

LAMPIRAN 1

Biodata Penulis

BIODATA PENULIS



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Motto : Jika dirimu merasa ingin menyerah, mengapa
dirimu sangat berani untuk memulainya.

Riwayat Pendidikan :

Sekolah	Jurusan	Periode
SDN 02 Cilacap	-	2006-2013
SMPN Al Azhar Cilacap	-	2013-2016
SMK Dr. Soetomo Cilacap	Pemesinan	2016-2019
Politeknik Negeri Cilacap	Teknik Mesin	2020-2023

LAMPIRAN 2

Tabel Produksi dan Perhitungan

Tabel Produksi dan Perhitungan

Tabel 2.1 Harga Sf_1 dan Sf_2 (Sularso,2008)

Jenis Bahan	Sf_1	Sf_2
Bahan SF dengan kekuatan dijamin	5,6	1,3-3,0
Bahan S-C dan baja paduan	6,0	1,3-3,0

Tabel 2.2 Faktor koreksi momen puntir (Sularso,2008)

Jenis Bahan	Kt
Halus	1,0
Sedikit kejutan atau tumbukan	1,0-1,5
Kejutan atau tumbukan besar	1,5-3,0

Tabel 2.3 Faktor koreksi momen lentur (Sularso,2008)

Jenis Bahan	Km
Momen lentur tetap	1,5
Momen lentur tumbukan ringan	1,5-2,0
Momen lentur tumbukan berat	2,3-3,0

Tabel 2.4 Penggolongan baja secara umum (Sularso & Suga,1993)

Golongan	Kadar C (%)
Baja Lunak	-0,15
Baja liat	0,2 - 0,3
Baja agak keras	0,3 – 0,5
Baja keras	0,5 – 0,8
Baja sangat keras	0,8 – 1,2

Tabel 2.5 Standar Baja (Sularso & Suga,1993)

Nama	Standar Jepang (JIS)	Standar Amerika (AISI), Inggris (BS), dan Jerman (DIN)
Baja karbon konstruksi mesin	S25C S30C S35C S40C S45C S50C S55C	AISI 1025, BS060A25 AISI 1030, BS060A30 AISI 1035, BS060A35, DIN C35 AISI 1040, BS060A40 AISI 1045, BS060A45, DIN C45, CK45 AISI 1050, BS060A50, DIN St 50.11 AISI 1055, BS060A55
Baja tempa	SF 40,45 50,55	ASTM A105-73
Baja nikel khrom	SNC SNC22	BS 653M31 BS En36
Baja nikel khrom molibden	SNCM 1 SNCM 2 SNCM 7 SNCM 8 SNCM22 SNCM23 SNCM25	AISI 4337 BS830M31 AISI 8645, BS En100D AISI 4340, BS817M40, 816M40 AISI 4315 AISI 4320, BS En325 BS En39B
Baja khrom	SCr 3 SCr 4 SCr 5 SCr21 SCr22	AISI 5135, BS530A36 AISI 5140, BS530A40 AISI 5145 AISI 5115 AISI 5120
Baja khrom molibden	SCM2 SCM3 SCM4 SCM5	AISI 4130, DIN 34CrMo4 AISI 4135, BS708A37, DIN34CrMo4 AISI 4140, BS708M40, DIN42CrMo4 AISI 4145, DIN50CrMo4

Rumus Empiris Gerak Makan per Mata Potong Gurdi (Widarto,2008)

- Untuk baja

$$f = 0.084\sqrt[3]{d}; mm / put \dots\dots\dots(8.2)$$

- Untuk besi tuang

$$f = 0.1\sqrt[3]{d}; mm / put \dots\dots\dots(8.3)$$

Tabel 2.6 Data Material, Kecepatan Potong, Sudut Mata Bor HSS, dan Cairan Pendingin Proses Gurdi (Widarto,2008)

MATERIAL	CUTTING SPEEDS 1.		POINT ANGLE	LIP CLEARANCE	COOLANTS
	(METERS/MINUTE) (FEET/MINUTE)				
	MPM	FPM			
Aluminum And Alloys	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 - 50	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, 0.2-0.3c	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 Brinell	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

Tabel 2.7 Putaran Mesin Gurdi (Dokumentasi : Politeknik Negeri Cilacap)

SPEED CHART . 31

CAUTION: Change speeds only with the machine stopped

50%	60%	BELT POSITION	50%	60%	BELT POSITION
125	150	4-5	710	850	1-6
185	225	3-5	1000	1200	2-7
210	255	4-6	1250	1500	3-8
300	350	2-5	1350	1600	1-7
350	400	3-6	1900	2300	2-8
420	500	4-7	2500	3000	1-8

LAMPIRAN 3

Data Bahan

Data Bahan

TABLE 2
CHEMICAL REQUIREMENTS

Note 1 — Where "... " appears in this table, there is no requirement. The heat analysis for manganese shall be determined and reported as described in the heat analysis section of Specification A 6/A 6M.

Product	Shapes ⁴	Plates ⁵					Bars				
		All	To 3/4 [20], incl	Over 3/4 to 1 1/2 [20 to 40], incl	Over 1 1/2 to 2 1/2 [40 to 65], incl	Over 2 1/2 to 4 [65 to 100], incl	Over 4 [100]	To 3/4 [20], incl	Over 3/4 to 1 1/2 [20 to 40], incl	Over 1 1/2 to 4 [100], incl	Over 4 [100]
				To 3/4 [20], incl	To 3/4 [20], incl	To 3/4 [20], incl			To 3/4 [20], incl		
Carbon, max, %	0.26	0.25	0.25	0.26	0.27	0.29	0.26	0.27	0.28	0.29	
Manganese, %	0.80-1.20	0.80-1.20	0.85-1.20	0.85-1.20	...	0.60-0.90	0.60-0.90	0.60-0.90	
Phosphorus, max, %	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	
Sulfur, max, %	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	
Silicon, %	0.40 max	0.40 max	0.40 max	0.15-0.40	0.15-0.40	0.15-0.40	0.40 max	0.40 max	0.40 max	0.40 max	
Copper, min, % when copper steel is specified	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	

⁴ Manganese content of 0.85-1.35% and silicon content of 0.15-0.40% is required for shapes over 426 lb/ft [634 kg/m].

⁵ For each reduction of 0.01% below the specified carbon maximum, an increase of 0.06% manganese above the specified maximum will be permitted up to the maximum of 1.35%.

2001 SECTION II

ASTM A36 Steel Plate Mechanical Properties

Mechanical Properties Tensile and Yield Strength	
Tensile strength, ksi [MPa]	58-80 [400-550]
Yield point, min, ksi [MPa]	36 [250]
Elongation in 8 in. [200 mm], min, %	20
Elongation in 2 in. [50 mm], min, %	23

AISI/SAE or ASTM Number	Tensile Strength [MPa (ksi)]	Yield Strength [MPa (ksi)]	Ductility [%EL in 50 mm (2 in.)]	Typical Applications
Plain Low-Carbon Steels				
1010	325 (47)	180 (26)	28	Automobile panels, nails, and wire
1020	380 (55)	210 (30)	25	Pipe; structural and sheet steel
A36	400 (58)	220 (32)	23	Structural (bridges and buildings)
A516 Grade 70	485 (70)	260 (38)	21	Low-temperature pressure vessels
High-Strength, Low-Alloy Steels				
A440	435 (63)	290 (42)	21	Structures that are bolted or riveted
A633 Grade E	520 (75)	380 (55)	23	Structures used at low ambient temperatures
A656 Grade 1	655 (95)	552 (80)	15	Truck frames and railway cars

ASTM A36

Kelebihan
Kemampuan mesin dan kemampuan las yang baik
Baja karbon rendah yang sering digunakan untuk pembuatan rangka mesin
Sifatnya mudah dibentuk
Mudah dicari di pasaran

Lampiran 4
Bill Of Materials

Tabel 4.1 *Bill Of Materials*

No	Nama Komponen	Spesifikasi	Satuan	Jumlah	Harga
1	Poros	Ø1" 50	cm	4	Rp. 320.000
2	Pipa besi	Ø4" 60	cm	1	Rp. 160.000
3	Pipa besi	Ø2" 60	cm	1	Rp. 130.000
3	Plat strip	6	m	1	Rp. 170.000
4	Plat besi	1	mm	3	Rp. 150.000
5	Besi siku	4 x 4	cm	3	Rp. 285.000
6	Sabuk dan Puli	3"	inch	4	Rp. 190.000
7	Motor bensin	9 hp	buah	1	Rp. 2.500.000
8	Gearbox	1:30	buah	1	Rp. 675.000
9	Bantalan	UCP 205	buah	6	Rp. 270.000
10	Roda gigi	-	buah	2	Rp. 300.000
11	Cat	Avian	liter	1	Rp.30.000
12	Baut dan mur	M4 dan M6	mm	100	Rp. 110.000
13	Batu gerinda potong	WD 4"	pack	1	Rp. 65.000
14	Batu gerinda	WD 4"	buah	5	Rp. 25.000
15	Elektroda	Kobe steel RB 26	pack	1	Rp. 85.000
16	Karet konveyor	1	cm	1	Rp. 100.000
Total					Rp. 5.565.000

Lampiran 5
Dokumen Produksi

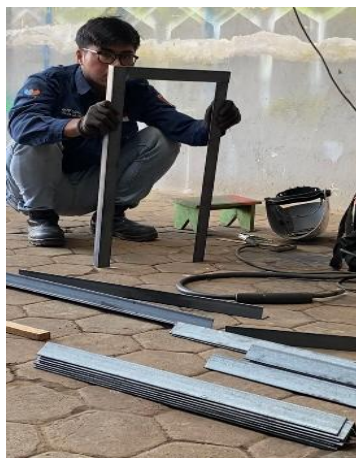


Gambar 5.1 Percobaan pengupasan menggunakan mesin



Gambar 5.2 Hasil pengupasan menggunakan mesin

Proses Produksi Rangka





Proses Produksi Pisau Pengupas





Proses Finishing dan Perakitan





