LAMPIRAN 1

BIODATA DIRI

LAMPIRAN 1

BIODATA DIRI

Nama	: Irfan Arip Fauzi
Tempat , Tgl Lahir	: Ciamis, 26 April 1999
Jenis Kelamin	: Laki-laki
Agama	: Islam
Kewarganegaraan	: Indonesia
Status	: Belom Kawin
Alamat	: Jl. Semadar, RT 001 RW 018 Kecamatan Cilacap Selatan, Kabupaten Cilacap, Jawa Tengah
Telephone	: 0895391661473
Email	: irfanarfa16@gmail.com
Hobi	: Berdagang
Motto	: “ Tetaplah berusaha, dan berdoa”

Riwayat Pendidikan:

1. SD Negeri Cilacap 02 Tahun 2004 - 2010
2. MTS Minat Kesugihan Tahun 2010 - 2013
3. SMK Dr Soetomo Cilacap Tahun 2014 - 2016

LAMPIRAN 2

TABEL ELEMEN MESIN DAN PERHITUNGAN PROSES PRODUKSI

LAMPIRAN 2

TABEL ELEMEN MESIN DAN PERHITUNGAN PROSES PRODUKSI

Tabel 1 Faktor koreksi daya (Sularso, 2008)

Daya yang ditransmisikan	**Fc**
Daya rata-rata yang diperlukan	1,2-2,0
Daya maksimum yang diperlukan	0,8-1,2
Daya normal	1,0-1,5

Tabel 2 Harga S*f1*dan S*f2* (Sularso, 2008)

Jenis Bahan	S*f1*	S*f2*
Bahan SF dengan kekuatan yang dijamin	5,6	1.3-3.0
Bahan S-C dan baja paduan	6,0	1,3-3,0

Tabel 3 Harga faktor Cb (Sularso, 2008)

Daya yang ditransmisikan	**Fc**
Diperkirakan terjadi beban lentur	1,2-3,0
Diperkirakan tidak terjadi beban lentur	1,0

Tabel 4 Faktor koreksi momen puntir (Sularso, 2008)

Daya yang ditransmisikan	**Fc**
Halus	1,0
Sedikit kejutan atau tumbukan	1,0-1,5
Kejutan atau tumbkan besar	1,5-3,0

Tabel 5 Tegangan tarik dan kecepatan potong

Material	Teg. Tarik (kg/mm2)	CS (m/mnt)
Plain carbon steel		
ST37 / MS	37	32
1030 / S30C	48	32
1035 / S35C	52	25
1040 / S40C	55	25
1045 / S45C / EMS45 / 1730	58	25
1050 / S50C / ST60	62	25
1055 / S55C	66	25
Alloy Steel (JIS Grade)		
SNC2, 3, 21	95	18
SNC22	100	13
SNCM1, 2, 22	90	18
SNCM7, 8, 23, 25	100	13
SCr3, 4, 21, 22	90	18
SCr5	100	13
SCM2, 3, 21, 22	90	18
SCM4, 5, 23	100	13
Tool Steel (AISI Grade)		
W Series	70	18
O Series	135	5
D Series	140	5
A Series	140	5
H Series	140	5
L Series	100	13
P Series	100	13
S Series	130	5
HSS T Series	150	5
HSS M Series	140	5

Material	Teg. Tarik (kg/mm2)	CS (m/mnt)
Spring Steel (JIS Grade)		
SUP4, 6, 7, 9, 10, 11	125	13
SUS 302, 304, 316 WPA	170	5
SUS 302,304, WPB	210	5
SUS 631J1 WPC	200	5
Stainless Steel		10-25
304, 304L, 316, 316L	70	18
410, 416	77	18
420, 420F	84	18
440C, 440F	91	18
Copper		70
Lead Bronze		50-70
Phospor Bronze		40-50
Pure Aluminum		200-300
Aluminum Alloy		70-120
Cast Iron		
GG20		25
GG25		18
GG30,35,40		18
GG45,50		13
GG55,60		5

Tabel 6 Data Material, Kecepatan Potong, Sudut Mata Bor HSS, dan Cairan Pendingin Proses Gurdi (Widarto, 2008)

MATERIAL	CUTTING SPEEDS i. (METERS/MINUTE) MPM	(FEET/MINUTE) FPM	POINT ANGLE	LIP CLEARANCE	COOLANTS
Aluminum And Alloy	61.00 - 91.50	200 - 300	90 - 130 deg	12 - 15 deg	Kerosene/Kerosene & Lard Oil/ Soluble Oil
Armor Plate	12.20 - 18.25	40 - 60	135 - 140 deg	6 - 9 deg	Light Machine Oil
Brass	61.00 - 91.50	200 - 300	118 - 118 deg	12 - 15 deg	Dry/ Soluble Oil/Kerosene/Lard Oil
Bronze	61.00 - 91.50	200 - 300	110 - 118 deg	12 - 15 deg	Dry/ Soluble Oil/Mineral Oil/Lard Oil
Bronze, High Tensile	21.35 - 45.75	70 - 150	100 - 110 deg	12 - 15 deg	Dry/ Soluble Oil/Mineral Oil/Lard Oil
Cast Iron, Soft	30.50 - 45.75	100 - 150	90 - 100 deg	12 - 15 deg	Air Jet Dry/ Soluble Oil
Cast Iron, Medium	21.35 - 30.50	70 - 100	100 - 110 deg	12 - 15 deg	Air Jet Dry/ Soluble Oil
Cast Iron, Hard	21.35 - 30.50	70 - 100	100 - 118 deg	8 - 12 deg	Air Jet Dry/ Soluble Oil
Cast Iron, Chilled	9.15 - 12.20	30 - 40	118 - 135 deg	5 - 9 deg	Air Jet Dry/ Soluble Oil
Copper	61.00 - 91.50	200 - 300	100 - 118 deg	12 - 15 deg	Air Jet Dry/ Soluble Oil
Copper Graphite Alloy (Carbon Drills)	18.30 - 21.35	60 - 70	**_**	**__**	Soluble Oil/Dry/Mineral Oil/Kerosene
Glass (Carbon Drills)	6.10 - 9.15	20 - 30	**_**	**_**	Soluble Oil/Dry/Mineral Oil/Kerosene
Iron, Malleable	15.25 - 27.45	50 - 90	90 - 100 deg	12 - 15 deg	Light Machine Oil
Magnesium And Alloys	76.25 - 122.0	250 - 400	70 - 118 deg	12 - 15 deg	Soluble Oil
Monel Nickel	4.15 - 15.28	30 - 50	118 - 125 deg	10 - 12 deg	Compressed Air/Mineral Oil
Nickel Alloys	12.20 - 18.30	40 - 60	135 - 140 deg	5 - 7 deg	Lard Oil/Soluble Oil
Plastic, Hot Set	30.50 - 91.50	100 - 300	60 - 90 deg	10 - 12 deg	Lard Oil/Soluble Oil
Plastic, Cold Set	30.50 - 91.50	100 - 300	118 - 135 deg	12 - 20 deg	Soap Solution
Steel, Low Carbon, 0.2-0.3ct	24.40 - 33.55	80 - 110	110 - 118 deg	7 - 9 deg	Soap Solution
Steel, Medium Carbon 0.4-0.5c	21.35 - 24.40	70 - 80	118 - 125 deg	7 - 9 deg	Soluble Oil/Mineral Oil/Sulfur Oil/Lard Oil
Steel (High Carbon 1.2c)	15.25 - 18.30	50 - 60	118 - 145 deg	7 - 9 deg	Soluble Oil/Mineral Oil/Sulfur Oil/Lard Oil
Steel, Forged	15.25 - 18.30	50 - 60	118 - 145 deg	7 - 12 deg	Soluble Oil/Mineral Oil/Sulfur Oil/Lard Oil
Steel, Alloy	15.25 - 21.35	50 - 70	118 - 125 deg	10 - 12 deg	Mineral Lard Oil
Steel, Alloy 300 To 400 Brinnel	6.10 - 9.15	20 - 30	130 - 140 deg	7 - 10 deg	Soluble Oil
Steel, Stainless, Free Machining	9.15 - 24.40	30 - 80	110 - 118 deg	8 - 12 deg	Soluble Oil
Steel, Stainless, Hard	4.57 - 15.25	15 - 50	118 - 135 deg	6 - 8 deg	Soluble Oil
Steel, Manganese	3.66 - 4.57	12 - 15	140 - 150 deg	7 - 10 deg	Soluble Oil
Stone (Carbide Drills)	7.63 - 9.15	25 - 30	**_**	**_**	Water Solution
Wood	91.50 - 122.2	300 - 400	60 - 70 deg	10 - 15 deg	Dry

- Untuk baja

$$f = 0{,}084\sqrt[3]{d}\,;mm/put \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(8.2)$$

- Untuk besi tuang

$$f = 0{,}1\sqrt[3]{d}\,;mm/put \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(8.3)$$

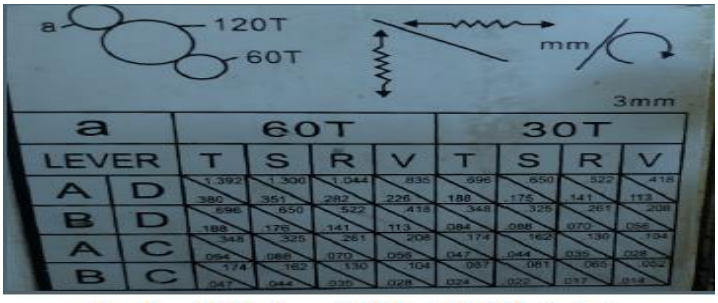
Gambar 1 Rumus Empiris Gerak Makan Per Mata Potong Gurdi(Widarto, 2008)

Tabel 7 Kecepatan Potong Proses Bubut Rata dan Ulir Untuk Pahat HSS (Widarto, 2008)

MATERIAL	STRAIGHT TURNING SPEED		THREADING SPEED	
	FEET PER MINUTE	METERS PER MINUTE	FEET PER MINUTE	METERS PER MINUTE
LOW-CARBON STEEL	80-100	24.4-30.5	35-40	10.7-12.2
MEDIUM-CARBON STEEL	60-80	18.3-24.4	25-30	7.6-9.1
HIGH-CARBON STEEL	35-40	10.7-12.2	15-20	4.6-6.1
STAINLESS STEEL	40-50	12.2-15.2	15-20	4.6-6.1
ALUMINUM AND ITS ALLOYS	200-300	61.0-91.4	50-60	15.2-18.3
ORDINARY BRASS AND BRONZE	100-200	30.5-61.0	40-50	12.2-15.2
HIGH-TENSILE BRONZE	40-60	12.2-18.3	20-25	6.1-7.6
CAST IRON	50-80	15.2-24.4	20-25	6.1-7.6
COPPER	60-80	18.3-24.4	20-25	6.1-7.6

NOTE: Speeds for carbide-tipped bits can be 2 to 3 times the speed recommended for high-speed steel

Gambar 2 Putaran Spindel



Gambar 3 Tabel gerak Makan Pada Mesin Bubut

Tabel 8 Kecepatan Potong Untuk Proses Frais Untuk Pasangan Benda Kerja dan Pisau HSS

WORKPIECE MATERIAL	CUTTING SPEED (m/s)	
	HSS	*WC*
Aluminum alloys	3–4	6–7
Magnesium alloys	4	10
Copper alloys	0.5–2	1–5
Steels	0.5–1	1–3
Stainless steels	0.15–0.5	1–2
High-temperature alloys	0.05–0.1	0.15–0.3
Titanium alloys	0.15–1	0.5–2
Cast irons	0.15–0.6	0.6–2
Thermoplastics	1.5–2	2–3
Thermosets	1–2	1–4

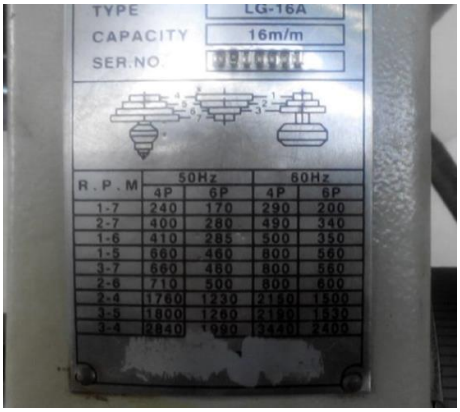
Note: (a) Depth of cut is usually 4 mm for rough turning and 0.7 mm for finish turning.
(b) Feeds for rough turning range from 0.2 mm/rev for materials with high hardness, to 2 mm/rev for lower hardness. Finishing cuts require lower feeds.
(c) Cutting speeds are for uncoated tools. Speeds for coated tools are from 25–75 percent higher.
(d) Cutting speeds for ceramic tools can be 2–3 times higher than the values indicated.
(e) Cutting speed for diamond tools is usually 4–15 m/s, depth of cut 0.05–0.2 mm, and feed 0.02–0.06 mm/rev.
(f) As hardness increases, cutting speed, feed, and depth of cut should be decreased.
(g) Speeds for free-machining metals are higher than those indicated.
(h) Speeds for other cutting processes are generally lower by as much as 75 percent.

Tabel 9 Tebal Beram Per Gigi Untuk Beberapa Tipe Pisau Frais dan Benda Kerja Yang dikerjakan (satuan dalam inchi) (Widarto, 2008)

TYPE OF CUTTER	ALUMINUM		BRONZE		CAST IRON		FREE MACHINING STEEL		ALLOY STEEL	
	HSS	CAR BIDE	HSS	CAR BIDE	HSS	CAR BIDE	HSS	CAR BIDE	HSS	CAR BIDE
FACE MILLS	.007 to .022	.007 to .020	.005 to .014	.004 to .012	.008 to .016	.006 to .020	.003 to .012	.006 to .016	.003 to .008	.003 to .014
HELICAL MILLS	.006 to .018	.008 to .016	.003 to .011	.004 to .010	.004 to .018	.002 to .018	.002 to .010	.003 to .013	.002 to .007	.003 to .012
SIDE CUTTING MILLS	.004 to .013	.004 to .012	.003 to .008	.003 to .007	.002 to .009	.003 to .012	.002 to .007	.003 to .009	.001 to .005	.002 to .008
END MILLS	.003 to .011	.003 to .010	.003 to .007	.002 to .006	.002 to .008	.003 to .010	.001 to .006	.002 to .008	.001 to .004	.002 to .007
FORM RELIEVED CUTTERS	.002 to .007	.002 to .006	.001 to .004	.001 to .004	.002 to .005	.002 to .006	.001 to .004	.002 to .005	.001 to .003	.001 to .004
CIRCULAR SAWS	.002 to .005	.002 to .005	.001 to .003	.001 to .003	.001 to .004	.002 to .006	.001 to .003	.001 to .004	.005 to .002	.001 to .004

Gambar 4 Tabel Horizontal Speed Frais XYZ 2000

Gambar 5 Tabel kecepatan mesin frais hijau

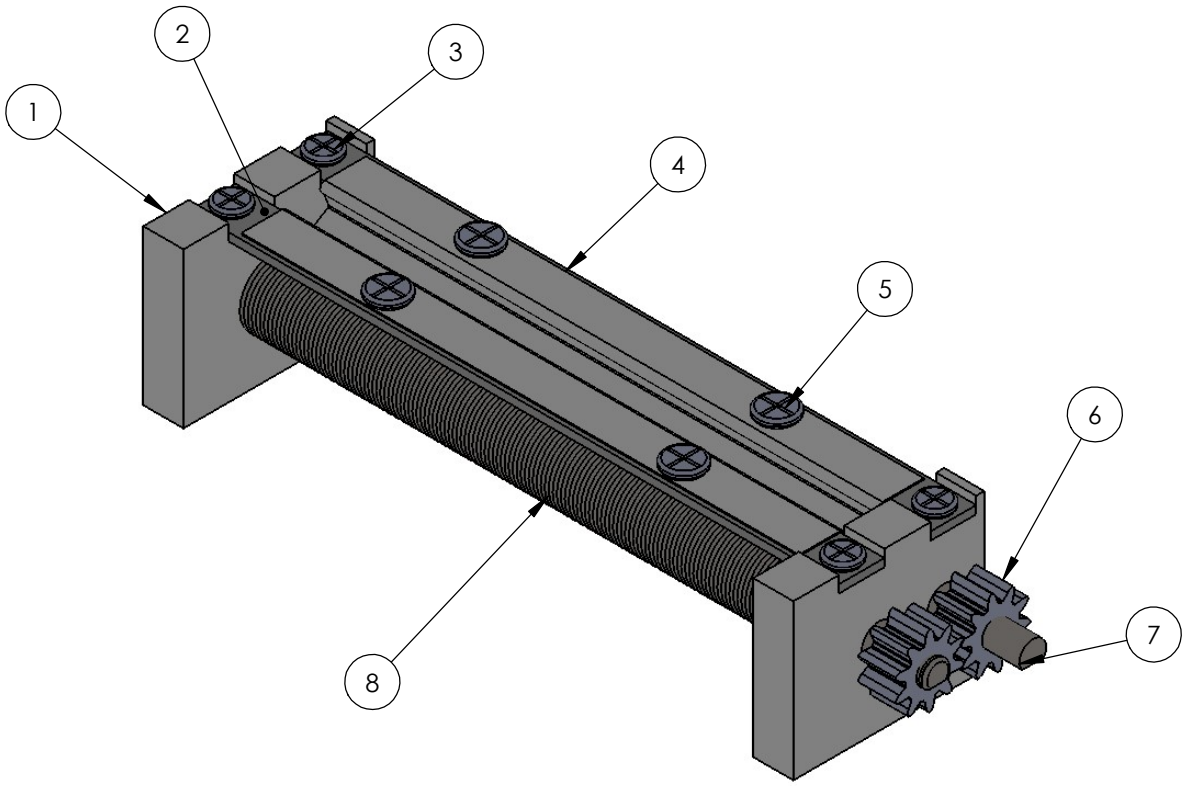


Gambar 6 Tabel kecepan mesin gurdi

LAMPIRAN 3

DETAIL DRAWING

NO	PERUBAHAN	TANGGAL	NAMA	NO	PERUBAHAN	TANGGAL	NAMA



JML	NAMA BAGIAN	BAHAN	UKURAN JADI	UKURAN KASAR	NO. ID	KETERANGAN
1	Pisau *Roll* 2	Stainless Steel 304	Lihat Detail	-	8	-
1	Pisau *Roll* 1	Stainless Steel 304	Lihat Detail	-	7	-
2	Roda Gigi	-	Lihat Detail	-	6	-
4	Baut M10	-	Lihat Detail	-	5	-
2	Penyisir Adonan	Aluminium	Lihat Detail	-	4	-
4	Baut M8	-	Lihat Detail	-	3	-
2	Batang Penghubung Dudukan	Low Carbon	Lihat Detail	-	2	-
2	Dudukan Pisau	ST 37	Lihat Detail	-	1	-

>	0	6	30	120	400	1000	PENGERJAAN LANJUT
<	6	30	120	400	1000	2000	
TOL	±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	

NO. ORDER

PROYEKSI

NAMA

Assembly Pisau Pemotong

NO. ASSY :

SKALA			
1:2	DIGAMBAR	13/04/21	IRFAN A.
	DIPERIKSA		
	DISAHKAN		
	SATUAN		mm

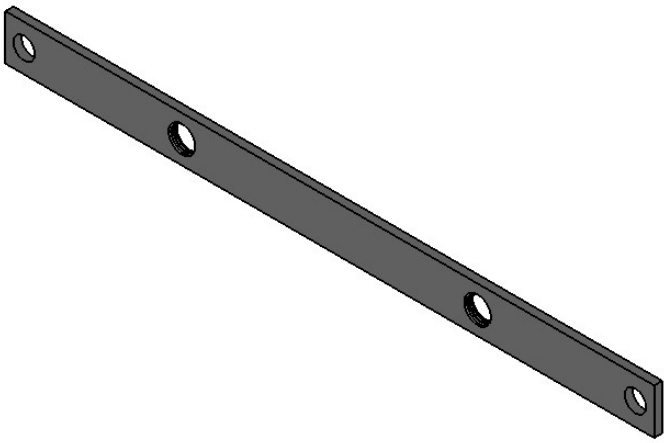
POLITEKNIK NEGERI CILACAP, JURUSAN TEKNIK MESIN
JL. Dr. SOETOMO, SIDAKAYA, CILACAP, 53212
TELP. 0282 - 533329 E-mail : tmpnc@politeknikcilacap.ac.id

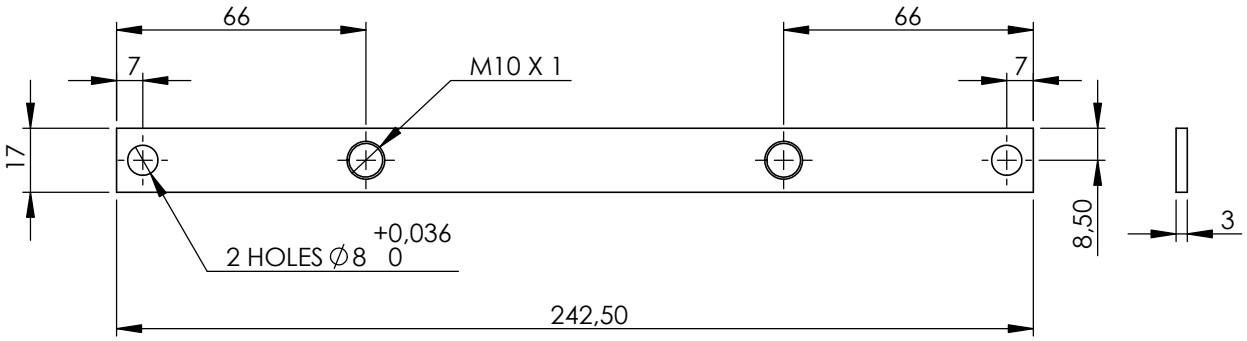
FORMAT: A4

NO. GAMBAR : PSP-00

PENGGANTI DARI | DIGANTI DENGAN | NO. LEMBAR | JUMLAH LEMBAR

NO	PERUBAHAN	TANGGAL	NAMA	NO	PERUBAHAN	TANGGAL	NAMA





JML	NAMA BAGIAN					BAHAN	UKURAN JADI	UKURAN KASAR	NO. ID	KETERANGAN
>	0	6	30	120	400	1000	PENGERJAAN LANJUT		NO. ORDER	PROYEKSI
<	6	30	120	400	1000	2000				
TOL	±0.1	±0.2	±0.3	±0.5	±0.8	±1.2				

NAMA

Batang Penghubung Dudukan

NO. ASSY :

SKALA			
1:2	DIGAMBAR	13/04/21	IRFAN A.
	DIPERIKSA		
	DISAHKAN		
	SATUAN		mm

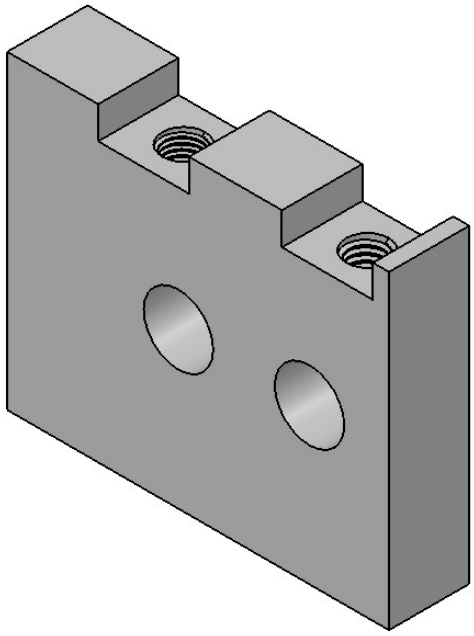
POLITEKNIK NEGERI CILACAP, JURUSAN TEKNIK MESIN
JL. Dr. SOETOMO, SIDAKAYA, CILACAP, 53212
TELP. 0282 - 533329 E-mail : tmpnc@politeknikcilacap.ac.id

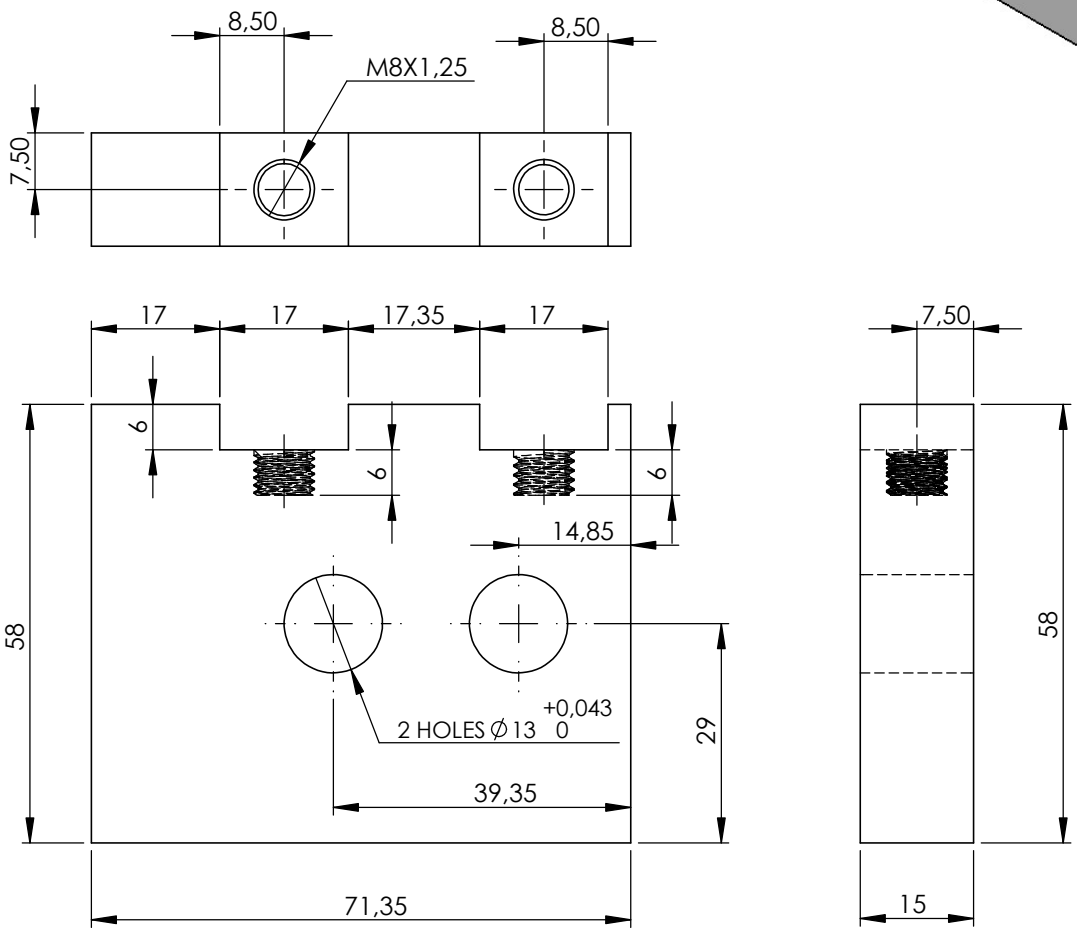
FORMAT: A4

NO. GAMBAR : PSP-01

PENGGANTI DARI | DIGANTI DENGAN | NO. LEMBAR | JUMLAH LEMBAR

NO	PERUBAHAN	TANGGAL	NAMA	NO	PERUBAHAN	TANGGAL	NAMA





JML	NAMA BAGIAN					BAHAN	UKURAN JADI	UKURAN KASAR	NO. ID	KETERANGAN
>	0	6	30	120	400	1000	PENGERJAAN LANJUT		NO. ORDER	PROYEKSI
<	6	30	120	400	1000	2000				
TOL	±0.1	±0.2	±0.3	±0.5	±0.8	±1.2				

NAMA

Dudukan Pisau

NO. ASSY :

SKALA			
1:1	DIGAMBAR	13/04/21	IRFAN A.
	DIPERIKSA		
	DISAHKAN		
	SATUAN		mm

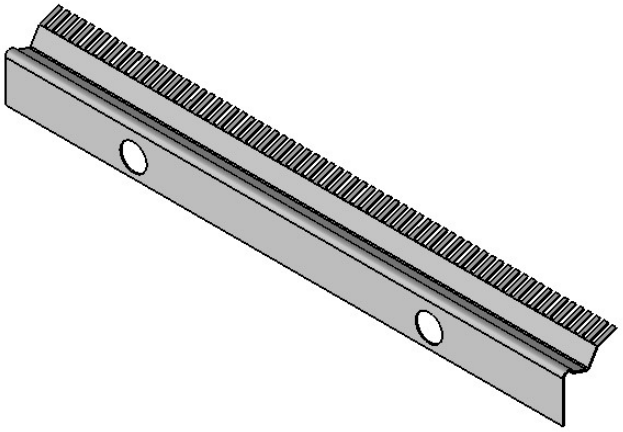
POLITEKNIK NEGERI CILACAP, JURUSAN TEKNIK MESIN
JL. Dr. SOETOMO, SIDAKAYA, CILACAP, 53212
TELP. 0282 - 533329 E-mail : tmpnc@politeknikcilacap.ac.id

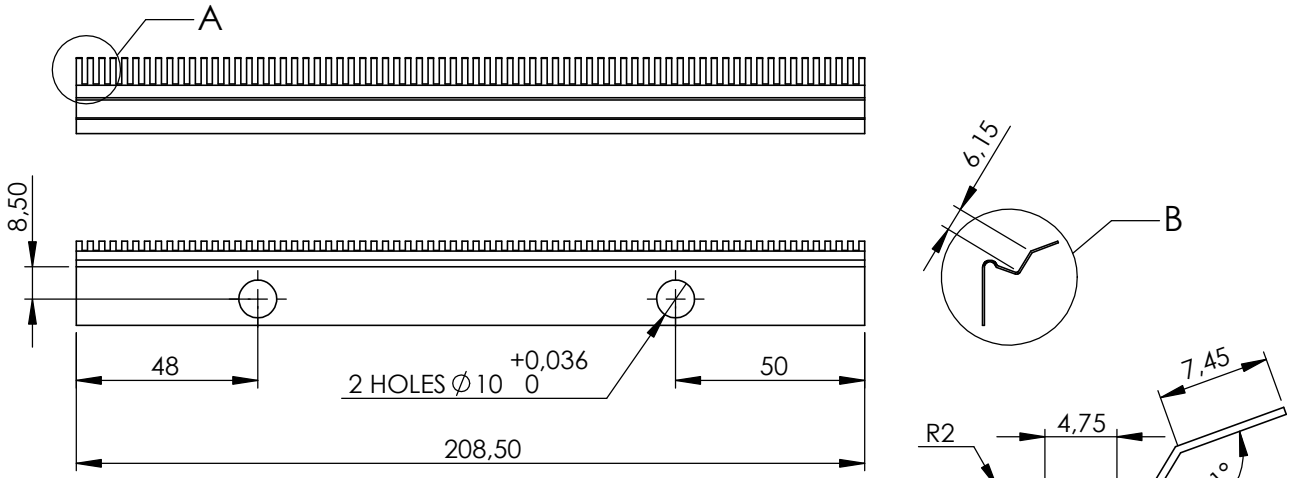
FORMAT A4

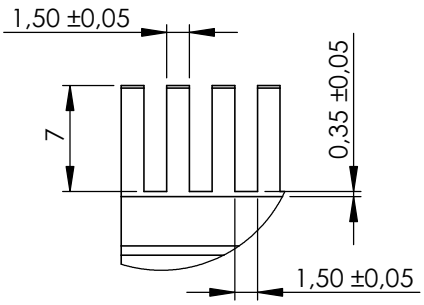
NO. GAMBAR : PSP-02

PENGGANTI DARI | DIGANTI DENGAN | NO. LEMBAR | JUMLAH LEMBAR

NO	PERUBAHAN	TANGGAL	NAMA	NO	PERUBAHAN	TANGGAL	NAMA







DETAIL A
SCALE 2 : 1

DETAIL B
SCALE 2 : 1

JML	NAMA BAGIAN					BAHAN	UKURAN JADI	UKURAN KASAR	NO. ID	KETERANGAN
>	0	6	30	120	400	1000	PENGERJAAN LANJUT		NO. ORDER	PROYEKSI
<	6	30	120	400	1000	2000				
TOL	±0.1	±0.2	±0.3	±0.5	±0.8	±1.2				

NAMA

Penyisir Adonan

NO. ASSY :

SKALA			
1:2	DIGAMBAR	13/04/21	IRFAN A.
	DIPERIKSA		
	DISAHKAN		
	SATUAN		mm

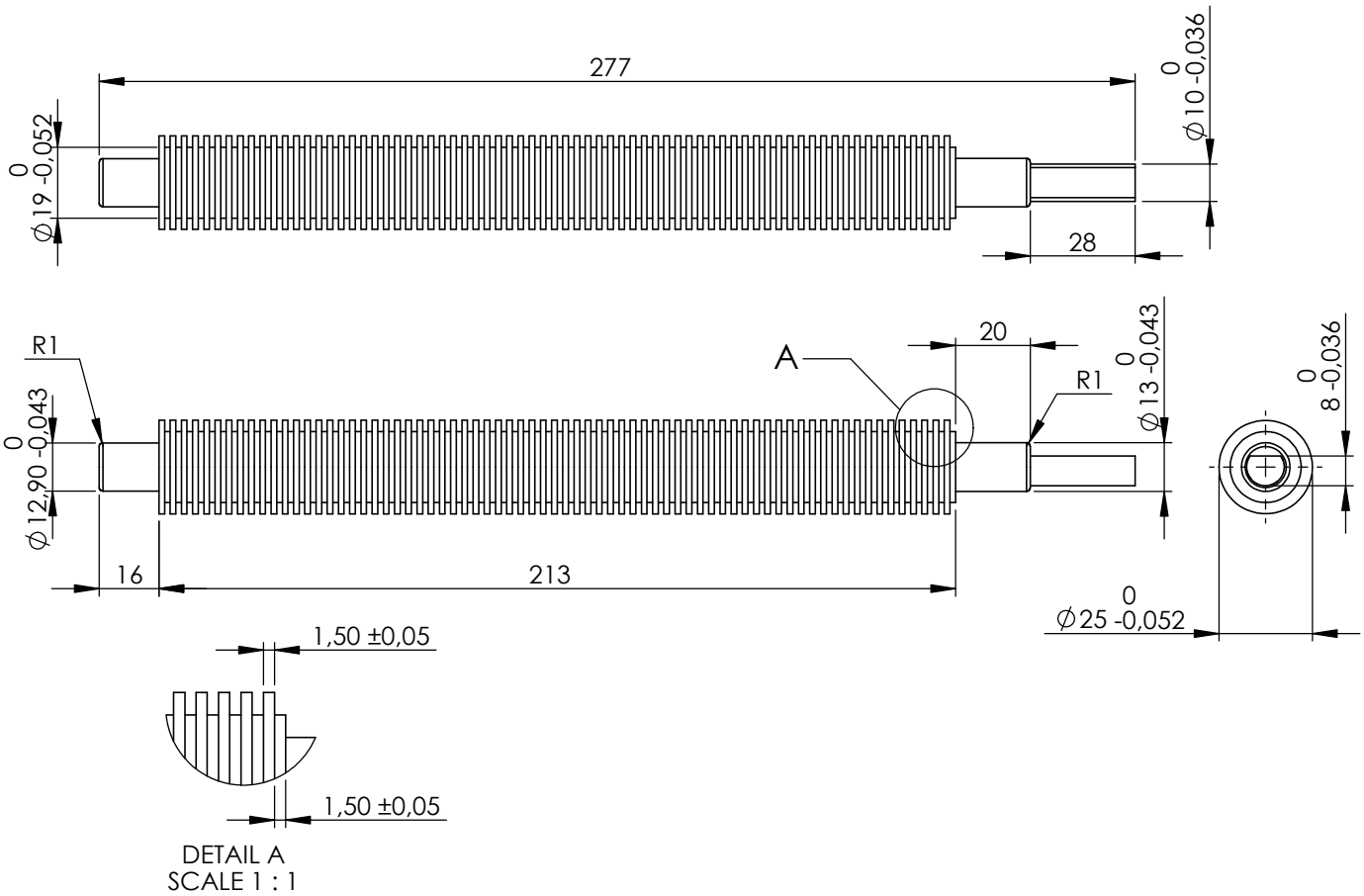
POLITEKNIK NEGERI CILACAP, JURUSAN TEKNIK MESIN
JL. Dr. SOETOMO, SIDAKAYA, CILACAP, 53212
TELP. 0282 - 533329 E-mail : tmpnc@politeknikcilacap.ac.id

FORMAT A4

NO. GAMBAR : PSP-03

PENGGANTI DARI | DIGANTI DENGAN | NO. LEMBAR | JUMLAH LEMBAR

NO	PERUBAHAN	TANGGAL	NAMA	NO	PERUBAHAN	TANGGAL	NAMA



DETAIL A
SCALE 1 : 1

JML	NAMA BAGIAN					BAHAN	UKURAN JADI	UKURAN KASAR	NO. ID	KETERANGAN
>	0	6	30	120	400	1000	PENGERJAAN LANJUT		NO. ORDER	PROYEKSI
<	6	30	120	400	1000	2000				
TOL	±0.1	±0.2	±0.3	±0.5	±0.8	±1.2				

NAMA

Pisau *Roll* 1

NO. ASSY :

SKALA			
1:2	DIGAMBAR	13/04/21	IRFAN A.
	DIPERIKSA		
	DISAHKAN		
	SATUAN		mm

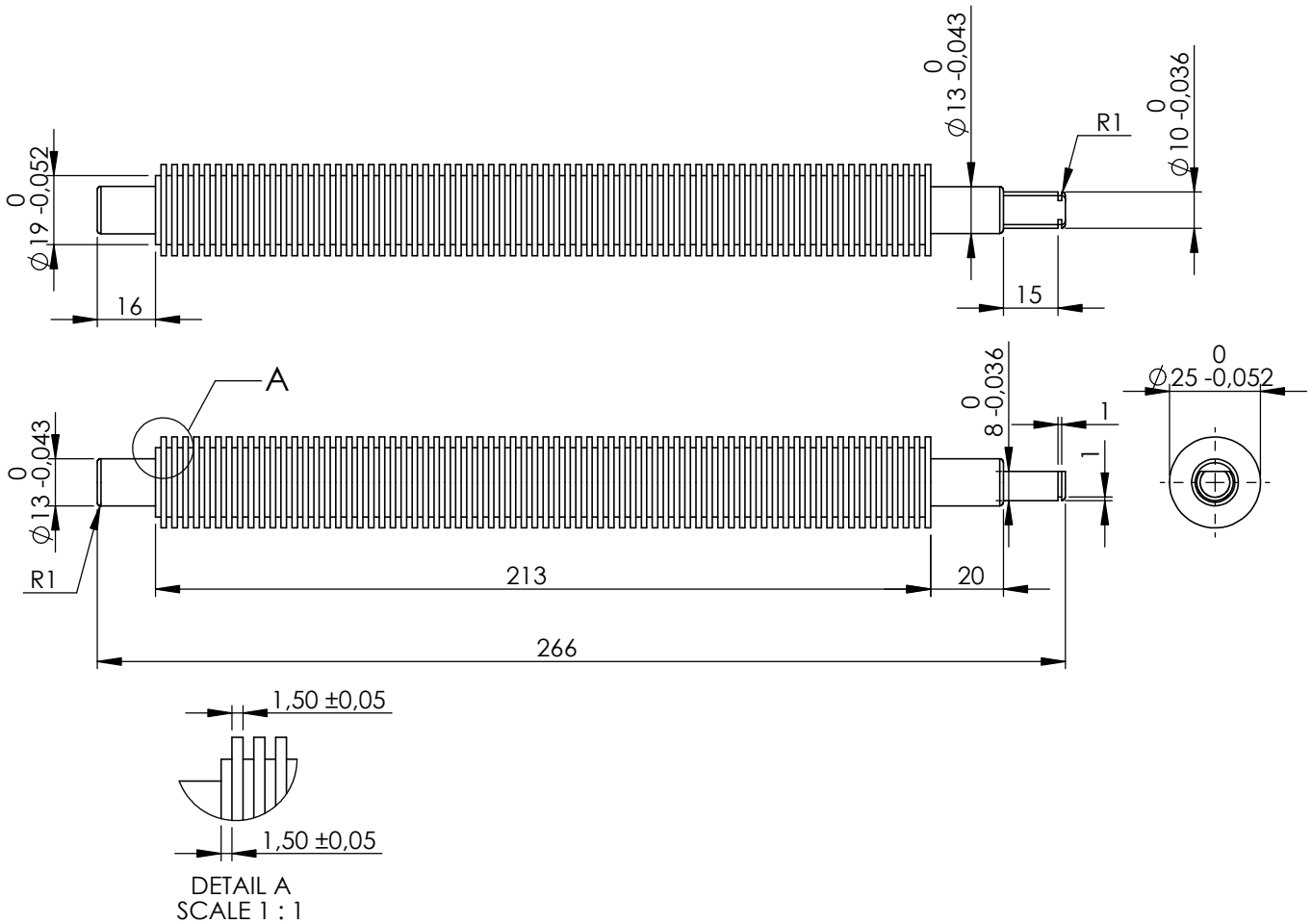
POLITEKNIK NEGERI CILACAP, JURUSAN TEKNIK MESIN
JL. Dr. SOETOMO, SIDAKAYA, CILACAP, 53212
TELP. 0282 - 533329 E-mail : tmpnc@politeknikcilacap.ac.id

FORMAT: A4

NO. GAMBAR : PSP-04

PENGGANTI DARI | DIGANTI DENGAN | NO. LEMBAR | JUMLAH LEMBAR

NO	PERUBAHAN	TANGGAL	NAMA	NO	PERUBAHAN	TANGGAL	NAMA



DETAIL A
SCALE 1 : 1

JML	NAMA BAGIAN					BAHAN	UKURAN JADI	UKURAN KASAR	NO. ID	KETERANGAN
>	0	6	30	120	400	1000	PENGERJAAN LANJUT		NO. ORDER	PROYEKSI
<	6	30	120	400	1000	2000				
TOL	±0.1	±0.2	±0.3	±0.5	±0.8	±1.2				

NAMA

Pisau *Roll* 2

NO. ASSY :

SKALA			
1:2	DIGAMBAR	13/04/21	IRFAN A.
	DIPERIKSA		
	DISAHKAN		
	SATUAN		mm

POLITEKNIK NEGERI CILACAP, JURUSAN TEKNIK MESIN
JL. Dr. SOETOMO, SIDAKAYA, CILACAP, 53212
TELP. 0282 - 533329 E-mail : tmpnc@politeknikcilacap.ac.id

FORMAT: A4

NO. GAMBAR : PSP-05

PENGGANTI DARI | DIGANTI DENGAN | NO. LEMBAR | JUMLAH LEMBAR

Hole dimensional tolerances for regularly used fitting

Units: μm

Standard dimension (mm) More than	Not more than	B10	C9	C10	D8	D9	D10	E7	E8	E9	F6	F7	F8	G6	G7	H6	H7	H8	H9	H10	JS6	JS7	K6	K7	M6	M7	N6	N7	P6	P7	R7	S7	T7	U7	X7
—	3	+180	+85	+100	+34	+45	+60	+24	+28	+39	+12	+16	+20	+8	+12	+6	+10	+14	+25	+40	±3	±5	0	0	−2	−2	−4	−4	−6	−6	−10	−14	—	−18	−20
		+140	+60	+60	+20	+20	+20	+14	+14	+14	+6	+6	+6	+2	+2	0	0	0	0	0			−6	−10	−8	−12	−10	−14	−12	−16	−20	−24		−28	−30
3	6	+188	+100	+118	+48	+60	+78	+32	+38	+50	+18	+22	+28	+12	+16	+8	+12	+18	+30	+48	±4	±6	+2	+3	−1	0	−5	−4	−9	−8	−11	−15	—	−19	−24
		+140	+70	+70	+30	+30	+30	+20	+20	+20	+10	+10	+10	+4	+4	0	0	0	0	0			−6	−9	−9	−12	−13	−16	−17	−20	−23	−27		−31	−36
6	10	+208	+116	+138	+62	+76	+98	+40	+47	+61	+22	+28	+35	+14	+20	+9	+15	+22	+36	+58	±4.5	±7	+2	+5	−3	0	−7	−4	−12	−9	−13	−17	—	−22	−28
		+150	+80	+80	+40	+40	+40	+25	+25	+25	+13	+13	+13	+5	+5	0	0	0	0	0			−7	−10	−12	−15	−16	−19	−21	−24	−28	−32		−37	−43
10	14	+220	+138	+165	+77	+93	+120	+50	+59	+75	+27	+34	+43	+17	+24	+11	+18	+27	+43	+70	±5.5	±9	+2	+6	−4	0	−9	−5	−15	−11	−16	−21	—	−26	−33 −51
14	18	+150	+95	+95	+50	+50	+50	+32	+32	+32	+16	+16	+16	+6	+6	0	0	0	0	0			−9	−12	−15	−18	−20	−23	−26	−29	−34	−39		−44	−38 −56
18	24	+244	+162	+194	+98	+117	+149	+61	+73	+92	+33	+41	+53	+20	+28	+13	+21	+33	+52	+84	±6.5	±10	+2	+6	−4	0	−11	−7	−18	−14	−20	−27	—	−33 −54	−46 −67
24	30	+160	+110	+110	+65	+65	+65	+40	+40	+40	+20	+20	+20	+7	+7	0	0	0	0	0			−11	−15	−17	−21	−24	−28	−31	−35	−41	−48	−33 −54	−40 −61	−56 −77
30	40	+270	+182	+220																															
		+170	+120	+120	+119	+142	+180	+75	+89	+112	+41	+50	+64	+25	+34	+16	+25	+39	+62	+100	±8	±12	+3	+7	−4	0	−12	−8	−21	−17	−25	−34	−39 −64	−51 −76	—
40	50	+280	+192	+230	+80	+80	+80	+50	+50	+50	+25	+25	+25	+9	+9	0	0	0	0	0			−13	−18	−20	−25	−28	−33	−37	−42	−50	−59	−45	−61	
		+180	+130	+130																													−70	−86	
50	65	+310	+214	+260																											−30	−42	−55	−76	
		+190	+140	+140	+146	+174	+220	+90	+106	+134	+49	+60	+76	+29	+40	+19	+30	+46	+74	+120	±9.5	±15	+4	+9	−5	0	−14	−9	−26	−21	−60	−72	−85	−106	—
65	80	+320	+224	+270	+100	+100	+100	+60	+60	+60	+30	+30	+30	+10	+10	0	0	0	0	0			−15	−21	−24	−30	−33	−39	−45	−51	−32	−48	−64	−91	
		+200	+150	+150																											−62	−78	−94	−121	
80	100	+360	+257	+310																											−38	−58	−78	−111	
		+220	+170	+170	+174	+207	+260	+107	+126	+159	+58	+71	+90	+34	+47	+22	+35	+54	+87	+140	±11	±17	+4	+10	−6	0	−16	−10	−30	−24	−73	−93	−113	−146	—
100	120	+380	+267	+320	+120	+120	+120	+72	+72	+72	+36	+36	+36	+12	+12	0	0	0	0	0			−18	−25	−28	−35	−38	−45	−52	−59	−41	−66	−91	−131	
		+240	+180	+180																											−76	−101	−126	−166	
120	140	+420	+300	+360																											−48	−77	−107			
		+260	+200	+200																											−88	−117	−147			
140	160	+440	+310	+370	+208	+245	+305	+125	+148	+185	+68	+83	+106	+39	+54	+25	+40	+63	+100	+160	±12.5	±20	+4	+12	−8	0	−20	−12	−36	−28	−50	−85	−119	—	—
		+280	+210	+210	+145	+145	+145	+85	+85	+85	+43	+43	+43	+14	+14	0	0	0	0	0			−21	−28	−33	−40	−45	−52	−61	−68	−90	−125	−159		
160	180	+470	+330	+390																											−53	−93	−131			
		+310	+230	+230																											−93	−133	−171			
180	200	+525	+355	+425																											−60	−105				
		+340	+240	+240																											−106	−151				
200	225	+565	+375	+445	+242	+285	+355	+146	+172	+215	+79	+96	+122	+44	+61	+29	+46	+72	+115	+185	±14.5	±23	+5	+13	−8	0	−22	−14	−41	−33	−63	−113	—	—	—
		+380	+260	+260	+170	+170	+170	+100	+100	+100	+50	+50	+50	+15	+15	0	0	0	0	0			−24	−33	−37	−46	−51	−60	−70	−79	−109	−159			
225	250	+605	+395	+465																											−67	−123				
		+420	+280	+280																											−113	−169				
250	280	+690	+430	+510																											−74					
		+480	+300	+300	+271	+320	+400	+162	+191	+240	+88	+108	+137	+49	+69	+32	+52	+81	+130	+210	±16	±26	+5	+16	−9	0	−25	−14	−47	−36	−126	—	—	—	—
280	315	+750	+460	+540	+190	+190	+190	+110	+110	+110	+56	+56	+56	+17	+17	0	0	0	0	0			−27	−36	−41	−52	−57	−66	−79	−88	−78				
		+540	+330	+330																											−130					
315	355	+830	+500	+590																											−87					
		+600	+360	+360	+299	+350	+440	+182	+214	+265	+98	+119	+151	+54	+75	+36	+57	+89	+140	+230	±18	±28	+7	+17	−10	0	−26	−16	−51	−41	−144	—	—	—	—
355	400	+910	+540	+630	+210	+210	+210	+125	+125	+125	+62	+62	+62	+18	+18	0	0	0	0	0			−29	−40	−46	−57	−62	−73	−87	−98	−93				
		+680	+400	+400																											−150					
400	450	+1010	+595	+690																											−103					
		+760	+440	+440	+327	+385	+480	+198	+232	+290	+108	+131	+165	+60	+83	+40	+63	+97	+155	+250	±20	±31	+8	+18	−10	0	−27	−17	−55	−45	−166	—	—	—	—
450	500	+1090	+635	+730	+230	+230	+230	+135	+135	+135	+68	+68	+68	+20	+20	0	0	0	0	0			−32	−45	−50	−63	−67	−80	−95	−108	−109				
		+840	+480	+480																											−172					

Note: In each column, the upper figure is the upper dimensional tolerance, and the lower figure is the lower dimensional tolerance.

Dimensional tolerances for regularly used fitting shaft

Units: μm

Standard dimension (mm) More than	Not more than	b9	c9	d8	d9	e7	e8	e9	f6	f7	f8	g5	g6	h4 *	h5	h6	h7	h8	h9	js5	js6	js7	k5	k6	m5	m6	n5 *	n6	p6	r6	s6	t6	u6	x6
—	3	−140	−60	−20	−20	−14	−14	−14	−6	−6	−6	−2	−2	0	0	0	0	0	0	±2	±3	±5	+4	+6	+6	+8	+8	+10	+12	+16	+20	—	+24	+26
		−165	−85	−34	−45	−24	−28	−39	−12	−16	−20	−6	−8	−3	−4	−6	−10	−14	−25				0	0	+2	+2	+4	+4	+6	+10	+14		+18	+20
3	6	−140	−70	−30	−30	−20	−20	−20	−10	−10	−10	−4	−4	0	0	0	0	0	0	±2.5	±4	±6	+6	+9	+9	+12	+13	+16	+20	+23	+27	—	+31	+36
		−170	−100	−48	−60	−32	−38	−50	−18	−22	−28	−9	−12	−4	−5	−8	−12	−18	−30				+1	+1	+4	+4	+8	+8	+12	+15	+19		+23	+28
6	10	−150	−80	−40	−40	−25	−25	−25	−13	−13	−13	−5	−5	0	0	0	0	0	0	±3	±4.5	±7	+7	+10	+12	+15	+16	+19	+24	+28	+32	—	+37	+43
		−186	−116	−62	−76	−40	−47	−61	−22	−28	−35	−11	−14	−4	−6	−9	−15	−22	−36				+1	+1	+6	+6	+10	+10	+15	+19	+23		+28	+34
10	14	−150	−95	−50	−50	−32	−32	−32	−16	−16	−16	−6	−6	0	0	0	0	0	0	±4	±5.5	±9	+9	+12	+15	+18	+20	+23	+29	+34	+39	—	+44	+51 +40
14	18	−193	−138	−77	−93	−50	−59	−75	−27	−34	−43	−14	−17	−5	−8	−11	−18	−27	−43				+1	+1	+7	+7	+12	+12	+18	+23	+28		+33	+56 +45
18	24	−160	−110	−65	−65	−40	−40	−40	−20	−20	−20	−7	−7	0	0	0	0	0	0	±4.5	±6.5	±10	+11	+15	+17	+21	+24	+28	+35	+41	+48	—	+54 +41	+67 +54
24	30	−212	−162	−98	−117	−61	−73	−92	−33	−41	−53	−16	−20	−6	−9	−13	−21	−33	−52				+2	+2	+8	+8	+15	+15	+22	+28	+35	+54 +41	+61 +48	+77 +64
30	40	−170	−120																															
		−232	−182	−80	−80	−50	−50	−50	−25	−25	−25	−9	−9	0	0	0	0	0	0	±5.5	±8	±12	+13	+18	+20	+25	+28	+33	+42	+50	+59	+64 +48	+76 +60	—
40	50	−180	−130	−119	−142	−75	−89	−112	−41	−50	−64	−20	−25	−7	−11	−16	−25	−39	−62				+2	+2	+9	+9	+17	+17	+26	+34	+43	+70 +54	+86 +70	
		−242	−192																															
50	65	−190	−140																											+60	+72	+85	+106	
		−264	−214	−100	−100	−60	−60	−60	−30	−30	−30	−10	−10	0	0	0	0	0	0	±6.5	±9.5	±15	+15	+21	+24	+30	+33	+39	+51	+41	+53	+66	+87	—
65	80	−200	−150	−146	−174	−90	−106	−134	−49	−60	−76	−23	−29	−8	−13	−19	−30	−46	−74				+2	+2	+11	+11	+20	+20	+32	+62	+78	+94	+121	
		−274	−224																											+43	+59	+75	+102	
80	100	−220	−170																											+73	+93	+113	+146	
		−307	−257	−120	−120	−72	−72	−72	−36	−36	−36	−12	−12	0	0	0	0	0	0	±7.5	±11	±17	+18	+25	+28	+35	+38	+45	+59	+51	+71	+91	+124	—
100	120	−240	−180	−174	−207	−107	−126	−159	−58	−71	−90	−27	−34	−10	−15	−22	−35	−54	−87				+3	+3	+13	+13	+23	+23	+37	+76	+101	+126	+166	
		−327	−267																											+54	+79	+104	+144	
120	140	−260	−200																											+88	+117	+147		
		−360	−300																											+63	+92	+122		
140	160	−280	−210	−145	−145	−85	−85	−85	−43	−43	−43	−14	−14	0	0	0	0	0	0	±9	±12.5	±20	+21	+28	+33	+40	—	+52	+68	+90	+125	+159	—	—
		−380	−310	−208	−245	−125	−148	−185	−68	−83	−106	−32	−39	−12	−18	−25	−40	−63	−100				+3	+3	+15	+15		+27	+43	+65	+100	+134		
160	180	−310	−230																											+93	+133	+171		
		−410	−330																											+68	+108	+146		
180	200	−340	−240																											+106	+151			
		−455	−355																											+77	+122			
200	225	−380	−260	−170	−170	−100	−100	−100	−50	−50	−50	−15	−15	0	0	0	0	0	0	±10	±14.5	±23	+24	+33	+37	+46	—	+60	+79	+109	+159	—	—	—
		−495	−375	−242	−285	−146	−172	−215	−79	−96	−122	−35	−44	−14	−20	−29	−46	−72	−115				+4	+4	+17	+17		+31	+50	+80	+130			
225	250	−420	−280																											+113	+169			
		−535	−395																											+84	+140			
250	280	−480	−300																											+126				
		−610	−430	−190	−190	−110	−110	−110	−56	−56	−56	−17	−17	0	0	0	0	0	0	±11.5	±16	±26	+27	+36	+43	+52	—	+66	+88	+94	—	—	—	—
280	315	−540	−330	−271	−320	−162	−191	−240	−88	−108	−137	−40	−49	−16	−23	−32	−52	−81	−130				+4	+4	+20	+20		+34	+56	+130				
		−670	−460																											+98				
315	355	−600	−360																											+144				
		−740	−500	−210	−210	−125	−125	−125	−62	−62	−62	−18	−18	0	0	0	0	0	0	±12.5	±18	±28	+29	+40	+46	+57	—	+73	+98	+108	—	—	—	—
355	400	−680	−400	−299	−350	−182	−214	−265	−98	−119	−151	−43	−54	−18	−25	−36	−57	−89	−140				+4	+4	+21	+21		+37	+62	+150				
		−820	−540																											+114				
400	450	−760	−440																											+166				
		−915	−595	−230	−230	−135	−135	−135	−68	−68	−68	−20	−20	0	0	0	0	0	0	±13.5	±20	±31	+32	+45	+50	+63	—	+80	+108	+126	—	—	—	—
450	500	−840	−480	−327	−385	−198	−232	−290	−108	−131	−165	−47	−60	−20	−27	−40	−63	−97	−155				+5	+5	+23	+23		+40	+68	+172				
		−995	−635																											+132				

Note: In each column, the upper figure is the upper dimensional tolerance, and the lower figure is the lower dimensional tolerance.

Note *: h4 and n5 are old JIS standards, however they are listed here because they apply to a large number of Misumi products.

LAMPIRAN 4

SPESIFIKASI STAINLESS STEEL 304

TSINGSHAN

MILL TEST CERTIFICATE
EN 10204 3.1

ISO 9001 | IS 6911 CM/L-4100050054 | CE

Purchaser		Melting Process	RKEF→AOD→LF→CCM	Contract No.	IRNC21/CC02009-APS	Certificate No.	2021042100384
Product Name	304 2B COLD ROLLED STAINLESS STEEL COIL SLIT EDGE	Steel Grade	304 2B	Product Standard	ASTM A240-2016	Condition of Delivery	COLD ROLLING

No.	Heat No.	Quantity	Coil No.	Size (mm)	Weight (Kg)	Chemical Composition (%)												Tensile Test				Hardness
						C	Si	Mn	P	S	Cr	Ni	N					Rm (N/mm2)	Rp0.2 (N/mm2)	Rp1.0 (N/mm2)	Elongation A (%)	HV
1	Y210312C09-4	1	QLZ21Z01320A	1.0*1219	6656	0.046	0.450	1.080	0.027	0.002	18.09	8.030	0.044					661	270		57	176/178
2	Y210312C09-4	1	QLZ21Z01320B	1.0*1219	6675	0.046	0.450	1.080	0.027	0.002	18.09	8.030	0.044					661	270		57	176/178
3	Y210312C09-4	1	QLZ21Z01320C	1.0*1219	6542	0.046	0.450	1.080	0.027	0.002	18.09	8.030	0.044					661	270		57	176/178
4	Y210305A07-2	1	QLZ21Z01307A	1.0*1219	6864	0.044	0.420	1.050	0.028	0.003	18.07	8.020	0.047					661	268		56	172/176
5	Y210305A07-2	1	QLZ21Z01307B	1.0*1219	6880	0.044	0.420	1.050	0.028	0.003	18.07	8.020	0.047					661	268		56	172/176
6	Y210305A07-2	1	QLZ21Z01307C	1.0*1219	6893	0.044	0.420	1.050	0.028	0.003	18.07	8.020	0.047					661	268		56	172/176
7	Y210324D20-4	1	QLZ21Z01313A	2.0*1219	6504	0.043	0.400	1.050	0.035	0.003	18.09	8.040	0.044					685	295		55	175/176
8	Y210324D20-4	1	QLZ21Z01313B	2.0*1219	6499	0.043	0.400	1.050	0.035	0.003	18.09	8.040	0.044					685	295		55	175/176
9	Y210324D20-4	1	QLZ21Z01313C	2.0*1219	6470	0.043	0.400	1.050	0.035	0.003	18.09	8.040	0.044					685	295		55	175/176
10	Y210103A48-2	1	QLZ21Z01273A	3.0*1219	6718	0.050	0.370	1.050	0.027	0.002	18.25	8.010	0.046					671	317		55.5	181/183
11	Y210103A48-2	1	QLZ21Z01273B	3.0*1219	6750	0.050	0.370	1.050	0.027	0.002	18.25	8.010	0.046					671	317		55.5	181/183
12	Y210103A48-2	1	QLZ21Z01273C	3.0*1219	6870	0.050	0.370	1.050	0.027	0.002	18.25	8.010	0.046					671	317		55.5	181/183
13	Y210305A06-1	1	QLZ21Z01299A	3.0*1219	6784	0.043	0.460	1.070	0.029	0.002	18.20	8.020	0.048					672	312		55	180/183
14	Y210305A06-1	1	QLZ21Z01299B	3.0*1219	6774	0.043	0.460	1.070	0.029	0.002	18.20	8.020	0.048					672	312		55	180/183
15	Y210305A06-1	1	QLZ21Z01299C	3.0*1219	7057	0.043	0.460	1.070	0.029	0.002	18.20	8.020	0.048					672	312		55	180/183
Total		15			100936																	

Remarks

1. Product Marking: Steel Grade, Heat No. Coil No. Size.

2.Surface Quality: ok 3.Shape: ok 4.Dimension: ok 5.Non-Metallic Inclusions: ok 6.Intergranular Corrosion (IGC PRE): ok

1. We here certify that the material herein described has been manufactured, sampled, tested and inspected in accordance with the requirements of above specifications.
2.We hereby certifly Product free weld repair; free of mercury; free from radiation contamination.
3. ISO 9001:2015 Quality management system identified by ZJQC.
4. We certify that the material described below fully conforms to IS 6911:2017 chemical composition and Mechanical properties of product as tested in accordance with the Scheme of Testing and Inspection contained in BIS certification marks license No. CM/L-4100050054
5. Issued in agreement with TÜV SÜD Industrie Service GmbH (April 2018). QMS approved acc. to PED&AD2000, Annex I, Para. 4.3 by Notified Body 0036(Certification no. DGR-0036-QS-W 848/2018/MUC).
6. Approved acc. to CPR 305/2011 with certification no. 0036-CPR-M-116-2019.
7. The certificate should be sealed by quality control department dedicate inspection stamp or authorized official stamp of sales.
8.Product heat treatment temperature: 1080°C

Typed by	YULIA	Department of Quality Assurance (Stamp)
Ratifying		
Date	2021.04.21	