

BAB IV

PENUTUP

Dengan selesainya penyusunan tugas merancang ini, maka penulis dapat mengambil kesimpulan yang berhubungan dengan perencanaan Kapal Ikan (*Skipjack Pole & Line*) 650 GRT, sebagai sarana penangkap ikan di Indonesia.

Adapun kesimpulan penulisan tersebut adalah sebagai berikut :

1. Ringkasan spesifikasi teknis kapal :

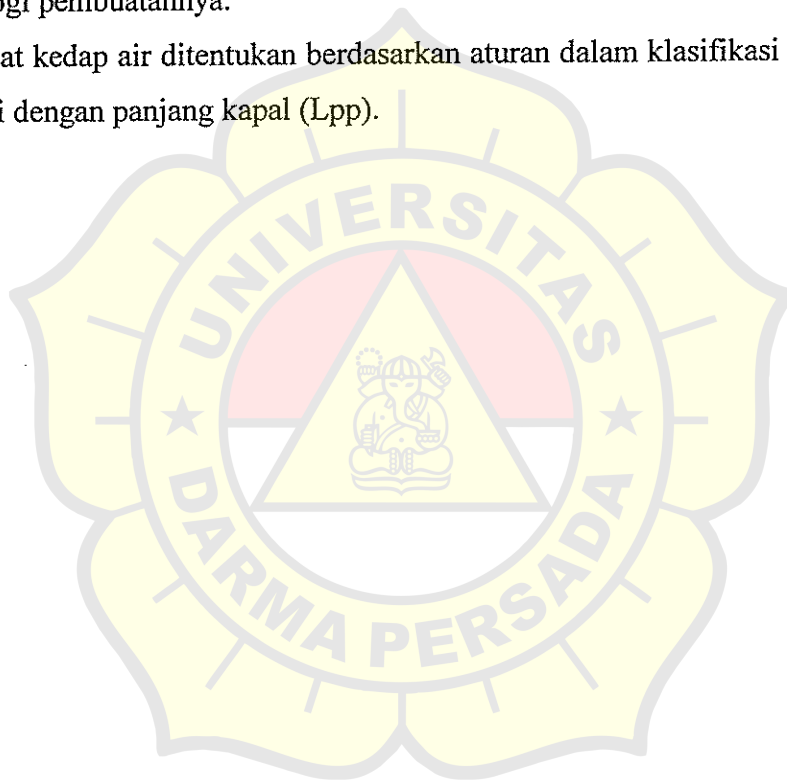
- Panjang seluruhnya (Loa) = 49,50 m
- Panjang antar garis tegak (Lpp) = 45,00 m
- Lebar (B) = 8,50 m
- Tinggi (H) = 4,15 m
- Sarat air (T) = 3,15 m
- Koefisien blok (Cb) = 0,690
- Koefisien prismatic (Cp) = 0,703
- Koefisien garis air (Cw) = 0,825
- Koefisien tengah kapal (Cm) = 0,980
- *Displacement* (Δ) = 876,468 Ton
- Volume (∇) = 855,090 m³
- Jumlah anak buah kapal (ABK) = 30 orang
- Kecepatan Dinas = 13,5 Knot

• Alat penggerak yang digunakan :

Jumlah Mesin	: 1 unit
Merk	: Yanmar Diesel
Daya	: 2000 HP (metric)
Putaran mesin	: 720 rpm
<i>Gear ratio</i>	: 1 : 1,79
<i>Bore x Stroke</i>	: 280 mm x 360 mm
Ukuran	: Panjang x Lebar x Tinggi 4947,5 mm x 1540 mm x 2658 mm

Berat : 17,95 Ton.
Diameter *Propeller* : 2,03 m
Jumlah daun : 4 (empat) buah

2. Dalam rancangan, kapal dikontrol terhadap stabilitas, *trim*, panjang genangan dan rencana pemuatan serta berat kapal, dimana semua hasil perhitungan harus memenuhi ketentuan yang berlaku.
3. Dalam menentukan ukuran utama yang akan diambil dalam perencanaan kapal, terlebih dahulu perlu diadakan pertimbangan-pertimbangan secara umum terutama dalam hal yang berhubungan dengan tahanan, stabilitas, ruang muatan, kekuatan kapal, ekonomi dan teknologi pembuatannya.
4. Jumlah sekat kedap air ditentukan berdasarkan aturan dalam klasifikasi yang digunakan, yaitu sesuai dengan panjang kapal (Lpp).



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_____ . *Rancangan Kapal Ikan*; Jakarta : Fakultas Teknologi Kelautan Universitas Darma Persada, 2000.

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Lampiran 1. Diagram *Speed Length Ratio* (F_n)

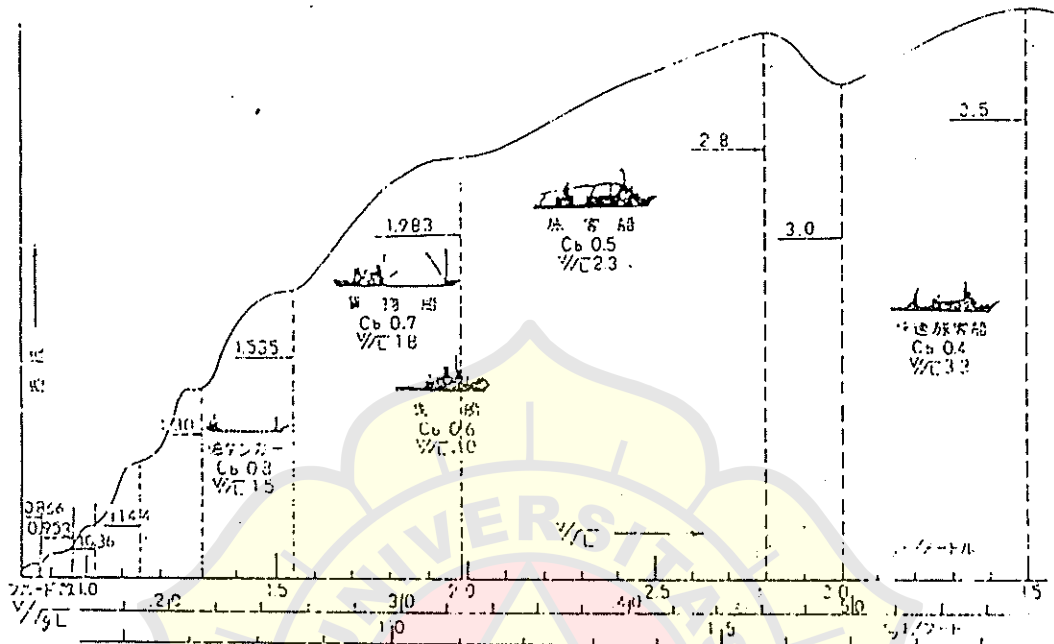


図1 V/L と抵抗

Lampiran 2. Diagram untuk menentukan h^* (Prohaska)

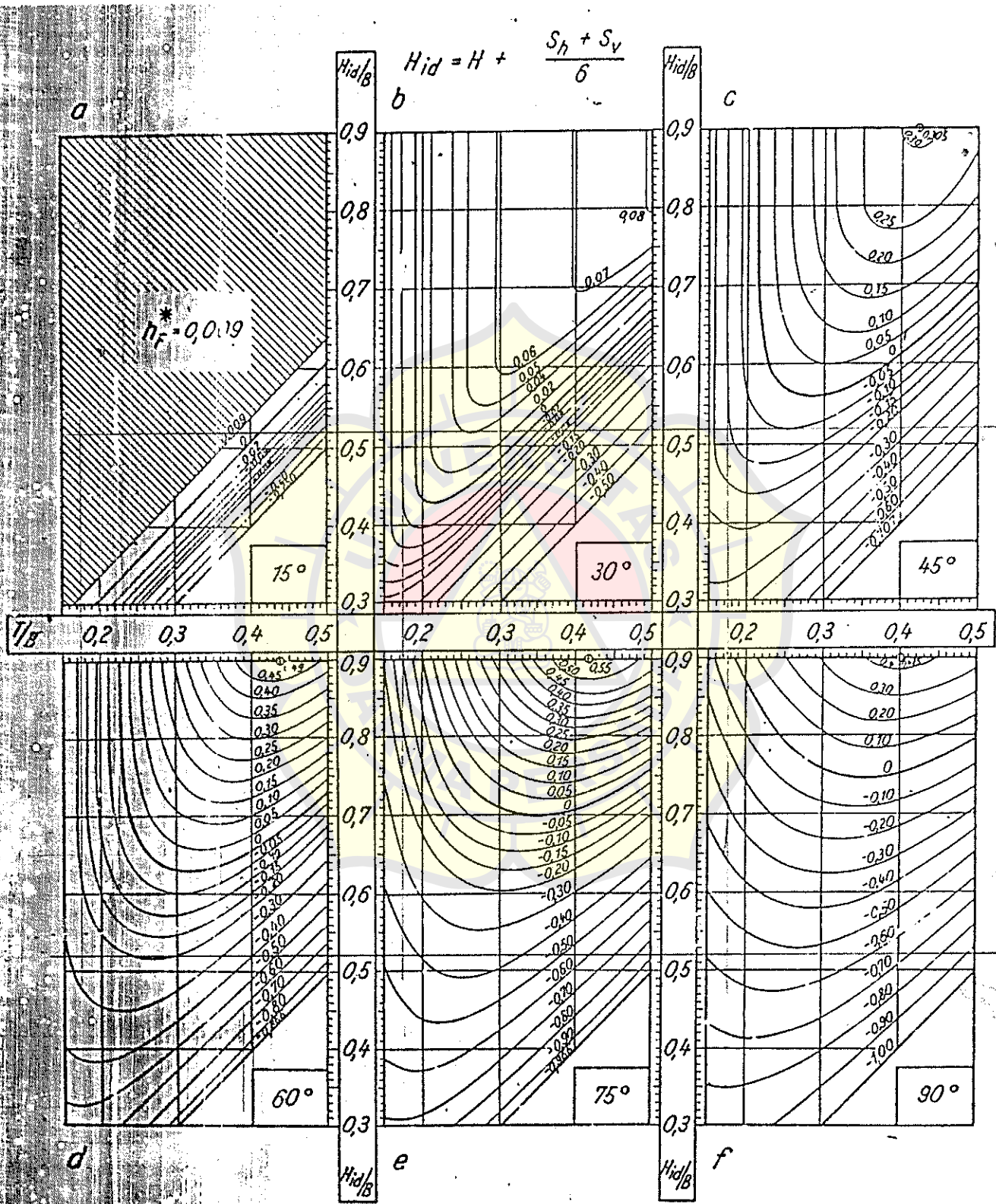


Bild 1.102 h_F^* über H_{id}/B und T/B

Lampiran 3. Diagram untuk menentukan letak *LCB*

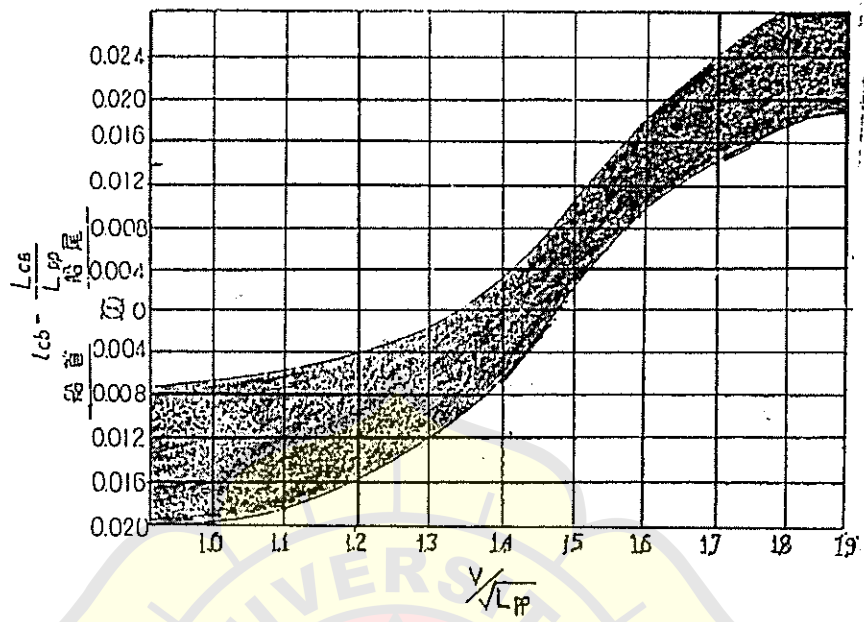
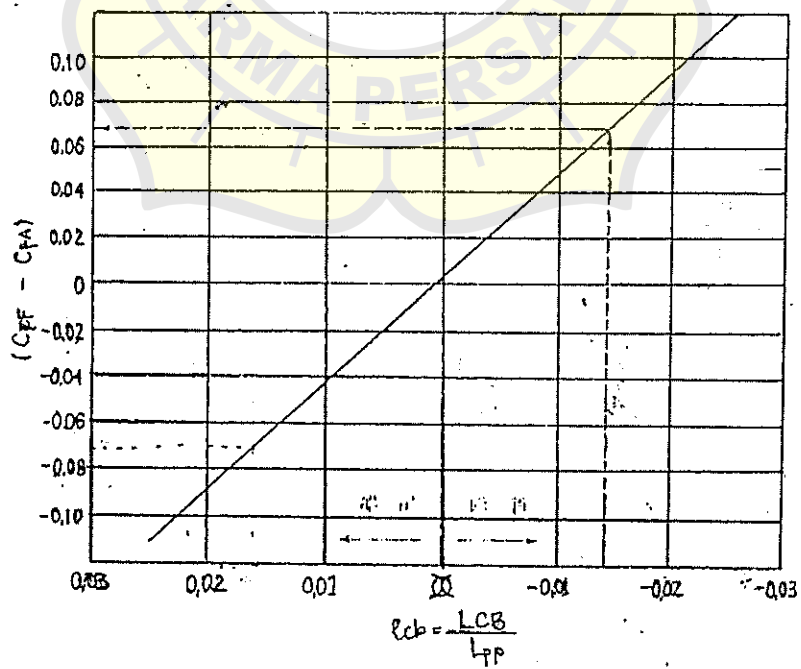


Diagram untuk menentukan koefisien depan dan belakang (*C_{pf} - C_{pa}*)



Lampiran 4. Diagram untuk menentukan prosentase luasan bagian depan

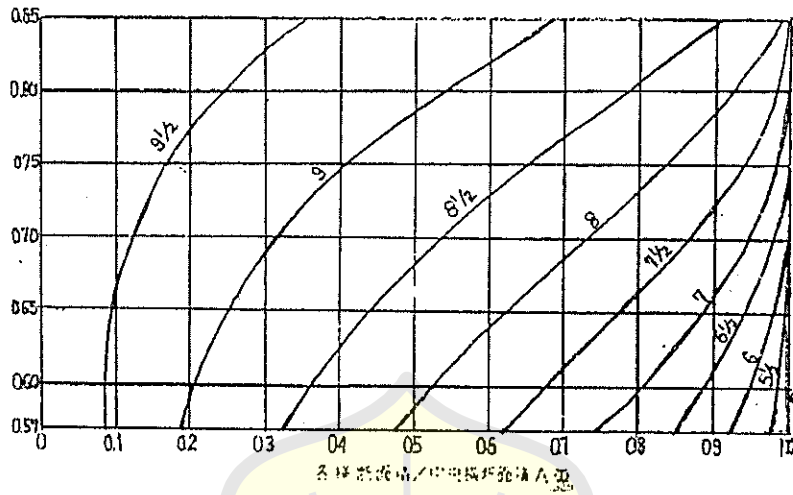
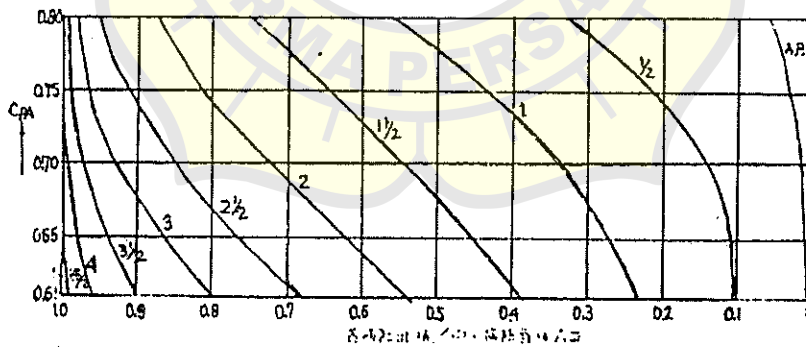
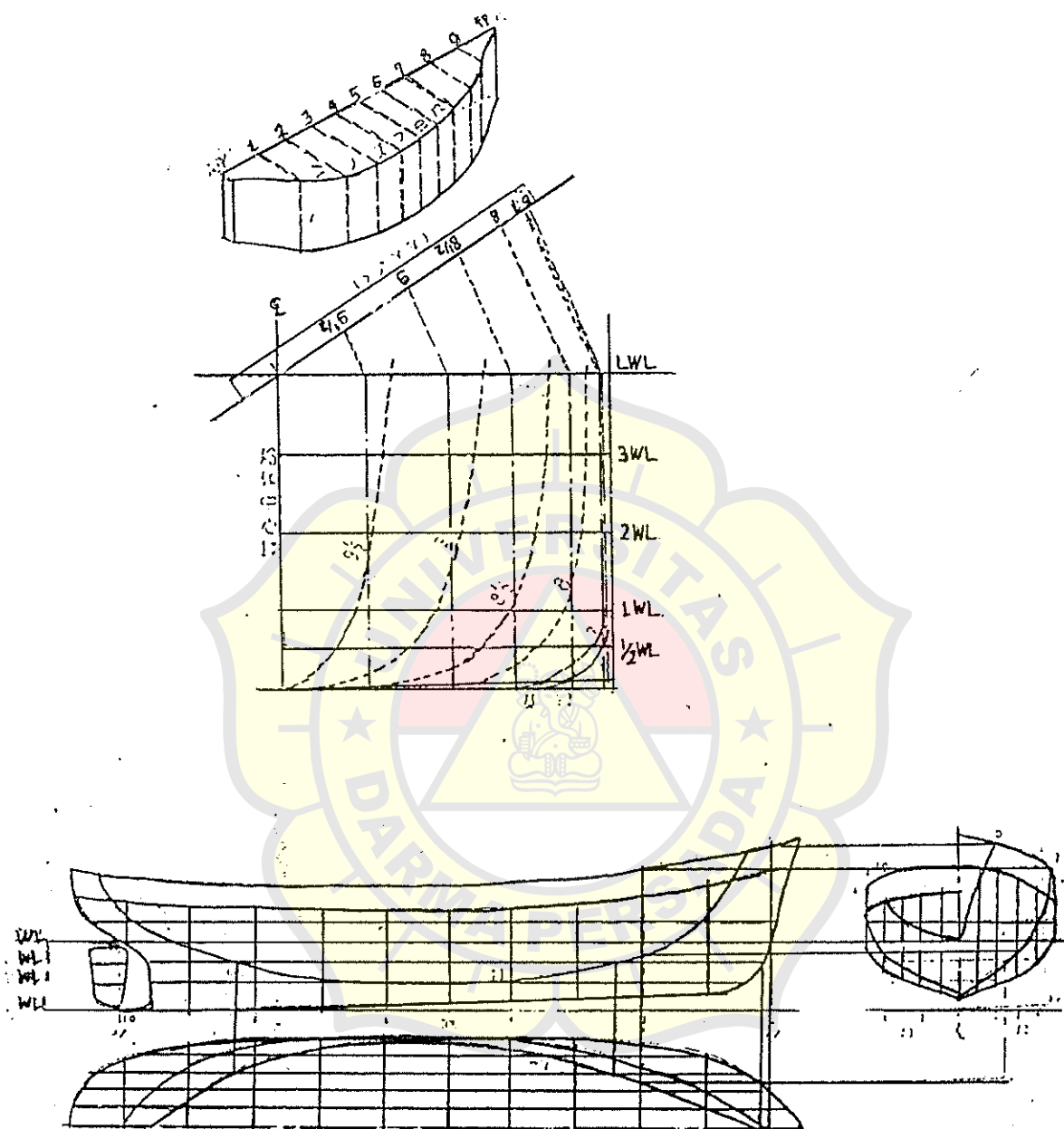


Diagram untuk menentukan prosentase luasan bagian belakang



Lampiran 5. Gambar cara pembuatan *Body Plan*



Lampiran 6. Diagram Koefisien Tahanan Sisa terhadap ratio kecepatan-panjang untuk harga Koefisien Prismatic Longitudinal yang berbeda-beda

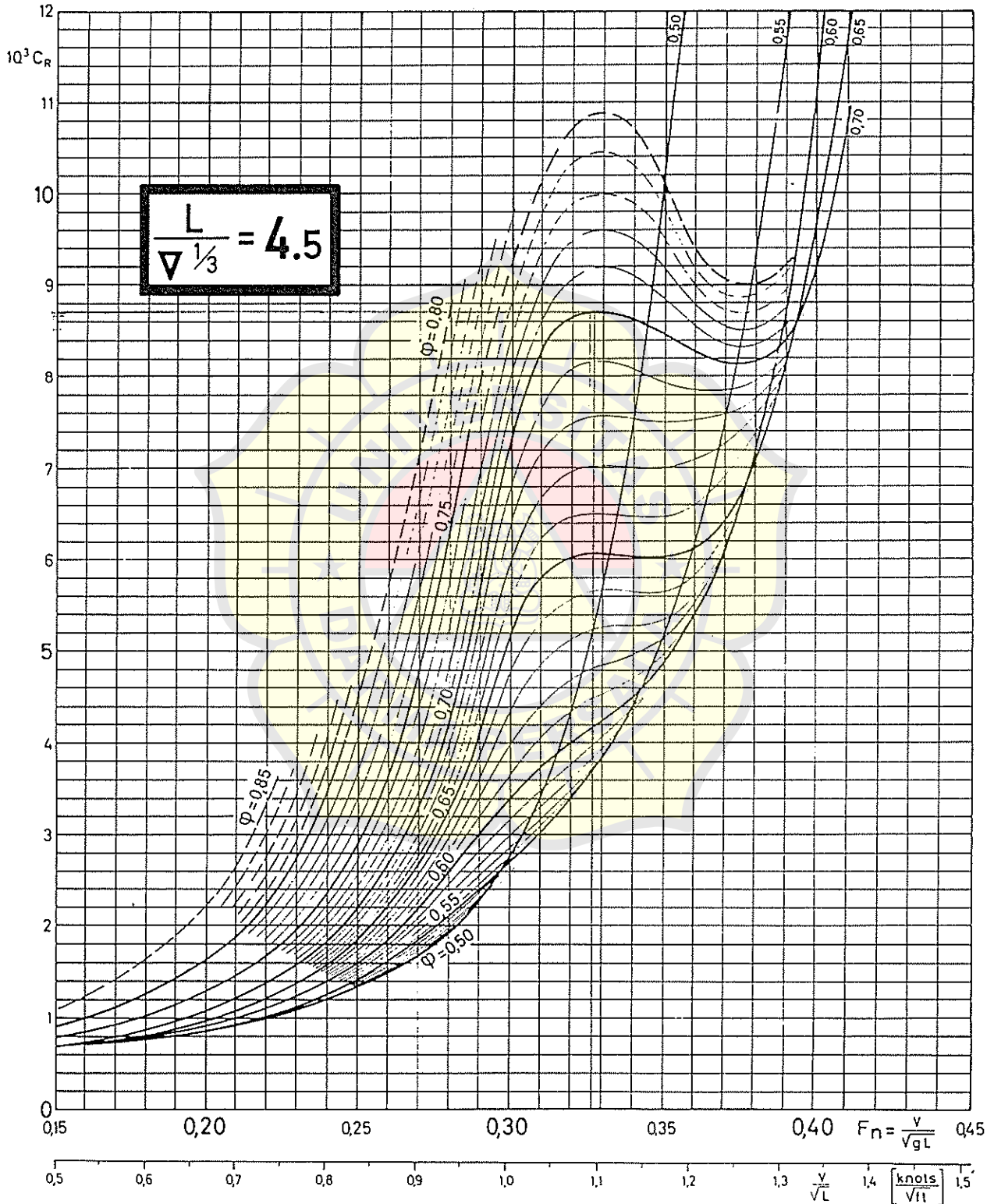


Figure 5.5.6. Residuary resistance coefficient versus speed-length ratio for different values of longitudinal prismatic coefficient. $L/v^{1/3} = 4.5$.

Lampiran 7. Diagram Koefisien Tahanan Sisa terhadap ratio kecepatan-panjang untuk harga Koefisien Prismatic *Longitudinal* yang berbeda-beda

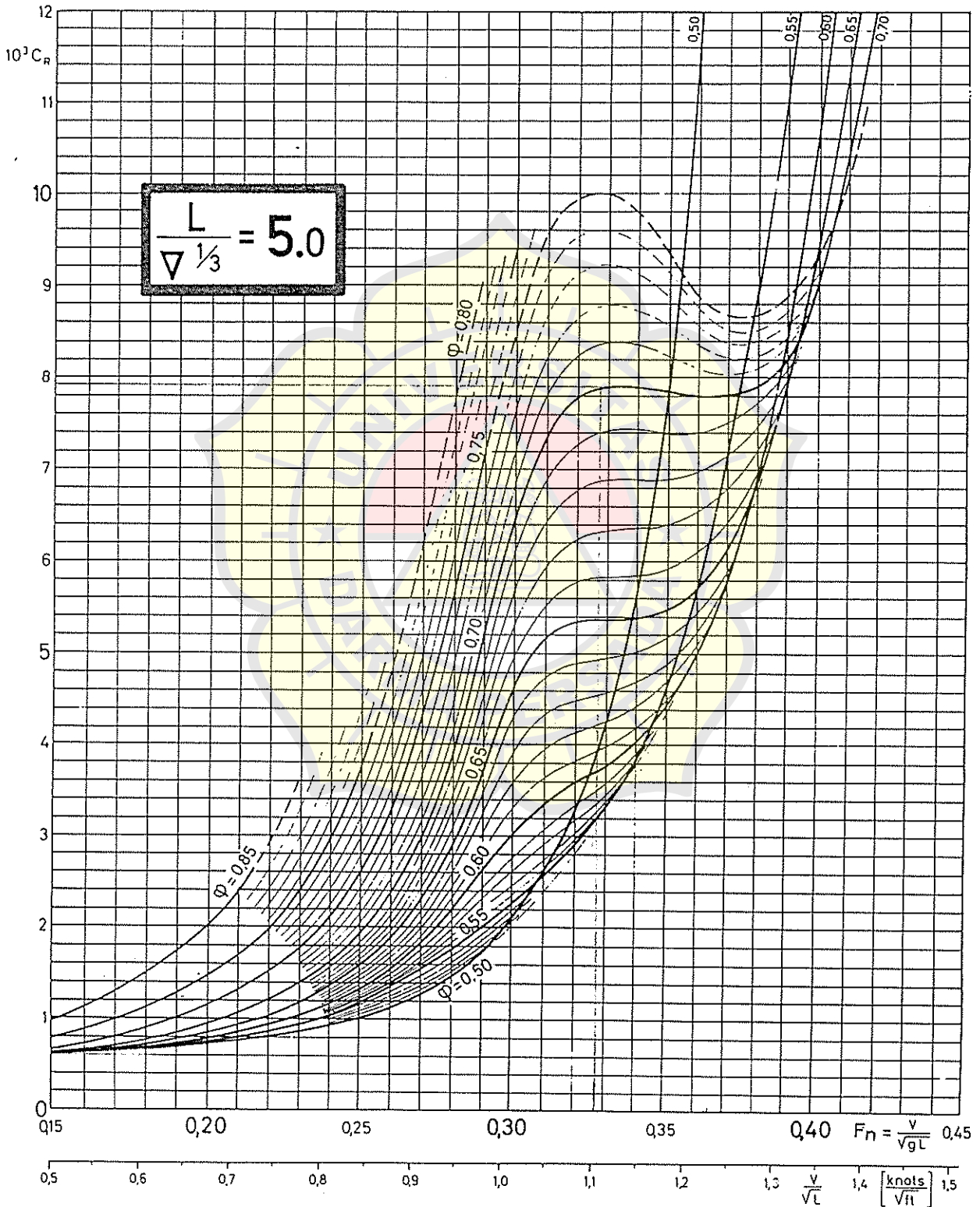


Figure 5.5.7. Residuary resistance coefficient versus speed-length ratio for different values of longitudinal prismatic coefficient. $L/\nabla^{1/3} = 5.0$.

Lampiran 8. Diagram untuk menentukan *LCB* standar

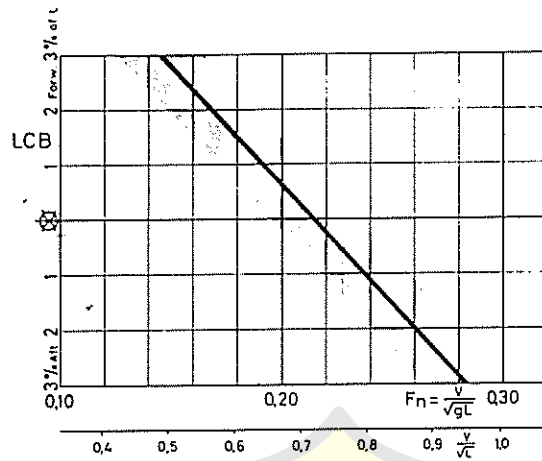


Figure 5.5.15. Standard LCB. The longitudinal position of the center of buoyancy that is considered the best possible.

Diagram untuk menentukan koreksi hambatan sisa

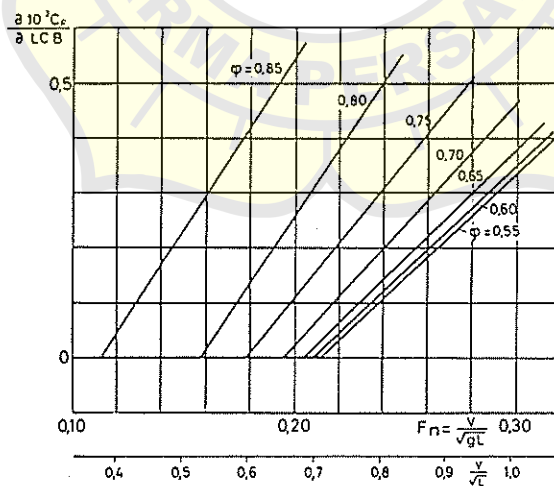


Figure 5.5.16. The correction of the residual resistance coefficient for LCB 1% forward of standard. The correction is thus $(\partial 10^3 C_R / \partial LCB) |\Delta LCB|$, where ΔLCB is the longitudinal distance between actual and standard LCB in percent of L . There is no correction for LCB aft of standard. The correction is always positive.

Lampiran 9. Diagram ITTC 1957

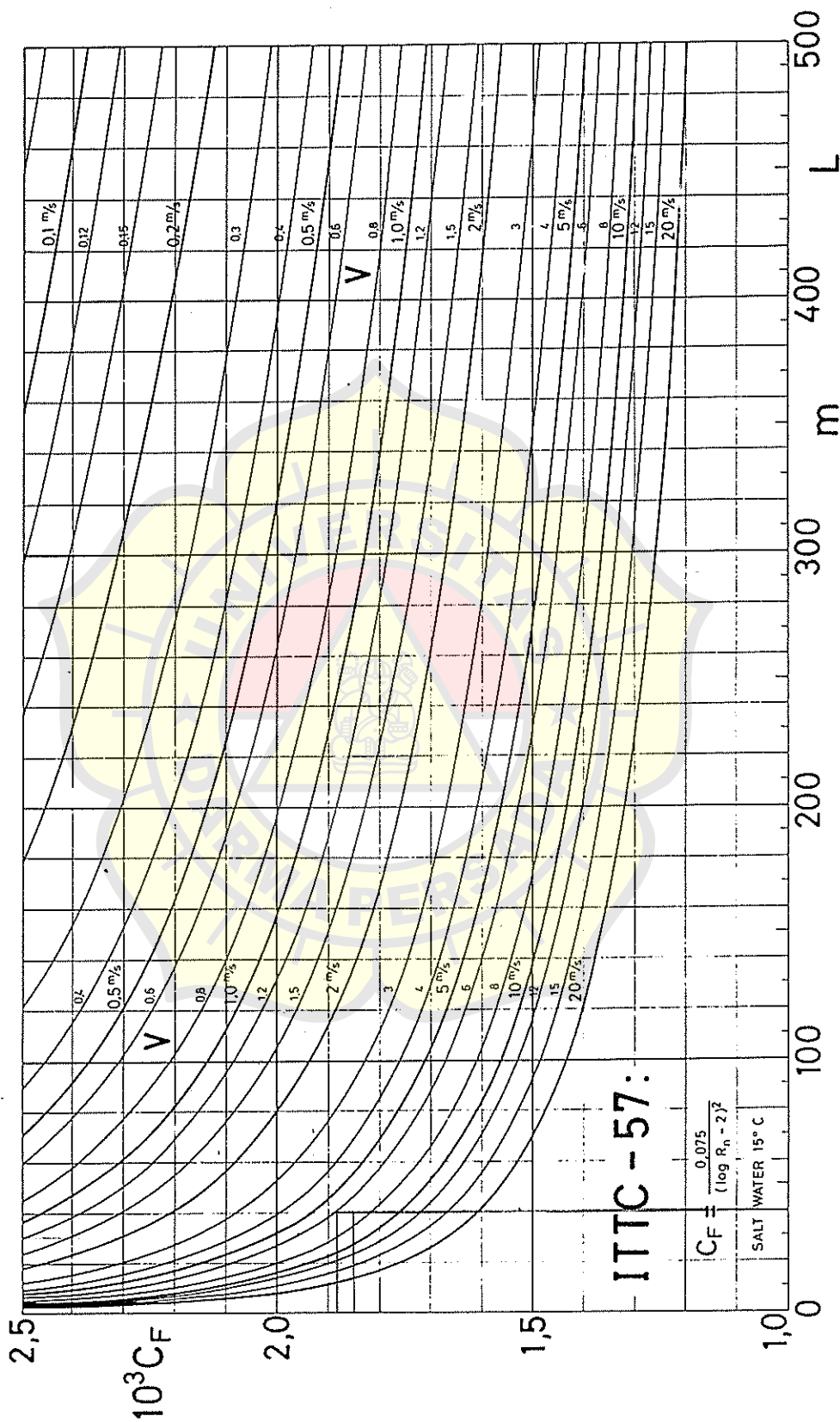
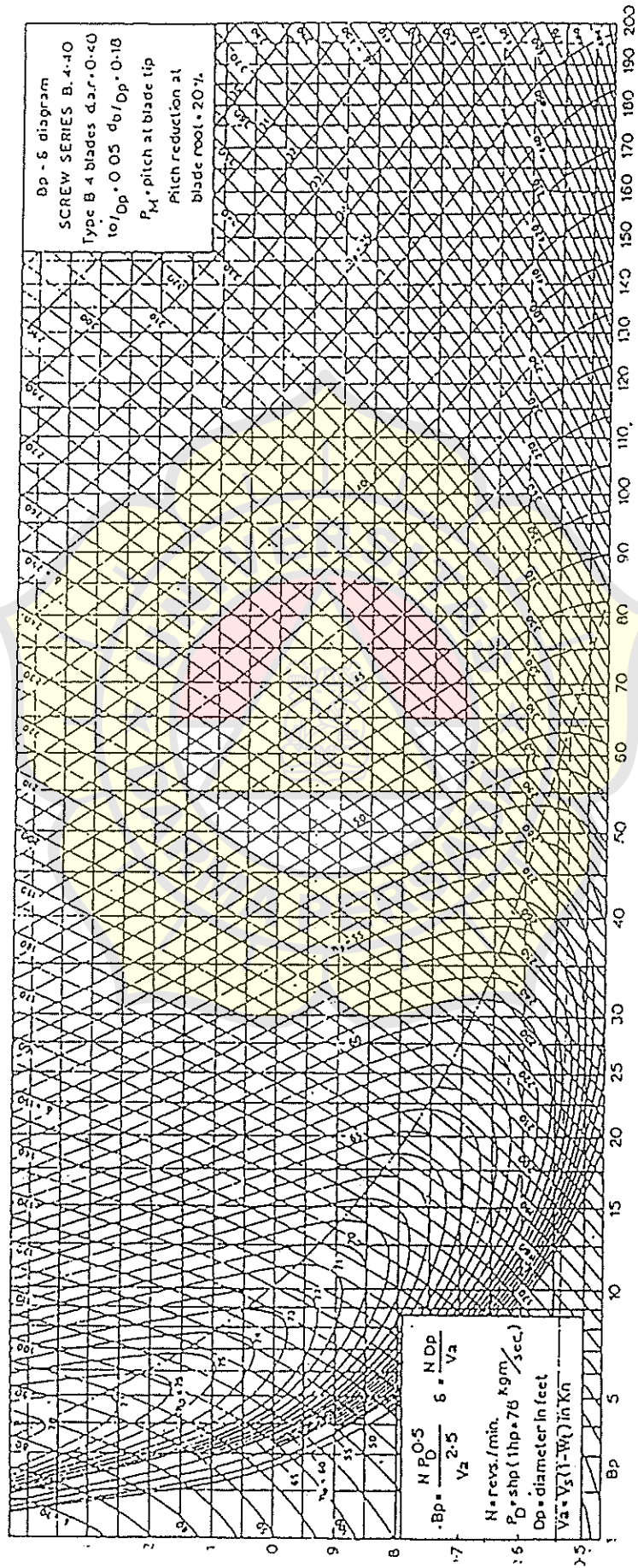
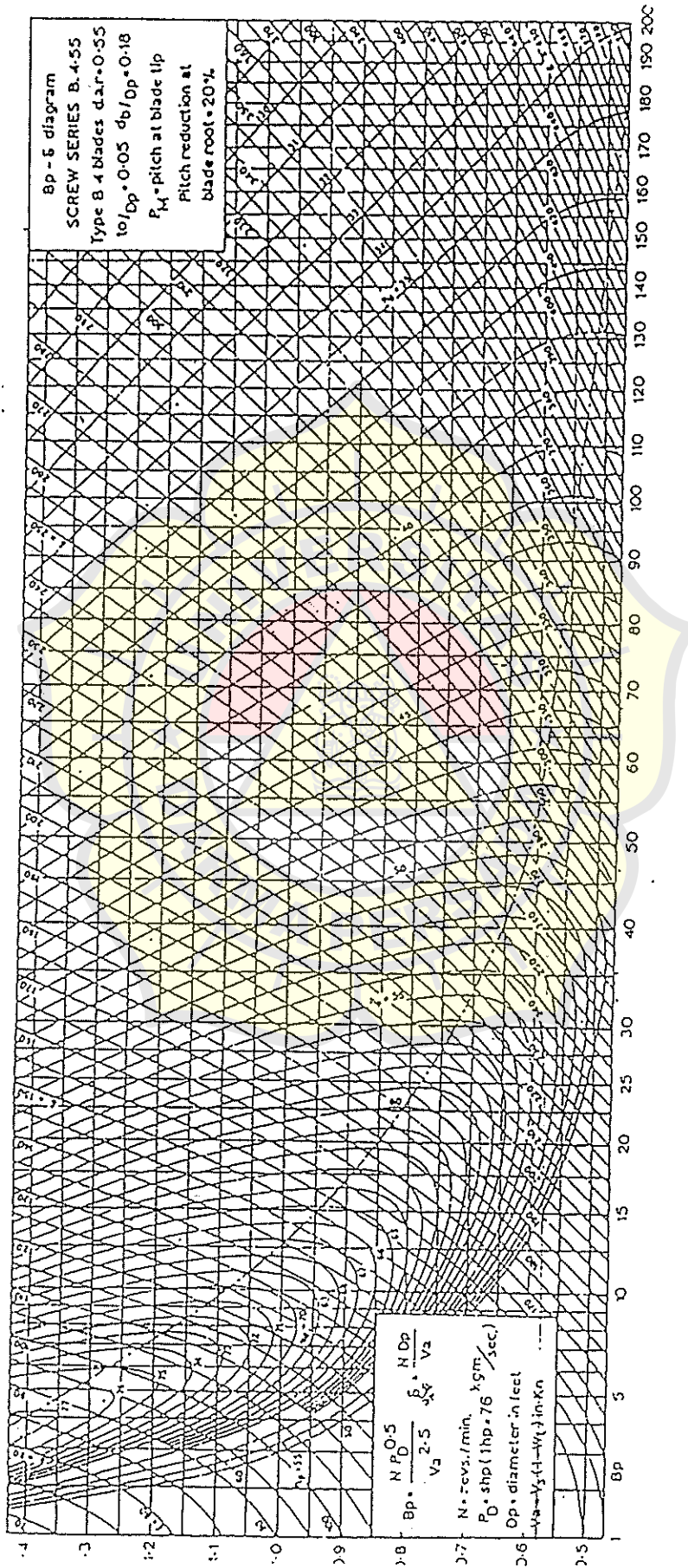


Figure 5.5.14. The frictional resistance coefficient C_f (according to ITTC 1957) as a function of ship length L and speed V .

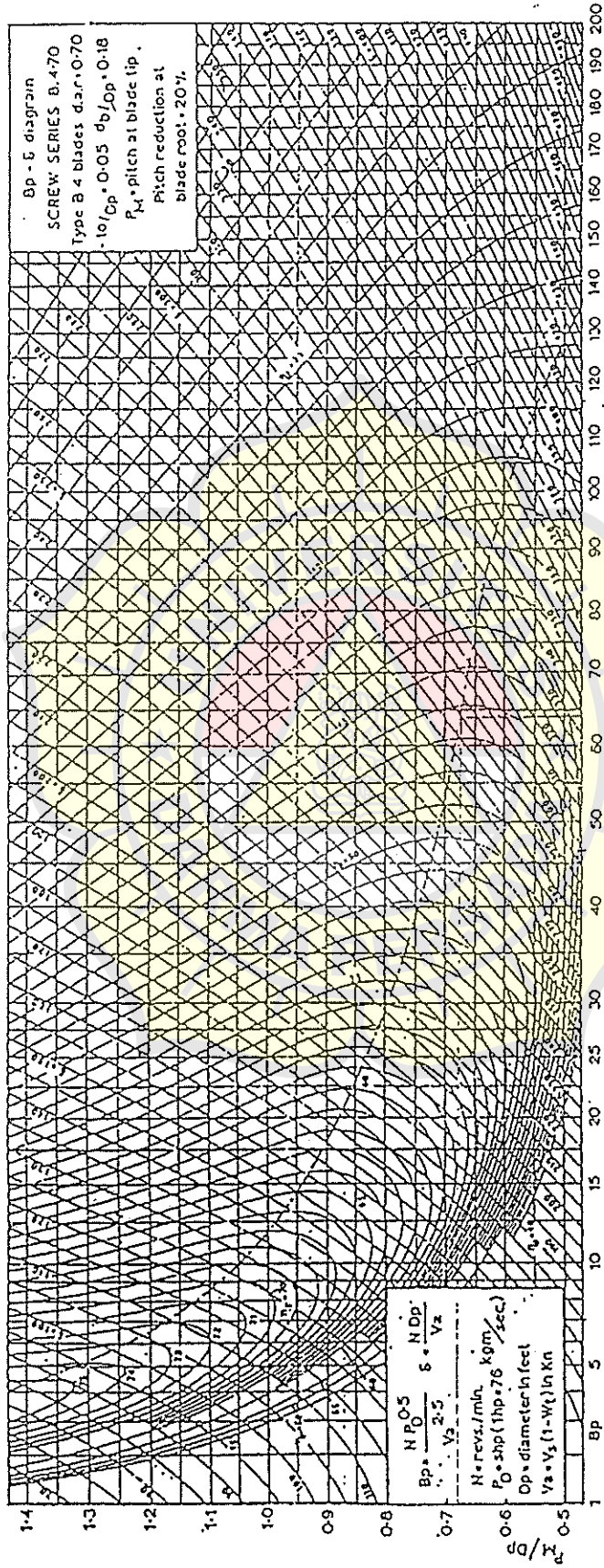
Lampiran 10. Diagram Bp - δ Series B4-40



Lampiran 11. Diagram Bp - δ Series B4-55



Lampiran 12. Diagram Bp – δ Series B4-70



Lampiran 13. Diagram *Burrill*

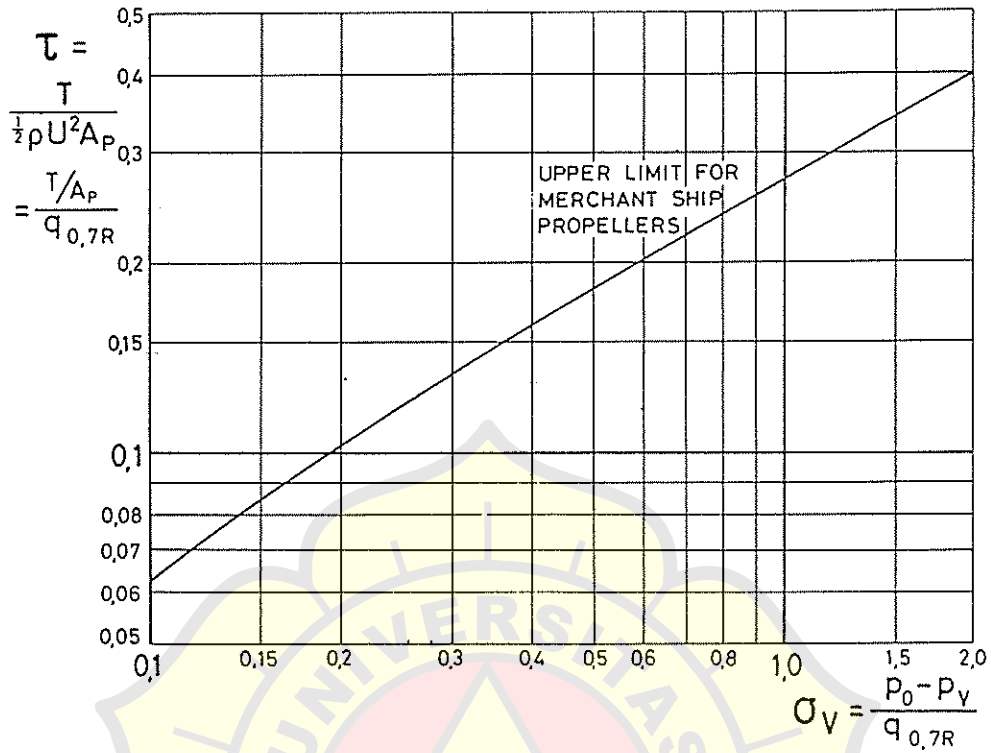


Figure 6.6.8. Cavitation diagram (Burrill).

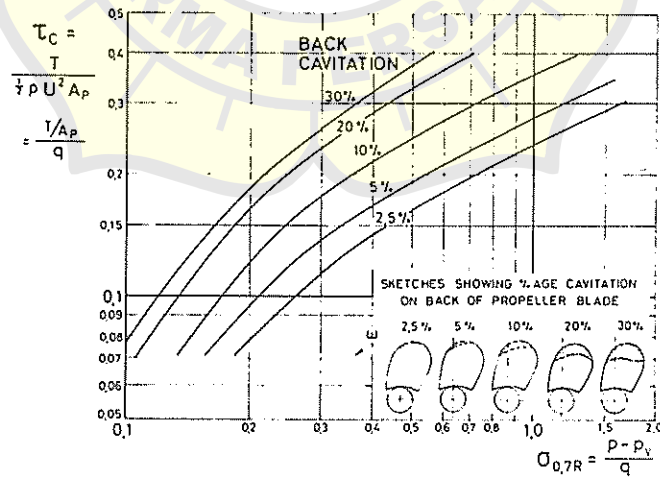
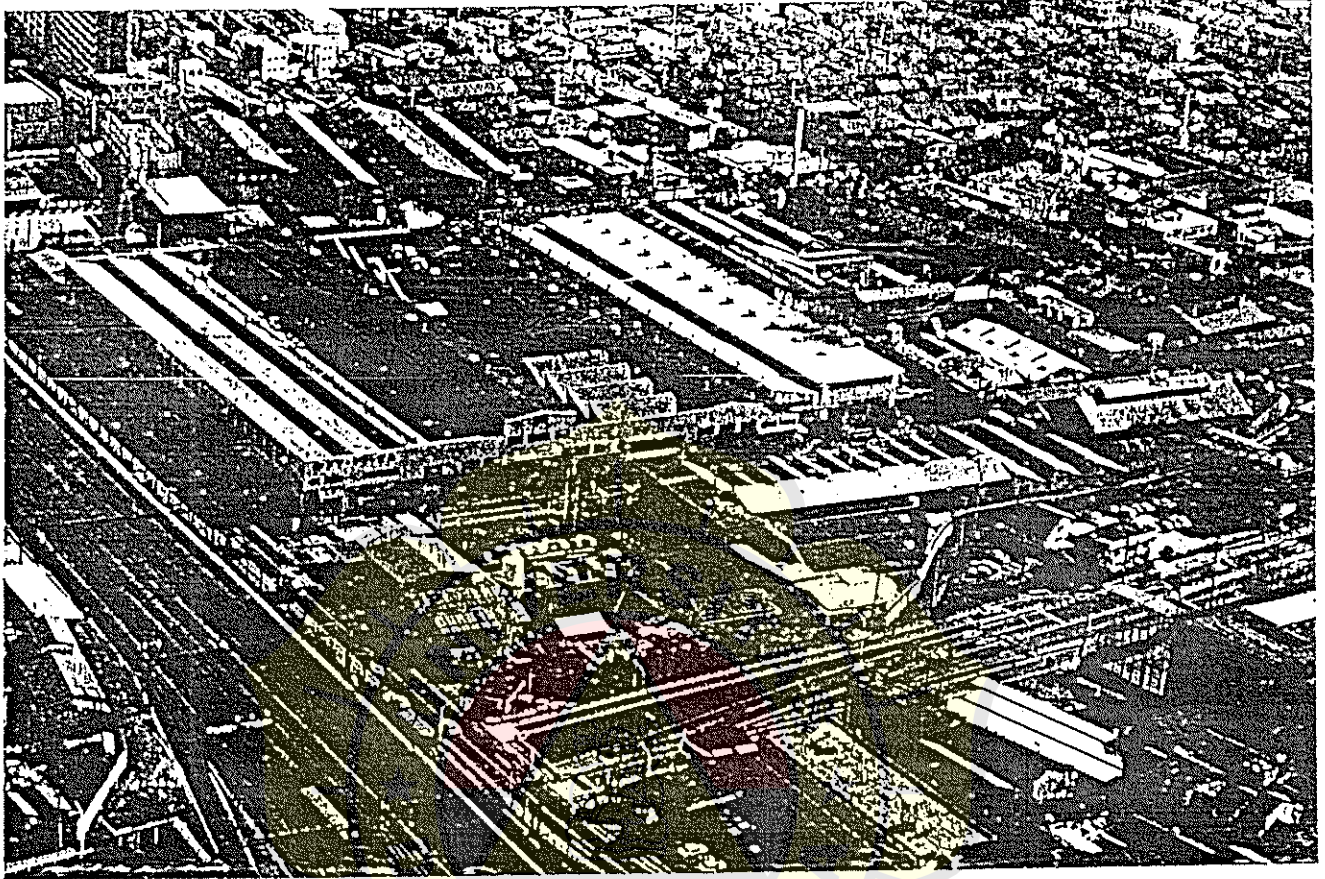


Figure 6.6.9. Cavitation diagram for a series four-bladed merchant ship propeller models.



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Outline of Company

Yanmar is the world's largest manufacturer of non-vehicular use diesel engines for marine-use, agriculture and industry. The marine mains cover the range from 5 to 3600 hp, auxiliaries from 5.6 to 4800 hp. In addition, Yanmar produces a wide range of high quality marine gears for all kinds of vessel. Yanmar engines are renowned for their durability, reliability, compactness, lightness of weight, easy handling and fuel efficiency. They incorporate many of the latest technologies, including advanced fuel injection systems, ceramic parts and other new materials, laser-hardening, electronic controls and advanced sensor technologies. Yanmar's marine engine production facilities have been accredited by Lloyd's Register of Shipping, the American Bureau of Shipping and Nippon Kaiji Kyokai. Yanmar marine engines are sold in more than 100 countries, with service bases in 19 key oceanic ports around the world.

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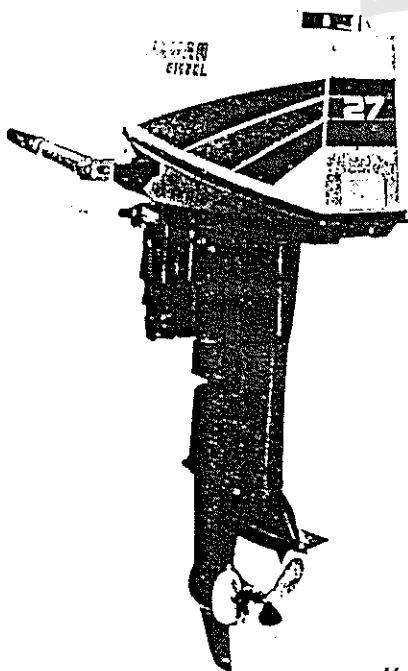
Yanmar Diesel Engine Co., Ltd.

The Yanmar Main Engine Line-up with True Marine Lineage

Yanmar's marine engines are designed to meet the realities of today's marine business, to get more nautical mileage out of every drop of fuel, and give more offshore service with less pause for maintenance. These abilities run through the great range of Yanmar marine engines up to 3,200 hp, serving abroad practically every type of vessel as mains, auxiliaries, and as inboard power for pleasure boats.

Fishing Boats

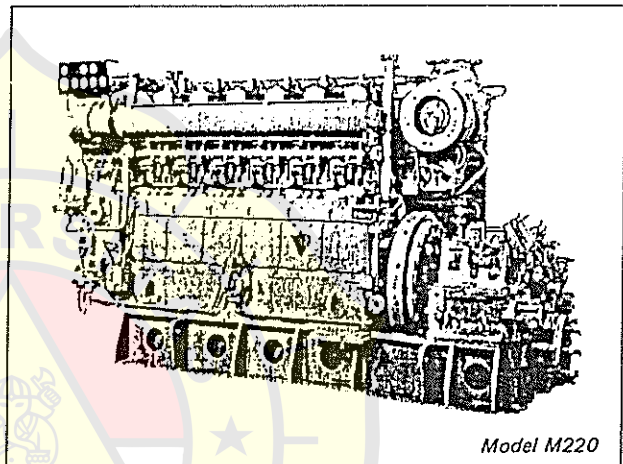
Yanmar is one of the world's most active companies in the supply of diesel engines to fishing boats. We export a major percentage of Japanese marine diesel under 300 hp for fishing boats. Yanmar's rugged and maintenance-free small horsepower diesels are specially suited for powering traditional boats including dhows, canoes and other wooden boats which have been long used in various areas of the world. Other advanced marine diesels precisely meet the demands of modern fishing with their stable power and all-speed performance. A recent technical breakthrough at Yanmar is the perfection of a lightweight diesel outboard which provide unheard of fuel savings and greatly boost productivity in coastal fishing. Together with our quality FRP fishing boats, produced in some 200 models, we are busy promoting modern coastal and offshore fishing in various part of the world.



Model D27

Work Boats

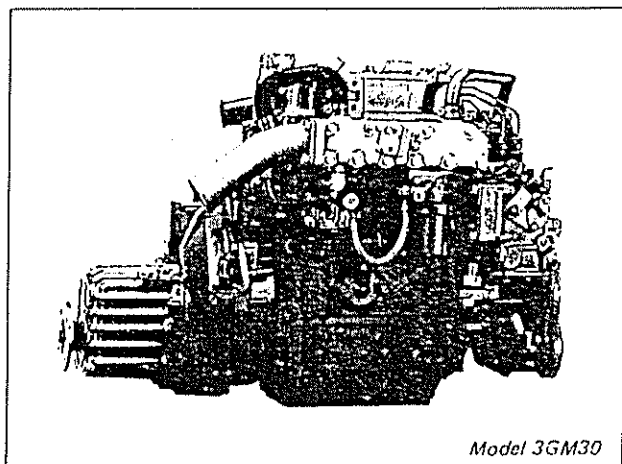
Yanmar's new high output, turbocharged marine diesel line-up is finding increasing and ever more diversified outlets for use in all kinds of cargo boats, tugs, dhows, passenger ferries and high-speed utility boats, thanks to powerful performance, lightness of weight, compactness and cost-cutting features. The new fuel pump delivers at high pressure with such incredibly precise timing that it can achieve almost 100% combustibility.



Model M220

Pleasure Boats

The name of Yanmar has a long and high reputation in major boating countries around Europe and U.S. for quality diesels. Yanmar's pleasure boat engine range covers a total of 28 models including V-drive, Angle-drive and Sail-drive models. Yanmar offers compact, tough, direct injection diesels in the max. output range from 9 hp to 140 hp to meet every type of marine pleasure requirement. Yanmar is also the fastest emerging force in the pleasure craft field, developing numerous sophisticated high speed power boats, especially for game fishing, all fitted with renowned Yanmar pleasure boat diesels.



Model 3GM30

Yanmar Diesel Engine Co., Ltd.

Specifications (Mains)

* Asterisk shows D1NG270B

Model	No. of cylinders	Bore x stroke: mm	Cont. rating output: hp/rpm	Dry weight: kg	Dimensions L x W x H: mm
D18	2	70 x 70	18/4500	74, 79	722 x 460 x 1286
D27	3	70 x 70	27/4500	82, 87	722 x 460 x 1368
D36	3	70 x 70	36/4500	114, 118	730 x 460 x 1433
1GM10	1	75 x 72	*9/3600	76	547 x 410 x 485
2GM20	2	75 x 72	*18/3600	106	638 x 455 x 495
2GM20F	2	75 x 72	*18/3600	114	643 x 482 x 545
3GM30	3	75 x 72	*27/3600	130	735 x 455 x 495
3GM30F	3	75 x 72	*27/3600	138	740 x 455 x 545
3HM35	3	80 x 85	*34/3400	158	786 x 485 x 617
3HM35F	3	80 x 85	*34/3400	167	791 x 475 x 638
2TD	2	100 x 115	26/2100	330	874 x 526 x 805
3TD	3	100 x 115	39/2100	400	1009.5 x 526 x 825
4TD	4	100 x 115	52/2100	510	1235.5 x 526 x 854.5
4JH2E	4	82 x 86	*50/3600	228	888.4 x 565 x 634.5
4JH2-TE	4	82 x 86	*62/3600	234	888.4 x 565 x 634.5
4JH2-HTE	4	82 x 86	*75/3600	244	888.4 x 565 x 643.5
4JH2-DTE	4	82 x 86	*88/3600	244	888.4 x 565 x 643.5
3ESDE	3	120 x 135	56/1800	680	1255 x 689 x 967
4ESDE	4	120 x 135	74/1800	800	1473 x 694 x 1015
4LH-TE	4	100 x 110	*110/3300	340	1058.2 x 649 x 726
4LH-HTE	4	100 x 110	*140/3300	350	1058.2 x 649 x 726
4CHE	4	105 x 125	70/2300	655	1372 x 688 x 1025
6CHE	6	105 x 125	105/2300	785	1661 x 690 x 1018
6CH-HTE	6	105 x 125	155/2300	830	1658 x 690 x 1056
6CH-DTE	6	105 x 125	190/2300	880	1658 x 690 x 1091
6CH-UTE	6	105 x 125	255/2550	915	1551.5 x 730 x 1111
4KDE	4	145 x 170	110/1450	1430	1701 x 731 x 1164
6KDE	6	145 x 170	165/1450	2263	2495 x 741 x 1202
6HA(M)E	6	130 x 150	165/2000	1145	1529 x 885 x 1097
6HA(M)-HTE	6	130 x 150	240/2000	1230	1529 x 939 x 1233
6HA(M)-DTE	6	130 x 150	300/2000	1250	1529 x 939 x 1233
6GH-UTE	6	117.9 x 140	350/2300	1335	1762 x 898.5 x 1247.5
6LAAE	6	148 x 165	240/1900	2120	1703 x 921 x 1275.5
6LA-DTE	6	148 x 165	400/1800	1890	1719 x 1012.5 x 1358
6LAA-UTE	6	148 x 165	530/1850	1890	1719 x 1012.5 x 1358
8LAA-DTE	Vee 8	148 x 165	530/1800	2420	1983 x 1430 x 1420
8LAA-UTE	Vee 8	142 x 165	650/1850	2420	1983 x 1430 x 1420
12LAA-DTE	Vee 12	148 x 165	800/1800	3300	2553 x 1430 x 1470
12LAA-UTE	Vee 12	148 x 165	1000/1850	3300	2553 x 1430 x 1470
S165	6	165 x 210	200/1200	3100	2574.5 x 1043 x 1586
S165-T	6	165 x 210	300/1300	3150	2574.5 x 1070 x 1586
S165-UT	6	165 x 210	450/1300	3600	2697 x 1070 x 1586
S165-ST	6	165 x 210	550/1300	3780	2697 x 1070 x 1586
S165-ET	6	165 x 210	600/1350	3780	2847 x 1070 x 1586

(Continued on next page)

Yanmar Diesel Engine Co., Ltd.

Model	No. of cylinders	Bore x stroke: mm	Cont. rating output: hp/rpm	Dry weight: kg	Dimensions L x W x H: mm
S185-UT	6	185 x 230	500/900	6000	3457 x 1170 x 1974
S185-ST	6	185 x 230	550/900	6040	3457 x 1170 x 1974
S185-ET	6	185 x 230	600/900	6090	3457 x 1170 x 2029
S185A-ET	6	185 x 230	650/950	6090	3457 x 1170 x 2029
M200D-UN	6	200 x 260	600/750	7350	3504 x 1120 x 1958
M200D-SN	6	200 x 260	660/750	7350	3508 x 1120 x 1958
M200-DN	6	200 x 260	600/900	6900	3411 x 1120 x 1958
M200-SN	6	200 x 260	800/900	7350	3508 x 1120 x 2013
M200-EN	6	200 x 260	900/900	7700	3650 x 1120 x 2013
M220-UN	6	220 x 300	1000/800	9100	3884 x 1162 x 2038
M220-SN	6	220 x 300	1100/800	9100	3910 x 1162 x 2143
M220-EN	6	220 x 300	1200/800	9100	3903 x 1162 x 2143
T240-UT	6	240 x 310	1000/750	10700	4131 x 1203 x 2244
T240-ST	6	240 x 310	1100/750	10700	4131 x 1203 x 2244
T240-ET	6	240 x 310	1200/750	10700	4131 x 1203 x 2244
T240A-ET	6	240 x 310	1400/800	11930	4303 x 1203 x 2244
T260-UT	6	260 x 330	1300/700	12930	4691 x 1443 x 2388
T260-ST	6	260 x 330	1400/700	12930	4691 x 1443 x 2388
T260-ET	6	260 x 330	1500/700	13080	4691 x 1443 x 2447
T260A-ET	6	260 x 330	1600/750	13300	4691 x 1443 x 2447
Z280-SN	6	280 x 360	1600/650	16550	4947.5 x 1540 x 2658
Z280-EN	6	280 x 360	1800/650	16550	4947.5 x 1540 x 2658
Z280A-EN	6	280 x 360	2000/720	17950	4947.5 x 1540 x 2658
Z280A-GN	6	280 x 360	2200/720	20900	5417 x 1481 x 2658
8Z280-SN	8	280 x 360	2100/650	22580	6288 x 1914 x 2651
8Z280-EN	8	280 x 360	2400/650	22580	6288 x 1914 x 2651
8Z280A-EN	8	280 x 360	2600/720	24330	6288 x 1914 x 2651
8Z280A-GN	8	280 x 360	2900/720	26600	6288 x 1914 x 2651
12T26-ST	Vee 12	260 x 330	2800/700	24800	5989 x 1857 x 2726
12T26-ET	Vee 12	260 x 330	3000/700	25200	6127 x 1982 x 2726
12T26A-ET	Vee 12	260 x 330	3200/750	25200	6127 x 1982 x 2850.5
MF24-HT	6	240 x 420	600/420	12450	4166 x 1363 x 2465
MF24-DT	6	240 x 420	700/420	12450	4166 x 1363 x 2465
MF24-UT	6	240 x 420	800/420	12450	4166 x 1363 x 2465
MF24-ST	6	240 x 420	950/420	12700	4237 x 1363 x 2465
MF26-HT	6	260 x 500	1000/350	16400	4607 x 1485 x 2840
MF26-ST	6	260 x 500	1200/380	17300	4897 x 1485 x 2840
MF28-HT	6	280 x 450	1000/380	18500	4803 x 1577 x 2880
MF28-DT	6	280 x 450	1100/380	19400	5093 x 1577 x 2880
MF28-UT	6	280 x 450	1200/380	19400	5093 x 1577 x 2880
MF28-ST	6	280 x 450	1300/380	19600	5093 x 1577 x 2925
MF33-DT	6	330 x 620	1600/300	26000	5297 x 1785 x 3440
MF33-UT	6	330 x 620	1800/300	26000	5297 x 1785 x 3440
MF33-ST	6	330 x 620	2000/300	26000	5297 x 1785 x 3440

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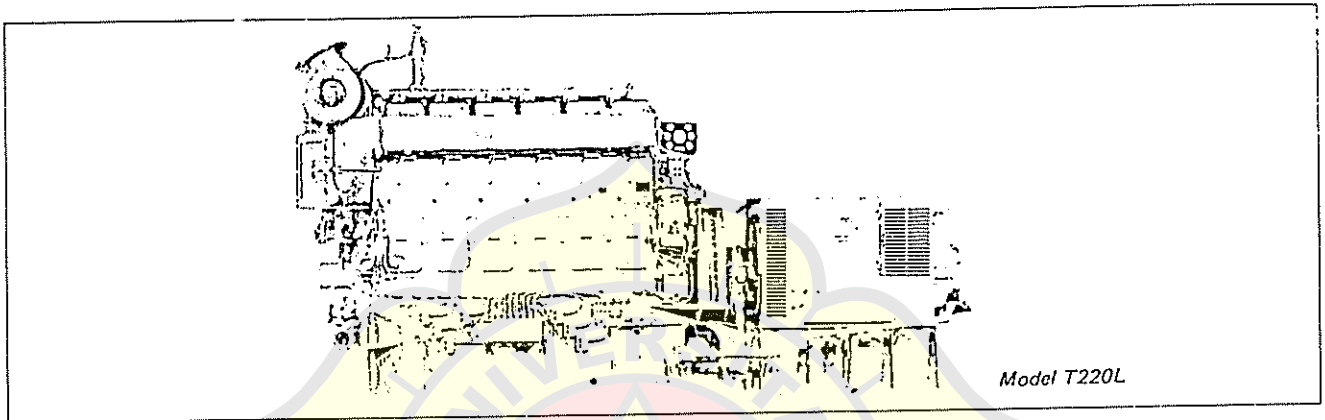
Model	Cycle	Cylinders	Bore (mm)	Stroke (mm)	Mean Piston Speed (m/s)	Speed (r/min)	Output (kW/cyl)	Output range (kW)	BMEP (bar)	Specific Fuel (g/kWh)
S165 series	4	6L	165	210	8.40-9.45	1200-1350	147-441	5.57-14.85	210	
6N165-EN	4	6L	165	232	10.83	1400	588	17.28	192	
S185 series	4	6L	185	230	6.90-7.28	900-950	405-478	14.83-15.60	215	
M200 series	4	6L	200	260	6.50-7.80	750-900	441-662	14.69-18.26	193	
M220 series	4	6L	220	300	8.00	800	736-883	16.44-19.73	193	
T240 series	4	6L	240	310	7.75-8.27	750-800	809-1030	15.69-18.72	192	
T260 series	4	6L	260	330	7.70-8.47	700-770	1030-1177	17.12-18.26	201	
6N260 series	4	6L	260	360	9.00	750	1177-1471	16.74-20.93	190	
Z280 series	4	6L	280	360	7.80-8.64	650-720	1324-1471	18.74-18.80	197	
8Z280 series	4	8L	280	360	7.80-8.64	650-720	1765-1912	18.74-18.80	177	
6N280 series	4	6L	280	380	9.12	720	1471-1839	17.81-22.26	189	
8N280 series	4	8L	280	380	9.12	720	1912-2354	17.36-21.37	189	
6N330 series	4	6L	330	440	9.09	620	2207-2574	19.29-22.50	188	
8N330 series	4	8L	330	440	9.09	620	2942-3310	19.29-21.70	188	
MF24 series	4	6L	240	420	5.88	420	441-588	11.28-15.04	197	
MF26 series	4	6L	260	500	5.83-6.67	350-400	588-956	11.90-18.36	194	
MF29 series	4	6L	290	520	6.59	380	1030-1177	16.10-18.40	193	
MF33 series	4	6L	330	620	6.20-6.82	300-330	1177-1618	15.09-18.86	190	

Yanmar Diesel Engine Co., Ltd.

Marine Auxiliaries

Yanmar serves a great range of on-board power demands with its line-up of auxiliary engines. In the cost conscious world of marine transportation, profitable fleet operation has been more important and to meet these needs Yanmar offers

economical inboard co-generation systems, including MDO/HFO operation and various fuel pre-treatment systems. The lowest possible fuel consumption is a standard feature of all Yanmar marine auxiliaries, and all can stand extremely long hours continuous operation with major overhauls.



Model T220L

Specifications (Auxiliary)

*The size excluding the fresh water cooler.

Model	No. of cylinders	Bore x stroke: mm	Cont. rating output: hp/rpm	Dry weight: kg	Dimensions L x W x H: mm
1GM10L	1	75 x 72	6/3000, 7/3600	67	385 x 470 x 502
2GML	2	72 x 72	11/3000, 13/3600	97	481 x 470 x 512
2GMFL	2	72 x 72	11/3000, 13/3600	105	481 x 470 x 562
3GML	3	72 x 72	17/3000, 20/3600	122	566 x 470 x 512
3GMFL	3	72 x 72	17/3000, 20/3600	130	566 x 470 x 562
3HML	3	75 x 85	21.5/3000, 25.5/3600	147	606 x 470 x 617
3HMFL	3	75 x 85	21.5/3000, 25.5/3600	156	606 x 470 x 646
4CHLN	4	105 x 125	38/1500, 50/1800	500	1089 x 840 x 1021
6CHLN	6	105 x 125	62/1500, 74/1800	620	1378 x 840 x 1022
6CHL-TN	6	105 x 125	74/1500, 100/1800	640	1378 x 840 x 1242
6CHL-HTN	6	105 x 125	100/1500, 120/1800	670	1378 x 840 x 1241
3KDL	3	145 x 170	70/1200, 85/1500	940	1082 x 715 x 1182
4KDL	4	145 x 170	95/1200, 115/1500	1150	1351 x 715 x 1182
5KDL	5	145 x 170	120/1200, 140/1500	1345	1553 x 725 x 1182
6KFL	6	145 x 170	145/1200, 170/1500	1780	1798 x 837 x 1200
6KFL-T	6	145 x 170	185/1200, 225/1500	1890	2114 x 943 x 1448
6KFL-HT	6	145 x 170	220/1200, 270/1500	1930	2114 x 985 x 1448
6KFL-UT	6	145 x 170	270/1200, 300/1500	2050	2139 x 1106 x 1568
6HAL-N	6	130 x 150	125/1500, 150/1800	1150	2000 x 962 x 1278
6HAL-TN	6	130 x 150	150/1500, 180/1800	1200	1910 x 856 x 1322
6HAL-HTN	6	130 x 150	200/1500, 240/1800	1250	1910 x 873.5 x 1322
6HAL-DTN	6	130 x 150	250/1500, 300/1800	1270	1910 x 873.5 x 1322
6LAAL-DTN	6	148 x 165	360/1500, 420/1800	1950	1766 x 1061 x 1529.5
8LAAL-DTN	Vee 8	148 x 165	480/1500, 560/1800	2400	1983 x 1316 x 1420
12LAAL-DTN	Vee 12	148 x 165	720/1500, 840/1800	3500	2553 x 1430 x 1470
S165L	6	165 x 210	200/1200	2700*	2181 x 1070 x 1581
S165SL-T	6	165 x 210	200/1200	2750*	2181 x 1070 x 1581
S165L-HN	6	165 x 210	270/1000, 360/1200	2900*	2214 x 1070 x 1581

(Continued on next page)

Yanmar Diesel Engine Co., Ltd.

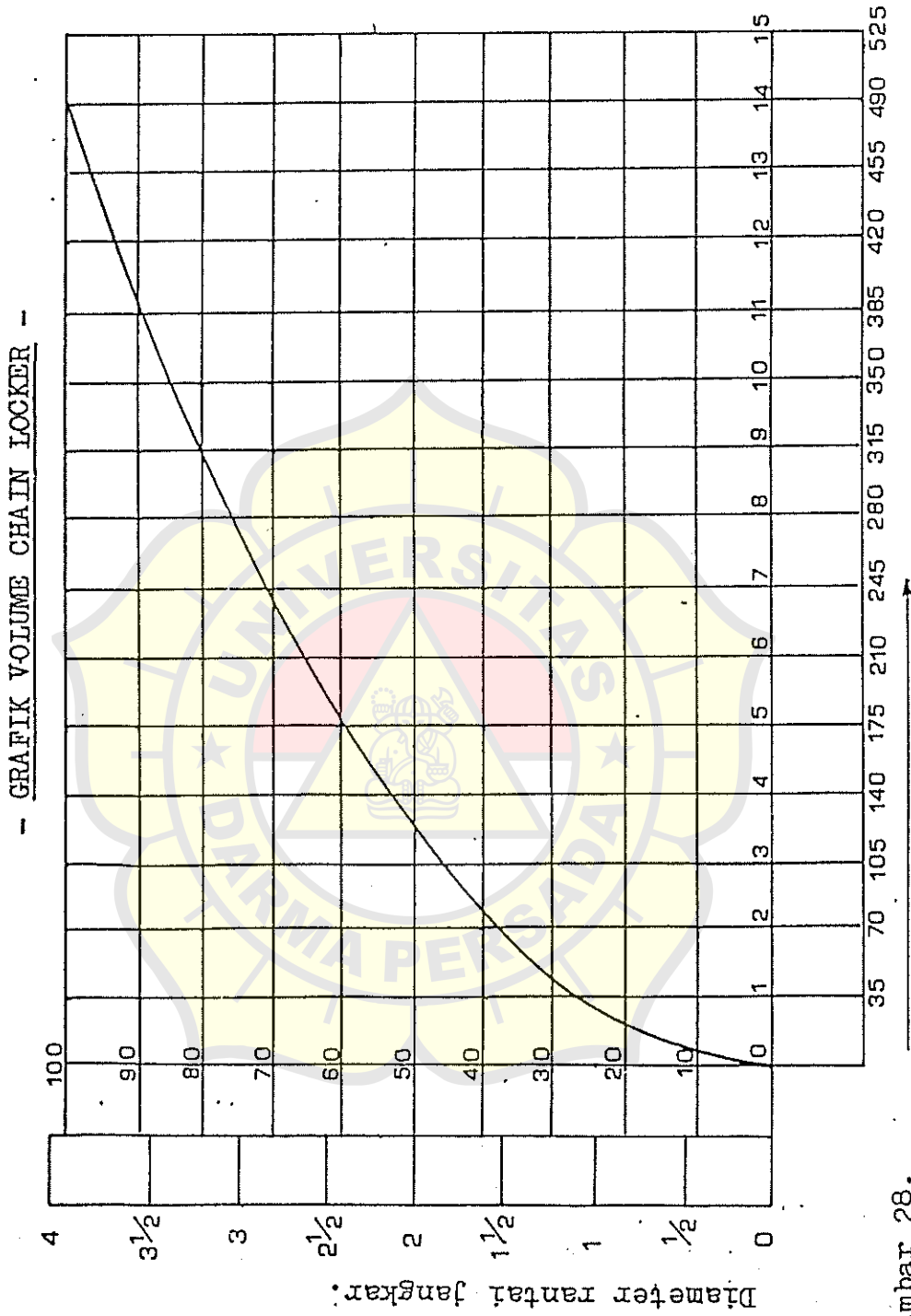
Model	No. of cylinders	Bore x stroke: mm	Cont. rating output: hp/rpm	Dry weight: kg	Dimensions L x W x H: mm
S165L-DN	6	165 x 210	330/1000, 420/1200	2900*	2214 x 1070 x 1581
S165L-UN	6	165 x 210	360/1000, 480/1200	2900*	2214 x 1070 x 1581
S165L-SN	6	165 x 210	420/1000, 540/1200	2900*	2214 x 1070 x 1581
S165L-EN	6	165 x 210	480/1000, 600/1200	2900*	2214 x 1070 x 1581
S185DL-UT	6	185 x 230	420/720, 420/750	5400	2687 x 1134 x 1749
S185DL-ST	6	185 x 230	480/720, 480/750	5400	2687 x 1134 x 1749
S185DL-ET	6	185 x 230	540/720, 540/750	5400	2687 x 1134 x 1749
S185L-UT	6	185 x 230	540/900, 540/1000	5400	2687 x 1134 x 1749
S185L-ST	6	185 x 230	600/900, 600/1000	5000	2687 x 1134 x 1749
S185L-ET	6	185 x 230	660/900, 660/1000	5000	2687 x 1134 x 1749
S185AL-UT	6	185 x 230	600/1200	5000	2687 x 1134 x 1749
S185AL-ST	6	185 x 230	660/1200	5000	2687 x 1134 x 1749
M200L-UN	6	200 x 260	600/720, 600/750	5800	2919 x 1120.5 x 1844
M200L-SN	6	200 x 260	660/720, 660/750	5800	2923 x 1120.5 x 1880
M200L-EN	6	200 x 260	750/720, 750/750	5800	2977 x 1120.5 x 1883
M200L-UN	6	200 x 260	720/900, 720/1000	5800	2919 x 1120.5 x 1844
M200AL-SN	6	200 x 260	830/900, 830/1000	5800	2977 x 1120.5 x 1883
M200AL-EN	6	200 x 260	900/900, 900/1000	5800	2977 x 1120.5 x 1833
M220L-UN	6	220 x 300	830/720, 830/750	7200	3165 x 1162 x 2070
M220L-SN	6	220 x 300	900/720, 900/750	7200	3165 x 1162 x 2070
M220L-EN	6	220 x 300	1000/720, 1000/750	7200	3204 x 1162 x 2143
M220AL-UN	6	220 x 300	1000/900, 1000/1000	7200	3165 x 1162 x 2070
M220AL-SN	6	220 x 300	1100/900, 1100/1000	7200	3211 x 1162 x 2143
M220AL-EN	6	220 x 300	1200/900, 1200/1000	7200	3204 x 1162 x 2143
T240L-UT	6	240 x 310	1000/720, 1000/750	8400	3394 x 1203 x 2244
T240L-ST	6	240 x 310	1100/720, 1100/750	8400	3381 x 1203 x 2244
T240L-ET	6	240 x 310	1200/720, 1200/750	8400	3381 x 1203 x 2244
T240AL-ST	6	240 x 310	1200/900	8400	3381 x 1203 x 2244
T240AL-ET	6	240 x 310	1300/900	8400	3381 x 1203 x 2244
T260L-ST	6	260 x 330	1300/720, 1300/750	9600	3711 x 1313 x 2388
T260L-ST	6	260 x 330	1400/720, 1400/750	9600	3711 x 1313 x 2388
T260L-ET	6	260 x 330	1500/720, 1500/750	9750	3891 x 1343 x 2447
Z280L-UT	6	280 x 360	1600/720, 1600/750	12400	3895 x 1540 x 2658
Z280L-ST	6	280 x 360	1800/720, 1800/750	12600	3895 x 1540 x 2658
Z280L-ET	6	280 x 360	2000/720, 2000/750	12600	3895 x 1540 x 2658
8Z280L-UT	8	280 x 360	2200/720, 2200/750	16200	4888 x 1575 x 2651
8Z280L-ST	8	280 x 360	2400/720, 2400/750	16400	4888 x 1575 x 2651
8Z280L-ET	8	280 x 360	2600/720, 2600/750	16400	4888 x 1575 x 2651
12T26L-ST	Vee 12	260 x 330	2600/720, 2600/750	18600	4266 x 2360 x 2726
12T26L-ST	Vee 12	260 x 330	2800/720, 2800/750	18600	4266 x 2360 x 2726
12T26L-ET	Vee 12	260 x 330	3000/720, 3000/750	19000	4404 x 2360 x 280.5
12ZL-UT	Vee 12	280 x 340	3200/720, 3200/750	26000	5108 x 2730 x 2937
12ZL-ST	Vee 12	280 x 340	3600/720, 3600/750	26500	5108 x 2730 x 3005
16ZL-ST	Vee 16	280 x 340	4800/720, 4800/750	34000	6216 x 2894 x 3286

Lampiran 16. Data Katalog Gear Box

Modul	MGN Type		MGNV Type		Max. Input Speed (rpm)	SAE F.W. Hs.g.	Dimensions (mm)				Weight (kg)
	A	B	A	B			A	B	C	D	
MGN 123					3300	1,2	350	426	179	327	199
MGN 133					2800	0,1,2	415	500	211	406	230
MGN 233					2600	0,1	548,5	605	254	495	410
MGN 273					2500	0,1	620	705	265	510	470
MGN 332					2500	0,1	770	736,6	235	490	540
MGN 433					2500	0,1	745	880	310	625	880
MGN 472					2150	00,0	975,5	1000	330	685	1200
MGNV232					2600	0,1	547,5	605	282	495	420
MGNV272					2500	0,1	623	705	336,2	530	490
MGNV332					2500	0,1	720	760	329	550	580
MGNV432					2500	0,1	756,5	920	419	675	1000
MGNV472					2150	00,0	862,32	930	469,26	750	1450

Specifications

Lampiran 17. Grafik untuk menentukan volume *Chain Locker*



Gambar 28.

Volume Chain locker untuk setiap 100 fathoms panjang rantai.

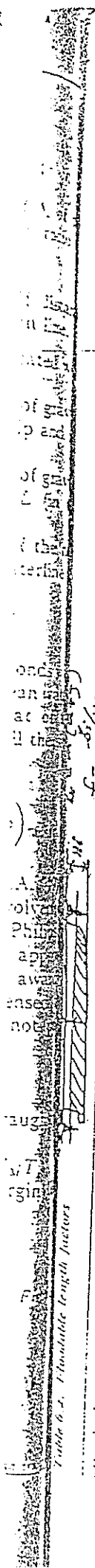


Figure 6.5. Floodable length factors

block shear ratio coefficient δ	fore body												after body												
	l_{10} 0.15L _{pp}	l_{20} 0.20L _{pp}	l_{30} 0.30L _{pp}	l_{40} 0.40L _{pp}	l_{50} 0.45L _{pp}	l_{60} 0.50L _{pp}	l_{70} 0.55L _{pp}	l_{80} 0.60L _{pp}	l_{90} 0.70L _{pp}	l_{100} 0.80L _{pp}	l_{110} 0.85L _{pp}	l_{120} 0.90L _{pp}	l_{130} 0.95L _{pp}	l_{140} 1.00L _{pp}	fore terminal	sheer block coefficient									
δ	m	a	m	a	m	a	m	a	m	a	m	a	m	a	m	a									
0.60	41.2	0.275	57.4	0.077	57.7	0.045	66.9	0.021	96.3	-0.013	104.9	-0.020	98.5	-0.017	72.9	0.012	55.7	0.048	56.3	0.080	61.7	0.115	40.2	0.379	0.30
0.62	40.9	0.268	56.6	0.072	56.8	0.044	66.0	0.024	95.3	-0.008	105.1	-0.017	99.4	-0.015	74.2	0.012	56.0	0.045	55.4	0.077	60.8	0.110	40.1	0.368	0.30
0.64	39.4	0.248	54.9	0.041	54.2	0.017	62.8	0.004	91.2	-0.013	104.3	-0.019	98.2	-0.015	69.5	0.007	51.4	0.032	48.4	0.073	55.8	0.007	36.8	0.365	0.16
0.66	40.6	0.261	55.9	0.067	55.9	0.043	65.1	0.027	94.4	-0.004	105.2	-0.014	100.3	-0.012	75.3	0.013	56.2	0.044	54.7	0.074	59.9	0.104	39.9	0.359	0.30
0.68	38.6	0.238	53.1	0.033	52.4	0.015	61.5	0.008	89.6	-0.005	104.2	-0.013	99.2	-0.012	70.4	0.009	51.6	0.031	47.8	0.069	54.6	0.061	36.8	0.351	0.16
0.68	40.2	0.245	54.5	0.056	54.4	0.039	63.8	0.032	92.2	0.004	105.2	-0.009	101.9	-0.005	76.9	0.018	56.4	0.046	53.2	0.068	59.0	0.093	39.4	0.342	0.30
0.70	38.3	0.229	52.2	0.028	51.6	0.014	61.0	0.009	80.9	-0.001	104.1	-0.010	101.0	-0.006	71.6	0.015	52.0	0.032	46.7	0.062	52.3	0.076	36.6	0.310	0.16
0.70	40.0	0.235	53.9	0.051	53.6	0.037	63.3	0.035	92.1	0.008	105.2	-0.006	102.6	-0.002	77.6	0.022	56.6	0.048	52.5	0.066	57.3	0.087	39.1	0.331	0.30
0.72	38.1	0.219	51.5	0.023	50.9	0.013	60.7	0.011	88.2	0.003	104.1	-0.007	101.8	-0.004	72.1	0.019	52.2	0.034	46.2	0.059	51.2	0.072	35.5	0.319	0.16
0.72	39.9	0.225	53.2	0.046	53.0	0.036	62.9	0.038	91.5	0.012	105.2	-0.003	103.5	0.001	78.4	0.025	56.9	0.050	52.0	0.065	56.4	0.082	38.8	0.324	0.30
0.74	38.0	0.207	50.7	0.018	50.2	0.012	60.6	0.012	87.6	0.007	104.2	-0.004	102.7	-0.001	72.8	0.023	52.5	0.037	45.0	0.057	50.1	0.069	36.4	0.300	0.16
0.74	39.8	0.215	52.6	0.042	52.3	0.036	62.6	0.041	91.1	0.016	105.4	0.000	104.4	0.004	79.5	0.028	57.4	0.053	51.5	0.064	55.6	0.076	38.6	0.314	0.30
0.76	38.0	0.194	49.9	0.015	49.5	0.012	60.5	0.014	87.2	0.011	104.4	-0.001	103.6	0.002	73.9	0.026	52.9	0.039	45.4	0.056	49.0	0.066	36.3	0.296	0.16
0.76	39.7	0.203	51.9	0.040	51.7	0.038	62.5	0.044	90.9	0.020	105.7	0.002	105.6	0.006	81.0	0.029	58.2	0.056	51.0	0.064	54.9	0.070	38.4	0.303	0.30
0.76	38.0	0.180	49.1	0.013	49.0	0.013	60.5	0.017	86.9	0.015	104.7	0.001	104.8	0.004	75.3	0.028	53.6	0.042	45.1	0.054	48.0	0.062	36.2	0.283	0.16
0.76	39.7	0.190	51.2	0.040	51.1	0.041	62.5	0.048	90.9	0.023	106.1	0.005	107.0	0.008	83.1	0.030	59.4	0.059	50.7	0.065	54.2	0.065	38.4	0.288	0.30
0.80	30.1	0.166	48.2	0.013	48.4	0.015	60.5	0.020	86.7	0.018	105.1	0.004	106.3	0.006	77.2	0.028	54.5	0.046	44.9	0.054	47.1	0.059	36.2	0.269	0.16
0.80	39.8	0.176	50.3	0.041	50.5	0.046	62.6	0.052	91.0	0.027	106.7	0.008	108.6	0.009	85.6	0.030	60.9	0.062	50.4	0.066	53.5	0.059	36.5	0.272	0.30
0.80	38.3	0.152	47.2	0.015	47.9	0.018	60.6	0.024	86.7	0.021	105.7	0.006	109.0	0.007	79.5	0.030	55.6	0.049	44.8	0.054	46.3	0.055	36.3	0.253	0.16

This table applies to all cases where:
 1. The forebody ratio varies from 0.18 to 0.39;
 2. The sheer ratio varies from 0.16 to 0.30 forward and from 0.08 to 0.15 aft;
 3. The block coefficient varies from 0.5 to 0.80;
 4. The terminal equal to one-half the floodable length given by the formula for a permeability of 0.000001.



JURUSAN TEKNIK PERKAPALAN
FAKULTAS TEKNOLOGI KELAUTAN
UNIVERSITAS DARMA PERSADA

Jl. Radin Inten II Pondok Kelapa, Jakarta Timur 13450

FORM ASISTENSI TUGAS MERANCANG (KP 4229)
Lines Plan, Hydrostatic & Bonjean

Nama : Hendra Arthur Toloh
N . I . M : 98 310 008
Tipe Kapal : Kapal Ikan (Skipjack Pole & Line) 650 GRT

Data Kapal :
- LOA : 49,50 m. - Bmld : 8,50 m.
- LWL : 45,90 m. - Hmld : 4,15 m.
- LPP : 45,00 m. - Tmld : 3,15 m.

NO	TANGGAL	KETERANGAN	PARAF
1.	31-05-01	Pra rancangan : agar diperiksa kembali dgn referensi yg didapat - jumlah crew untuk kapal jenis tsb.	
2.	6-06-01	Pra rancangan dgn dasar buku referensi yg menjadi acuan - ok.	
3.	18-02-02	Bentuk garis yg kurang layak agar diperbaiki (lines) Periksa kembali proyeksi upper deck. (lines)	
4.	20-03-02	Periksa kembali lengkungan Ø F dan DDT. Periksa kembali lengkungan WPA dan WSA.	
5.	21-03-02	Bonjean Curve & Hydrostatic Curve sudah diperiksa kembali.	

Ddsen pembimbing,

(Ir. Joedonowarso P. M.Si)



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Jl. Radin Inten II Pondok Kelapa, Jakarta Timur 13450

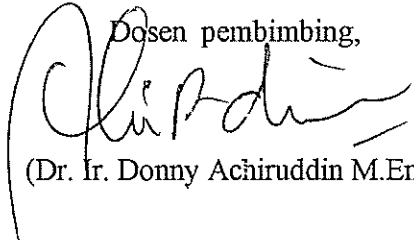
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- LPP	: 45,00 m.	- Tmld	: 3,15 m.

NO	TANGGAL	KETERANGAN	PARAF
1	5/04-02	PENGETESAN LINES PLAN	DA
2	12/04-02	PENYAHITAMAN HIDROSTATIK & BONJEAN.	DA

Dosen pembimbing,

(Dr. Ir. Donny Achiruddin M.Eng)



JURUSAN TEKNIK PERKAPALAN
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Jl. Radin Inten II Pondok Kelapa, Jakarta Timur 13450

FORM ASISTENSI TUGAS MERANCANG (KP 4229)
Hambatan & Propulsi Kapal

Nama : Hendra Arthur Toloh
N . I . M : 98 310 008
Tipe Kapal : Kapal Ikan (Skipjack Pole & Line) 650 GRT

Data Kapal :

- LOA	: 49,50 m.	- Bmld	: 8,50 m.
- LWL	: 45,90 m.	- Hmld	: 4,15 m.
- LPP	: 45,00 m.	- Tmld	: 3,15 m.

NO	TANGGAL	KETERANGAN	PARAF
1.	20.03.02.	<ul style="list-style-type: none">- guluk buku yang digunakan dalam penulisan diganti dengan referensi no : ? (senari daftar pustaka)- Gambar & Grafik yg di pakai harus dilampirkan- Perhatikan penulisan satuan & simbol- diperbaiki sesuai Catatan yg ada.	
2.	26.03.02	<ol style="list-style-type: none">1. Perhitungan hambatan kapal sudah di perbaiki!2. Propulsi & lampirkan diagram Bp - S yg digunakan3. rapat dilanjutkan y merencanakan berikutnya.	

Dosen pembimbing,

(Ir. Fanny Octaviani)



JURUSAN TEKNIK PERALATAN KELAUTAN
FAKULTAS TEKNOLOGI KELAUTAN
UNIVERSITAS DARMA PERSADA
JL. Radin Inten II Pondok Kelapa, Jakarta Timur 13450

FORM ASISTENSI TUGAS MERANCANG (KP 4229)
Hambatan & Propulsi Kapal

Nama : Hendra Arthur Toloh
N . I . M : 98 310 008
Tipe Kapal : Kapal Ikan (Skipjack Pole & Line) 650 GRT

Data Kapal :
- LOA : 49,50 m. - Bmld : 8,50 m.
- LWL : 45,90 m. - Hmld : 4,15 m.
- LPP : 45,00 m. - Tmld : 3,15 m.

NO	TANGGAL	KETERANGAN	PARAF
1	8/4/09	- Penyusunan literatur dan Referensi - Koreksi Pelajaran Dinias (terlupakan)	
2	15/4/09	- Ailem	

Dosen pembimbing,

(Ir. Satochid Sosrodiredjo, MM)



JURUSAN TEKNIK PERKAPALAN
FAKULTAS TEKNOLOGI KELAUTAN
UNIVERSITAS DARMA PERSADA

JL. Radin Inten II Pondok Kelapa, Jakarta Timur 13450

FORM ASISTENSI TUGAS MERANCANG (KP 4229)
Rencana Umum (General Arrangement)

Nama : Hendra Arthur Toloh
N . I . M : 98 310 008
Tipe Kapal : Kapal Ikan (Skipjack Pole & Line) 650 GRT

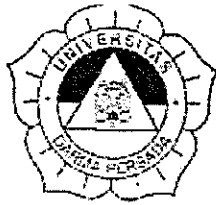
Data Kapal :

- LOA	: 49,50 m.	- Bmld	: 8,50 m.
- LWL	: 45,90 m.	- Hmld	: 4,15 m.
- LPP	: 45,00 m.	- Tmld	: 3,15 m.

NO	TANGGAL	KETERANGAN	PARAF
1.	18/02-03	- Penempatan Tangki = F.O dan L.O agar dikoreksi sesuai petunjuk lengkapi deupan Frame space sesuai hasil perhitungan.	
2.	20/02-03	- Perubahan sudah dilakukan dan OK.	

Dosen pembimbing,

(Ir. Joedonowarso P, M.Si)



JURUSAN TEKNIK PERKAPALAN
FAKULTAS TEKNOLOGI KELAUTAN
UNIVERSITAS DARMA PERSADA

JL. Radin Inten II Pondok Kelapa, Jakarta Timur 13450

FORM ASISTENSI TUGAS MERANCANG (KP 4229)
GRT & NRT

Nama : Hendra Arthur Toloh
N . I . M : 98 310 008
Tipe Kapal : Kapal Ikan (Skipjack Pole & Line) 650 GRT

Data Kapal :
- LOA : 49,50 m. - Bmld : 8,50 m.
- LWL : 45,90 m. - Hmld : 4,15 m.
- LPP : 45,00 m. - Tmld : 3,15 m.

NO	TANGGAL	KETERANGAN	PARAF
01	15 11. 02	<p>- Tahap 2 Perhitungan yang di kerjakan benar !</p> <p>- Ada hal yg masih kosong / blanka bolong di koreksi.</p> <p>- Di per gelas mengenai referensi gambar yg di butuhkan dalam pengerjaan perhitungan.</p>	

Dosen pembimbing,

(Ir. Fanny Octaviani)



JURUSAN TEKNIK PERKAPALAN
FAKULTAS TEKNOLOGI KELAUTAN
UNIVERSITAS DARMA PERSADA

Jl. Radin Inten II Pondok Kelapa, Jakarta Timur 13450

FORM ASISTENSI TUGAS MERANCANG (KP 4229)
Capacity Plan

Nama : Hendra Arthur Toloh
N . I . M : 98 310 008
Tipe Kapal : Kapal Ikan (Skipjack Pole & Line) 650 GRT

Data Kapal :
- LOA : 49,50 m. - Bmld : 8,50 m.
- LWL : 45,90 m. - Hmld : 4,15 m.
- LPP : 45,00 m. - Tmld : 3,15 m.

NO	TANGGAL	KETERANGAN	PARAF
1.	18/02-03	Penjelasan konstruksi rencana pondir lengkap dengan sketsa.	
2	20/02-03	Perhitungan dan penempatan tangki F.O dan L.O sudah dilaksanakan.	

Dosen pembimbing,

(Ir. Joedonowarso P, M.Si)



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UNIVERSITAS DARMA PERSADA

JL. Radin Inten II Pondok Kelapa, Jakarta Timur 13450

FORM ASISTENSI TUGAS MERANCANG (KP 4229)
Stabilitas & Trim

Nama : Hendra Arthur Toloh
N . I . M : 98 310 008
Tipe Kapal : Kapal Ikan (Skipjack Pole & Line) 650 GRT

Data Kapal :

- LOA	: 49,50 m.	- Bmld	: 8,50 m.
- LWL	: 45,90 m.	- Hmld	: 4,15 m.
- LPP	: 45,00 m.	- Tmld	: 3,15 m.

NO	TANGGAL	KETERANGAN	PARAF
1	5. Maret 2003	<ul style="list-style-type: none">- Untuk penulisan referensi / bks. yang harus diperbaiki (di bedakan).- Perbaiki posisi dan gambar : contoh cara pembacaan.- Pada pengambilan kondisi dalam perhitungan harus di pergelus keterangannya.	
2.	6. Maret 2003	<ul style="list-style-type: none">- Penggambaran kondisi sudah baik. (Perhitungan stabilitas)- Perhitungan Stabilitas Statis pada kondisi statis I, cargo hold ditulis 0 gongon dikosongkan.- Perhitungan trim dapat diterima. <p style="text-align: center;">2</p>	

Dosen pembimbing,

(Ir. Fanny Octaviani)



JUKUSAN TEKNIK PERKAPALAN
FAKULTAS TEKNOLOGI KELAUTAN
UNIVERSITAS DARMA PERSADA

JL. Radin Inten II Pondok Kelapa, Jakarta Timur 13450

FORM ASISTENSI TUGAS MERANCANG (KP 4229)
Konstruksi & Kekuatan

Nama : Hendra Arthur Toloh
N . I . M : 98 310 008
Tipe Kapal : Kapal Ikan (Skipjack Pole & Line) 650 GRT

Data Kapal :
- LOA : 49,50 m. - Bmld : 8,50 m.
- LWL : 45,90 m. - Hmld : 4,15 m.
- LPP : 45,00 m. - Tmld : 3,15 m.

NO	TANGGAL	KETERANGAN	PARAF
1.	17. 05. 03	- Ditambahkan content & profil yg di gunakan. - Tabel & yg di gunakan di lampirkan. - Tambahkan dengan gambar u/ kit. Perhitungan. - Gambar Midship di sekujur. - Gambar Buhaan kulit, Cons. Perhitungan.	
2.	03 04. 03	- Perhitungan kekuatan menurut tahap & sudah dia. - Gambar & yg di berikan keterangan skala. - Untuk teg. tarik & teg. tekan di lihat berdasarkan pel referensi	

Dosen pembimbing,

(Ir. Fanny Octaviani)



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Konstruksi & Kekuatan

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- LPP	: 45,00 m.	- Tmld	: 3,15 m.

NO	TANGGAL	KETERANGAN	PARAF
01.	08-04-'03	- Gambar diperbaiki - Pemahaman gambar konstruksi - Gambar konstruksi dipelajari.	
02.	10-04-'03	- Gambar sudah diperbaiki. - Perhitungan dan gambar konstruksi & kekuatan dapat diterima, OK!	

Dosen pembimbing,

(Ir. Donny Achiruddin, M.Eng. Ph.D)