

LAMPIRAN 1
DATA PERHITUNGAN PROSES BUBUT

LAMPIRAN 1

**TABEL DATA MATERIAL, *CUTTING SPEED*, DAN SPESIFIKASI
KECEPATAN PUTARAN *SPINDLE* MESIN BUBUT**


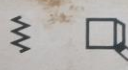
MATERIAL	STRAIGHT TURNING SPEED		THREADING SPEED	
	FEET PER MINUTE	METERS PER MINUTE	FEET PER MINUTE	METERS PER MINUTE
LOW-CARBON STEEL	80-100	24.4-30.5	35-40	10.7-12.2
MEDIUM-CARBON STEEL	60-80	18.3-24.4	25-30	7.6-9.1
HIGH-CARBON STEEL	35-40	10.7-12.2	15-20	4.6-6.1
STAINLESS STEEL	40-50	12.2-15.2	15-20	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 1A Data material dan *cutting speed* proses bubut (Widarto, 2008)

	1	2	3
A	60	220	860
B	92	360	1400
C	140	530	2000

Gambar 1B Variasi kecepatan *spindle* mesin bubut

LONGITUDINAL FEED					TRANSVERSE FEED				
 [mm/rev]					 [mm/rev]				
⊙	M				⊙	M			
	D	E	F	G		D	E	F	G
1	0.044	0.088	0.176	0.352	1	0.020	0.039	0.079	0.158
2	0.050	0.099	0.198	0.396	2	0.022	0.044	0.089	0.178
3	0.052	0.105	0.210	0.420	3	0.023	0.047	0.094	0.188
4	0.055	0.110	0.220	0.440	4	0.024	0.049	0.098	0.196
5	0.060	0.121	0.242	0.484	5	0.027	0.054	0.109	0.218
6	0.063	0.127	0.254	0.508	6	0.028	0.057	0.114	0.228
7	0.066	0.132	0.264	0.528	7	0.029	0.059	0.118	0.236
8	0.072	0.144	0.287	0.574	8	0.032	0.064	0.128	0.256
9	0.075	0.149	0.298	0.596	9	0.033	0.067	0.134	0.268
10	0.077	0.154	0.308	0.616	10	0.034	0.069	0.138	0.276
11	0.083	0.166	0.331	0.662	11	0.037	0.074	0.148	0.296

Gambar 1C Variasi *feeding* mesin bubut

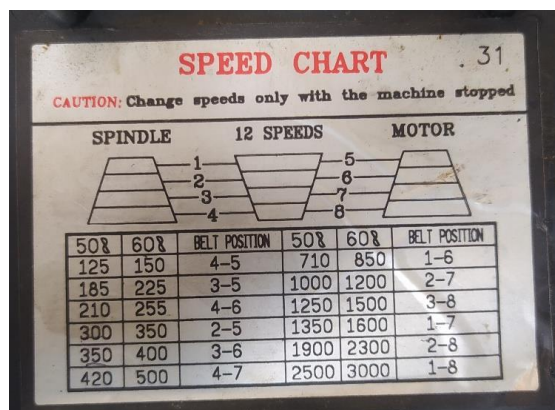
LAMPIRAN 2
DATA PERHITUNGAN PROSES GURDI

LAMPIRAN 2

TABEL DATA MATERIAL, *CUTTING SPEED*, DAN SPESIFIKASI KECEPATAN PUTARAN *SPINDLE* MESIN GURDI

MATERIAL	CUTTING SPEEDS I.		POINT ANGLE	LIP CLEARANCE	COOLANTS
	(METERS/MINUTE) MPM	(FEET/MINUTE) 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, 0.2-0.3ct	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 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

Gambar 2A Data material dan *cutting speed* proses gurdi (Widarto, 2008)



Gambar 2B Variasi kecepatan *spindle* mesin gurdi

- Untuk baja

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

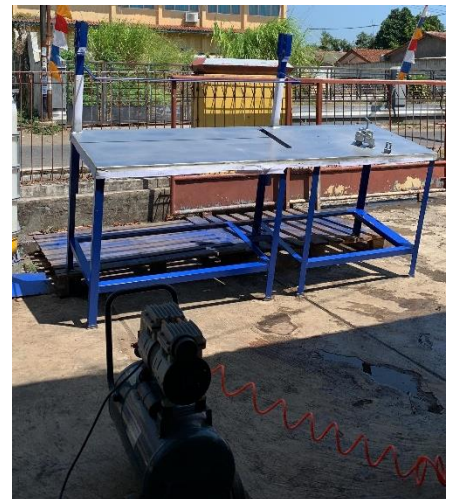
- Untuk besi tuang

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

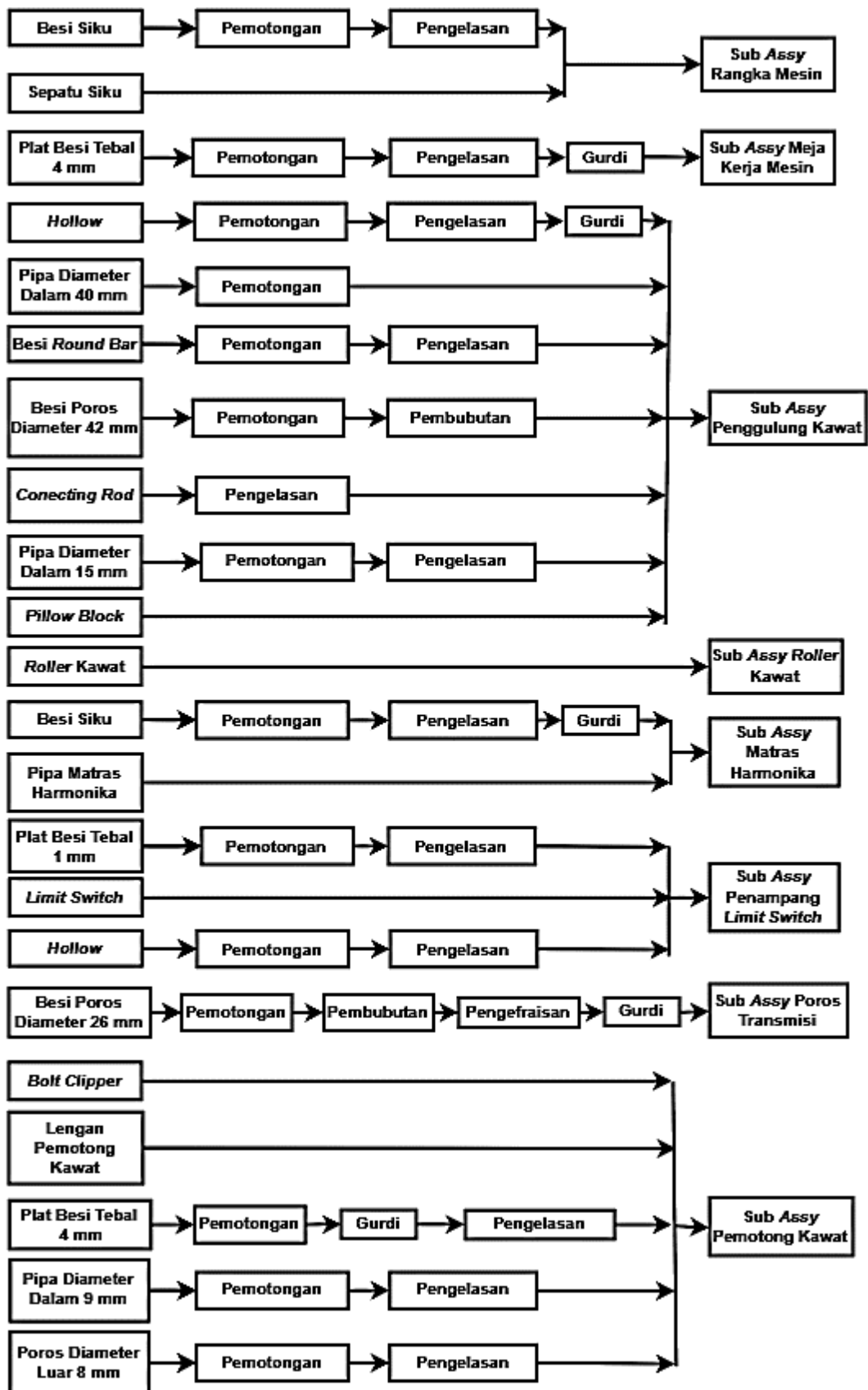
Gambar 2C Rumus empiris gerak makan gurdi (Widarto, 2008)

LAMPIRAN 3
DATA PERHITUNGAN PROSES FRAIS

LAMPIRAN 4
DOKUMENTASI PROSES PRODUKSI



LAMPIRAN 5
FLOW OF PROCES



LAMPIRAN 6
TABLE OF MATERIALS

NO	SUB ASSY	KOMPONEN
1.	Rangka Mesin	Besi Siku 40 mm x 40 mm
2.	Meja Kerja Mesin	Plat Besi Tebal 4 mm (2000 mm x 60 mm)
3.	Penggulung Kawat	Pipa Besi Diameter dalam 40 mm <i>Hollow</i> 40 mm x 40 mm Besi Poros Diameter 40 mm Besi <i>Round Bar</i> 10 mm <i>Pillow Block</i> UCF 204 <i>Conecting Rod</i> Pipa Diameter Dalam 15 mm
4.	<i>Roller Kawat</i>	Komponen dibeli jadi
5.	Matras Harmonika	Pipa Matras Ulir (Komponen dibeli jadi)
6.	Penampang <i>Limit Switch</i>	Plat Besi Tebal 1 mm
7.	Poros Transmisi	Besi Poros Diameter 25 mm
8.	Pemotong Kawat	<i>Bolt Clipper</i> (Komponen dibeli jadi) Lengan Pemotong Kawat (Komponen dibeli jadi) Plat Tebal 4 mm Pipa Diameter Dalam 9 mm Poros Diameter Luar 8 mm

LAMPIRAN 7
BIODATA PENULIS

LAMPIRAN 7
BIODATA PENULIS



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redup namun tidak pernah padam.
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1. SD Negeri 5 Gumilir
2. SMP Negeri 5 Cilacap
3. SMK Negeri 2 Cilacap