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LAMPIRAN

LSTROM MACHINERY
)DUCT SPECIFICATION

Description	APP42-150
Serial Number	95 119767
Time of delivery/EXW	9534
Date printed	21.06.95

ner
IDAH KIAT PULP & PAPER

SIA

order # 312-A-0626
PO Line #
y code ID

Ahlstrom Pte Ltd

9 Scotts Road
10-01/03 Pacific Plaza
SINGAPORE 0922

Equipment No 312-A-0644

C E S S D A T A

liquid	PULP	Efficiency	79,7 %
ty Q	133,3 l/s	Pump rotational speed	1470 1/min
	30 m	Motor power	55 kW
ower P	50 kW	Version	06
ump power	50 kW	Pump Size	APP42-150

r	Ahlstrom Mantta	Shaft material	SS2324
	06	Gasket Material	Klinger SIL C-4430
ze	APP42-150	O-ring Material	NBR
eristic curve	"1500" rpm	Flange Drilling	ISO 2084 PN 10
r Type	Closed	Bearing unit supplied by	Ahlstrom production unit
r No.	283921	Bearing Unit Lubrication	Grease lubrication
r Dia.	340 mm	Measuring stud 699	Yes
r turning angle	9 o	Shaft Seal Fitting	P02
Material	A890 3A		

T I N G

	E180/3-Fe Sa2 1/2 SFS4962
ade	NCS 1700

erson	CHIA SOO MENG	LBU Order #	ASI/125/95
Pte Ltd		LBU Position	4
		Telephone	
Road			

Lampiran 1. Data-data perencanaan

Sumber : PT. Indah Kiat Pulp and Paper Corp.

4. Norden Number

Adalah angka yang menunjukkan kesetaraan suatu filter dengan jumlah filter standar yang dipasang counter current untuk menghasilkan pulp dengan tingkat kebersihan pulp yang sama.

Nordin Number untuk:
Vacuum Drum Washer= 2.5 - 4
Single Stage Diffuser= 3 - 5
Kamyr Digester - hr wash= 7 - 11
Pressure Washer= 3 - 6

Semakin besar Norden Number berarti semakin bagus filter tersebut.

III. BLEACHING

Chlorinasi

Tujuan:
Memisahkan lignin dari serat (delignifikasi) dengan memakai Cl_2.
Kondisi proses:

- Temperaturnya sama dengan temperatur udara luar
- Konsistensi sekitar 3 - 5%
- Waktu reaksi antara 1 sampai 2
- Banyaknya pemakaian tergantung dari Kappa Number, yaitu dengan menggunakan istilah Kappa Factor

$$\text{Kappa Number} = \frac{\%\ \text{Chlorine yang dipakai}}{\text{Kappa Number}}$$

Sistim lama Kappa Factor antara 0.2 sampai 0.25
Untuk sistim baru dengan memakai substitusi ClO_2
Kappa Factor antara 0.1 sampai 0.15

Sewaktu Cl_2 bereaksi dengan lignin Cl_2 akan mengalami perubahan sebagai berikut:
Reaksi substitusi= $Cl_2 \rightarrow OCl^- + Cl^-$
Reaksi oksidasi= $Cl_2 \rightarrow 2Cl^-$

Dan lignin akan berubah menjadi chlorolignin.
Cl_2 dapat juga bereaksi dengan selulosa yang mengakibatkan degradasi dari selulosa tersebut. Reaksinya adalah:

$Cl_2 \rightarrow 2Cl^*$
$HCLO \rightarrow Cl^* + HO^*$
$2HCLO \rightarrow H_2O + CLO_2$
$CLO_2 \rightarrow CLO^* + CL^*$
CL_2 dapat membentuk senyawa HCLO yang merusak serat
$Cl_2 + H_2O \rightarrow HCLO + H^+ + Cl^-$

Sumber : PT. Indah Kiat Pulp and Paper Corp.

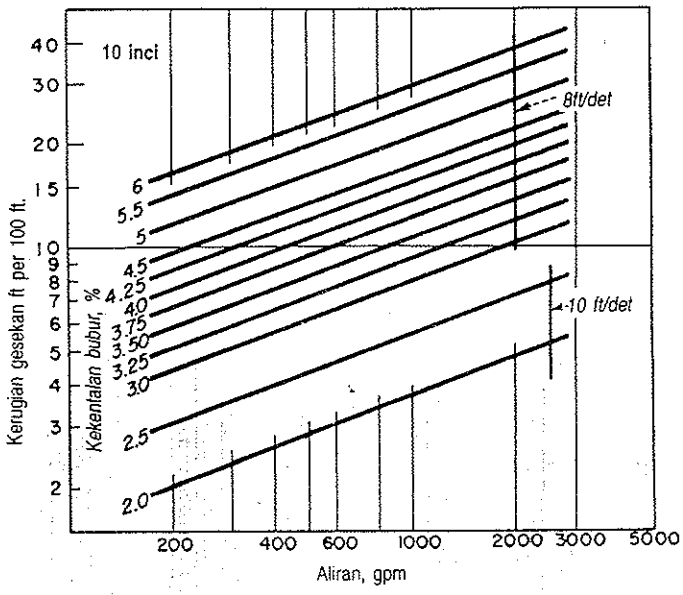
Lampiran 3. Lamjutan

Temperature °C.	Temperature °F.	Specific gravity	$NaClO_3$, %	Lb. $NaClO_3$/ gal. of sol.	Gal. H_2O to dissolve 1 lb. $NaClO_2$
−15	5	1.380	43.1	4.95	0.167
0	32	1.390	44.0	5.09	0.152
20	68	1.430	50.4	6.0	0.115
40	104	1.472	56.0	6.87	0.0932
60	140	1.515	61.6	7.78	0.073
80	176	1.558	66.8	8.68	0.0598
100	212	1.600	71.5	9.54	0.0474

Hypochlorite, %	1.5	1.0	0.5	0
Brightness, G.E.	69	62	46	—
Viscosity, cps.	130	171	219	234
ClO_2, %	0.5	0.5	0.5	0.75
Brightness, G.E.	88	86	78	66
Viscosity, cps.	123	184	215	230
NaOH, %	0.5	0.5	0.5	0.5
Brightness, G.E.	84	83	75	66
Viscosity, cps.	114	157	190	220
ClO_2, %	0.2	0.2	0.4	0.5
Brightness, G.E.	92	92	92	88
Viscosity, cps.	102	142	171	188
Aged brightness, G.E. (1 hr. at 105°C.)	88	88	88	86

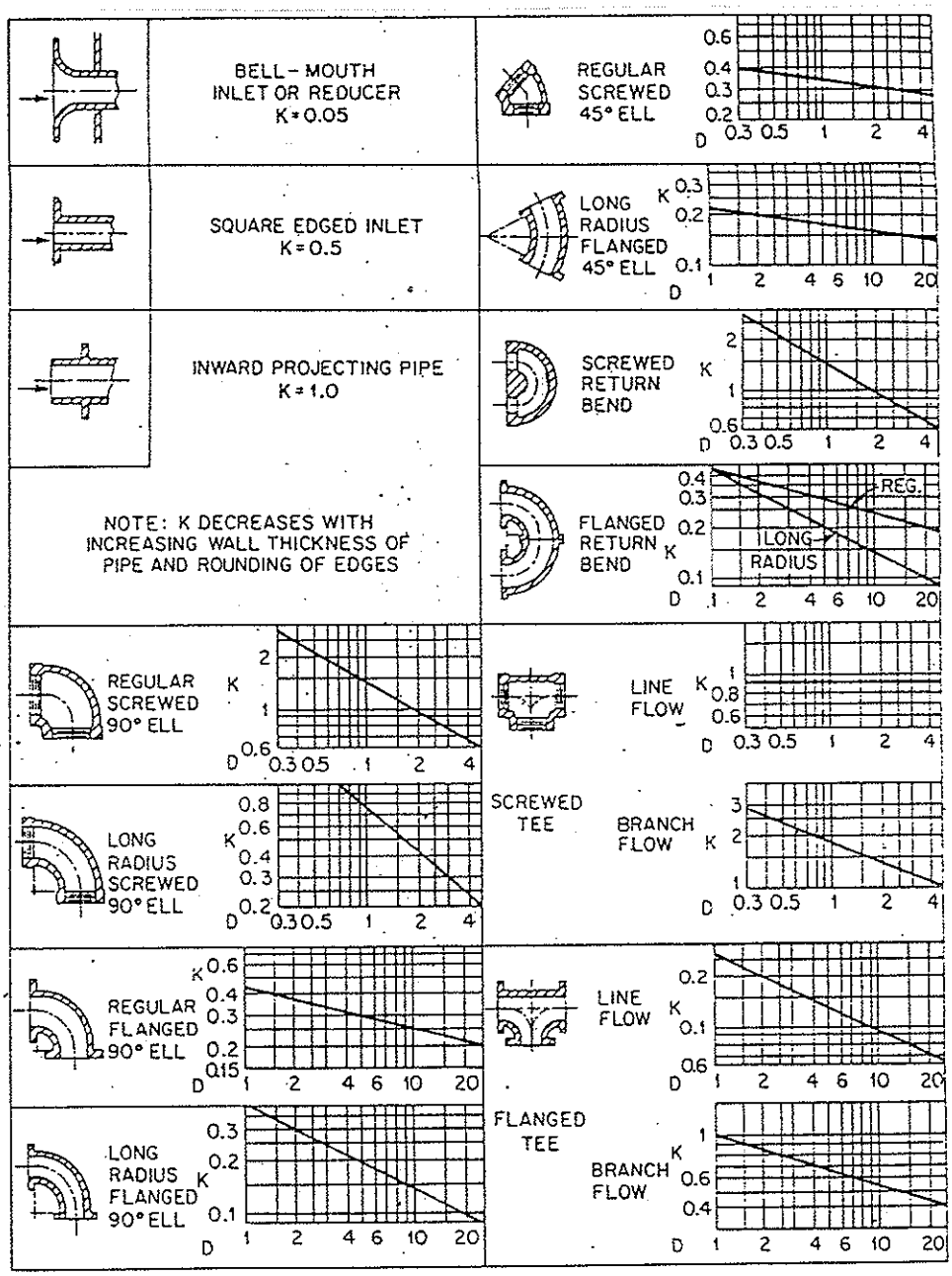
Sumber : James, 1960

Lampiran 4. Kerugian gesekan untuk bubur kertas paa pipa baja ukuran 10 in.



Sumber : Hicks Edwards, 1971

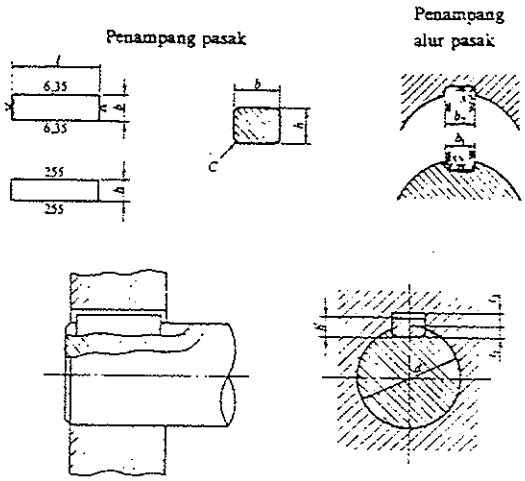
Lampiran 5. Kerugian gesek pada instalasi pipa



$$h = K \frac{V^2}{2g} \text{ FEET OF FLUID}$$

Sumber : Karassik, 1976

Lampiran 7. Dimensi utama pasak



Ukuran-ukuran utama

(Satuan : mm)

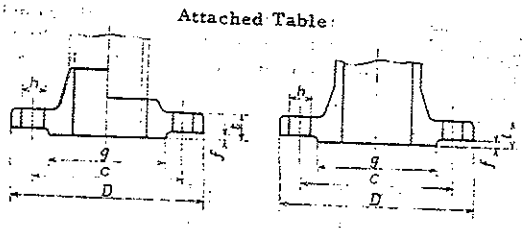
Ukuran nominal pasak $b \times h$	Ukuran standar b, b_1, dan b_2	Ukuran standar h: Pasak prismatis / Pasak luncur	Pasak tirus	C	l*	Ukuran Standar r_1	Ukuran standar r_2: Pasak prismatis	Pasak luncur	Pasak tirus	r_3 dan r_4	Referensi: Diameter poros yang dapat dipakai d**
2 × 2	2	2		0,16–0,25	6–20	1,2	1,0		0,5	0,08–0,16	Lebih dari 6–8
3 × 3	3	3			6–36	1,8	1,4		0,9		" 8–10
4 × 4	4	4			8–45	2,5	1,8		1,2		" 10–12
5 × 5	5	5			10–56	3,0	2,3		1,7		" 12–17
6 × 6	6	6			14–70	3,5	2,8		2,2		" 17–22
(7 × 7)	7	7	7,2	0,25–0,40	16–80	4,0	3,0	3,5	3,0	0,16–0,25	" 20–25
8 × 7	8	7			18–90	4,0	3,3		2,4		" 22–30
10 × 8	10	8			22–110	5,0	3,3		2,4		" 30–38
12 × 8	12	8			28–140	5,0	3,3		2,4		" 38–44
14 × 9	14	9			36–160	5,5	3,8		2,9		" 44–50
(15 × 10)	15	10	10,2	0,40–0,60	40–180	5,0	5,0	5,5	5,0	0,25–0,40	" 50–55
16 × 10	16	10			45–180	6,0	4,3		3,4		" 50–58
18 × 11	18	11			50–200	7,0	4,4		3,4		" 58–65
20 × 12	20	12			56–220	7,5	4,9		3,9		" 65–75
22 × 14	22	14			63–250	9,0	5,4		4,4		" 75–85
(24 × 16)	24	16	16,2	0,60–0,80	70–280	8,0	8,0	8,5	8,0	0,40–0,60	" 80–90
25 × 14	25	14			70–280	9,0	5,4		4,4		" 85–95
28 × 16	28	16			80–320	10,0	6,4		5,4		" 95–110
32 × 18	32	18			90–360	11,0	7,4		6,4		" 110–130

* l harus dipilih dari angka-angka berikut sesuai dengan daerah yang bersangkutan dalam tabel.
6, 8, 10, 12, 14, 16, 18, 20, 22, 25, 28, 32, 36, 40, 45, 50, 56, 63, 70, 80, 90, 100, 110, 125, 140, 160, 180, 200, 220, 250, 280, 320, 360, 400.

Sumber : Sularso, 1978

Lampiran 8. Spesifikasi flanged yang digunakan

Attached Table



Unit: mm

Nominal flange size	Outside diameter of steel pipe for welded ends	Outside diameter of flange D	Dimension of flange parts t	f	Bolt holes Diameter g	Diameter of bolt hole C	Number	h	Dimensions of the screw thread of bolt
10	17.3	110	16	1	52	75	4	19	M 16
15	21.7	115	18	1	55	80	4	19	M 16
20	27.2	120	18	1	60	85	4	19	M 16
25	34.0	130	20	1	70	95	4	19	M 16
32	42.7	140	22	2	80	105	4	19	M 16
40	48.6	160	22	2	90	120	4	23	M 20
50	60.5	165	22	2	105	130	8	19	M 16
65	76.3	200	26	2	130	160	8	23	M 20
80	89.1	210	28	2	140	170	8	23	M 20
90	101.6	230	30	2	150	185	8	25	M 22
100	114.3	240	32	2	160	195	8	25	M 22
125	139.8	275	36	2	195	230	8	25	M 22
150	165.2	305	38	2	235	275	12	27	M 24
200	216.3	330	42	2	280	320	12	27	M 24
250	267.4	450	48	2	345	390	12	33	M 30x3
300	318.5	515	52	3	405	450	16	33	M 30x3
350	355.6	560	54	3	450	495	16	33	M 30x3
400	406.4	630	60	3	510	560	16	39	M 36x3

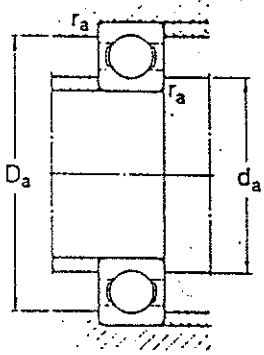
Remarks 1. Coupling faces of the flanges shall conform to JIS B 2202. Figures shown above, however, are given for examples of the large raised faces specified in JIS B 2202.

2. Bolt hole diameter (h) shall conform to Grade 3 in JIS B 1001 for the bolts of designation M16, and to Grade 2 in JIS B 1001 for the bolts of designation M 30 x 3 or over.

3. Dimensional tolerances shall conform to JIS B 2203.

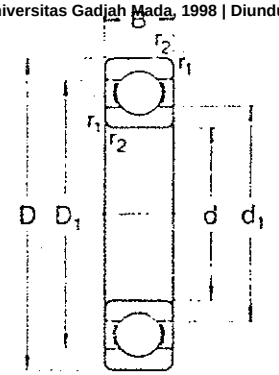
Sumber : JIS, 1981

Lampiran 9. Spesifikasi bantalan bola jenis alur dalam (bantalan kiri)

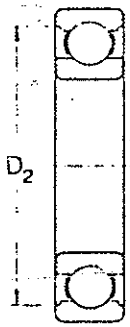


Dimensions					Abutment and fillet dimensions		
d	d_1 ≈	D_1 ≈	D_2 ≈	$r_{1,2}$ min	d_a min	D_a max	r_a max
mm					mm		
45	48,7	54,3	–	0,3	47	56	0,3
	55	65,4	–	0,6	49	71	0,6
	54,7	65,6	67,8	1	50	70	1
	57,6	72,9	75,2	1,1	51,5	78,5	1
	62,1	83,7	86,7	1,5	53	92	1,5
	68,9	96,9	–	2	54	111	2
50	54,7	60,3	–	0,3	52	63	0,3
	60	70,4	–	0,6	54	76	0,6
	59,7	70,6	72,8	1	55	75	1
	62,5	78,1	81,7	1,1	56,5	83,5	1
	68,7	92,1	95,2	2	59	101	2
	75,4	106	–	2,1	61	119	2
55	60,2	66,8	–	0,3	57	70	0,3
	67	76	–	0,6	59	86	0,6
	66,3	79,1	81,5	1,1	61,5	83,5	1
	69	86,6	89,4	1,5	63	92	1,5
	75,3	101	104	2	64	111	2
	81,5	115	–	2,1	66	129	2
60	65,6	72,4	–	0,3	62	76	0,3
	72	83,4	–	0,6	64	91	0,6
	71,3	84,1	86,5	1,1	66,5	88,5	1
	75,5	94,2	97	1,5	68	102	1,5
	81,8	109	113	2,1	71	119	2
	88,1	123	–	2,1	71	139	2
65	71,1	78,9	–	0,6	69	81	0,6
	76,5	88,5	–	0,6	69	96	0,6
	76,3	89,1	91,5	1,1	71,5	93,5	1
	83,3	103	106	1,5	73	112	1,5
	88,3	118	122	2,1	76	129	2
	94	132	–	2,1	76	149	2
70	76,1	83,9	–	0,6	74	86	0,6
	83,3	97,1	–	0,6	74	106	0,6
	82,8	97,6	99,9	1,1	76,5	103,5	1
	87	109	111	1,5	78	117	1,5
	94,9	126	130	2,1	81	139	2
	103	147	–	3	83	167	2,5

Sumber : SKF, 1981



with full outer ring shoulder

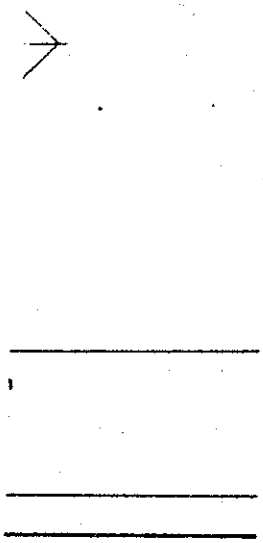


with recessed outer ring shoulder

Principal dimensions			Basic load ratings dynamic	static	Limiting speeds Lubrication grease	oil	Mass	Designation
d	D	B	C	C_0				
mm			N		r min		kg	–
45	58	7	6 050	3 800	9 500	12 000	0.040	61809
	75	10	15 600	9 300	9 000	11 000	0.17	16009
	75	16	21 200	12 200	9 000	11 000	0.25	6009
	85	19	33 200	18 600	7 500	9 000	0.41	6209
	100	25	52 700	30 000	6 700	8 000	0.83	6309
	120	29	76 100	45 500	6 000	7 000	1.55	6409
50	65	7	6 240	4 250	9 000	11 000	0.052	61810
	80	10	16 300	10 000	8 500	10 000	0.18	16010
	80	16	21 600	13 200	8 500	10 000	0.26	6010
	90	20	35 100	19 600	7 000	8 500	0.46	6210
	110	27	61 800	36 000	6 300	7 500	1.05	6310
	130	31	87 100	52 000	5 300	6 300	1.90	6410
55	72	9	8 320	5 600	8 500	10 000	0.083	61811
	90	11	19 500	12 200	7 500	9 000	0.26	16011
	90	18	28 100	17 000	7 500	9 000	0.39	6011
	100	21	43 600	25 000	6 300	7 500	0.61	6211
	120	29	71 500	41 500	5 600	6 700	1.35	6311
	140	33	99 500	63 000	5 000	6 000	2.30	6411
60	78	10	8 710	6 100	7 500	9 000	0.11	61812
	95	11	19 900	13 200	6 700	8 000	0.28	16012
	95	18	29 600	18 300	6 700	8 000	0.42	6012
	110	22	47 500	28 000	6 000	7 000	0.78	6212
	130	31	81 900	48 000	5 000	6 000	1.70	6312
	150	35	108 000	69 500	4 800	5 600	2.75	6412
65	85	10	11 700	8 300	7 000	8 500	0.13	61813
	100	11	21 200	14 600	6 300	7 500	0.30	16013
	100	18	30 700	19 600	6 300	7 500	0.44	6013
	120	23	55 900	34 000	5 300	6 300	0.99	6213
	140	33	92 300	56 000	4 800	5 600	2.10	6313
	160	37	119 000	78 000	4 500	5 300	3.30	6413
70	90	10	12 100	9 150	6 700	8 000	0.14	61814
	110	13	28 100	19 000	6 000	7 000	0.43	16014
	110	20	37 700	24 500	6 000	7 000	0.60	6014
	125	24	61 800	37 500	5 000	6 000	1.05	6214
	150	35	104 000	63 000	4 500	5 300	2.50	6314
	180	42	143 000	104 000	3 800	4 500	4.85	6414

Sumber : SKF, 1981

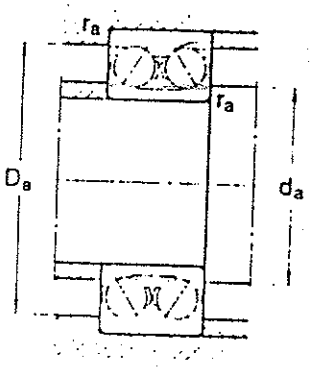
Lampiran 11. Spesifikasi bantalan kontak sudut (bantalan sebelah kanan)



Sumber : SKF, 1981

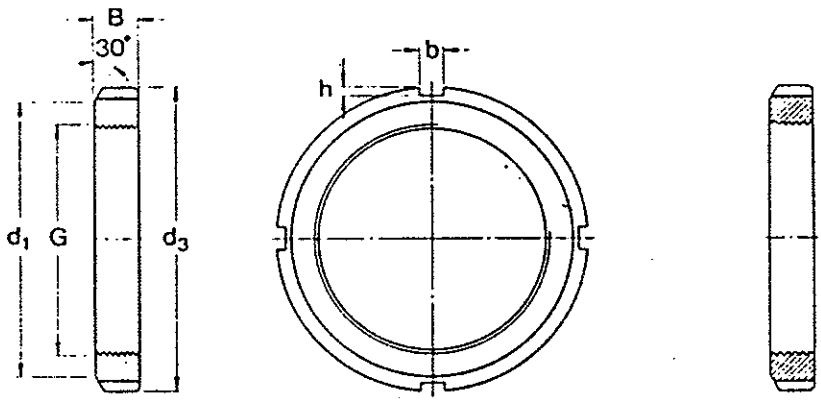
Sumber : SKF, 1981

Lampiran 12. Lanjutan



Dimensions					Abutment and fillet dimensions		
d	d_1 ≈	D_1 ≈	$r_{1,2}$ min	a	d_a min	D_a max	r_a max
mm					mm		
60	78	98,3	1.5	71	69	101	1.5
	87.2	115	2.1	86	72	118	2
	88.8	115	2.1	123	72	118	2
65	83.7	105	1.5	76	74	111	1.5
	92.5	122	2.1	94	77	128	2
	93.6	125	2.1	132	77	128	2
70	90.6	111	1.5	81	79	116	1.5
	99,2	131	2.1	101	82	138	2
	100	134	2.1	142	82	138	2
75	94,7	116	1.5	84	84	121	1.5
	106	139	2,1	107	87	148	2
80	102	127	2	91	90	130	2
	113	148	2,1	112	92	158	2
85	107	133	2	97	95	140	2
	120	157	3	119	99	166	2.5
90	115	143	2	104	100	150	2
	128	169	3	125	104	176	2.5
95	124	154	2,1	111	107	158	2
	135	178	3	133	109	186	2,5
100	129	160	2,1	118	112	168	2
	142	187	3	139	114	201	2.5
110	143	178	2.1	132	122	188	2
	155	205	3	153	124	226	2,5

Lampiran 13. Spesifikasi lock nuts



Dimensions						Mass	Designation	Appropriate locking washer	hook impact spanner
G	d_1	d_3	B	b	h				
mm						kg	-	-	
M 10×0,75	13,5	18	4	3	2	0.004	KM 0	MB 0	-
M 12×1	17	22	4	3	2	0.007	KM 1	MB 1	-
M 15×1	21	25	5	4	2	0.010	KM 2	MB 2	-
M 17×1	24	28	5	4	2	0.013	KM 3	MB 3	-
M 20×1	26	32	6	4	2	0.019	KM 4	MB 4	HN 4
M 25×1,5	32	38	7	5	2	0.025	KM 5	MB 5	HN 5
M 30×1,5	38	45	7	5	2	0.043	KM 6	MB 6	HN 6
M 35×1,5	44	52	8	5	2	0.053	KM 7	MB 7	HN 7
M 40×1,5	50	58	9	6	2.5	0.085	KM 8	MB 8	HN 8
M 45×1,5	56	65	10	6	2,5	0,12	KM 9	MB 9	HN 9
M 50×1,5	61	70	11	6	2.5	0.15	KM 10	MB 10	HN 10
M 55×2	67	75	11	7	3	0.16	KM 11	MB 11	HN 11
M 60×2	73	80	11	7	3	0,17	KM 12	MB 12	HN 12
M 65×2	79	85	12	7	3	0,20	KM 13	MB 13	HN 13
M 70×2	85	92	12	8	3.5	0.24	KM 14	MB 14	HN 14
M 75×2	90	98	13	8	3.5	0.29	KM 15	MB 15	HN 15
M 80×2	95	105	15	8	3.5	0.40	KM 16	MB 16	HN 16
M 85×2	102	110	16	8	3.5	0,45	KM 17	MB 17	HN 17
M 90×2	108	120	16	10	4	0,56	KM 18	MB 18	HN 18
M 95×2	113	125	17	10	4	0,66	KM 19	MB 19	HN 19
M 100×2	120	130	18	10	4	0,70	KM 20	MB 20	HN 20
M 105×2	126	140	18	12	5	0,85	KM 21	MB 21	HN 21
M 110×2	133	145	19	12	5	0,97	KM 22	MB 22	HN 22
M 115×2	137	150	19	12	5	1,00	KM 23	MB 23	718909
M 120×2	138	155	20	12	5	1,10	KM 24	MB 24	718909
M 125×2	148	160	21	12	5	1,20	KM 25	MB 25	718909
M 130×2	149	165	21	12	5	1,25	KM 26	MB 26	718909
M 135×2	160	175	22	14	6	1,55	KM 27	MB 27	718909

Sumber : SKF, 1981

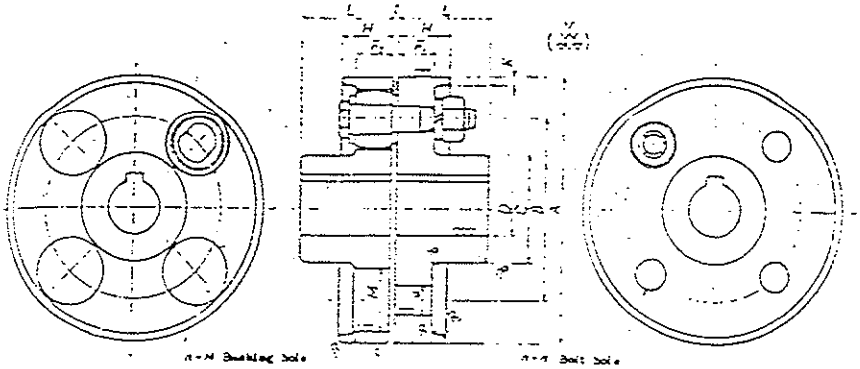
Lampiran 14. Lanjutan

Dimensions						Mass	Designation	Appropriate locking washer	Impact spanner
G	d_1	d_3	B	b	h				
mm						kg	–	–	
M 140×2	160	180	22	14	6	1,55	KM 28	MB 28	718909
M 145×2	172	190	24	14	6	1,80	KM 29	MB 29	718909
M 150×2	171	195	24	14	6	2,00	KM 30	MB 30	718909, 718910
M 155×3	182	200	25	16	7	2,30	KM 31	MB 31	718910
M 160×3	182	210	25	16	7	2,60	KM 32	MB 32	718910
M 165×3	193	210	26	16	7	2,70	KM 33	MB 33	718910
M 170×3	193	220	26	16	7	2,80	KM 34	MB 34	718910
M 180×3	203	230	27	18	8	3,05	KM 36	MB 36	718910
M 190×3	214	240	28	18	8	3,40	KM 38	MB 38	718910
M 200×3	226	250	29	18	8	3,70	KM 40	MB 40	718910, 718911
Tr 205×4	232	250	30	18	8	3,40	HML 41 T	–	718910, 718911
Tr 210×4	238	270	30	20	10	4,75	HM 42 T	–	718911
Tr 215×4	242	260	30	20	9	3,70	HML 43 T	–	718911
Tr 220×4	250	280	32	20	10	5,35	HM 44 T	MB 44	718911
Tr 230×4	260	290	34	20	10	5,80	HM 46 T	–	718911
Tr 235×4	262	280	34	20	9	4,60	HML 47 T	–	718911
Tr 240×4	270	300	34	20	10	6,20	HM 48 T	MB 48	718911
Tr 250×4	290	320	36	20	10	7,00	HM 54 T	–	718911
Tr 260×4	300	330	36	24	12	8,55	HM 52 T	MB 52	718912
Tr 270×4	310	340	38	24	12	9,20	HM 54 T	–	718912
Tr 280×4	320	350	38	24	12	10,0	HM 56 T	MB 56	718912
Tr 290×4	330	370	40	24	12	12,0	HM 58 T	–	718912
Tr 310×5	350	390	42	24	12	13,5	HM 62 T	–	718912
Tr 330×5	380	420	52	28	15	20,5	HM 66 T	–	718913
Tr 345×5	384	410	45	28	13	11,5	HML 69 T	–	718913
Tr 350×5	410	450	55	28	15	25,0	HM 70 T	–	718913
Tr 370×5	430	470	58	28	15	28,0	HM 74 T	–	718913
Tr 410×5	452	480	52	32	14	19,0	HML 82 T	–	718913

Sumber : SKF, 1981

Lampiran 15. Kopling fles luwes

Attached Table 1. Flexible Flanged Shaft Coupling



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

Unit: mm

Nominal bore of coupling A	D		L	C	B	F_1	F_2	H	K	(1) a	e	M	(2) t	Reference X	Reference c	Reference Diameter of bolt	Reference
	Largest bore diameter	Smallest bore diameter															
90	18	—	28	35.5	50	14	14	22	6	6	5	19	3	2	1	50	
100	22	—	35.5	40	67	16	16	22.4	6	6	10	22	3	2	1	56	
112	25	16	40	45	75	16	16	22.4	6	6	10	22	3	2	1	58	
125	28	18	45	50	85	18	18	25	6	6	14	32	3	2	1	64	
140	35	22	50	63	100	18	18	25	6	6	14	32	3	2	1	64	
160	45	25	56	80	115	18	18	25	6	6	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	25	57	4	4	1	115	
315	90	63	112	160	226	28	40	45	8	10	28	57	4	4	1	115	
355	100	71	125	180	250	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	5	1	150	
630	160	110	180	280	500	35.5	56	63	12	18	35.5	72	5	5	1	150	

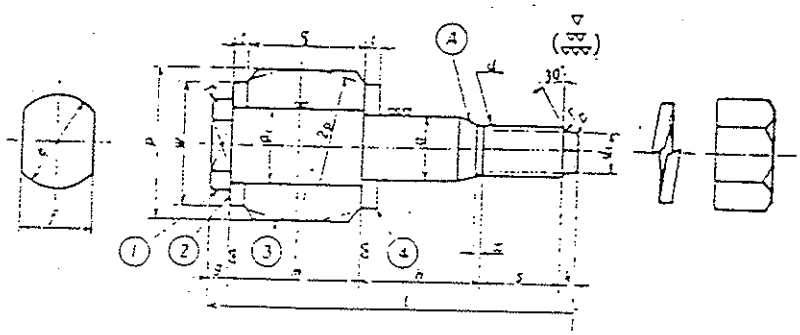
Notes (1) The letter a indicates the number of bush holes or bolt holes.
(2) The letter t indicates the clearance produced at the time of assembling the coupling bodies, and is equivalent to the thickness of coupling bolt washer.

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

Sumber : JIS, 1981

Lampiran 16. Baut kopling

Attached Table 2. Coupling Bolt for Flexible Flanged Shaft Coupling



Unit: mm

Dimension d×l	① Bolt d	d_1	a	d_2	c	f	g	m	k	r	h	l	r (approx.)
× 50	M 8	9	8	5.5	12	10	4	17	15	12	2	50	0.4
× 56	M 10	12	10	7	16	13	4	19	17	14	2	56	0.5
× 64	M 12	15	14	9	19	17	5	23	19	16	3	64	0.6
× 85	M 20	22.4	20	15	28	24	5	26.4	24.6	25	4	85	1
×100	M 24	28	25	18	34	30	6	32	30	27	5	100	1
×116	M 24	31.5	28	18	38	32	6	44	30	31	5	116	1
5×150	M 30	40	35.5	22	48	41	8	61	38.5	36.5	6	150	1.2

Dimension d×l	② Washer d_1	w	t	③ Bushing d_1	p	q	④ Washer a	w	t
× 50	9	14	3	9	18	14	8	14	3
× 56	12	18	3	12	22	16	10	18	3
× 64	16	25	3	16	31	18	14	25	3
× 85	22.4	32	4	22.4	40	22.4	20	32	4
×100	28	40	4	28	50	28	25	40	4
×116	31.5	45	4	31.5	56	40	28	45	4
5×150	40	56	5	40	71	56	35.5	56	5

Notes 1. The hexagon nuts shall be such that of Class 1 ordinary finish specified in JIS B 1181, of which strength class shall be 4 and thread accuracy 6 H (or Class 2).
2. The spring washers shall be No. 1 S specified in JIS B 1251.
3. The dimensions of width across flats are in accordance with JIS B 1002. The dimensional tolerance shall be of Class 2.
4. The shape and dimensions of the screw end shall be same as the half dog point specified in JIS B 1003.
5. The accuracy of the screw thread shall conform to 6 g (or Class 2) of JIS B 0209.
6. The portion (A) may be either tapered or terraced.
7. The length x may be constituted either by an incomplete-threads or by an under-cut for thread cutting. However, a length of approximately two threads shall be taken for x in the case of the incomplete-thread.
8. Bushing may be formed either to cylindrical shape or to spherical shape. When the bushing is of cylindrical shape both ends of external periphery shall be chamfered.
9. The bushing may provide metallic lining.

Sumber : JIS, 1981

Lampiran : 17. Dimensi utama ulir metrik

Unit : mm

Designation of screw thread (1)			Pitch	Depth of thread engagement	Internal thread		
					Major diameter	Pitch diameter	Minor diameter
					D	D_2	D_1
					External thread		
1	2	3	P	H_1	Major diameter d	Pitch diameter d_2	Minor diameter d_1
M 1	M 1.1		0.25	0.135	1.000	0.838	0.729
M 1.2			0.25	0.135	1.100	0.938	0.829
			0.25	0.135	1.200	1.038	0.929
M 1.6	M 1.4		0.3	0.162	1.400	1.205	1.075
	M 1.8		0.35	0.189	1.600	1.373	1.221
			0.35	0.189	1.800	1.573	1.421
M 2	M 2.2		0.4	0.217	2.000	1.740	1.567
M 2.5			0.45	0.244	2.200	1.908	1.713
			0.45	0.244	2.500	2.208	2.013
M 3×0.5	M 3.5		0.5	0.271	3.000	2.675	2.459
M 4×0.7			0.6	0.325	3.500	3.110	2.850
			0.7	0.379	4.000	3.545	3.242
M 5×0.8	M 4.5		0.75	0.406	4.500	4.013	3.688
M 6			0.8	0.433	5.000	4.480	4.134
			1	0.541	6.000	5.350	4.917
M 8		M 7	1	0.541	7.000	6.350	5.917
		M 9	1.25	0.677	8.000	7.188	6.647
			1.25	0.677	9.000	8.188	7.647
M 10		M 11	1.5	0.812	10.000	9.026	8.376
M 12			1.5	0.812	11.000	10.026	9.376
			1.75	0.947	12.000	10.863	10.106
M 16	M 14		2	1.083	14.000	12.701	11.835
	M 18		2	1.083	16.000	14.701	13.835
			2.5	1.353	18.000	16.376	15.294
M 20	M 22		2.5	1.353	20.000	18.376	17.294
M 24			2.5	1.353	22.000	20.376	19.294
			3	1.624	24.000	22.051	20.752
M 30	M 27		3	1.624	27.000	25.051	23.752
	M 33		3.5	1.894	30.000	27.727	26.211
			3.5	1.894	33.000	30.727	29.211
M 36	M 39		4	2.165	36.000	33.402	31.670
M 42			4	2.165	39.000	36.402	34.670
			4.5	2.436	42.000	39.077	37.129
M 48	M 45		4.5	2.436	45.000	42.077	40.129
	M 52		5	2.706	48.000	44.752	42.587
			5	2.706	52.000	48.752	46.587
M 56	M 60		5.5	2.977	56.000	52.428	50.046
M 64			5.5	2.977	60.000	56.428	54.046
	M 68		6	3.248	64.000	60.103	57.505
			6	3.248	68.000	64.103	61.505

Note (1) Screw threads in column 1 shall preferentially be chosen and, if necessary, in column 2, and then in column 3.

Remark: Columns 1, 2 and 3 conform to the preferred order of selection for nominal diameter of ISO general purpose metric screw threads specified in ISO 261.

Sumber : JIS, 1981