３．海外の主要諸元に関する基準等との比較評価

3.1　海外での基準等における主要諸元の値

日本の技術基準において示されている船舶の主要諸元と同様に，海外においても様々な文献において船舶の主要諸元が示されている．ここでは，以下の海外における政府等の公的機関，PIANC等の国際機関，書籍等において示されている船舶の主要諸元を時系列的に**表 3-1～表 3-8** に示す．これらは港湾研究部において収集できた文献のみを示しており，これら以外の文献が存在することが十分に想定される．また，⑦Guidelines for Design of Fenders Systemsについては，国土技術政策総合研究所港湾研究部港湾計画研究室の前身である港湾技術研究所システム研究室の赤倉研究官が参加して作業を実施した．赤倉研究官は，それ以前に 1999 年版技術基準に引用されている参考文献[3)]の作業も実施している．

なお，⑦Guidelines for Design of Fenders Systems を除くこれらの海外の基準等においては,「港湾の施設の技術上の基準 1999」で明記されているデータの出典，解析手法等は明記されていない．

①Port and Harbor Engineering : Gregory Tsinker, 1996（**表 3-1**）

② Recommendations of the Committee for Waterfront Structures Harbours and Waterways EAU 1996 : Issued by the Committee for Water front Structures of the Society for Harbours Engineering and the German Society for Soil Mechanics and Foundation Engineering, 1996（**表 3-2**）

③Approach Channels A Guide for Design : Final Report of the Joint PIANC-IAPH Working Group Ⅱ-30 in cooperation with IMPA and IALA, 1997 （**表 3-3**）

④運輸省　港湾局監修 「港湾の施設の技術上の基準」1999

⑤TECHNICAL CODES FOR PORT ENGINEERNIG : SECTOR STANDARDS OF THE PEOPLE'S REPUBLIC OF CHINA, 2000（**表 3-4**）

⑥⑤OBRAS MARIIMAS TECNOLOGIA : Puertos del Estado, 2000（**表 3-5**）

⑦Guidelines for Design of Fenders Systems : Report of WG 33 of the MARITIME NAVIGATION COMMISSION , International Navigation Association PIANC, 2002 （**表 3-6～表 3-8**）

3.2　日本の技術基準と海外基準等との比較

日本の技術基準とこれらの海外基準等との主要諸元の値を比較した結果を**表 3-9** に示す．ただし，船種，船階級がそれぞれにおいて異なるために，比較可能な船種, 船階級のみを対象としている. なお, ⑦Guidelines for Design of Fenders Systems ではカバー率 50%値と 75%値が示されていることから，この両者を明記している．

この**表 3-9** では，「港湾の施設の技術上の基準 1999」を 100 とした場合の各基準等の指標値とともに，３種類の平均値を算定している．上段では８種類全ての平均値を，中段では④「港湾の施設の技術上の基準 1999」を除いた 7 種類の平均値を，下段では⑦Guidelines for Design of Fenders Systems のうち④「港湾の施設の技術上の基準 1999」と同様の概念である 75%値のみを対象とした 6 種類の平均値を示している．また，この 6 種類のデータについての変動状況を**図 3-1** に示している．

この結果から, ④「港湾の施設の技術上の基準 1999」を基準（100）とした場合に，ほぼ同年代に公表された世界の基準等の平均値（６種類のデータを対象）は概ね±５％（95～105）の変動内であり，この変動幅を超えるのは 50,000GT 級旅客船（ｄ）のみであることが確認される．このため，④「港湾の施設の技術上の基準 1999」により示される船舶の主要諸元の値は世界的にも標準的な値であり海外でも適用可能な値として評価することができる．さらに，次期の技術基準の改訂に際しても従来の手法を踏まえて解析を実施することが妥当であると判断される．ただし，他の船種と比較して，変動幅の大きコンテナ船に関しては，従来とおりの手法に加えてより詳細な分析手法を適用することが必要であると判断される. また, 旅客船に関しては，①，特に②について対象としたデータ等の特殊な要因があると判断される．

表 3-1　①Port and Harbor Engineer

	tonnage	Length (m)	Width (m)	Depth (m)	Fully Loaded Draft (m)	Displacement (t)
Cargo	700	52	8.3	3.8	3.6	900
Boats	1,000	60	9.3	4.4	4.1	1,300
	2,000	77	11.5	5.8	5.1	2,700
	3,000	90	13.1	6.8	5.7	4,000
	4,000	100	14.3	7.7	6.3	5,300
	5,000	109	15.3	8.4	6.7	6,700
	6,000	117	16.2	9.0	7.1	8,000
	7,000	124	17.0	9.6	7.5	9,300
	8,000	130	17.7	10.1	7.8	10,700
	9,000	136	18.4	10.6	8.1	12,000
	10,000	142	19.0	11.1	8.3	13,300
	12,000	152	20.1	11.9	8.8	16,000
	15,000	165	21.6	13.0	9.5	20,000
	17,000	173	22.4	13.7	9.8	22,700
	20,000	184	23.6	14.6	10.3	26,700
Passenger	500	50	8.2	4.5	4.0	500
Boats	1,000	65	10.0	5.3	4.5	1,000
	2,000	82	12.0	6.4	5.2	2,000
	3,000	95	13.5	7.3	5.7	3,000
	4,000	105	14.8	8.0	6.3	4,000
	5,000	113	15.8	8.8	6.8	5,000
	6,000	121	16.7	9.5	7.2	6,000
	7,000	127	17.5	10.2	7.6	7,000
	8,000	135	18.2	10.8	8.0	8,000
	10,000	145	19.2	12.0	8.5	10,000
	15,000	165	21.5	13.0	8.8	15,000
	20,000	180	23.0	13.8	9.0	20,000
	30,000	210	26.5	15.5	9.5	30,000
	50,000	245	30.5	18.0	10.5	50,000
	80,000	290	36.0	21.0	11.7	80,000
Ore	1,000	61	8.9	4.8	3.3	1,300
Carriers	2,000	77	11.1	6.0	5.1	2,700
	3,000	88	12.7	6.8	5.7	4,000
	4,000	96	13.9	7.5	6.1	5,300
	5,000	104	14.9	8.1	6.5	6,700
	15,000	149	21.3	11.5	8.6	20,000
	20,000	164	23.4	12.7	9.2	26,700
	25,000	176	25.1	13.6	9.8	33,300
	30,000	187	26.6	14.4	10.3	40,000
	40,000	206	29.2	15.9	11.0	53,300
	50,000	222	31.4	17.1	11.7	66,700
	60,000	235	33.3	18.1	12.3	80,000
	70,000	248	35.0	19.0	12.8	93,300
	80,000	259	36.6	19.9	13.2	106,700
	100,000	278	39.3	21.4	14.0	133,300
Tankers	300	37	7.0	3.3	3.0	400
	500	43	7.8	3.8	3.5	700
	700	54	7.9	4.0	3.8	900
	1,000	61	8.9	4.5	4.2	1,300
	2,000	76	11.2	5.7	5.1	2,700
	3,000	87	12.8	6.5	5.7	4,000
	4,000	96	14.0	7.2	6.2	5,300
	5,000	103	15.1	7.8	6.5	6,700
	6,000	110	16.0	8.2	6.9	8,000
	7,000	116	16.8	8.7	7.2	9,300
	20,000	164	23.7	12.3	9.5	26,700
	25,000	176	25.5	13.3	10.1	33,300
	30,000	187	27.1	14.1	10.6	40,000
	35,000	197	28.5	14.8	11.1	46,700
	40,000	206	29.7	15.5	11.5	53,300
	50,000	222	32.0	16.7	12.2	66,700
	60,000	236	34.0	17.8	12.8	80,000
	70,000	248	35.7	18.7	13.4	93,300
	80,000	260	37.3	19.6	13.9	106,700
	100,000	280	40.1	21.1	14.8	133,300
	120,000	297	42.6	22.4	15.5	160,000

表 3-2　②Recommendations of the Committee for Waterfront Structures Harbours and Waterways EAU 1996

Seagoing Vessels
Passenger Vessels(table R39-1.1)

tonnage	Carrying capacity	Displace-ment *G*	Overall length	Length between perps	Beam	Draft
GT	DWT	t	m	m	m	m
80,000	-	75,000	315	295	35.5	11.5
70,000	-	65,000	315	295	34.0	11.0
60,000	-	55,000	310	290	32.5	10.5
50,000	-	45,000	300	280	31.0	10.5
40,000	-	35,000	265	245	29.5	10.0
30,000	-	30,000	230	210	28.0	10.0

Bulk Carriers(table R39-1.2) (oil, ore, coal, grain, etc.)

tonnage	Carrying capacity	Displace-ment *G*	Overall length	Length between perps	Beam	Draft
GT	DWT	t	m	m	m	m
-	450,000	524,000	424	404	68.5	25.0
-	420,000	490,000	418	398	67.0	24.5
-	380,000	445,000	407	386	64.5	24.0
-	365,000	428,000	404	383	63.5	23.0
-	340,000	400,000	398	378	62.5	23.0
-	300,000	356,000	385	364	59.5	22.0
-	275,000	326,000	376	355	57.5	21.5
-	250,000	300,000	367	346	55.5	20.5
-	225,000	270,000	356	336	53.5	20.5
-	200,000	240,000	345	326	51.0	19.5
-	175,000	212,000	330	315	48.5	18.5
-	150,000	180,000	315	300	46.0	16.5
-	125,000	155,000	295	280	43.5	16.0
-	100,000	125,000	280	265	41.0	15.0
-	85,000	105,000	265	255	38.0	14.0
-	65,000	85,000	255	245	33.5	13.0
-	45,000	60,000	230	220	29.0	11.5
-	35,000	45,000	210	200	27.0	11.0
-	25,000	30,000	190	180	24.5	10.5
-	15,000	20,000	165	155	21.5	9.5

Mixed Cargo Freighters(Full Deck Construction)(table R31-1.3)

tonnage	Carrying capacity	Displace-ment *G*	Overall length	Length between perps	Beam	Draft
GT	DWT	t	m	m	m	m
10,000	15,000	20,000	165	155	21.5	9.5
7,500	11,000	15,000	150	140	20.0	9.0
5,000	7,500	10,000	135	125	17.5	8.0
4,000	6,000	8,000	120	110	16.0	7.5
3,000	4,500	6,000	105	100	14.5	7.0
2,000	3,000	4,000	95	90	13.0	6.0
1,500	2,200	3,000	90	85	12.0	5.5
1,000	1,500	2,000	75	70	10.0	4.5
500	700	1,000	60	55	8.5	3.5

Fishing Vessels(table R39-1.4)

tonnage	Carrying capacity	Displace-ment *G*	Overall length	Length between perps	Beam	Draft
GT	DWT	t	m	m	m	m
2,500	-	2,800	90	80	14.0	5.9
2,000	-	2,500	85	75	13.0	5.6
1,500	-	2,100	80	70	12.0	5.3
1,000	-	1,750	75	65	11.0	5.0
800	-	1,550	70	60	10.5	4.8
600	-	1,200	65	55	10.0	4.5
400	-	800	55	45	8.5	4.0
200	-	400	40	35	7.0	3.5

Container Ships(table R39-1.5)

Carrying capacity	Displace-ment *G*	Overall length	Length between perps	Beam	Draft	Number of containers	Generation
DWT	t	m	m	m	m	circa	
75,000	90,000	350	335	45.0	14.0	6,000	6th
66,300	80,000	275	262	40.0	14.0	4,800	5th
64,500	77,500	294	282	32.2	13.5	4,400	5th
55,000	77,000	275	260	39.4	12.5	3,900	4th
50,000	73,500	290	275	32.4	13.0	2,800	3rd
42,000	61,000	285	270	32.3	12.0	2,380	3rd
36,000	51,000	270	255	31.8	11.7	2,000	3rd
30,000	41,500	228	214	31.0	11.3	1,670	2nd
25,000	34,000	212	198	30.0	10.7	1,380	2nd
20,000	27,000	198	184	28.7	10.0	1,100	2nd
15,000	20,000	180	166	26.5	9.0	810	1st
10,000	13,500	159	144	23.5	8.0	530	1st
7,000	9,600	143	128	19.0	6.5	316	1st

Car transport Ships(table R39-1.6)

Carrying capacity	Displace-ment *G*	Overall length	Length between perps	Beam	Draft	No. of cars
DWT	t	m	m	m	m	approx.
28,000	45,000	198	183	32.3	11.8	6,200
26,300	42,000	213	198	32.3	10.5	6,000
17,900	33,000	195	180	32.2	9.7	5,600

Ferries and Ro-Ro Ships(table R39-1.7)

Carrying capacity	Displace-ment *G*	Overall length	Length between perps	Beam	Draft
DWT	t	m	m	m	m
106,400	115,000	253.00	238.00	40.00	15.10
64,400	76,100	225.00	215.00	34.00	13.00
42,500	53,000	182.50	173.00	32.30	12.00
27,750	39,800	177.30	158.10	27.30	11.55
18,000	32,650	181.20	165.00	30.40	9.30
16,000	23,400	178.10	164.00	26.80	7.60
14,000	21,500	163.80	148.60	23.50	8.80
12,000	20,000	190.90	173.00	26.00	7.18
10,000	23,410	192.50	181.00	27.30	6.75
8,000	16,000	156.00	137.00	22.60	7.30
6,000	20,750	179.40	170.00	27.80	6.27
4,000	17,500	163.40	150.00	27.00	6.20
2,000	10,800	164.70	159.60	17.70	5.90

The data in the vary according to type of load(cars, trucks, trailers, waggons, passengers) and load shares.

表 3-3　③Approach　Channels　A　Guide　for　Design　1997.

Tankers (ULCC)

Dead-weight tonnes	Displacement tonnes	LengthOA m	Lengthpp m	Beam m	Draught m	Block Coefficient
500,000	590,000	415.0	392.0	73.0	24.0	0.86
400,000	475,000	380.0	358.0	68.0	23.0	0.85
350,000	420,000	365.0	345.0	65.5	22.0	0.85

Tankers (VLCC)

Dead-weight tonnes	Displacement tonnes	LengthOA m	Lengthpp m	Beam m	Draught m	Block Coefficient
300,000	365,000	350.0	330.0	63.0	21.0	0.84
275,000	335,000	340.0	321.0	61.0	20.5	0.84
250,000	305,000	330.0	312.0	59.0	19.9	0.83
225,000	277,000	320.0	303.0	57.0	19.3	0.83
200,000	246,000	310.0	294.0	55.0	18.5	0.82

Tankers

Dead-weight tonnes	Displacement tonnes	LengthOA m	Lengthpp m	Beam m	Draught m	Block Coefficient
175,000	217,000	300.0	285.0	52.5	17.7	0.82
150,000	186,000	285.0	270.0	49.5	16.9	0.82
125,000	156,000	270.0	255.0	46.5	16.0	0.82
10,000	125,000	250.0	236.0	43.0	15.1	0.82
80,000	102,000	235.0	223.0	40.0	14.0	0.82
70,000	90,000	225.0	213.0	38.0	13.5	0.82
60,000	78,000	217.0	206.0	36.0	13.0	0.81

Product and Chemical Tankers

Dead-weight tonnes	Displacement tonnes	LengthOA m	Lengthpp m	Beam m	Draught m	Block Coefficient
50,000	66,000	210.0	200.0	32.2	12.6	0.81
40,000	54,000	200.0	190.0	30.0	11.8	0.80
30,000	42,000	188.0	178.0	28.0	10.8	0.78
20,000	29,000	174.0	165.0	24.5	9.8	0.73
10,000	15,000	145.0	137.0	19.0	7.8	0.74
5,000	8,000	110.0	104.0	15.0	7.0	0.73
3,000	4,900	90.0	85.0	13.0	6.0	0.74

Bulk Carriers／OBO's

Dead-weight tonnes	Displacement tonnes	LengthOA m	Lengthpp m	Beam m	Draught m	Block Coefficient
400,000	464,000	375.0	356.0	62.5	24.0	0.87
350,000	406,000	362.0	344.0	59.0	23.0	0.87
300,000	350,000	350.0	333.0	56.0	21.8	0.86
250,000	292,000	335.0	318.0	52.5	20.5	0.85
200,000	236,000	315.0	300.0	48.5	19.0	0.85
150,000	179,000	290.0	276.0	44.0	17.5	0.84
125,000	150,000	275.0	262.0	41.5	16.5	0.84
100,000	121,000	255.0	242.0	39.0	15.3	0.84
80,000	98,000	240.0	228.0	36.5	14.0	0.84
60,000	74,000	220.0	210.0	33.5	12.8	0.82
40,000	50,000	195.0	185.0	29.0	11.5	0.80
20,000	26,000	160.0	152.0	23.5	9.3	0.78
10,000	13,000	130.0	124.0	18.0	7.5	0.78

Container Ships(Post Panamax)

Dead-weight tonnes	Displacement tonnes	LengthOA m	Lengthpp m	Beam m	Draught m	Block Coefficient
70,000	100,000	280.0	266.0	41.8	13.8	0.65
65,000	92,000	274.0	260.0	41.2	13.5	0.64
60,000	84,000	268.0	255.0	39.8	13.2	0.63
55,000	76,500	261.0	248.0	38.3	12.8	0.63

Container Ships(Panamax)

Dead-weight tonnes	Displacement tonnes	LengthOA m	Lengthpp m	Beam m	Draught m	Block Coefficient
60,000	83,000	290.0	275.0	32.2	13.2	0.71
55,000	75,500	278.0	264.0	32.2	12.8	0.69
50,000	68,000	267.0	253.0	32.2	12.5	0.67
45,000	61,000	255.0	242.0	32.2	12.2	0.64
40,000	54,000	237.0	225.0	32.2	11.7	0.64
35,000	47,500	222.0	211.0	32.2	11.1	0.63
30,000	40,500	210.0	200.0	30.0	10.7	0.63
25,000	33,500	195.0	185.0	28.5	10.1	0.63
20,000	27,000	174.0	165.0	26.2	9.2	0.68
15,000	20,000	152.0	144.0	23.7	8.5	0.69
10,000	13,500	130.0	124.0	21.2	7.3	0.70

Freight Ro-Ro Ships

Dead-weight tonnes	Displacement tonnes	LengthOA m	Lengthpp m	Beam m	Draught m	Block Coefficient
50,000	87,500	287.0	273.0	32.2	12.4	0.80
45,000	81,000	275.0	261.0	32.2	12.0	0.80
40,000	72,000	260.0	247.0	32.2	11.4	0.79
35,000	63,000	245.0	233.0	32.2	10.8	0.78
30,000	54,000	231.0	219.0	32.0	10.2	0.75
25,000	45,000	216.0	205.0	31.0	9.6	0.75
20,000	36,000	197.0	187.0	28.6	9.1	0.75
15,000	27,500	177.0	168.0	26.2	8.4	0.74
10,000	18,400	153.0	145.0	23.4	7.4	0.73
5,000	9,500	121.0	115.0	19.3	6.0	0.71

Cargo Vessels

Dead-weight tonnes	Displacement tonnes	LengthOA m	Lengthpp m	Beam m	Draught m	Block Coefficient
40,000	54,500	209.0	199.0	30.0	12.5	0.73
35,000	48,000	199.0	189.0	28.9	12.0	0.73
30,000	41,000	188.0	179.0	27.7	11.3	0.73
25,000	34,500	178.0	169.0	26.4	10.7	0.72
20,000	28,000	166.0	158.0	24.8	10.0	0.71
15,000	21,500	152.0	145.0	22.6	9.2	0.71
10,000	14,500	133.0	127.0	19.8	8.0	0.72
5,000	7,500	105.0	100.0	15.8	6.4	0.74
2,500	4,000	85.0	80.0	13.0	5.0	0.77

Vehicle Carries

Dead-weight tonnes	Displacement tonnes	LengthOA m	Lengthpp m	Beam m	Draught m	Block Coefficient
30,000	48,000	210.0	193.0	32.2	11.7	0.66
25,000	42,000	205.0	189.0	32.2	10.9	0.63
20,000	35,500	198.0	182.0	32.2	10.0	0.61
15,000	28,500	190.0	175.0	32.2	9.0	0.56

Ferries

Gross tonnes	Displacement tonnes	LengthOa m	Lengthpp m	Beam m	Draught m	Block Coefficient
50,000	25,000	197.0	183.0	30.6	7.1	0.63
40,000	21,000	187.0	174.0	28.7	6.7	0.63
35,000	19,000	182.0	169.0	27.6	6.5	0.63
30,000	17,000	175.0	163.0	26.5	6.3	0.62
25,000	15,000	170.0	158.0	25.3	6.1	0.62
20,000	13,000	164.0	152.0	24.1	5.9	0.60
15,000	10,500	155.0	144.0	22.7	5.6	0.57

Cruise Liners

Gross tonnes	Displacement tonnes	LengthOa m	Lengthpp m	Beam m	Draught m	Block Coefficient
80,000	44,000	272.0	231.0	35.0	8.0	0.68
70,000	38,000	265.0	225.0	32.2	7.8	0.67
60,000	34,000	252.0	214.0	32.2	7.6	0.65
50,000	29,000	234.0	199.0	32.2	7.1	0.64
40,000	24,000	212.0	180.0	32.2	6.5	0.64
35,000	21,000	192.0	164.0	32.2	6.3	0.63

表 3-4　⑤TECHNICAL CODES FOR PORT ENGINEERNIG　2000

Design Ship Dimensions of General Vessel
TableA.0.1-1

Tonnage of ship	Design ship dimension (m)			
DWT (t)	Overall length *L*	Molded breadth *B*	Molded depth *H*	Loaded draft *T*
1000 (1000～1500)	65	11	5.3	4.4
2000 (1501～2500)	75	12	6.8	5.2
3000 (2501～4500)	97	15	7.9	6.1
5000 (4501～7500)	112	17	9.2	7.0
10000 (7501～11500)	153	20	11.8	8.8
15000 (11501～16500)	162	22	13.3	9.8
20000 (16501～22000)	175	24	14.4	10.4

Design Ship Dimensions of Bulk Carriers
TableA.0.1-2

Tonnage of ship	Design ship dimension (m)			
DWT (t)	Overall length *L*	Molded breadth *B*	Molded depth *H*	Loaded draft *T*
10000 (7501～12500)	150	20	11.0	8.5
15000 (12501～17500)	157	21	12.3	9.3
20000 (17501～22500)	170	23	13.4	10.0
30000 (22501～35000)	190	26	14.6	10.8
40000 (35001～45000)	205	29	16.2	11.8
50000 (45001～65000)	230	32	17.5	12.7
70000 (65001～75000)	253	35	19.3	13.8
100000 (75001～105000)	260	39	21.4	15.2
120000 (105001～135000)	269	42	24.2	17.0
150000 (135001～175000)	300	46	25.9	18.1
200000 (175001～225000)	322	50	27.3	19.0

Design Ship Dimensions of Oil Tankers
TableA.0.1-3

Tonnage of ship	Design ship dimension (m)			
DWT (t)	Overall length *L*	Molded breadth *B*	Molded depth *H*	Loaded draft *T*
1000 (1000～1500)	68	10	5.3	4.3
2000 (1501～2500)	75	12	6.8	5.3
3000 (2501～4500)	100	14	7.5	5.7
5000 (4501～7500)	110	15	9.0	6.5
10000 (7501～12500)	150	20	11.4	9.0
20000 (12501～27500)	182	25	13.0	10.0
30000 (27501～45000)	212	29	15.4	11.4
50000 (45001～65000)	235	32	17.4	12.6
80000 (65001～85000)	250	38	19.0	13.6
100000 (85001～105000)	268	39	21.2	15.2
120000 (105001～135000)	279	42	23.1	16.9
150000 (135001～175000)	294	46	24.0	17.7
200000 (175001～225000)	326	50	25.6	19.1
225000 (215001～235000)	329	52	27.2	20.5
250000 (235001～275000)	346	54	27.6	20.8
300000 (275001～375000)	358	56	29.4	22.4

Design Ship Dimensions of Container Ships
TableA.0.1-4

Tonnage of ship	Design ship dimension (m)				
DWT (t)	Overall length *L*	Molded breadth *B*	Molded depth *H*	Loaded draft *T*	Container loaded (TEU)
4000 (1000～5000)	105	16	8.0	5.8	＜200
10000 (5001～12000)	152	22	12.8	8.8	201～500
15000 (12001～17500)	197	25	15.8	9.8	501～900
25000 (17501～27500)	217	30	18.9	10.7	901～1500
30000 (27501～32500)	237	31	20.0	11.5	1501～1800
35000 (32501～37500)	260	32	21.0	12.0	1801～2100
40000 (37501～45000)	270	33	21.2	12.5	2101～3000
50000 (45001～65000)	294	35	21.8	13.3	3001～4800

Design Ship Dimensions of Roll-on/Roll-off Ship
TableA.0.1-5

Tonnage of ship	Design ship dimension (m)			
DWT (t)	Overall length *L*	Molded breadth *B*	Molded depth *H*	Loaded draft *T*
1000 (851～1500)	99	16	10.0	4.4
2000 (1501～2500)	115	17	11.0	5.3
3000 (2501～4500)	130	20	12.8	6.2
5000 (4501～7500)	147	22	14.3	7.1
10000 (7501～12500)	173	28	16.0	8.2
15000 (12501～17500)	194	30	19.4	9.5
20000 (17501～22500)	212	31	21.3	10.2
30000 (22501～35000)	235	32	21.4	11.6

Design Ship Dimensions of Vehicle Carrier
TableA.0.1-6

Tonnage of ship	Design ship dimension (m)				
DWT (t)	Overall length *L*	Molded breadth *B*	Molded depth *H*	Loaded draft *T*	Vehicle loaded (set)
1000 (500～1500)	95	15	10	4.7	＜450
2000 (1501～2500)	109	17	13	5.4	451～700
3000 (2501～4500)	124	20	14	6.5	701～1100
5000 (4501～7500)	152	25	15	7.6	1101～1900
10000 (7501～11500)	176	28	21	8.1	1901～3100
15000 (11501～16500)	194	32	24	9.0	3101～5000
20000 (16501～22500)	200	32	24	9.5	5001～6500

Design Ship Dimensions of Bulk Carrier
TableA.0.1-7

Tonnage of ship	Design ship dimension (m)			
DWT (t)	Overall length *L*	Molded breadth *B*	Molded depth *H*	Loaded draft *T*
1000 (500～1500)	66	11	4.9	4.4
2000 (1501～2500)	78	12	5.9	5.0
3000 (2501～4500)	98	15	7.6	6.2
5000 (4501～7500)	113	16	8.2	6.9
10000 (7501～12500)	133	20	10.1	7.8
15000 (12501～17500)	157	22	12	9.1
20000 (17501～22500)	165	24	13.4	9.7
30000 (22501～35000)	196	24	14.2	10.6
40000 (35501～45000)	188	31	15.7	11.3

Design Ship Dimensions of Liquid Chebical Product and Oil Tankers
TableA.0.1-8

Tonnage of ship	Design ship dimension (m)			
DWT (t)	Overall length *L*	Molded breadth *B*	Molded depth *H*	Loaded draft *T*
1000 (1000～1500)	67	10	5.0	4.3
2000 (1501～2500)	80	12	6.0	5.2
3000 (2501～4500)	98	14	7.5	6.2
5000 (4501～7500)	113	18	8.6	7.1
10000 (7501～12500)	135	20	10.9	8.4
20000 (12501～27500)	172	25	13.5	10.2
30000 (27501～45000)	178	32	15.6	11.6
50000 (45501～65000)	221	32	18.3	13.3

Design Ship Dimensions of Liquid Chebical Product and Oil Tankers
TableA.0.2-1

Tonnage of ship	Length of Overall (m)				Molded breadth (m)				Molded depth (m)			
DWT (t)	Max.	Min.	Mean	Normal	Max.	Min.	Mean	Normal	Max.	Min.	Mean	Normal
4000 (1000～5000)	182	61	93	105	20.3 (8)	10.8 (4)	14.6 (5)	16	11.6	4.0	7.2	8.0
10000 (5001～12000)	190	86	125	152	29.0 (11)	15.0 (6)	19.5 (7)	22	14.6	7.5	9.7	12.8
15000 (12001～17500)	214	137	165	197	32.3 (13)	19.2 (7)	23.7 (9)	25	30.6	10.6	13.6	15.8
25000 (17501～27500)	258	155	193	217	32.2 (13)	20.8 (8)	27.3 (11)	30	18.9	12.0	15.2	18.9.
30000 (27501～32500)	262	173	215	237	32.3 (13)	23.6 (9)	30.2 (12)	31	21.6	14.6	17.3	20.0
35000 (32501～37500)	289	183	225	260	32.3 (13)	26.8 (9)	31.6 (12)	32	23.9	14.7	18.5	21.0
40000 (37501～42500)	297	203	248		32.3 (13)	30.5 (12)	32.0 (13)		24.0	16.4	19.6	
45000 (42501～47500)	292	229	255		32.3 (13)	32.0 (13)	32.2 (13)		24.3	17.4	20.0	
50000 (47501～55000)	294	243	274		39.4 (16)	32.2 (13)	33.2 (13)		24.6	18.8	21.7	
60000 (55001～65000)	297	275	290		39.0 (15)	32.0 (13)	33.3 (13)		21.7	17.4	21.3	

Tonnage of ship	Loaded draft (m)				Loading Capacity (TEU)				Ship statistics
DWT (t)	Max.	Min.	Mean	Normal	Max.	Min.	Mean	Normal	(vessel)
4000 (1000～5000)	7.2	3.4	5.2	5.8	583	48	177	-	118
10000 (5001～12000)	9.9	5.3	7.1	8.8	918	124	418	-	207
15000 (12001～17500)	10.5	7.9	9.0	9.8	1174	398	774	-	158
25000 (17501～27500)	11.6	7.9	10.2	10.7	2708	322	1200	-	217
30000 (27501～32500)	11.8	9.7	11.1	11.5	2500	1027	1681	-	110
35000 (32501～37500)	12.0	10.6	11.5	12.0	2670	1140	1928	-	63
40000 (37501～42500)	12.5	10.4	11.6		3161	1700	2507	-	63
45000 (42501～47500)	13.0	11.2	12.0		3800	2228	3046	-	78
50000 (47501～55000)	13.2	11.6	12.6		4425	2052	3306	-	68
60000 (55001～65000)	13.6	11.7	12.9		4800	3600	4143	-	94

Ship's Dimensions of Typical Roll-on/Roll-off Ships
TableA.0.2-2

Ship's DWT	Length of Overall (m)			Molded breadth (m)			Molded depth (m)			Loaded draft (m)			Ship statistics
(t)	Max.	Min.	Mean	Max.	Min.	Mean	Max.	Min.	Mean	Max.	Min.	Mean	(vessel)
1000 (851～1500)	148	64	87	23.5	10.5	14.2	14.9	4.4	8.2	6.8	2.9	4.1	62
2000 (1501～2500)	156	73	95	22.0	10.5	15.4	16.3	4.0	8.5	6.0	3.4	4.6	107
3000 (2501～4500)	199	81	112	27.0	13.0	17.8	19.3	3.7	10.4	6.9	3.6	5.5	254
5000 (4501～7500)	190	99	132	32.2	15.0	19.8	17.4	6.1	12.1	7.7	4.5	6.4	225
10000 (7501～12500)	199	118	154	32.2	18.0	23.2	27.4	7.0	13.8	9.5	4.9	7.5	140
15000 (12501～17500)	241	133	178	32.3	19.4	27.8	32.4	9.0	16.4	13.3	7.4	9.0	122
20000 (17501～22500)	252	156	194	32.3	20.0	27.7	32.1	11.3	17.4	11.1	8.2	9.7	100
30000 (22501～35000)	288	175	216	32.5	26.0	31.6	31.5	12.3	19.8	11.9	7.5	10.8	65

Ship's Dimensions of Typical Bulk Cement Carrier
TableA.0.2-3

Ship's DWT	Length of Overall (m)			Molded breadth (m)			Molded depth (m)			Loaded draft (m)			Ship statistics
(t)	Max.	Min.	Mean	Max.	Min.	Mean	Max.	Min.	Mean	Max.	Min.	Mean	(vessel)
1000 (1000～1500)	73	45	62	16.2	9.0	10.6	6.0	4.1	4.7	4.9	3.4	4.1	39
2000 (1501～2500)	91	63	73	14.0	9.0	11.8	6.8	4.7	5.6	5.2	3.5	4.8	36
3000 (2501～4500)	103	75	89	17.0	12.3	14.1	8.1	5.7	6.9	6.9	4.0	5.7	52
5000 (4501～7500)	134	87	108	23.4	14.3	16.1	11.2	5.4	8.2	7.3	3.1	6.6	84
10000 (7501～12500)	149	111	124	20.0	16.5	18.4	11.0	8.3	9.6	8.3	6.7	7.4	34R

表 3-5　⑥OBRAS　MARIIMAS TECNOLOGIA

Petroleros para crudo

Tonelaje de Peso Muerto (TPM) t	Desplaza-miento(△) t	Eslora Total(L) m	Eslora entre perpendiculares (Lpp) m	Manga (B) m	Puntal (T) m	Calado (D) m	Coeficiente de Bloque
500,000	590,000	415.0	392.0	73.0	30.5	24.0	0.86
400,000	475,000	380.0	358.0	68.0	29.2	23.0	0.85
350,000	420,000	365.0	345.0	65.5	28.0	22.0	0.85
300,000	365,000	350.0	330.0	63.0	27.0	21.0	0.84
275,000	335,000	340.0	321.0	31.0	26.3	20.5	0.84
250,000	305,000	330.0	312.0	59.0	25.5	19.9	0.83
225,000	277,000	320.0	303.0	57.0	24.8	19.3	0.83
200,000	246,000	310.0	294.0	55.0	24.0	18.5	0.82
175,000	217,000	300.0	285.0	52.5	23.0	17.7	0.82
150,000	186,000	285.0	270.0	49.5	22.0	16.9	0.82
125,000	156,000	270.0	255.0	46.5	21.0	16.0	0.82
100,000	125,000	250.0	236.0	43.0	19.8	15.1	0.82
80,000	102,000	235.0	223.0	40.0	18.7	14.0	0.82
70,000	90,000	225.0	213.0	38.0	18.2	13.5	0.82
60,000	78,000	217.0	206.0	36.0	17.0	13.0	0.81

Transportadores de productos petroliferos y quimicos

Tonelaje de Peso Muerto (TPM) t	Desplaza-miento(△) t	Eslora Total(L) m	Eslora entre perpendiculares (Lpp) m	Manga (B) m	Puntal (T) m	Calado (D) m	Coeficiente de Bloque
50,000	66,000	210.0	200.0	32.2	16.4	12.6	0.81
40,000	54,000	200.0	190.0	30.0	15.4	11.8	0.80
30,000	42,000	188.0	178.0	28.0	14.2	10.8	0.78
20,000	29,000	174.0	165.0	24.5	12.6	9.8	0.73
10,000	15,000	145.0	137.0	19.0	10.0	7.8	0.74
5,000	8,000	110.0	104.0	15.0	8.6	7.0	0.73
3,000	4,900	90.0	85.0	13.0	7.2	6.0	0.74

Graneleros y Polivalentes

Tonelaje de Peso Muerto (TPM) t	Desplaza-miento(△) t	Eslora Total(L) m	Eslora entre perpendiculares (Lpp) m	Manga (B) m	Puntal (T) m	Calado (D) m	Coeficiente de Bloque
400,000	464,000	375.0	356.0	62.5	30.6	24.0	0.87
350,000	406,000	362.0	344.0	59.0	29.3	23.0	0.87
300,000	350,000	350.0	333.0	56.0	28.1	21.8	0.86
250,000	292,000	335.0	318.0	52.5	26.5	20.5	0.85
200,000	236,000	315.0	300.0	48.5	25.0	19.0	0.85
150,000	179,000	290.0	276.0	44.0	23.3	17.5	0.84
125,000	150,000	275.0	262.0	41.5	22.1	16.5	0.84
100,000	121,000	255.0	242.0	39.0	20.8	15.3	0.84
80,000	98,000	240.0	228.0	36.5	19.4	14.0	0.84
60,000	74,000	220.0	210.0	33.5	18.2	12.8	0.82
40,000	50,000	195.0	185.0	29.0	16.3	11.5	0.80
20,000	26,000	160.0	152.0	23.5	12.6	9.3	0.78
10,000	13,000	130.0	124.0	18.0	10.0	7.5	0.78

Metaneros

Tonelaje de Peso Muerto (TPM) t	Desplaza-miento(△) t	Eslora Total(L) m	Eslora entre perpendiculares (Lpp) m	Manga (B) m	Puntal (T) m	Calado (D) m	Coeficiente de Bloque
60,000	88,000	290.0	275.0	44.5	26.1	11.3	0.64
40,000	59,000	252.0	237.0	38.2	22.3	10.5	0.62
20,000	31,000	209.0	199.0	30.0	17.8	9.7	0.54

Transportadores de Gases Licuados

Tonelaje de Peso Muerto (TPM) t	Desplaza-miento(△) t	Eslora Total(L) m	Eslora entre perpendiculares (Lpp) m	Manga (B) m	Puntal (T) m	Calado (D) m	Coeficiente de Bloque
60,000	95,000	265.0	245.0	42.2	23.7	13.5	0.68
50,000	80,000	248.0	238.0	39.0	23.0	12.9	0.67
40,000	65,000	240.0	230.0	35.2	20.8	12.3	0.65
30,000	49,000	226.0	216.0	32.4	19.9	11.2	0.62
20,000	33,000	207.0	197.0	26.8	18.4	10.6	0.59
10,000	17,000	160.0	152.0	21.1	15.2	9.3	0.57
5,000	8,800	134.0	126.0	16.0	12.5	8.1	0.54
3,000	5,500	116.0	110.0	13.3	10.1	7.0	0.54

Portacontenedores(Post Panamax)

Tonelaje de Peso Muerto (TPM) t	Desplaza-miento(△) t	Eslora Total(L) m	Eslora entre perpendiculares (Lpp) m	Manga (B) m	Puntal (T) m	Calado (D) m	Coeficiente de Bloque
70,000	100,000	280.0	266.0	41.8	23.6	13.8	0.65
65,000	92,000	274.0	260.0	41.2	23.2	13.5	0.64
60,000	84,000	268.0	255.0	39.8	22.8	13.2	0.63
55,000	76,500	261.0	248.0	38.3	22.4	12.8	0.63

Portacontenedores

Tonelaje de Peso Muerto (TPM) t	Desplaza-miento(△) t	Eslora Total(L) m	Eslora entre perpendiculares (Lpp) m	Manga (B) m	Puntal (T) m	Calado (D) m	Coeficiente de Bloque
60,000	83,000	290.0	275.0	32.2	22.8	13.2	0.71
55,000	75,500	278.0	264.0	32.2	22.4	12.8	0.69
50,000	68,000	267.0	253.0	32.2	22.1	12.5	0.67
45,000	61,000	255.0	242.0	32.2	21.4	12.2	0.64
40,000	54,000	237.0	225.0	32.2	20.4	11.7	0.64
35,000	47,500	222.0	211.0	32.2	19.3	11.1	0.63
30,000	40,500	210.0	200.0	30.0	18.5	10.7	0.63
25,000	33,500	195.0	185.0	28.5	17.5	10.1	0.63
20,000	27,000	174.0	165.0	26.2	16.2	9.2	0.68
15,000	20,000	152.0	144.0	23.7	15.0	8.5	0.69
10,000	13,500	130.0	124.0	21.2	13.3	7.3	0.70

Ro-Ro

Tonelaje de Peso Muerto (TPM) t	Desplaza-miento(△) t	Eslora Total(L) m	Eslora entre perpendiculares (Lpp) m	Manga (B) m	Puntal (T) m	Calado (D) m	Coeficiente de Bloque
50,000	87,500	287.0	273.0	32.2	28.5	12.4	0.80
45,000	81,500	275.0	261.0	32.2	27.6	12.0	0.80
40,000	72,000	260.0	247.0	32.2	26.2	11.4	0.79
35,000	63,000	245.0	233.0	32.2	24.8	10.8	0.78
30,000	54,000	231.0	219.0	32.0	23.5	10.2	0.75
25,000	45,000	216.0	205.0	31.0	22.0	9.6	0.75
20,000	36,000	197.0	187.0	28.6	21.0	9.1	0.75
15,000	27,500	177.0	168.0	26.2	19.2	8.4	0.74
10,000	18,400	153.0	145.0	23.4	17.0	7.4	0.73
5,000	9,500	121.0	115.0	19.3	13.8	6.0	0.71

Mercantes de Carga Genera

Tonelaje de Peso Muerto (TPM) t	Desplaza-miento(△) t	Eslora Total(L) m	Eslora entre perpendiculares (Lpp) m	Manga (B) m	Puntal (T) m	Calado (D) m	Coeficiente de Bloque
40,000	54,500	209.0	199.0	30.0	18.0	12.5	0.73
35,000	48,000	199.0	189.0	28.9	17.0	12.0	0.73
30,000	41,000	188.0	179.0	27.7	16.0	11.3	0.73
25,000	34,500	178.0	169.0	26.4	15.4	10.7	0.72
20,000	28,000	166.0	158.0	24.8	13.8	10.0	0.71
15,000	21,500	152.0	145.0	22.6	12.8	9.2	0.71
10,000	14,500	133.0	127.0	19.8	11.2	8.0	0.72
5,000	7,500	105.0	100.0	15.8	8.5	5.4	0.74
2,500	4,000	85.0	80.0	13.0	6.8	5.0	0.77

Transportadores de coches

Tonelaje de Peso Muerto (TPM) t	Desplaza-miento(△) t	Eslora Total(L) m	Eslora entre perpendiculares (Lpp) m	Manga (B) m	Puntal (T) m	Calado (D) m	Coeficiente de Bloque
30,000	48,000	210.0	193.0	32.2	31.2	11.7	0.66
25,000	42,000	205.0	189.0	32.2	29.4	10.9	0.63
20,000	35,500	198.0	182.0	32.2	27.5	10.0	0.61
15,000	28,500	190.0	175.0	32.2	25.5	9.0	0.56

Buques de Guerra

Tonelaje de Peso Muerto (TPM) t	Desplaza-miento(△) t	Eslora Total(L) m	Eslora entre perpendiculares (Lpp) m	Manga (B) m	Puntal (T) m	Calado (D) m	Coeficiente de Bloque
16000(1)	20,000	172.0	163.0	23.0	-	8.2	0.65
15000(2)	19,000	195.0	185.0	24.0	-	9.0	0.48
5000(3)	5,700	117.0	115.0	16.8	-	3.7	0.80
4000(4)	7,000	134.0	127.0	14.3	-	7.9	0.49
3500(5)	4,600	120.0	115.0	12.5	-	5.5	0.58
1500(6)	2,100	90.0	85.0	9.3	-	5.2	0.51
1500(7)	1,800	68.0	67.0	6.8	-	5.4	0.73
1400(8)	1,800	89.0	85.0	10.5	-	3.5	0.58
750(9)	1,000	52.0	49.0	10.4	-	4.2	0.47
400(10)	500	58.0	55.1	7.6	-	2.6	0.46

Transbortadores Ferries(convencionales)

Tonelaje de Peso Muerto (TPM) t	Desplaza-miento(△) t	Eslora Total(L) m	Eslora entre perpendiculares (Lpp) m	Manga (B) m	Puntal (T) m	Calado (D) m	Coeficiente de Bloque
50,000	25,000	197.0	183.0	30.6	16.5	7.1	0.63
40,000	21,000	187.0	174.0	28.7	15.7.	6.7	0.63
35,000	19,000	182.0	169.0	27.6	15.3	6.5	0.63
30,000	17,000	175.0	163.0	26.5	14.9	6.3	0.62
25,000	15,000	170.0	158.0	25.3	14.5	6.1	0.62
20,000	13,000	164.0	152.0	24.1	14.1	5.9	0.60
15,000	10,500	155.0	144.0	22.7	13.6	5.6	0.57

TABLA 3.1.　(Continuacion)

Transbordadores Rapidos, Fast Ferries(valores provisionales)

Tonelaje de Peso Muerto (TPM) t	Desplaza-miento(△) t	Eslora Total(L) m	Eslora entre perpendiculares (Lpp) m	Manga (B) m	Puntal (T) m	Calado (D) m	Coeficiente de Bloque
Catamaran							
4,000	640	83.0	73.0	23.2(1)	4.0	2.0(3)	0.43(4)
5,000	800	88.0	78.0	24.7(1)	4.2	2.1(3)	0.44(4)
6,000	960	95.0	84.0	26.6(1)	4.4	2.2(3)	0.44(4)
Monocasco							
8,000	1,280	102.0	87.5	15.4(2)	5.0	2.5(3)	0.45
10,000	1,600	112.0	102.0	16.9(2)	5.2	2.5(3)	0.45
15,000	2,400	128.0	120.0	19.2(2)	5.4	2.7(3)	0.47
20,000	3,200	140.0	133.0	21.0(2)	5.8	2.9(3)	0.49

Cruceros de pasaje

Tonelaje de Peso Muerto (TPM) t	Desplaza-miento(△) t	Eslora Total(L) m	Eslora entre perpendiculares (Lpp) m	Manga (B) m	Puntal (T) m	Calado (D) m	Coeficiente de Bloque
80,000	44,000	272.0	231.0	35.0	20.0	8.0	0.68
70,000	38,000	265.0	225.0	32.2	19.3	7.8	0.67
60,000	34,000	252.0	214.0	32.2	18.8	7.6	0.65
50,000	29,000	234.0	199.0	32.2	18.0	7.1	0.64
40,000	24,000	212.0	180.0	32.2	17.3	6.5	0.64
35,000	21,000	192.0	164.0	32.2	17.0	6.3	0.63

Pesqueros

Tonelaje de Peso Muerto (TPM) t	Desplaza-miento(△) t	Eslora Total(L) m	Eslora entre perpendiculares (Lpp) m	Manga (B) m	Puntal (T) m	Calado (D) m	Coeficiente de Bloque
3,000	4,200	90.0	85.0	14.0	6.8	5.9	0.60
2,500	3,500	85.0	81.0	13.0	6.4	5.6	0.59
2,000	2,700	80.0	76.0	12.0	6.0	5.3	0.56
1,500	2,200	76.0	72.0	11.3	5.8	5.1	0.53
1,200	1,900	72.0	68.0	11.0	5.7	5.0	0.50
1,000	1,600	70.0	66.0	10.5	5.4	4.8	0.48
700	1,250	65.0	62.0	10.0	5.1	4.5	0.45
500	800	55.0	53.0	8.6	4.5	4.0	0.44
250	400	40.0	38.0	7.0	4.0	3.5	0.43

Embarcaciones deportivas(a motor)

Tonelaje de Peso Muerto (TPM) t	Desplaza-miento(△) t	Eslora Total(L) m	Eslora entre perpendiculares (Lpp) m	Manga (B) m	Puntal (T) m	Calado (D) m	Coeficiente de Bloque
-	50.0	24.0	-	5.5	-	3.3	-
-	35.0	21.0	-	4.0	-	3.0	-
-	27.0	18.0	-	4.4	-	27.0	-
-	16.5	15.0	-	4.0	-	2.3	-
-	6.5	12.0	-	3.4	-	1.8	-
-	4.5	9.0	-	2.7	-	1.5	-
-	1.3	6.0	-	2.1	-	1.0	-

Embarcaciones deportivas(a vela)

Tonelaje de Peso Muerto (TPM) t	Desplaza-miento(△) t	Eslora Total(L) m	Eslora entre perpendiculares (Lpp) m	Manga (B) m	Puntal (T) m	Calado (D) m	Coeficiente de Bloque
-	60.0	24.0	-	4.6	-	3.6	-
-	40.0	21.0	-	4.3	-	3.0	-
-	22.0	18.0	-	4.0	-	2.7	-
-	13.0	15.0	-	3.7	-	2.4	-
-	10.0	12.0	-	3.5	-	2.1	-
-	3.5	9.0	-	3.3	-	1.8	-
-	1.5	6.0	-	2.4	-	1.5	-

表 3-6　⑦Guidelines for the Design of Fenders Systems:2002(Marcom Report of WG33 2002) ①

Appendix C. Table C-1　　Confidence Limit : 50%

Type	Deadweight tonnage	Displa-cement	Length Overall	Length P.P.	Breadth	Depth	Maximum Draft	Wind Lateral Area(m^2)		Wind Front Area(m^2)	
								Full Load Condition	Ballast Condition	Full Load Condition	Ballast Condition
	(t)	(t)	(m)	(m)	(m)	(m)	(m)				
General Cargo Ship	1,000	1,580	63	58	10.3	5.2	3.6	227	292	59	88
	2,000	3,040	78	72	12.4	6.4	4.5	348	463	94	134
	3,000	4,460	88	82	13.9	7.2	5.1	447	605	123	172
	5,000	7,210	104	96	16.0	8.4	6.1	612	849	173	236
	7,000	9,900	115	107	17.6	9.3	6.8	754	1,060	216	290
	10,000	13,900	128	120	19.5	10.3	7.6	940	1,340	274	361
	15,000	20,300	146	136	21.8	11.7	8.7	1,210	1,760	359	463
	20,000	26,600	159	149	23.6	12.7	9.6	1,440	2,130	435	552
	30,000	39,000	181	170	26.4	14.4	10.9	1,850	2,780	569	709
	40,000	51,100	197	186	28.6	15.7	12.0	2,210	3,370	690	846
Bulk Carrier	5,000	6,740	106	98	15.0	8.4	6.1	615	850	205	231
	7,000	9,270	116	108	16.6	9.3	6.7	710	1,010	232	271
	10,000	13,000	129	120	18.5	10.4	7.5	830	1,230	264	320
	15,000	19,100	145	135	21.0	11.7	8.4	980	1,520	307	387
	20,000	25,000	157	148	23.0	12.8	9.2	1,110	1,770	341	443
	30,000	36,700	176	167	26.1	14.4	10.3	1,320	2,190	397	536
	50,000	59,600	204	194	32.3	16.8	12.0	1,640	2,870	479	682
	70,000	81,900	224	215	32.3	18.6	13.3	1,890	3,440	542	798
	100,000	115,000	248	239	37.9	20.7	14.8	2,200	4,150	619	940
	150,000	168,000	279	270	43.0	23.3	16.7	2,610	5,140	719	1,140
	200,000	221,000	303	294	47.0	25.4	18.2	2,950	5,990	800	1,310
	250,000	273,000	322	314	50.4	27.2	19.4	3,240	6,740	868	1,450
Container Ship	7,000	10,200	116	108	19.6	9.3	6.9	1,320	1,360	300	396
	10,000	14,300	134	125	21.6	10.7	7.7	1,690	1,700	373	477
	15,000	21,100	157	147	24.1	12.6	8.7	2,250	2,190	478	591
	20,000	27,800	176	165	26.1	14.1	9.5	2,750	2,620	269	687
	25,000	34,300	192	180	27.7	15.4	10.2	3,220	3,010	652	770
	30,000	40,800	206	194	29.1	16.5	10.7	3,660	3,370	729	850
	40,000	53,700	231	218	32.3	18.5	11.7	4,480	4,040	870	990
	50,000	66,500	252	238	32.3	20.2	12.5	5,230	4,640	990	1,110
	60,000	79,100	271	256	35.2	21.7	13.2	5,950	5,200	1,110	1,220
Oil Tanker	1,000	1,450	59	54	9.7	4.3	3.8	170	266	78	80
	2,000	2,810	73	68	12.1	5.4	4.7	251	401	108	117
	3,000	4,140	83	77	13.7	6.3	5.3	315	509	131	146
	5,000	6,740	97	91	16.0	7.5	6.1	419	689	167	194
	7,000	9,300	108	102	17.8	8.4	6.7	505	841	196	233
	10,000	13,100	121	114	19.9	9.5	7.5	617	1,040	232	284
	15,000	19,200	138	130	22.5	11.0	8.4	770	1,320	281	355
	20,000	25,300	151	143	24.6	12.2	9.1	910	1,560	322	416
	30,000	37,300	171	163	27.9	14.0	10.3	1,140	1,990	390	520
	50,000	60,800	201	192	32.3	16.8	11.9	1,510	2,690	497	689
	70,000	83,900	224	214	36.3	18.9	13.2	1,830	3,280	583	829
	100,000	118,000	250	240	40.6	21.4	14.6	2,230	4,050	690	1,010
	150,000	174,000	284	273	46.0	24.7	16.4	2,800	5,150	840	1,260
	200,000	229,000	311	300	50.3	27.3	17.9	3,290	6,110	960	1,480
	300,000	337,000	354	342	57.0	31.5	20.1	4,120	7,770	1,160	1,850
Ro-Ro Ship	1,000	1,970	66	60	13.2	5.2	3.2	700	810	216	217
	2,000	3,730	85	78	15.6	7.0	4.1	970	1,110	292	301
	3,000	5,430	99	90	17.2	8.4	4.8	1,170	1,340	348	364
	5,000	8,710	119	109	19.5	10.5	5.8	1,480	1,690	435	464
	7,000	11,900	135	123	21.2	12.1	6.6	1,730	1,970	503	544
	10,000	16,500	153	141	23.1	14.2	7.5	2,040	2,320	587	643
	15,000	24,000	178	163	25.6	16.9	8.7	2,460	2,790	701	779
	20,000	31,300	198	182	27.4	19.2	9.7	2,810	3,180	794	890
	30,000	45,600	229	211	30.3	23.0	11.3	3,400	3,820	950	1,080

Type	Deadweight tonnage	Displa-cement	Length Overall	Length P.P.	Breadth	Depth	Maximum Draft	Wind Lateral Area(m^2)		Wind Front Area(m^2)	
								Full Load Condition	Ballast Condition	Full Load Condition	Ballast Condition
	(t)	(t)	(m)	(m)	(m)	(m)	(m)				
Passenger Ship	1,000	850	60	54	11.4	4.1	1.9	426	452	167	175
	2,000	1,580	76	68	13.6	5.3	2.5	683	717	225	234
	3,000	2,270	87	78	15.1	6.2	3.0	900	940	267	277
	5,000	3,580	104	92	17.1	7.5	3.6	1,270	1,320	332	344
	7,000	4,830	117	103	18.6	8.6	4.1	1,600	1,650	383	396
	10,000	6,640	133	116	20.4	9.8	4.8	2,040	2,090	446	459
	15,000	9,530	153	132	22.5	11.5	5.6	2,690	2,740	530	545
	20,000	12,300	169	146	24.2	12.8	7.6	3,270	3,320	599	614
	30,000	17,700	194	166	26.8	14.9	7.6	4,310	4,350	712	728
	50,000	27,900	231	197	30.5	18.2	7.6	6,090	6,120	880	900
	70,000	37,600	260	220	33.1	20.7	7.6	7,660	7,660	1,020	1,040
Ferry	1,000	810	59	54	12.7	4.6	2.7	387	404	141	145
	2,000	1,600	76	69	15.1	5.8	3.3	617	646	196	203
	3,000	2,390	88	80	16.7	6.5	3.7	811	851	237	247
	5,000	3,940	106	97	19.0	7.6	4.3	1,150	1,200	302	316
	7,000	5,480	119	110	20.6	8.5	4.8	1,440	1,510	354	372
	10,000	7,770	135	125	22.6	9.5	5.3	1,830	1,930	419	442
	15,000	11,600	157	145	25.0	10.7	6.0	2,400	2,540	508	537
	20,000	15,300	174	162	26.8	11.7	6.5	2,920	3,090	582	618
	30,000	22,800	201	188	29.7	13.3	7.4	3,830	4,070	705	752
	40,000	30,300	223	209	31.9	14.5	8.0	4,660	4,940	810	860
Gas Carrier	1,000	2,210	68	63	11.1	5.3	4.3	350	436	121	139
	2,000	4,080	84	78	13.7	6.8	5.2	535	662	177	203
	3,000	5,830	95	89	15.4	7.8	5.8	686	846	222	254
	5,000	9,100	112	104	17.9	9.4	6.7	940	1,150	295	335
	7,000	12,300	124	116	19.8	10.6	7.4	1,150	1,410	355	403
	10,000	16,900	138	130	22.0	12.0	8.2	1,430	1,750	432	490
	15,000	24,100	157	147	24.8	13.9	9.3	1,840	2,240	541	612
	20,000	31,100	171	161	27.1	15.4	10.0	2,190	2,660	634	716
	30,000	44,400	194	183	30.5	17.8	11.7	2,810	3,400	794	894
	50,000	69,700	227	216	35.5	21.3	11.7	3,850	4,630	1,050	1,180
	70,000	94,000	252	240	39.3	24.0	11.7	4,730	5,670	1,270	1,420
	100,000	128,000	282	268	43.7	27.3	11.7	5,880	7,030	1,550	1,730

表 3-7　⑦Guidelines for the Design of Fenders Systems:2002(Marcom Report of WG33 2002) ②

Appendix C. Table C-1											Confidence Limit : 75%
Type	Deadweight tonnage	Displa-cement	Length Overall	Length P.P.	Breadth	Depth	Maximum Draft	Wind Lateral Area(m^2)		Wind Front Area(m^2)	
								Full Load Condition	Ballast Condition	Full Load Condition	Ballast Condition
	(t)	(t)	(m)	(m)	(m)	(m)	(m)				
General	1,000	1,690	67	62	10.8	5.8	3.9	278	342	63	93
Cargo	2,000	3,250	83	77	13.1	7.2	4.9	426	541	101	142
Ship	3,000	4,750	95	88	14.7	8.1	5.6	547	408	132	182
	5,000	7,690	111	104	16.9	9.4	6.6	750	993	185	249
	7,000	10,600	123	115	18.6	10.4	7.4	922	1,240	232	307
	10,000	14,800	137	129	20.5	11.6	8.3	1,150	1,570	294	382
	15,000	21,600	156	147	23.0	13.1	9.5	1,480	2,060	385	490
	20,000	28,400	170	161	24.9	14.3	10.4	1,760	2,490	466	585
	30,000	41,600	193	183	27.8	16.2	11.9	2,260	3,250	611	750
	40,000	54,500	211	200	30.2	17.6	13.0	2,700	3,940	740	895
Bulk	5,000	6,920	109	101	15.5	8.6	6.2	689	910	221	245
Carrier	7,000	9,520	120	111	17.2	9.5	6.9	795	1,090	250	287
	10,000	13,300	132	124	19.2	10.6	7.7	930	1,320	286	340
	15,000	19,600	149	140	21.8	11.9	8.6	1,100	1,630	332	411
	20,000	25,700	161	152	23.8	13.0	9.4	1,240	1,900	369	470
	30,000	37,700	181	172	27.0	14.7	10.6	1,480	2,360	428	569
	50,000	61,100	209	200	32.3	17.1	12.4	1,830	3,090	518	723
	70,000	84,000	231	221	32.3	18.9	13.7	2,110	3,690	586	846
	100,000	118,000	255	246	39.2	21.1	15.2	2,460	4,460	669	1,000
	150,000	173,000	287	278	44.5	23.8	17.1	2,920	5,520	777	1,210
	200,000	227,000	311	303	48.7	25.9	18.6	3,300	6,430	864	1,380
	250,000	280,000	332	324	52.2	27.7	19.9	3,630	7,240	938	1,540
Container	7,000	10,700	123	115	20.3	9.8	7.2	1,460	1,590	330	444
Ship	10,000	15,100	141	132	22.4	11.3	8.0	1,880	1,990	410	535
	15,000	22,200	166	156	25.0	13.3	9.0	2,490	2,560	524	663
	20,000	29,200	186	175	27.1	14.9	9.9	3,050	3,070	625	771
	25,000	36,100	203	191	28.8	16.3	10.6	3,570	3,520	716	870
	30,000	43,000	218	205	30.2	17.5	11.1	4,060	3,950	800	950
	40,000	56,500	244	231	32.3	19.6	12.2	4,970	4,730	950	1,110
	50,000	69,900	266	252	32.3	21.4	13.0	5,810	5,430	1,090	1,250
	60,000	83,200	286	271	36.5	23.0	13.8	6,610	6,090	1,220	1,370
Oil	1,000	1,580	61	58	10.2	4.5	4.0	190	280	86	85
Tanker	2,000	3,070	76	72	12.6	5.7	4.9	280	422	119	125
	3,000	4,520	87	82	14.3	6.6	5.5	351	536	144	156
	5,000	7,360	102	97	16.8	7.9	6.4	467	726	184	207
	7,000	10,200	114	108	18.6	8.9	7.1	564	885	216	249
	10,000	14,300	127	121	20.8	10.0	7.9	688	1,090	255	303
	15,000	21,000	144	138	23.6	11.6	8.9	860	1,390	309	378
	20,000	27,700	158	151	25.8	12.8	9.6	1,010	1,650	355	443
	30,000	40,800	180	173	29.2	14.8	10.9	1,270	2,090	430	554
	50,000	66,400	211	204	32.3	17.6	12.6	1,690	2,830	548	734
	70,000	91,600	235	227	38.0	19.9	13.9	2,040	3,460	642	884
	100,000	129,000	263	254	42.5	22.5	15.4	2,490	4,270	761	1,080
	150,000	190,000	298	290	48.1	25.9	17.4	3,120	5,430	920	1,340
	200,000	250,000	327	318	52.6	28.7	18.9	3,670	6,430	1,060	1,570
	300,000	368,000	371	363	59.7	33.1	21.2	4,600	8,180	1,280	1,970
Ro-Ro	1,000	2,190	73	66	14.0	6.2	3.5	880	970	232	232
Ship	2,000	4,150	94	86	16.6	8.4	4.5	120	1,320	314	323
	3,000	6,030	109	99	18.3	10.0	5.3	1,460	1,590	374	391
	5,000	9,670	131	120	20.7	12.5	6.4	1,850	2,010	467	497
	7,000	13,200	148	136	22.5	14.5	7.2	2,170	2,350	541	583
	10,000	18,300	169	155	24.6	17.0	8.2	2,560	2,760	632	690
	15,000	26,700	196	180	27.2	20.3	9.6	3,090	3,320	754	836
	20,000	34,800	218	201	29.1	23.1	10.7	3,530	3,780	854	960
	30,000	50,600	252	233	32.2	27.6	12.4	4,260	4,550	1,020	1,160

Type	Deadweight tonnage	Displa-cement	Length Overall	Length P.P.	Breadth	Depth	Maximum Draft	Wind Lateral Area(m^2)		Wind Front Area(m^2)	
								Full Load Condition	Ballast Condition	Full Load Condition	Ballast Condition
	(t)	(t)	(m)	(m)	(m)	(m)	(m)				
Passenger Ship	1,000	1,030	64	60	12.1	4.9	2.6	464	486	187	197
	2,000	1,910	81	75	14.4	6.3	3.4	744	770	251	263
	3,000	2,740	93	86	16.0	7.4	4.0	980	1,010	298	311
	5,000	4,320	112	102	18.2	9.0	4.8	1,390	1,420	371	386
	7,000	5,830	125	114	19.8	10.2	5.5	1,740	1,780	428	444
	10,000	8,010	142	128	21.6	11.7	6.4	2,220	2,250	498	516
	15,000	11,500	163	146	23.9	13.7	7.5	2,930	2,950	592	611
	20,000	14,900	180	160	25.7	15.3	8.0	3,560	3,570	669	690
	30,000	21,300	207	183	28.4	17.8	8.0	4,690	4,680	795	818
	50,000	33,600	248	217	32.3	21.7	8.0	6,640	6,580	990	1,010
	70,000	45,300	278	243	35.2	24.6	8.0	8,350	8,230	1,140	1,170
Ferry	1,000	1,230	67	61	14.3	5.5	3.4	411	428	154	158
	2,000	2,430	86	78	17.0	6.8	4.2	656	685	214	221
	3,000	3,620	99	91	18.8	7.7	4.8	862	903	259	269
	5,000	5,970	119	110	21.4	9.0	5.5	1,220	1,280	330	344
	7,000	8,310	134	124	23.2	10.0	6.1	1,530	1,600	387	405
	10,000	11,800	153	142	25.4	11.1	6.8	1,940	2,040	458	482
	15,000	17,500	177	164	28.1	12.6	7.6	2,550	2,690	555	586
	20,000	23,300	196	183	30.2	13.8	8.3	3,100	3,270	636	673
	30,000	34,600	227	212	33.4	15.6	9.4	4,070	4,310	771	819
	40,000	45,900	252	236	35.9	17.1	10.2	4,950	5,240	880	940
Gas Carrier	1,000	2,480	71	66	11.7	5.7	4.6	390	465	133	150
	2,000	4,560	88	82	14.3	7.2	5.7	597	707	195	219
	3,000	6,530	100	93	16.1	8.4	6.4	465	903	244	273
	5,000	10,200	117	109	18.8	10.0	7.4	1,050	1,230	323	361
	7,000	13,800	129	121	20.8	11.3	8.1	1,290	1,510	389	434
	10,000	18,900	144	136	23.1	12.9	9.0	1,600	1,870	474	527
	15,000	27,000	164	154	26.0	14.9	10.1	2,050	2,390	593	658
	20,000	34,800	179	169	28.4	16.5	11.0	2,450	2,840	696	770
	30,000	49,700	203	192	32.0	19.0	12.3	3,140	3,630	870	961
	50,000	78,000	237	226	37.2	22.8	12.3	4,290	4,940	1,150	1,270
	70,000	105,000	263	251	41.2	25.7	12.3	5,270	6,050	1,390	1,530
	100,000	144,000	294	281	45.8	29.2	12.3	6,560	7,510	1,690	1,860

表 3-8　⑦Guidelines for the Design of Fenders Systems:2002(Marcom Report of WG33 2002) ③

Appendix C. Table C-2 VESSEL DISPLACEMENTS. Confidence Limits: 50%,75%,95%									
Type	Deadweight tonnage (t)	Displacement (t)			Type	Deadweight tonnage (t)	Displacement (t)		
		50%	75%	95%			50%	75%	95%
General	1,000	1,850	1690	1850	Ro-Ro	1,000	1,970	2,170	2,540
Cargo	2,000	3,040	3250	3560	Ship	2,000	3,730	4,150	4,820
Ship	3,000	4,460	4750	5210		3,000	5,430	6,030	7,010
	5,000	7,210	7690	8440		5,000	8,710	9,670	11,200
	7,000	9,900	10600	11600		7,000	11,900	13,200	15,300
	10,000	13,900	14800	16200		10,000	16,500	18,300	21,300
	15,000	20,300	21600	23700		15,000	24,000	2,700	31,000
	20,000	26,600	28400	31000		20,000	31,300	34,800	41,400
	30,000	39,000	41600	45600		30,000	45,600	50,600	58,800
	40,000	51,100	54500	59800	Passenger	1,000	850	1,030	1350
Bulk	5,000	6,740	6,920	7190	Ship	2,000	1,580	1,910	2,500
Carrier	7,000	9,270	9,520	9880		3,000	2,270	2,740	3,590
	10,000	13,000	13,300	13800		5,000	3,580	4,320	5,650
	15,000	19,100	19,600	20300		7,000	4,830	5,830	7,630
	20,000	25,000	25,700	26700		10,000	6,640	8,010	10,500
	30,000	36,700	37,700	39100		15,000	9,530	11,500	15,000
	50,000	59,600	61,100	63500		20,000	12,300	14,900	19,400
	70,000	81,900	84,000	87200		30,000	17,700	21,300	27,900
	100,000	115,000	118,000	122000		50,000	27,900	33,600	44,000
	150,000	168,000	173,000	179000		70,000	37,600	45,300	59,300
	200,000	221,000	227,000	236000	Ferry	1,000	810	1,230	2,240
	250,000	273,000	280,000	291000		2,000	1,600	2,430	4,430
Container	7,000	10200	10,700	11500		3,000	2,390	3,620	6,590
Ship	10,000	14300	15,100	16200		5,000	3,940	5,970	10,900
	15,000	21100	22,200	23900		7,000	5,480	8,310	15,100
	20,000	27800	29,200	31400		10,000	7,770	11,800	21,500
	25,000	34300	36,100	38800		15,000	11,600	17,500	31,900
	30,000	40800	43,000	46200		20,000	15,300	23,300	42,300
	40,000	53700	56,500	60800		30,000	22,800	34,600	63,000
	50,000	66500	69,900	75200		40,000	30,300	45,900	83,500
	60,000	79100	83,200	89400					
Oil	1,000	1,450	1,580	1,800	Gas	1,000	2,210	2,480	2,910
Tanker	2,000	2,810	3,070	3,480	Carrier	2,000	4,080	4,560	5,370
	3,000	4,140	4,520	5,130		3,000	5,830	6,530	7,680
	5,000	6,740	7,360	8,360		5,000	9,100	10,200	12,000
	7,000	9,300	10,200	11,500		7,000	12,300	13,800	16,200
	10,000	13,100	14,300	16,200		10,000	16,900	18,900	22,200
	15,000	19,200	21,000	23,900		15,000	24,100	27,000	31,700
	20,000	25,300	27,700	31,400		20,000	31,100	34,800	40,900
	30,000	37,300	40,800	46,300		30,000	44,400	49,700	58,500
	50,000	60,800	66,400	75,500		50,000	69,700	78,000	91,800
	70,000	83,900	91,600	104,000		70,000	94,000	105,000	124,000
	100,000	118,000	129,000	146,000		100,000	128,000	144,000	169,000
	150,000	174,000	190,000	216,000					
	200,000	229,000	250,000	284,000					
	300,000	337,000	368,000	418,000					

表 3-9　日本の技術基準と海外基準等との比較

10,000DWT級　貨物船

	DWT	Loa		B		d	
① HANDBOOK OF PORT AND HARBOR ENGINEER	10,000	142	104	19.0	95	8.3	101
② Recommendations of the Committee for Waterfront Structures Harbours and Waterways EAU 1996	11,000	150	109	20.0	101	9.0	110
③ Approach Channels A Guide for Design	10,000	133	97	19.8	99	8.0	98
④ 港湾の施設の技術上の基準　1999	10,000	137	100	19.9	100	8.2	100
⑤ SECTOR STANDARDS OF THE PEOPLE'S REPUBLIC OF CHINA	10,000	153	112	20.0	101	8.8	107
⑥ OBRAS MARIMAS TECNOLOGIA 2000	10,000	133	97	19.8	99	8.0	98
⑦-1 Guidelines for the Desigh of Fenders Systems:2002　50%	10,000	128	93	19.5	98	7.6	93
⑦-2 Guidelines for the Desigh of Fenders Systems:2002　75%	10,000	137	100	20.5	103	8.3	101
		全部	102	全部	100	全部	101
		④以外	102	④以外	99	④以外	101
		④、⑦-1以外	103	⑦-1以外	100	⑦-1以外	102

100,000DWT級　貨物船

	DWT	Loa		B		d	
① HANDBOOK OF PORT AND HARBOR ENGINEER	100,000	278	109	39.3	100	14.0	93
② Recommendations of the Committee for Waterfront Structures Harbours and Waterways EAU 1996	100,000	280	109	41.0	104	15.0	99
③ Approach Channels A Guide for Design	100,000	255	100	39.0	99	15.3	101
④ 港湾の施設の技術上の基準　1999	100,000	256	100	39.3	100	15.1	100
⑤ SECTOR STANDARDS OF THE PEOPLE'S REPUBLIC OF CHINA	100,000	260	102	39.0	99	15.2	101
⑥ OBRAS MARIMAS TECNOLOGIA 2000	100,000	255	100	39.0	99	15.3	101
⑦-1 Guidelines for the Desigh of Fenders Systems:2002　50%	100,000	248	97	37.9	96	14.8	98
⑦-2 Guidelines for the Desigh of Fenders Systems:2002　75%	100,000	255	100	39.2	100	15.2	101
		全部	102	全部	100	全部	99
		④以外	102	④以外	100	④以外	99
		④、⑦-1以外	103	⑦-1以外	100	⑦-1以外	99

30,000DWT級　コンテナ船

	DWT	Loa		B		d	
① HANDBOOK OF PORT AND HARBOR ENGINEER	-	-		-		-	
② Recommendations of the Committee for Waterfront Structures Harbours and Waterways EAU 1996	30,000	228	105	31.0	103	11.3	102
③ Approach Channels A Guide for Design	30,000	210	96	30.0	99	10.7	96
④ 港湾の施設の技術上の基準　1999	30,000	218	100	30.2	100	11.1	100
⑤ SECTOR STANDARDS OF THE PEOPLE'S REPUBLIC OF CHINA	30,000	237	109	31.0	103	11.5	104
⑥ OBRAS MARIMAS TECNOLOGIA 2000	30,000	210	96	30.0	99	10.7	96
⑦-1 Guidelines for the Desigh of Fenders Systems:2002　50%	30,000	206	94	29.1	96	10.7	96
⑦-2 Guidelines for the Desigh of Fenders Systems:2002　75%	30,000	218	100	30.2	100	11.1	100
		全部	100	全部	100	全部	99
		④以外	100	④以外	100	④以外	99
		④、⑦-1以外	101	⑦-1以外	101	⑦-1以外	100

50,000DWT級　コンテナ船

	DWT	Loa		B		d	
① HANDBOOK OF PORT AND HARBOR ENGINEER	-	-		-		-	
② Recommendations of the Committee for Waterfront Structures Harbours and Waterways EAU 1996	50,000	290	109	32.4	100	13.0	100
③ Approach Channels A Guide for Design	50,000	267	100	32.2	100	12.5	96
④ 港湾の施設の技術上の基準　1999	50,000	266	100	32.3	100	13.0	100
⑤ SECTOR STANDARDS OF THE PEOPLE'S REPUBLIC OF CHINA	50,000	294	111	35.0	108	13.3	102
⑥ OBRAS MARIMAS TECNOLOGIA 2000	50,000	267	100	32.2	100	12.5	96
⑦-1 Guidelines for the Desigh of Fenders Systems:2002　50%	50,000	252	95	32.3	100	12.5	96
⑦-2 Guidelines for the Desigh of Fenders Systems:2002　75%	50,000	266	100	32.3	100	13.0	100
		全部	102	全部	101	全部	99
		④以外	103	④以外	101	④以外	98
		④、⑦-1以外	104	⑦-1以外	102	⑦-1以外	99

70,000DWT級　タンカー

	DWT	Loa		B		d	
① HANDBOOK OF PORT AND HARBOR ENGINEER	70,000	248	106	35.7	94	13.4	96
② Recommendations of the Committee for Waterfront Structures Harbours and Waterways EAU 1996	-	-		-		-	
③ Approach Channels A Guide for Design	70,000	225	96	38.0	100	13.5	97
④ 港湾の施設の技術上の基準　1999	70,000	235	100	38.0	100	13.9	100
⑤ SECTOR STANDARDS OF THE PEOPLE'S REPUBLIC OF CHINA	80,000	250	106	38.0	100	13.6	98
⑥ OBRAS MARIMAS TECNOLOGIA 2000	70,000	225	96	38.0	100	13.5	97
⑦-1 Guidelines for the Desigh of Fenders Systems:2002　50%	70,000	224	95	36.3	96	13.2	95
⑦-2 Guidelines for the Desigh of Fenders Systems:2002　75%	70,000	235	100	38.0	100	13.9	100
		全部	100	全部	98	全部	98
		④以外	100	④以外	98	④以外	97
		④、⑦-1以外	101	⑦-1以外	99	⑦-1以外	98

50,000GT級　旅客船

	GT	Loa		B		d	
① HANDBOOK OF PORT AND HARBOR ENGINEER	50,000	245	99	30.5	94	10.5	131
② Recommendations of the Committee for Waterfront Structures Harbours and Waterways EAU 1996	50,000	300	121	31.0	96	10.5	131
③ Approach Channels A Guide for Design	50,000	234	94	32.2	100	7.1	89
④ 港湾の施設の技術上の基準　1999	50,000	248	100	32.3	100	8.0	100
⑤ SECTOR STANDARDS OF THE PEOPLE'S REPUBLIC OF CHINA	-	-		-		-	
⑥ OBRAS MARIMAS TECNOLOGIA 2000	50,000	234	94	32.2	100	7.1	89
⑦-1 Guidelines for the Desigh of Fenders Systems:2002　50%	50,000	231	93	30.5	94	7.6	95
⑦-2 Guidelines for the Desigh of Fenders Systems:2002　75%	50,000	248	100	32.3	100	8.0	100
		全部	100	全部	98	全部	105
		④以外	100	④以外	97	④以外	106
		④、⑦-1以外	102	⑦-1以外	98	⑦-1以外	108

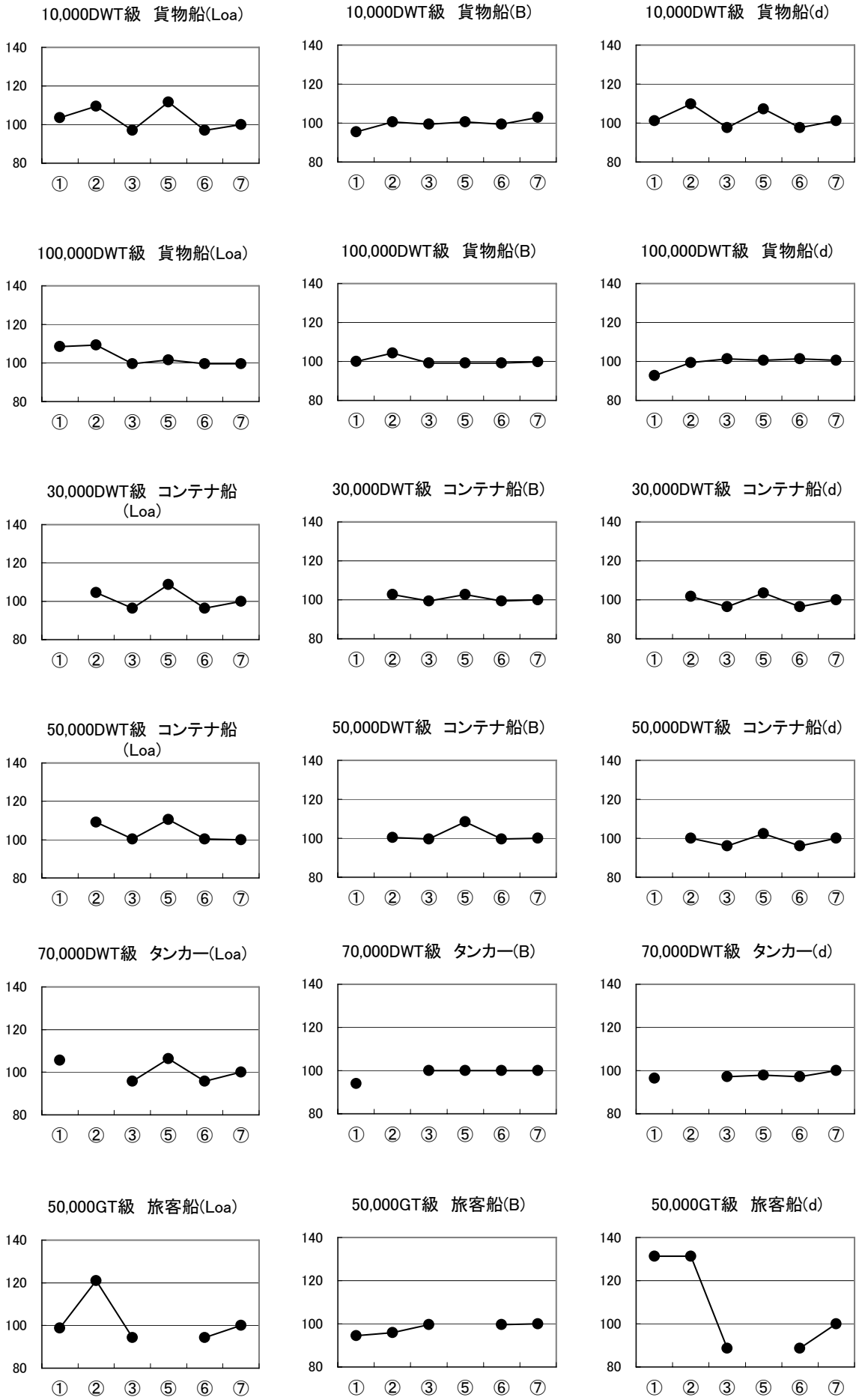

図 3-1　1999 年版基準を 100 とした場合