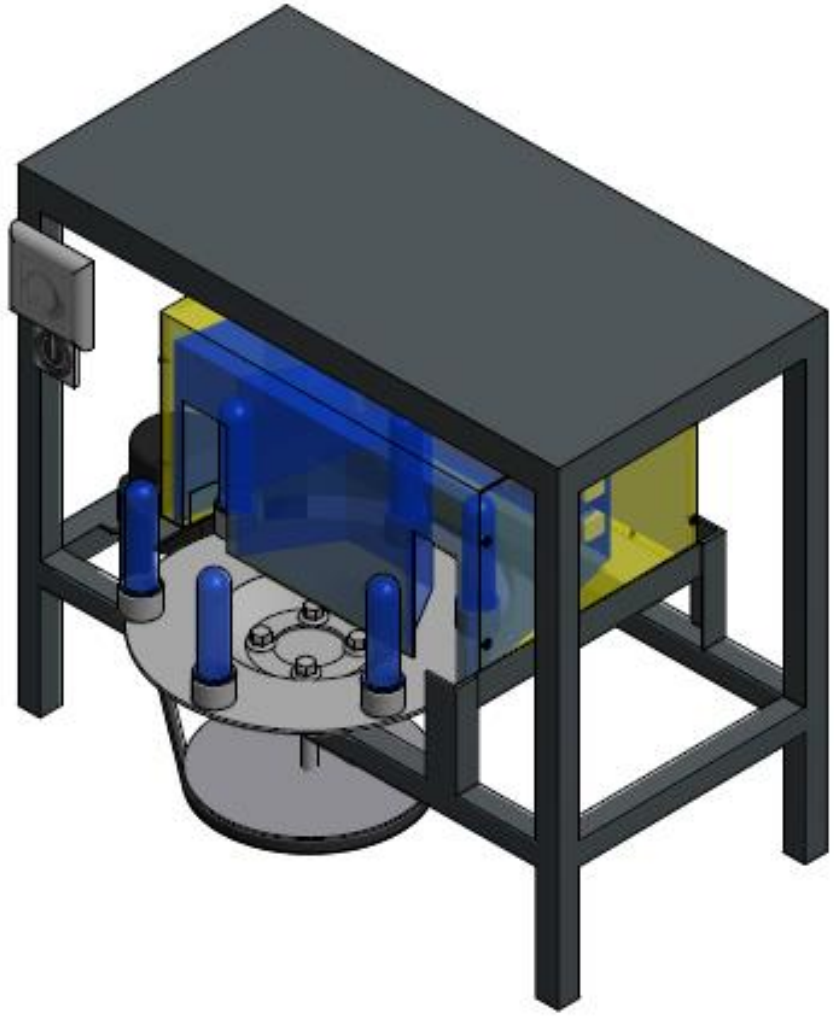
Key Properties

The key properties of Polyethylene Terephthalate Polyester (PETP) are tabulated below.

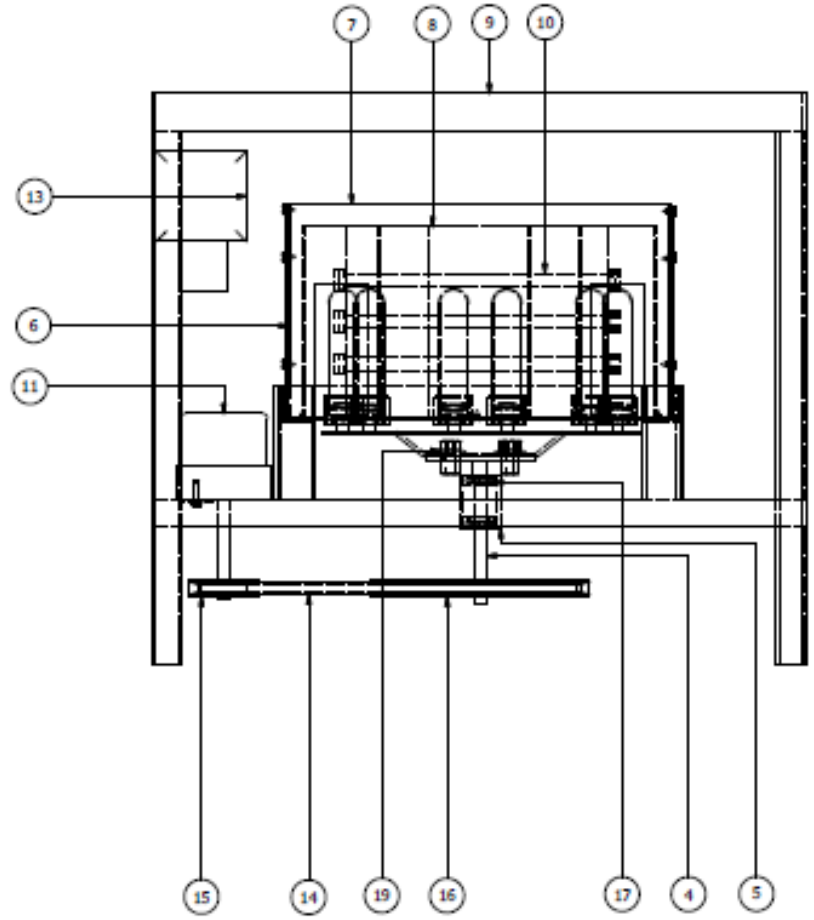
Thermal Properties	
Coefficient of thermal expansion ($x10^{-6}$ K^{-1})	20 - 80
Heat-deflection temperature - 0.45 MPa (°C)	115
Heat-deflection temperature - 1.8 MPa (°C)	80
Lower working temperature (°C)	-40 to -60
Specific heat ($J.K^{-1}.kg^{-1}$)	1200 - 1350
Thermal conductivity ($W.m^{-1}.K^{-1}$)	0.15 - 0.4 @ 23
Upper working temperature (°C)	115 - 170

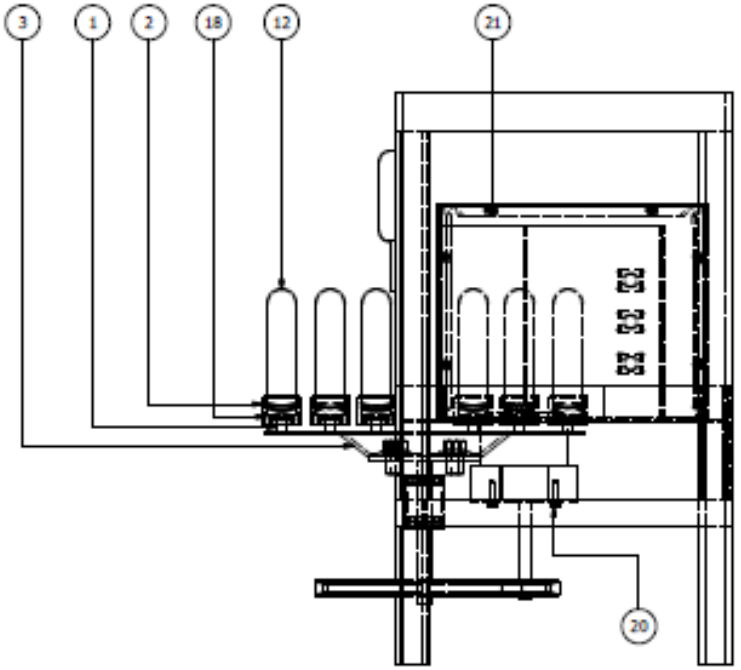
LAMPIRAN II

“DESAIN HASIL PERANCANGAN”



	Skala : 1 : 3 Satuan : mm Tanggal : 05 Juni 2018	Nama : Septian Hary Nugroho NIM : 201403130164 Dilihat :	Signature:
TEKNIK MESIN		Assembly Infrared Heater Blow Molding Machine	NO. 01 / A2

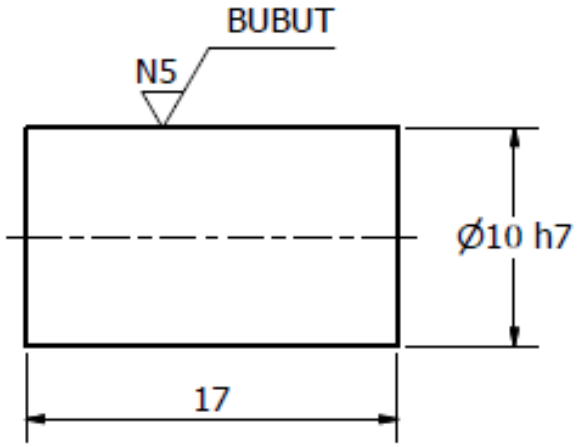




PARTS LIST

NO.	NAME PART	MATERIAL	DESCRIPTION	QTY
1	Base Pin	Steel ASTM A36		1
2	Base Roller	Steel ASTM A36		1
3	Base Disc	Steel ASTM A36		1
4	Disc Shaft	Steel ASTM A36		1
5	Bush Disc Shaft	Steel ASTM A36		1
6	Base Layer	Galvalume		1
7	Covering	Galvalume		1
8	Intl Layer	Galvalume		1
9	Meja	Steel ASTM A36		1
10	Infrared	Glass, Tungsten, Ceramics		3
11	Motor	Generic		1
12	Preform	PET Plastic		6
13	Saklar	Generic		2
14	V-Belt	Rubber		1
15	Pulley Ø 60	Aluminum Alloy 4032		1
16	Pulley Ø 200	Aluminum Alloy 4032		1
17	Ball Bearing JIS B 1521-6201 12x32x10	Chromium Steell		2
18	Ball Bearing JIS B 1521-6200 10x30x9	Chromium Steel		6
19	Bolt Hex ANSI M12 x 1.75 x 20	SS AISI 304		4
20	Bolt Hex ANSI M4 x 0,7 x 20	SS AISI 304		2
21	Countersunk Tapping Screw 4,2 x 9,5	SS AISI 304		17

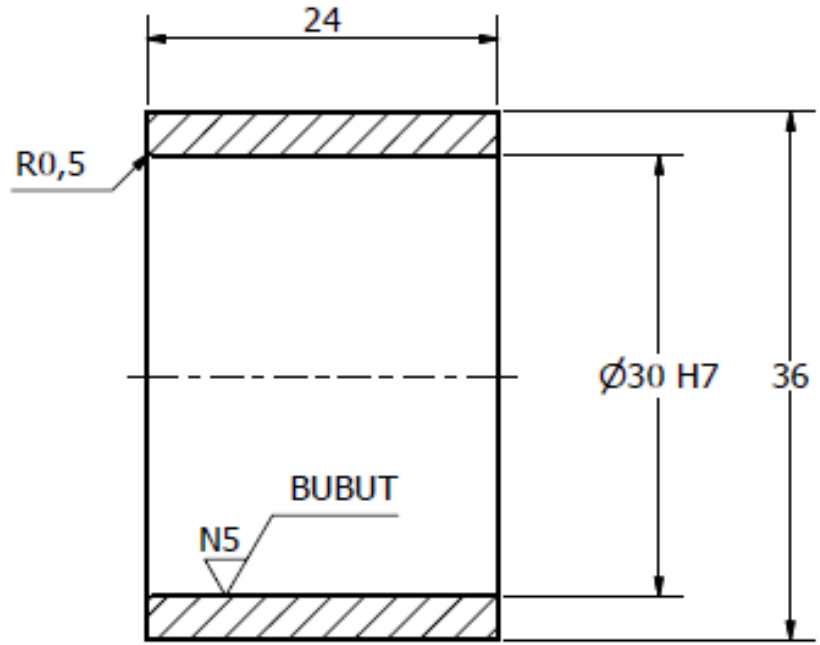
Skala : 1 : 3.5 Satuan : mm Tanggal : 05 Juni 2018	Nama : Septian Harry Nugroho NIM : 2014030164 Dikoreksi :	Signature:	
TEKNIK MESIN	Assembly Infrared Heater Blow Molding Machine	NO. 02	A2



PARTS LIST			
NO.	NAME PART	MATERIAL	DESCRIPTION
1	Base Pin	Steel ASTM A36	

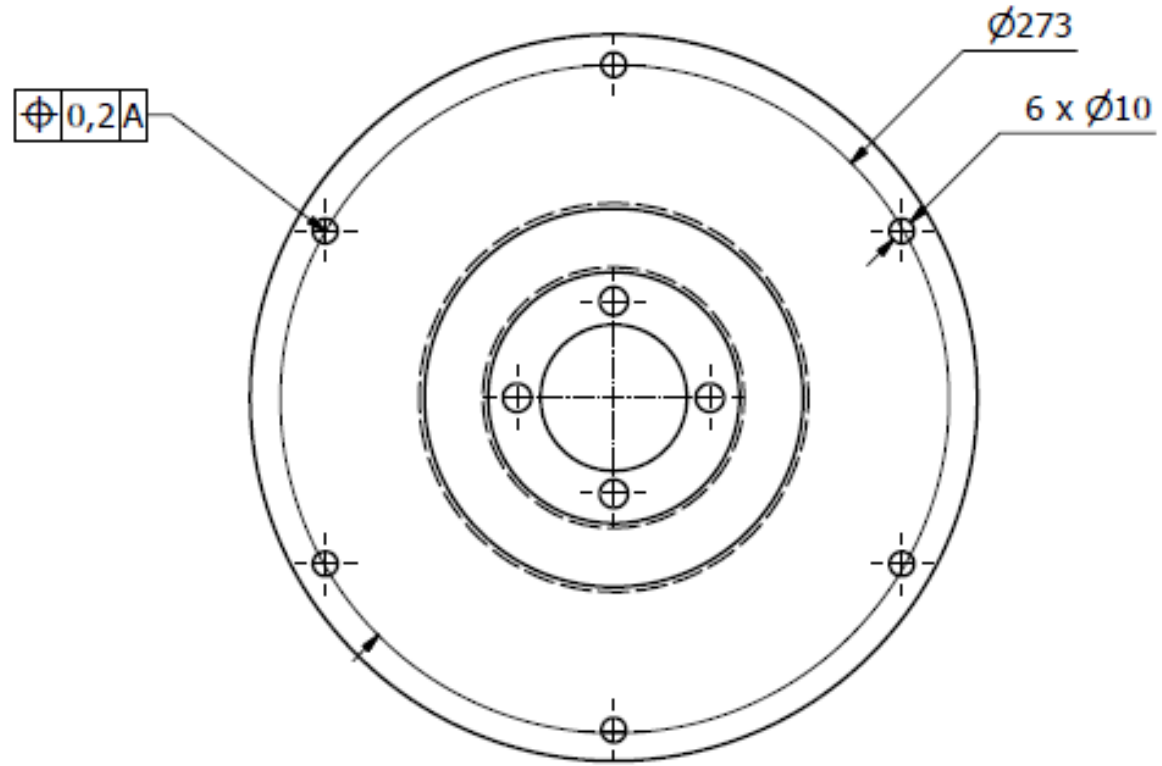
	Skala : 3:1	Digambar : Septian	Signature:
	Satuan : mm	NIM : 20140130164	
	Tanggal : 04 Juni 2018	Dilihat :	

TEKNIK MESIN UMY	BASE PIN	NO. 1	A4



PARTS LIST			
NO.	NAME PART	MATERIAL	DESCRIPTION
2	Base Roller	Steel ASTM A36	

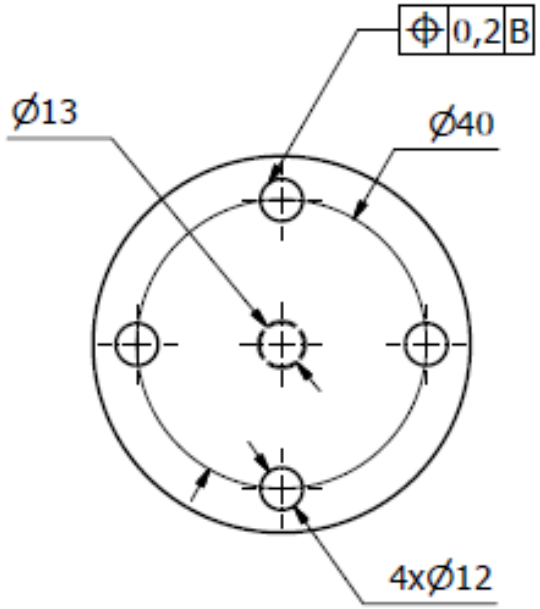
	Skala : 2:1	Digambar : Septian	Signature:
	Satuan : mm	NIM : 20140130164	
	Tanggal : 04 Juni 2018	Dilihat :	
TEKNIK MESIN UMY	BASE ROLLER	NO. 2	A4

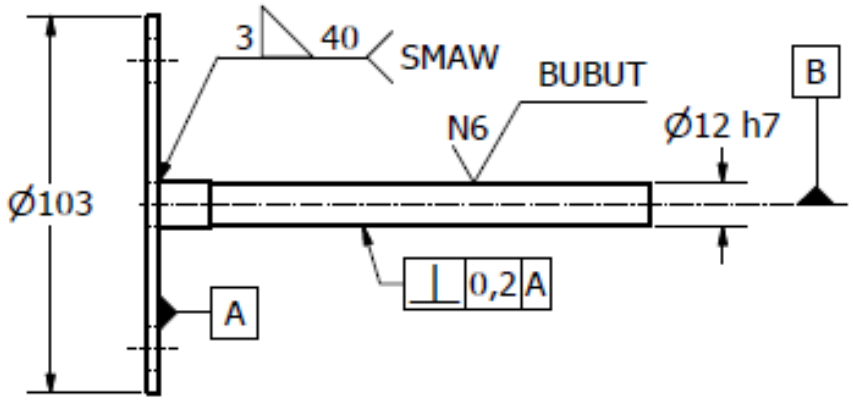


PARTS LIST			
NO.	NAME PART	MATERIAL	DESCRIPTION
3	Base Disc	Steel ASTM A36	

	Skala : 1:3	Digambar : Septian	Signature:
	Satuan : mm	NIM : 20140130164	
	Tanggal : 04 Juni 2018	Dilihat :	

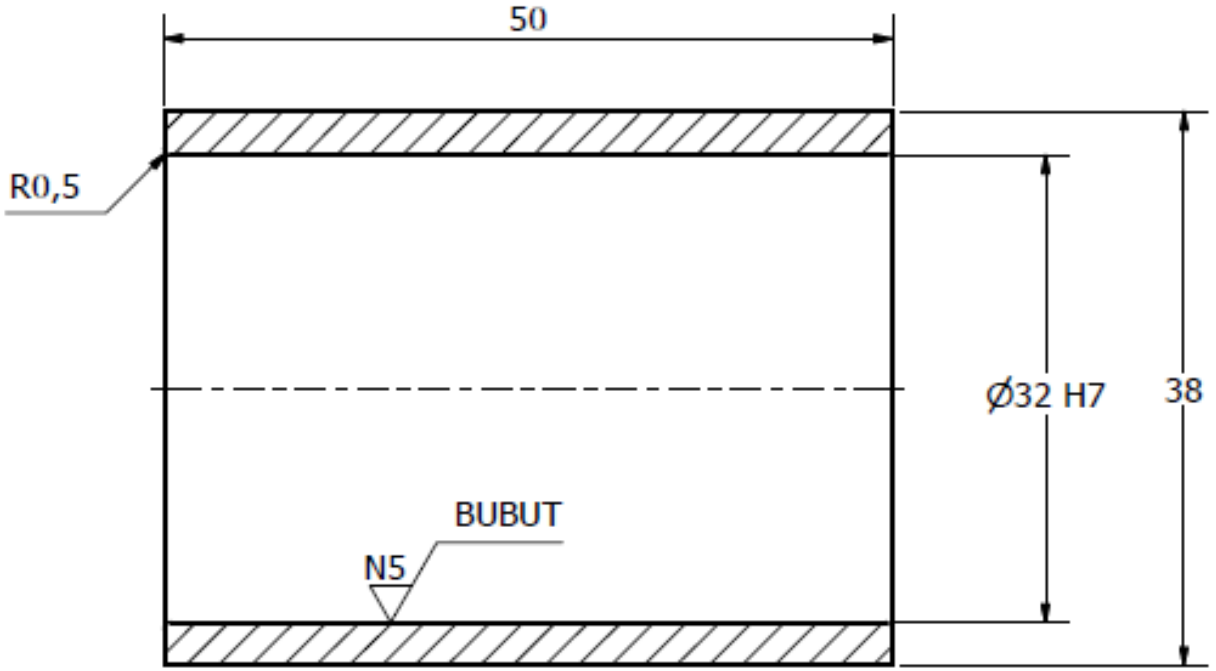
TEKNIK MESIN UMY	BASE DISC	NO. 3	A4





PARTS LIST			
NO.	NAME PART	MATERIAL	DESCRIPTION
4	Disc Shaft	Steel ASTM A36	

Skala : 1:2	Digambar : Septian	Signature:	
Satuan : mm	NIM : 20140130164		
Tanggal : 04 Juni 2018	Dilihat :		
TEKNIK MESIN UMY	DISC SHAFT	NO. 4	A4

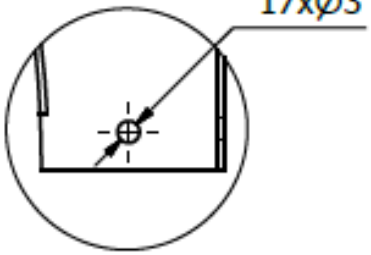


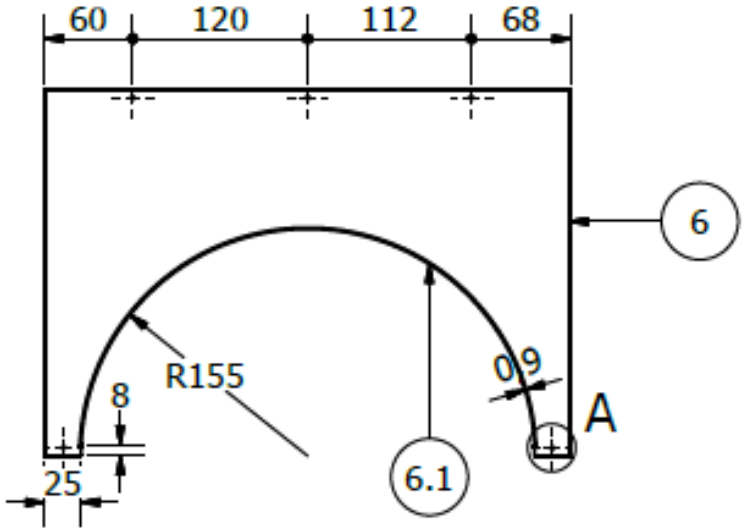
PARTS LIST			
NO.	NAME PART	MATERIAL	DESCRIPTION
5	Bush Disc Shaft	Steel ASTM A36	

	Skala : 1:1	Digambar : Septian	Signature:
	Satuan : mm	NIM : 20140130164	
	Tanggal : 04 Juni 2018	Dilihat :	

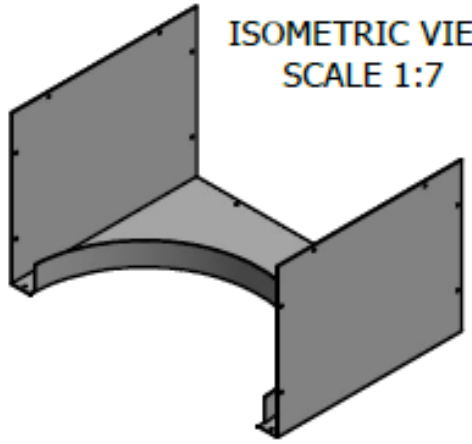
TEKNIK MESIN UMY	BUSH DISC SHAFT	NO. 5	A4

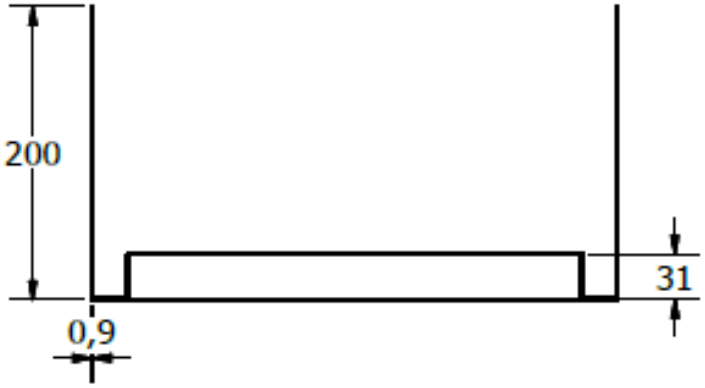
DETAIL A
SCALE 1 : 1

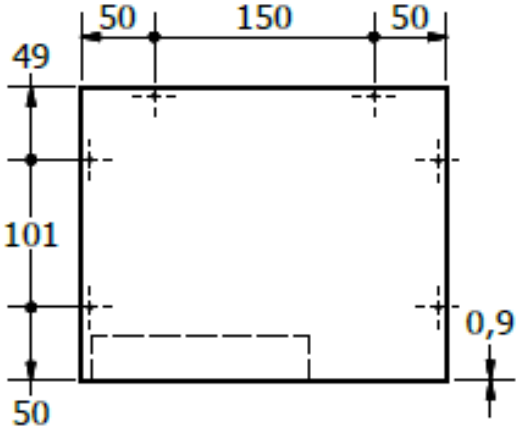




ISOMETRIC VIEW
SCALE 1:7



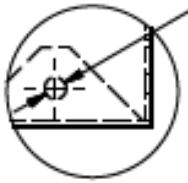




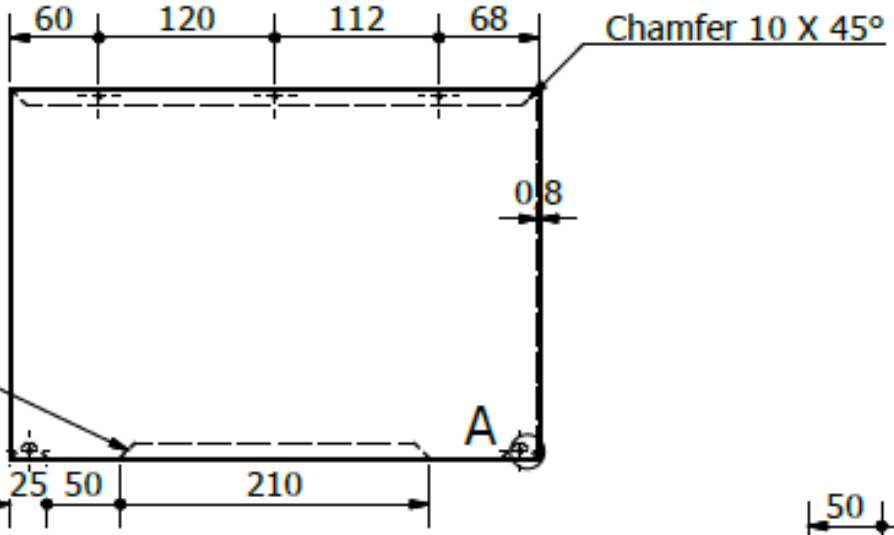
PARTS LIST			
NO.	NAME PART	MATERIAL	DESCRIPTION
6	Base Layer	Galvalume	
6.1	Sliding Roller	Galvalume	

	Skala : 1:5	Digambar : Septian	Signature:
	Satuan : mm	NIM : 20140130164	
	Tanggal : 04 Juni 2018	Dilihat :	
TEKNIK MESIN UMY	BASE LAYER	NO. 6	A4

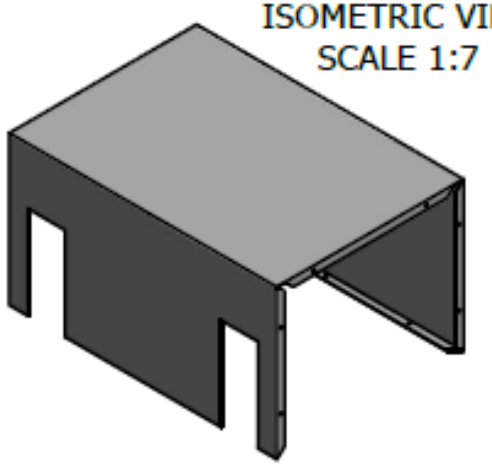
DETAIL A
SCALE 1 : 1

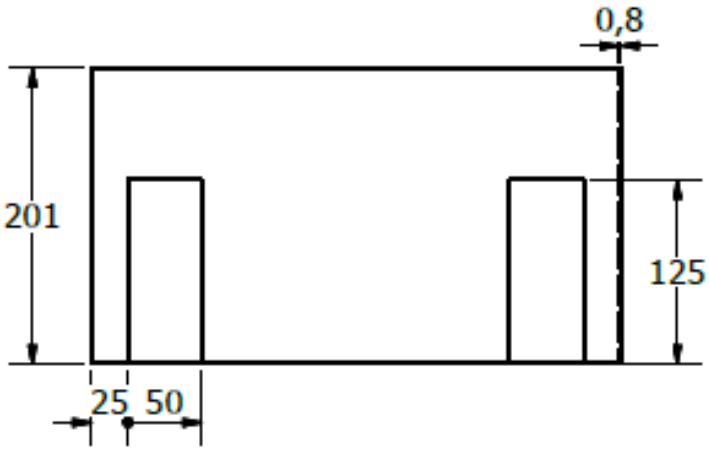


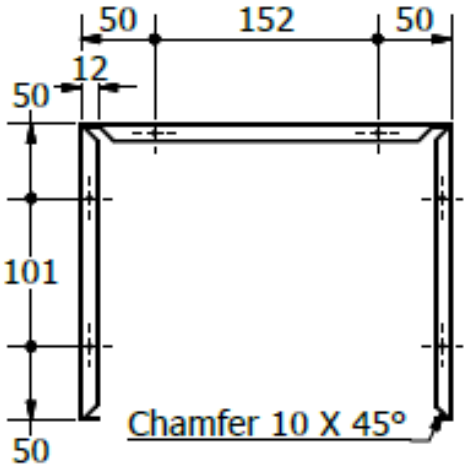
Ø3x17



ISOMETRIC VIEW
SCALE 1:7



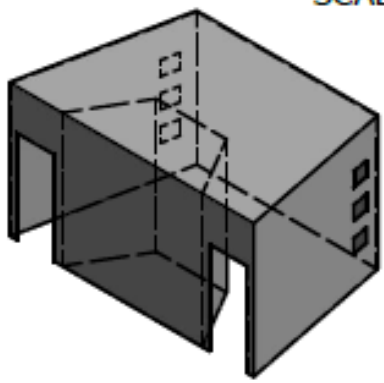


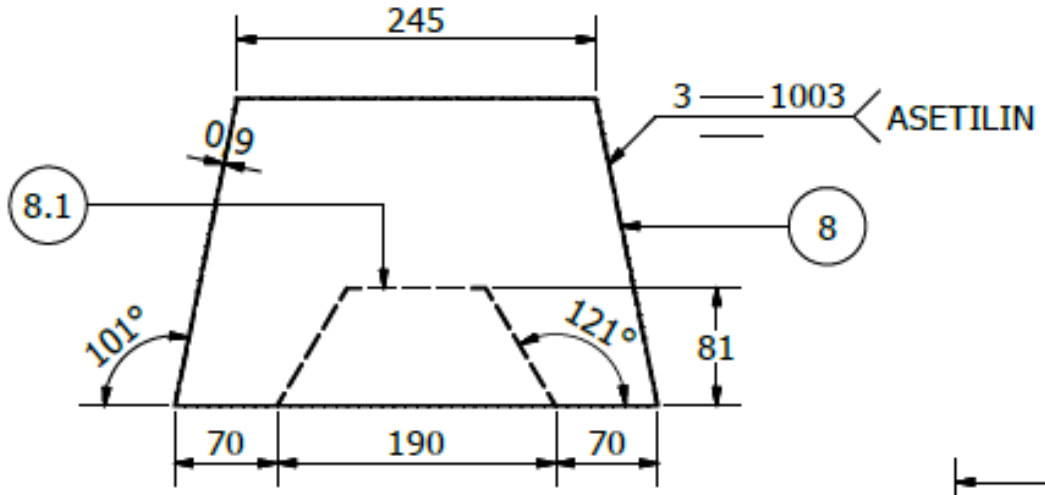


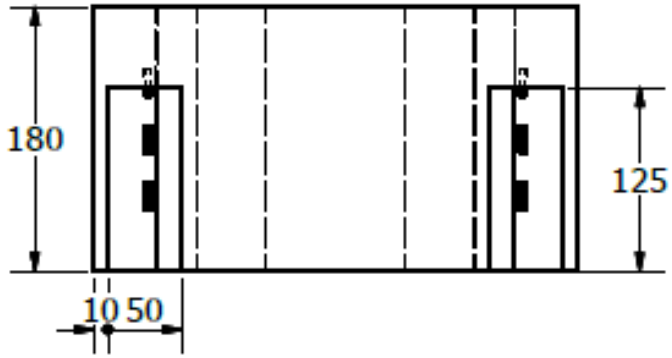
PARTS LIST			
NO.	NAME PART	MATERIAL	DESCRIPTION
7	Covering	Galvalume	

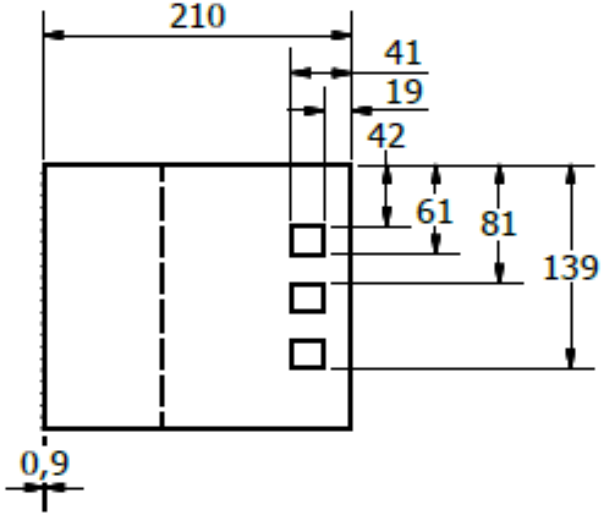
Skala : 1:5	Digambar : Septian	Signature:	
Satuan : mm	NIM : 20140130164		
Tanggal : 04 Juni 2018	Dilihat :		
TEKNIK MESIN UMY	COVERING	NO. 7	A4

ISOMETRIC VIEW
SCALE 1:7





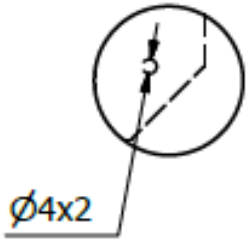


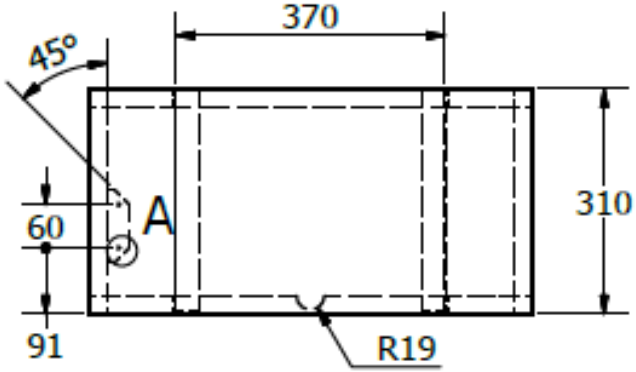


PARTS LIST			
NO.	NAME PART	MATERIAL	DESCRIPTION
8	Inti Layer	Galvalume	
8.1	Reflector	Galvalume	

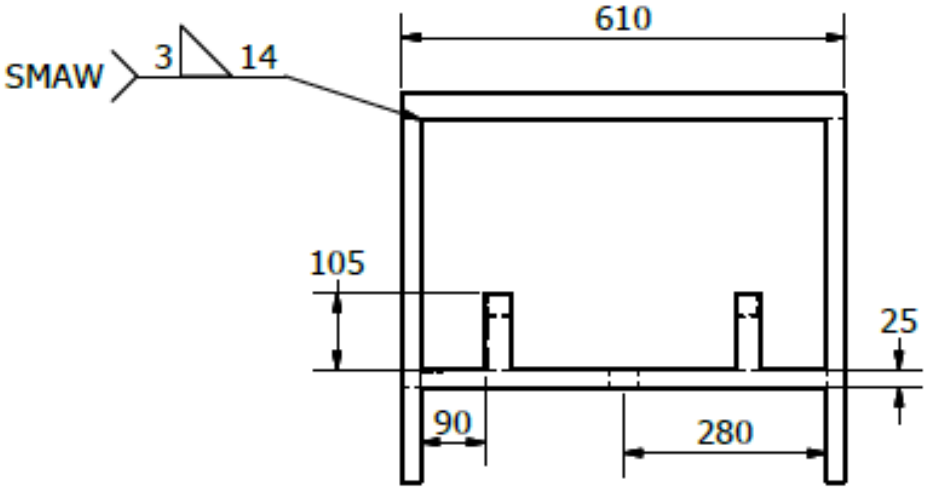
Skala : 1:4	Digambar : Septian	Signature:	
Satuan : mm	NIM : 20140130164		
Tanggal : 04 Juni 2018	Dilihat :		
TEKNIK MESIN UMY	INTI LAYER	NO. 8	A4

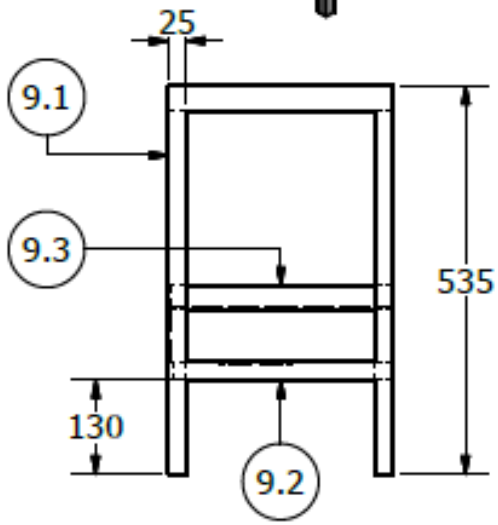
DETAIL A
SCALE 1 : 2





ISOMETRIC VIEW
SCALE 1:15





PARTS LIST			
NO.	NAME PART	MATERIAL	DESCRIPTION
9	Meja	Steel ASTM A36	
9.1	Cantilever Plate Vertical	Steel ASTM A36	
9.2	Cantilever Plate Horizontal	Steel ASTM A36	
9.3	Holder Plate	Steel ASTM A36	

	Skala : 1:10	Digambar : Septian	Signature:
	Satuan : mm	NIM : 20140130164	
	Tanggal : 04 Juni 2018	Dilihat :	
TEKNIK MESIN UMY	MEJA	NO. 9	A4