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LAMPIRAN 1 BAHAN-BAHAN UNTUK POMPA YANG UMUM DIGUNAKAN

Tabel 2.26 Bahan-bahan untuk pompa yang umum dipakai.

Nomor kelompok	Frekuensi	Rumah (casing)	Impeler	Pemakaian
A–1	○	FC	FC	Air tawar, air minum
A–2		FC	FCD	Air tawar, air minum
A–3	○	FC	SC	Air tawar, air minum
A–4	○	FC	BC	Air tawar, air minum Air laut
A–5	○	FC	PBC	Air tawar, air limbah Air laut
A–6	○	FC	ABC	Air tawar, air limbah Air laut
A–7	○	FC	SCS2	Air tawar, air minum Air limbah
A–8	○	FC	SCS12 or SCS13	Air limbah, air laut
A–9		FC berlapis karet	SCS12 or SCS13	Air distilasi, air laut
B–1	○	SC	SC	Air tawar, air laut
B–2		SC	ABC	Air tawar, air minum Air laut
B–3	○	SC	SCS2	Air tawar, air minum Air limbah
B–4		SC	SCS12 or SCS13	Air limbah, air laut
B–5		SC	SCS14 or SCS15	Air laut
C–1	○	BC	BC	Air distilasi, air laut
C–2		BC	PBC	Air laut
C–3		ABC	ABC	Air laut
D–1		SCS2	SCS2	Air limbah, air laut
D–2		SCS2	SCS12 or SCS13	Air limbah, air laut
D–3		SCS2	SCS14 or SCS15	Air laut
D–4	○	SCS12 or SCS13	SCS12 or SCS13	Air laut
D–5		SCS12 or SCS13	SCS14 or SCS15	Air laut
D–6		SCS12 or SCS13	Worthite	Air laut
E–1	○	SS	SC	Air tawar
E–2	○	SS	SCS2	Air tawar, air minum
E–3		SUS27	SCS13	Air tawar, air minum Air laut

1. Frekuensi dengan tanda "○" berarti bahan sering dipakai.
2. FC (besi cor) menyatakan FC15, FC20, FC25, dan FC25 Ma.
3. BC (perunggu cor) menyatakan BC2 dan BC3.
4. SC berarti baja karbon cor.
5. ABC berarti perunggu aluminium cor.
6. SS berarti plat baja.
7. Nomor kelompok besar berarti bahan dengan mutu lebih tinggi.

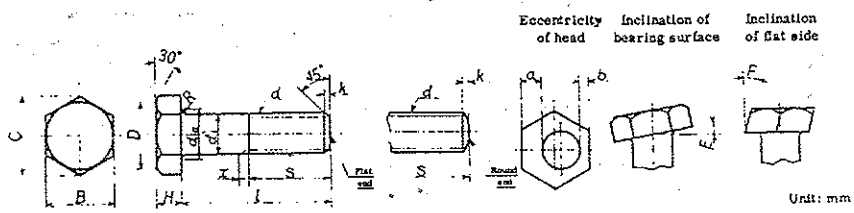
Sumber :

Sularso, *Dasar Perencanaan dan Pemilihan Elemen Mesin*, Pradnya Paramita, Jakarta, 1991

LAMPIRAN 2 STANDAR MUR DAN BAUT

UNIVERSITAS
GADJAH MADA

Attached Table 1.3 Hexagon Head Bolt, Regular



Unit: mm

Nominal size of thread (d)		d_1		H		B		C	D	R	d_s	k	$a-b$	E & F
Coarse	Fine	Basic dimension	Tolerance	Basic dimension	Tolerance	Basic dimension	Tolerance	Approx.	Approx.	Min.	Max.	Approx.	Max.	Max.
M 6	—	6	+0.6 −0.15	4	± 0.6	10	0 −0.6	11.5	9.8	0.25	7.2	1	0.5	2°
(M 7)	—	7	+0.7 −0.2	5		11	0 −0.7	12.7	10.7	0.25	8.2	1	0.5	
M 8	M 8×1	8		5.5		13		15	12.6	0.4	10.2	1.2	0.6	
M 10	M 10×1.25	10		7	± 0.8	17		19.6	16.5	0.4	12.2	1.5	0.7	
M 12	M 12×1.25	12	+0.9 −0.2	8		19	0 −0.8	21.9	18	0.6	15.2	2	1	
(M 14)	(M 14×1.5)	14		9		22		25.4	21	0.6	17.2	2	1.1	
M 16	M 16×1.5	16		10		24		27.7	23	0.6	19.2	2	1.2	
(M 18)	(M 18×1.5)	18		12		27		31.2	26	0.6	21.2	2.5	1.4	
M 20	M 20×1.5	20	+0.95 −0.35	13	± 0.9	30		34.6	29	0.8	24.4	2.5	1.5	
(M 22)	(M 22×1.5)	22		14		32	0 −1	37	31	0.8	26.4	2.5	1.6	
M 24	M 24×2	24		15		36		41.6	34	0.8	28.4	3	1.8	
(M 27)	(M 27×2)	27		17		41		47.3	39	1	32.4	3	2	
M 30	M 30×2	30		19	± 1	46		53.1	44	1	35.4	3.5	2.2	
(M 33)	(M 33×2)	33	+1.2 −0.4	21		50		57.7	48	1	38.4	3.5	2.4	
M 36	M 36×3	36		23		55	0 −1.2	63.5	53	1	42.4	4	2.6	
(M 39)	(M 39×3)	39		25		60		69.3	57	1	45.4	4	2.8	
M 42	—	42		26		65		75	62	1.2	48.6	4.5	3.1	
(M 45)	—	45		28		70		80.8	67	1.2	52.6	4.5	3.3	
M 48	—	48		30		75		86.5	72	1.6	56.6	5	3.6	
(M 52)	—	52	+1.2 −0.7	33	± 1.5	80		92.4	77	1.6	62.6	5	3.8	

Remarks 1. The nominal sizes of thread given in parentheses shall not be used as possible.

2. The nominal length (l), effective thread length (s) and transitional thread length (x) shall be in accordance with Attached Table 3.

3. The bolt ends shall be finished flat or round, but the purchaser may specify either one. However, the M 6 bolts shall have their ends unfinished, unless particularly specified to be finished.

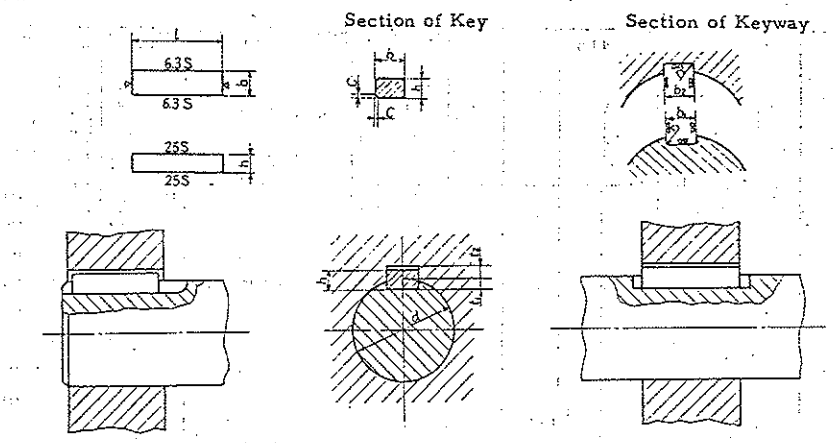
4. Where a larger bearing surface is particularly required, the dimensions B and C for the next larger bolt may be used.

References 1. The dimensions H and B conform to the specifications in ISO R 272-1968.

2. The dimension d_s conform to the specifications for regular products in ISO R 885-1968.

Sumber : JIS HANDBOOK 1981

LAMPIRAN 5 PASAK PARALEL DAN ALUR PASAK

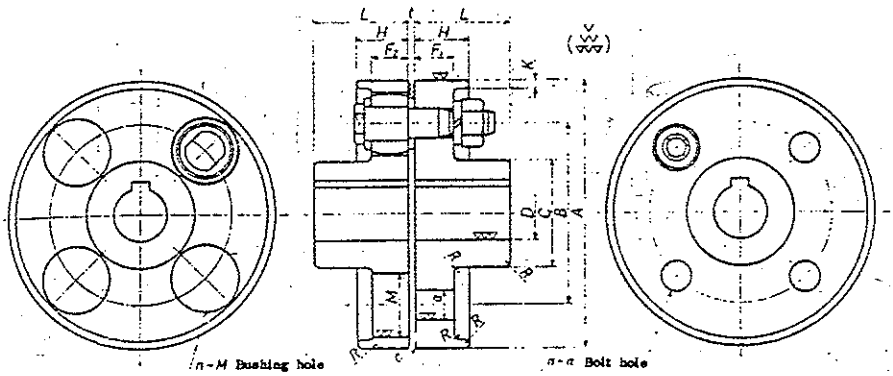


Unit: mm

Nominal size of key b×h	Dimension of key: b Basic dimension	b Tolerance (h 9)	h Basic dimension	h Tolerance	c	l(*)	Dimension of keyway: Basic dimension of b1 and b2	Close grade b1 and b2 Tolerance (P 9)	Normal grade b1 Tolerance (N 9)	Normal grade b2 Tolerance (Js 9)	r1 and r2	Basic dimension of t1	Basic dimension of t2	Tolerance of t1 and t2	Applicable shaft dia. (*)
2×2	2	0 −0.025	2	0 −0.025	0.16 ~0.25	6~20	2	−0.006 −0.031	−0.004 −0.029	±0.0125	0.08 ~0.16	1.2	1.0	+0.1 0	6~8
3×3	3		3			6~36	3					1.8	1.4		8~10
4×4	4	0 −0.030	4	0 −0.030		8~45	4	−0.012 −0.042	0 −0.030	±0.0150		2.5	1.8		10~12
5×5	5		5		0.25 ~0.40	10~56	5				0.16 ~0.25	3.0	2.3		12~17
6×6	6		6			14~70	6					3.5	2.8		17~22
(7×7)	7	0 −0.036	7	0 −0.036		16~80	7	−0.015 −0.051	0 −0.036	±0.0180		4.0	3.0	+0.2 0	20~26
8×7	8		7	h 11		18~90	8					4.0	3.3		22~30
10×8	10		8		0.40 ~0.60	22~110	10					5.0	3.3		30~38
12×8	12	0 −0.043	8	0 −0.090		28~140	12	−0.018 −0.061	0 −0.043	±0.0215	0.25 ~0.40	5.0	3.3		38~44
14×9	14		9			36~160	14					5.5	3.8		44~50
(15×10)	15		10			40~180	15					5.0	5.0		50~58
16×10	16		10			45~180	16					6.0	4.3		50~58
18×11	18		11	h 11		50~200	18					7.0	4.4		58~65
20×12	20	0 −0.052	12	0 −0.110	0.60 ~0.80	56~220	20	−0.022 −0.074	0 −0.052	±0.0260	0.40 ~0.60	7.5	4.9		65~75
22×14	22		14			63~250	22					9.0	5.4		75~85
(24×16)	24		16			70~280	24					8.0	8.0		80~95
25×14	25		14			78~280	25					9.0	5.4		85~95
28×16	28		16			80~320	28					10.0	6.4		95~110
32×18	32	0 −0.062	18			90~360	32	−0.026 −0.088	0 −0.062	±0.0310		11.0	7.4		110~

Sumber : JIS HANDBOOK 1981

LAMPIRAN 4 KOPLING FLENS FLEKSIBEL



Remark: The bolt holes shall be arranged approximately symmetrically with respect to the key way.

Unit: mm

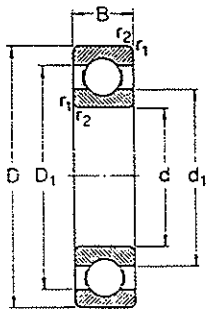
Nominal diameter of coupling A	D: Largest shaft-hole diameter	D: Smallest shaft-hole diameter	L	C	B	F_1	F_2	H	K	(1) n (number)	d	M	(2) t	Reference: K (Approx. R)	Reference: c (Approx. R)	Reference: Diameter and length of bolt
90	18	—	28	35.5	60	14	14	20	4	4	8	19	3	2	1	50
100	22	—	35.5	40	67	16	16	22.4	4	4	10	23	3	2	1	56
112	25	16	40	45	75	16	16	22.4	4	4	10	23	3	2	1	56
125	28	18	45	50	85	18	18	25	4	4	14	32	3	2	1	64
140	35	20	50	63	100	18	18	25	4	6	14	32	3	2	1	64
160	45	25	56	80	115	18	18	25	6	8	14	32	3	3	1	64
180	50	28	63	90	132	18	18	25	6	8	14	32	3	3	1	64
200	56	32	71	100	145	22.4	22.4	31.5	6	8	20	41	4	3	1	85
224	63	35	80	112	170	22.4	22.4	31.5	6	8	20	41	4	3	1	85
250	71	40	90	125	180	28	28	40	8	8	25	51	4	4	1	100
280	80	50	100	140	200	28	40	45	8	8	28	57	4	4	1	116
315	90	63	112	160	236	28	40	45	8	10	28	57	4	4	1	116
355	100	71	125	180	260	35.5	56	63	10	8	35.5	72	5	5	1	150
400	110	80	125	200	300	35.5	56	63	10	10	35.5	72	5	5	1	150
450	125	90	140	224	355	35.5	56	63	10	12	35.5	72	5	5	1	150
560	140	100	160	250	450	35.5	56	63	12	14	35.5	72	5	6	1	150
630	160	110	180	280	530	35.5	56	63	12	18	35.5	72	5	6	1	150

Notes (1) The letter n indicates the number of bush holes or bolt holes.
(2) The letter t indicates the clearance produced at the time of assembling the coupling bodies, and is equivalent to the thickness of coupling bolt washer.

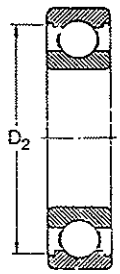
Remarks 1. The drawn-out length of bolt indicates the dimension from the shank end.
2. The screw hole to facilitate the drawing out of a coupling from a shaft is allowed to make optionally.

Sumber : JIS HANDBOOK 1981

LAMPIRAN 5 BANTALAN BOLA ALUR DALAM



With full outer ring shoulders



With recessed outer ring shoulders

Principal dimensions			Basic load ratings dynamic	static	Fatigue load limit	Speed ratings Lubrication grease	oil	Mass	Designation
d	D	B	C	C_0	P_u				
mm			N		N	r/min		kg	–
15	24	5	1 560	800	34	28 000	34 000	0,0074	61802
	28	7	4 030	2 040	85	24 000	30 000	0,016	61902
	32	8	5 590	2 850	120	22 000	28 000	0,025	16002
	32	9	5 590	2 850	120	22 000	28 000	0,030	6002
	35	11	7 800	3 750	160	19 000	24 000	0,045	6202
	42	13	11 400	5 400	228	17 000	20 000	0,082	6302
17	26	5	1 680	930	39	24 000	30 000	0,0082	61803
	30	7	4 360	2 320	98	22 000	28 000	0,018	61903
	35	8	6 050	3 250	137	19 000	24 000	0,032	16003
	35	10	6 050	3 250	137	19 000	24 000	0,039	6003
	40	12	9 560	4 750	200	17 000	20 000	0,065	6203
	47	14	13 500	6 550	275	16 000	19 000	0,12	6303
	62	17	22 900	10 800	455	12 000	15 000	0,27	6403
20	32	7	2 700	1 500	63	19 000	24 000	0,018	61804
	37	9	6 370	3 650	156	18 000	22 000	0,038	61904
	42	8	6 890	4 050	173	17 000	20 000	0,050	16004
	42	12	9 360	5 000	212	17 000	20 000	0,069	6004
	47	14	12 700	6 550	280	15 000	18 000	0,11	6204
	52	15	15 900	7 800	335	13 000	16 000	0,14	6304
	72	19	30 700	15 000	640	10 000	13 000	0,40	6404
25	37	7	4 360	2 600	125	17 000	20 000	0,022	61805
	42	9	6 630	4 000	176	16 000	19 000	0,045	61905
	47	8	7 610	4 750	212	14 000	17 000	0,060	16005
	47	12	11 200	6 550	275	15 000	18 000	0,080	6005
	52	15	14 000	7 800	335	12 000	15 000	0,13	6205
	62	17	22 500	11 600	490	11 000	14 000	0,23	6305
	80	21	35 800	19 300	815	9 000	11 000	0,53	6405
30	42	7	4 490	2 900	146	15 000	18 000	0,027	61806
	47	9	7 280	4 550	212	14 000	17 000	0,051	61906
	55	9	11 200	7 350	310	12 000	15 000	0,085	16006
	55	13	13 300	8 300	355	12 000	15 000	0,12	6006
	62	16	19 500	11 200	475	10 000	13 000	0,20	6206
	72	19	28 100	16 000	670	9 000	11 000	0,35	6306
	90	23	43 600	23 600	1 000	8 500	10 000	0,74	6406

Sumber : KATALOG SKF

LAMPIRAN 6 KARAKTERISTIK LOGAM BAJA

Table A-1 (continued)

Identification Number or Specification	Modulus of Elast. in Tension, psi	Tensile Strength, ksi	Yield Strength, ksi	Elongation in 2 in., %	Hardness BHN	Endurance Limit, ksi	Modulus of Elast. in Compression, ksi	Compressive Strength, ksi	Shear Strength, ksi	Impact Strength, (Charpy), ft-lb
	Cast Alloy Steels[b]									
Class 65,000	30 X 10⁶	68[c]	38	32	137	32	—	—	—	60
Class 80,000	30 X 10⁶	86[c]	54	24	170	39	—	—	—	48
Class 105,000	30 X 10⁶	110[c]	91	21	217	53	—	—	—	58
Class 150,000	30 X 10⁶	158[d]	142	13	311	74	—	—	—	30
Class 200,000	30 X 10⁶	205[d]	170	8	401	88	—	—	—	14
	Cast Carbon Steels									
Class 60,000[e]	30 X 10⁶	63	35	30	131	30	—	—	—	12
Class 70,000[f]	30 X 10⁶	75	42	27	143	35	—	—	—	30
Class 85,000[e]	30 X 10⁶	90	55	20	179	39	—	—	—	26
Class 100,000[d]	30 X 10⁶	105	75	19	212	45	—	—	—	40
	Alloy Cast Irons									
Ni-Hard Type 2[g]	25 X 10⁶	60	—	—	575	—	—	—	—	38
Duriron[h]	23 X 10⁶	16	—	—	520	—	—	—	—	3
Ni-Resist Type 1[i]	16 X 10⁶	27	—	—	150	—	—	—	—	60
	Cast Stainless Steels									
CB-30[e]	29 X 10⁶	95	60	15	195	—	—	—	—	
CF-8M[j]	28 X 10⁶	80	42	50	163	—	—	—	—	70
CF-20[j]	28 X 10⁶	77	36	50	163	—	—	—	—	75
CN-7M[j]	24 X 10⁶	69	32	48	130	—	—	—	—	70

Aaron deutschman, Machine Design, Mac Millan Company, New York, 1975

LAMPIRAN 7 KEKUATAN BESI COR KELABU

9 JIS G 5501. Besi cor kelabu.

Lambang	Tebal utama coran (mm)	Kekuatan tarik (kg/mm^2)	Kekerasan (kg/mm^2)
FC 20	4–8	24	255 atau kurang
	8–15	22	235 "
	15–30	20	223 "
	30–50	17	217 "
FC 25	4–8	28	269 "
	8–15	26	248 "
	15–30	25	241 "
	30–50	22	229 "
FC 30	8–15	31	269 "
	15–30	30	262 "
	30–50	27	248 "
FC 35	15–30	35	277 "
	30–50	32	269 "

Sumber :
Sularso, *Dasar Perencanaan dan Pemilihan Elemen Mesin*, Pradnya Paramita, Jakarta, 1991

LAMPIRAN 8 SIFAT BAHAN PERUNGGU FOSFOR

44 JIS H 5113. Perunggu fosfor cor.

Lambang	Cetakan	Unsur Kimia (%)				Kekuatan tarik (kg/mm^2)	Kekerasan (H_B)
		Cu	Sn	P	Kotoran		
PBC 2A	Pasir	87,0–91,0	9,0–12,0	0,05–0,20	1,0 atau kurang	20	60
PBC 2B	Logam	87,0–91,0	9,0–12,0	0,15–0,50	1,0 -	30	80
PBC 2C	Logam	84,0–88,0	12,0–15,0	0,10–0,50	1,0 -	–	90

Sumber :
Sularso, *Dasar Perencanaan dan Pemilihan Elemen Mesin*, Pradnya Paramita, Jakarta, 1991

LAMPIRAN 10 PUTARAN MOTOR INDUKSI 3 PHASE

Operating Values of Surface Cooled Three-Phase Squirrel Cage Motor

Size	P_N in kW	n min^{-1} (rpm)	I_N at 380 V in A	M_N in Nm	η in %	cos φ	$\frac{I_A}{I_N}$	$\frac{M_A}{M_N}$	$\frac{M_K}{M_N}$	m in kg
n_t = 3000 min^{-1} (rpm)										
63	0,25	2765	0,71	086	66	0,81	4,3	2,3	2,3	4,1
71	0,55	2800	1,45	1,9	71	0,85	4,9	2,3	2,3	6,6
80	0,75	2850	1,83	2,5	74	0,84	6,0	2,4	2,3	8,2
80	1,1	2850	2,55	3,7	77	0,85	6,1	2,4	2,3	9,9
90S	1,5	2860	3,6	5,0	77	0,82	6,2	2,5	2,5	12,9
90L	2,2	2860	4,8	7,4	82	0,85	6,8	2,8	2,8	15,7
100L	3	2895	6,4	9,8	83	0,86	7,2	2,4	2,6	21
112M	4	2895	8,2	13	84	0,88	7,6	2,4	2,8	25
132S	5,5	2925	11,2	18	85	0,88	7,0	2,2	2,8	43
132S	7,5	2930	14,9	25	87	0,88	7,7	2,5	3,0	50
160M	11	2935	22,5	36	88	0,84	6,5	2,1	2,6	71
160M	15	2940	30	49	90	0,85	7,1	2,3	2,6	82
160L	18,5	2940	36	60	91	0,86	7,6	2,5	2,9	99
180M	22	2940	41	71	91,5	0,89	6,9	2,5	3,0	165
n_t = 1500 min^{-1} (rpm)										
71	0,25	1325	0,79	1,8	62	0,78	3,2	1,7	1,7	4,8
80	0,55	1400	1,47	3,7	71	0,80	4,7	2,3	2,4	8,0
80	0,75	1400	1,95	5,1	74	0,80	5,0	2,5	2,6	9,4
90S	1,1	1410	2,8	7,5	75	0,81	5,0	2,1	2,5	12,3
90L	1,5	1405	3,7	10	75	0,82	4,9	2,2	2,6	15,6
100L	2,2	1415	5,2	15	79	0,82	6,0	2,2	2,6	22
100L	3	1415	6,8	20	81	0,83	6,2	2,7	3,0	24
112M	4	1435	9,2	27	83	0,80	7,0	2,9	3,0	29
132S	5,5	1450	11,7	36	84	0,85	7,0	2,2	2,8	39
132M	7,5	1450	15,6	49	86	0,85	7,6	2,4	3,3	53
160M	11	1460	22,5	72	88	0,84	7,6	2,4	3,0	74
160L	15	1460	30	98	89	0,85	7,7	2,2	2,9	90
180M	18,5	1455	37	121	90,5	0,84	6,2	2,6	2,5	165
180L	22	1455	43	144	91,2	0,85	6,4	2,6	2,5	180
n_t = 1000 min^{-1} (rpm)										
71	0,25	860	0,88	2,7	60	0,72	3,0	2,0	2,0	6,3
80	0,55	900	1,84	5,8	63	0,72	3,2	2,0	2,1	9,4
90S	0,75	905	2,2	8,0	71	0,75	3,9	2,2	2,3	12,5
90L	1,1	900	3,1	12	72	0,75	4,1	2,4	2,4	15,7
100L	1,5	925	4,0	15	76	0,76	4,5	2,0	2,1	22
112M	2,2	940	5,9	22	77	0,73	5,1	2,2	2,5	25
132S	3	955	7,6	30	80	0,75	5,5	2,0	2,4	38
132M	4	960	9,5	40	83	0,76	6,2	2,4	2,8	43
132M	5,5	960	13,1	55	84	0,76	6,4	2,6	3,0	51
160M	7,5	965	18,1	74	84	0,75	6,4	2,3	3,0	73
160L	11	965	24,3	108	88	0,78	7,2	2,7	3,0	99
180L	15	970	31	148	89	0,83	5,7	2,6	2,4	170
200L	18,5	975	37,5	181	90	0,83	5,7	2,6	2,3	220
200L	22	975	44	215	90,5	0,84	5,7	2,6	2,3	235

Sumber : Tables for The Electric Trade, Deutsche Gesellschaft Fur technische Zusammenarbeit (GTZ) Gmbh, Germany, 1985

LAMPIRAN 9 SIFAT-SIFAT BERBAGAI LOGAM

Material	Modulus of Elasticity in Tension, psi	Shear Modulus of Elasticity, psi	Poisson's Ratio	Density lb/in.^{3}	Coefficient of Thermal Expansion, in./in./°F	Thermal Conductivity Btu/hr/ ft^2/°F/ft.	Specific Heat Btu/lb/°F	Melting Point[a] °F
Gray cast iron	See Table A-1	5.5 X 10^6 Cl.20 8.0 X 10^6 Cl.50	0.27	0.260	6.7 X 10^{-6}	29.0	—	2150
Malleable cast iron	See Table A-1	12.5 X 10^6	0.27	0.264	5.9 X 10^{-6} , - 7.5 X 10^{-6}[b]	29.5	0.122	2250
Nodular or ductile iron	See Table A-1	9.3 X 10^6	0.29	0.251	6.6 X 10^{-6} - 10.4 X 10^{-6}[b]	19.0	—	2150
Cast alloy steels	See Table A-1	11.3 X 10^6	0.33	0.283	8.1 X 10^{-6}	27.0	0.105	2740
Cast carbon steels	See Table A-1	11.3 X 10^6 [c]	0.33[c]	0.283	8.3 X 10^{-6}	27.0	—	2250
Alloy cast irons	See Table A-1	11.3 X 10^6 [c]	0.33[c]	0.266	4.5 X 10^{-6} - 10.7 X 10^{-6}[b]	—	—	2500[c]
Cast stainless steels	See Table A-1	11.5 X 10^6 [c]	0.26[c]	0.280	6.4 X 10^{-6} - 10.4 X 10^{-6}[b]	8.2 - 14.5[b]	0.125	2750
Plain carbon steels	30 X 10^6	11.5 X 10^6	0.27-0.30	0.283	6.7 X 10^{-6} - 8.1 X 10^{-6}	27.0	0.105	2775
Alloy steels	30 X 10^6	11.5 X 10^6	0.27-0.30	0.280	6.3 X 10^{-6} - 8.6 X 10^{-6}[b]	21.7 - 38.5[b]	0.110	2760
Wrought stainless steels	28.5 X 10^6	11.5 X 10^6	0.26	0.290	e	f, b	0.120	g
Wrought aluminum alloys	10.3 X 10^6	3.8 X 10^6	0.36	0.097	13 X 10^{-6}	67.4-135[b]	0.230	1215
Cast aluminum alloys	10.3 X 10^6	3.8 X 10^6	0.36	0.097	12.6 X 10^{-6}	66.6	0.230	1195
Wrought copper alloys	15.5 X 10^6	5.8 X 10^6	0.33	0.305	11.0 X 10^{-6}	d	0.090	d
Cast copper base alloys	See Table A-10	5.4 X 10^6	0.33	0.303	10.1 X 10^{-6}	d	0.090	d
Nickel base alloys	See Table A-13	—	0.34	0.304	7.6 X 10^{-6}	d	0.100	d
Wrought and cast magnesium alloys	6.5 X 10^6	2.4 X 10^6	0.35	0.065	14.4 X 10^{-6}	d	0.250	1200

SOURCE: Data was compiled from the *1973 Materials Selector*, Reinhold Publishing Co., New York, and *Properties of Some Metals and Alloys*, International Nickel Co., Inc.

NOTE: The values listed are average values except as indicated.

[a]These are max. values

[b]Where two values are given, they are respectively the low and high values and are too wide for a meaningful average. The reader should refer to the ASM Handbook, Vol 1 for detailed and specific data.

[c]These are approximate values.

[d]Refer to ASM Handbook, Vol. 1 for values of particular materials.

[e] Ferritic Stainless Steel: 5.6 X 10^{-6}; Martensitic Stainless Steel: 6.0 X 10^{-6}; Austenitic Stainless Steel: 9.4 X 10^{-6}

[f] Ferritic Stainless Steel: 12.1 – 15.1; Martensitic Stainless Steel: 11.7 – 21.2; Austenitic Stainless Steel: 8.0 – 9.4

[g] Ferritic Stainless Steel: 2790; Martensitic Stainless Steel: 2800; Austenitic Stainless Steel: 2650

[h]At room temperature

Sumber :

Aaron deutschman, Machine Design, Mac Millan Company, New York, 1975

LAMPIRAN II SIFAT BAHAN BAJA KARBON YANG DIFINIS DINGIN

2 JIS G 3123. Batang baja karbon difnis dingin (Sering dipakai untuk poros).

Lambang	Perlakuan panas	Diameter (mm)	Kekuatan tarik (kg/mm²)	Kekerasan	
				H_RC (H_RB)	H_B
S35C-D	Dilunakkan	20 atau kurang	58–79	(84)–23	–
		21–80	53–69	(73)–17	144–216
	Tanpa dilunakkan	20 atau kurang	63–82	(87)–25	–
		21–80	58–72	(84)–19	160–225
S45C-D	Dilunakkan	20 atau kurang	65–86	(89)–27	–
		21–80	60–76	(85)–22	166–238
	Tanpa dilunakkan	20 atau kurang	71–91	12 –30	–
		21–80	66–81	(90)–24	183–253
S55C-D	Dilunakkan	20 atau kurang	72–93	14 –31	–
		21–80	67–83	10 –26	188–260
	Tanpa dilunakkan	20 atau kurang	80–101	19 –34	–
		21–80	75–91	16 –30	213–285

Sumber :
Sularso, *Dasar Perencanaan dan Pemilihan Elemen Mesin*, Pradnya Paramita, Jakarta, 1991

LAMPIRAN 12 STANDAR KEPALA BAUT DAN MUR

Screws and Nuts

Cheese head screw with slot	Countersunk screw with slot	Oval head countersunk screw with slot	Hexagon head screw	Capstan headed screw
DIN 84	DIN 963	DIN 964	DIN 931	DIN 404
Socket head cap screw	Countersunk Phillips screw	Oval head countersunk Phillips screw	Hexagon cap fitting bolt	High knurled screw with slot
DIN 912	DIN 965	DIN 966	DIN 609	DIN 465
Wing screw	Truss-head screw with square neck	Headless screw	Stone screw	Ring screw
DIN 316	DIN 603	DIN 427	DIN 529	DIN 580
Button head wood screw with slot	Countersunk wood screw with slot	Hexagon head wood screw	Button headed nail screw	Cheese head tap screw with slot
DIN 96	DIN 97	DIN 571	DIN 7514	DIN 7971

Hexagonal nuts	Castellated nuts	Cap nuts	Capstan nut	Slotted nut
DIN 934 self-locking	DIN 937	DIN 917	DIN 548	DIN 546
DIN 985	DIN 935	DIN 1587	Two-hole nut: DIN 547	Flat knurled nut: DIN 467

Coding of screws and nuts

Example: Hexagon screw DIN 931 – A M 10 x 80 – 8.8 m

- Designation
- DIN-Sheet
- Type
- Thread type
- Nominal diameter (without header)
- Screw length
- Property class
- Quality

Property classes for screws made of steel DIN ISO 898 P. 1/4.79

Property classes	3.6	4.6	4.8	5.6	5.8	6.8	6.9	8.8	10.9	12.9
R_m in N/mm²	340	400		500		600		800	1000	1200
R_e in N/mm²	200	240	320	300	400	480	540	640	900	1080
A_5 in %	25	25	14	20	10	8	12	12	9	8

Property classes for nuts made of steel DIN ISO 898 P. 2/3.81

Property classes	4	5	6	8	10	12
Test voltage in N/mm²	400	500	600	800	1000	1200

For screws and nuts made of non-ferrous metals, the appropriate material is specified instead of the property class.

Performance quality for screws and nuts

Quality class Symbol	fine f	med. m	medium coarse mg	coarse g

Thread lengths of screws, types of the screws

Type	A	B
Model	Thread up to head	Cheese head screw with shaft

Sumber : Tables for The Electric Trade, Deutsche Gesellschaft Fur technische Zusammenarbeit (GTZ) Gmbh, Germany, 1985