Secondary Legislation

DCE - MTI 3J-1/1

Maritime Transport (Anchors and Cables) Instrument [year]

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Contents

Section 1 Preliminary provisions

1.1 Title

This MTI is the Maritime Transport (Anchors and Cables) Instrument [year].

1.2 Commencement

This MTI comes into force on [same date as *Part 3J*].

1.3 What this MTI does

This MTI specifies, for the purposes of *Part 1A: Maritime (Design, Construction, and Equipment) Rules* and *Part 3J: Maritime (Design, Construction, and Equipment – Anchors and Cables) Rules,* standards and requirements for the design and construction of anchors, cables, accessories, windlasses, capstans, and winches on New Zealand ships that are commercial ships.

1.4 Application of MTI provisions

(1) This MTI specifies—

(a) requirements with which a ship, described in rule 3J: A1.3, must comply; and

(b) standards that are, for the purposes of rule 3J: C1.1, the relevant materials, design, manufacturing, testing, and certification standards.

(2) If there is a conflict between this MTI and the maritime rules, the maritime rules apply.

(3) If there is a conflict between this MTI and material incorporated by reference in this MTI, the MTI applies.

1.5 Interpretation

(1) A term that is used in this MTI and defined in Part 3J has the same meaning as in that Part.

(2) In this MTI, unless the context otherwise requires,—

coastal limits has the meaning set out in *Part 20: Operating Limits*

design waterline means the deepest load line at which the ship is designed to operate

enclosed water limits has the meaning set out in *Part 20: Operating Limits*

EN means the equipment number of a ship calculated in accordance with Appendix 1 of this MTI

grade of chain cable means the grade assigned by an inspecting organisation, based on the nominal tensile strength of the steel used for the manufacture of the chain cable

HHP means high holding power

high holding power anchor means an anchor with a minimum holding power of at least twice that of an ordinary stockless anchor

holding power means the force needed to break out an anchor embedded in the seabed, expressed in Newtons

inshore fishing limits has the meaning set out in *Part 20: Operating Limits*

inshore limits has the meaning set out in *Part 20: Operating Limits*

length overall means the length of the ship measured from the foreside of the head of the stem to the aftermost part of the transom or stern of the ship and—

(a) includes structures such as deckhouses that project beyond those terminal points; and

(b) does not include fittings such as beltings, bowsprits, platforms, pulpits, and booms that project beyond those terminal points

LOA means length overall

offshore limits has the meaning set out in *Part 20: Operating Limits*

ordinary stockless anchor means a generic or standard anchor with an assumed holding power of three times its weight, but is not an HHP or a SHHP anchor

passenger ship means—

(a) for a ship that does not proceed beyond restricted limits, a commercial ship that carries any passengers; and

(b) for a ship that proceeds beyond restricted limits, a commercial ship that carries more than 12 passengers

pendant means a length of chain cable, of the diameter that would be required for the anchor, shackled between an anchor and the anchor's cable

restricted limits has the meaning set out in *Part 20: Operating Limits*

special steel means steel with a nominal tensile strength of 490 or more Newtons per square millimetre but less than 690 Newtons per square millimetre

super high holding power anchor means an anchor with a minimum holding power of at least 4 times that of an ordinary stockless anchor

(3) In this MTI, codes and official standards (such as AS/NZS and ISO) are referred to as standards and by the abbreviations listed in Appendix 6.

Section 2 Anchors and cables

2.1 Application of requirements for anchors and cables

This Section specifies requirements for anchors and cables fitted to a ship for the purposes of rule 3J: C2.1.

2.2 Number of anchors that must be fitted to a ship

Ships that must have a minimum of 2 anchors fitted

(1) Except as provided in subclause (2), a ship must be fitted with a minimum of 2 anchors if the ship—

(a) is of 24 metres or more in LLL; or

(b) is a barge; or

(c) is a sailing ship; or

(d) is not a sailing ship and is of less than 24 metres in LLL and—

(i) the ship operates within enclosed water limits, and the anchor weight that corresponds to the ship's length and height in Table 1 of Appendix 3 is 100 kilograms or more; or

(ii) the ship operates within inshore limits, inshore fishing limits, or coastal limits and the anchor weight that corresponds to the ship's length and height in Table 2 of Appendix 3 is 25 kilograms or more; or

(iii) the ship operates within offshore limits, and the anchor weight that corresponds to the ship's length and height in Table 3 of Appendix 3 is 25 kilograms or more.

(2) A passenger ship is not required to be fitted with 2 anchors if—

(a) the ship is of less than 24 metres in LLL; and

(b) the ship does not proceed beyond restricted limits; and

(c) as part of its normal operations, the ship only undertakes voyages between a fixed wharf, jetty, or berth and another fixed wharf, jetty, or berth.

Ships that must have a minimum of 1 anchor fitted

(3) A ship that is not required to be fitted with 2 anchors must be fitted with a minimum of 1 anchor.

2.3 Anchor weight must be sufficient to hold a ship when required

(1) A minimum anchor weight specified in this Section must be increased to the extent a surveyor determines necessary to hold a ship when required, if the surveyor determines that the specified weight is insufficient to achieve this due to the nature of the ship or its operations.

(2) The nature of a ship or its operations that may necessitate an increased minimum anchor weight under subclause (1), includes but is not limited to—

(a) the ship has unusually high windage due to heavy rigging or large superstructures; or

(b) the ship operates in areas with poor anchor holding characteristics.

2.4 Minimum weights of ordinary stockless anchors

(1) The weight of the head of an ordinary stockless anchor must be at least 60 percent of the total weight of the anchor.

(2) An ordinary stockless anchor fitted to a ship must weigh at least—

(a) the minimum weight that corresponds with the ship's EN in Appendix 2; or

(b) in the case of a ship of less than 24 metres in LLL, the lesser of—

(i) the minimum weight described in paragraph (a); and

(ii) the minimum weight that is determined in accordance with subclauses (3) to (8.)

Ships of less than 24 metres in LLL that are not sailing ships or barges

(3) Unless subclause (4) or (5) applies, each ordinary stockless anchor on a ship of less than 24 metres in LLL, that is not a sailing ship or a barge, must have the minimum weight that corresponds with the ship's overall length and height that is specified in—

(a) Table 1 of Appendix 3, if the ship operates within enclosed water limits only; or

(b) Table 2 of Appendix 3, if the ship operates within inshore limits, inshore fishing limits or coastal limits; or

(c) Table 3 of Appendix 3, if the ship operates in offshore limits.

(4) Where a ship is required to be fitted with 2 anchors of a specified weight, any 1 anchor may differ by up to 10 percent from the specified weight, provided the total weight of both anchors is no less than twice the specified weight.

(5) A weight specified in accordance with subclause (3) is reduced by 25 percent if the ship has a planing hull.

Sailing ships of less than 24 metres in LLL

(6) In the case of a sailing ship of less than 24 metres in LLL, the minimum weight is the minimum weight specified in Appendix 4 that corresponds with the ship's average length, calculated as follows:

$$L = \frac{L_{OA} + L_{WL}}{2}$$

Where:

L = the ship's average length, in metres:

L_{OA} = the ship's LOA, in metres:

L_{WL} = the ship's length on the design waterline, in metres.

Typically, for square rigged commercial sailing ships up to 50 metres in length an approximate increase in anchor weight and cable strength of 50 percent is required on that for a typical motor ship of the same size.

Barges of less than 24 metres in LLL

(7) An ordinary stockless anchor fitted to a barge of less than 24 metres in LLL must have the minimum weight that corresponds to the ship's *EN* in Appendix 5.

(8) If a barge to which subclause (7) applies does not proceed beyond restricted limits, the minimum anchor weight is reduced by 50 percent.

2.5 HHP and SHHP anchors

Weight requirements for HHP and SHHP anchors

(1) An HHP anchor that is fitted to a ship must weigh at least 75 percent of the applicable weight that would be required of an ordinary stockless anchor for that ship under clause 2.4.

(2) A SHHP anchor that is fitted to a ship must weigh at least 50 percent of the applicable weight that would be required of an ordinary stockless anchor for that ship under clause 2.4.

Material, diameter, and length of cables fitted to HHP and SHHP anchors

(3) The type, diameter, and length of a cable fitted to an HHP or a SHHP anchor under clauses 2.7 and 2.8 must be determined by using the ordinary stockless anchor weight.

(4) The ordinary stockless weight in subclause (3) is—

(a) for an HHP anchor, the weight of the HHP anchor multiplied by 1.333; and

(b) for a SHHP anchor, the weight of the SHHP multiplied by 2.

2.6 Number of cables that must be fitted to a ship

(1) A ship must be fitted with a cable for each anchor required under clause 2.2.

(2) A cable fitted under subclause (1) must comply with requirements in clauses 2.7 and 2.8 that correspond with the anchor for which it is fitted.

2.7 Type of cable

(1) Subject to subclauses (3) to (5), a cable that is required to be fitted to a ship must be—

(a) a stud-link chain cable; or

(b) a short-link chain cable; or

(c) a fibre rope cable; or

(d) a steel wire rope cable.

(2) For the purposes of clause 2.6 and the tables in Appendices 2 to 5, a cable may be used that is not of a type specified in those tables, provided that—

(a) the cable is a type specified in subclause (1); and

(b) the cable has an equivalent breaking load to the mild steel chain cable specified in Table 4 of Appendix 3; and

(c) if the cable is a stud-link chain cable or a short-link chain cable, it must have the same diameter as the chain cable specified in the table for the ship.

Restrictions on the use of cable materials

(3) A stud-link chain cable or a short-link chain cable with a tensile strength of less than 400 Newtons per square millimetre must not be fitted as an anchor's cable for an HHP or a SHHP anchor.

(4) A steel wire rope cable must not be fitted to a ship—

(a) with an EN of more than 500; and

(b) if the ordinary stockless weight of the cable's anchor is 130 kilograms or more, unless a manufacturer's certificate is issued and the steel wire rope cable has been manufactured and tested in accordance with 1 of the following:

(i) the rules of a recognised classification society:

(ii) *BS EN 12385-4+A1*:

(iii) *EN 12385-4+A1*:

(iv) *AS 3569-10*:

(v) *ISO 2408.*

(5) A recognised classification society means any of the following:

(a) American Bureau of Shipping:

(b) Bureau Veritas:

(c) Det Norske Veritas (DNV):

(d) Lloyd's Register of Shipping:

(e) Nippon Kaiji Kyokai.

(6) A fibre rope cable must not be fitted to a ship if—

(a) the ship is of 24 metres or more in LLL; or

(b) the ordinary stockless weight of the cable's anchor is 130 kilograms or more.

Steel wire rope and fibre rope chain cables must be fitted with a pendant

(7) A steel wire or fibre rope cable must be fitted with a pendant that is at least—

(a) 3 metres long, if the ordinary stockless weight of the anchor is 25 kilograms or less; or

(b) 6 metres long, if the ordinary stockless weight of the anchor is more than 25 kilograms but no more than 130 kilograms; or

(c) 9 metres long, if the ordinary stockless weight of the anchor is more than 130 kilograms.

Additional requirements for steel wire rope cables

(8) A steel wire rope fitted to a ship as an anchor's cable—

(a) must be hot-dipped, galvanised, and lubricated; and

(b) must not be fitted to a ship unless every surface with which the steel wire rope comes into contact when in use is rounded, with a minimum radius of 10 times the diameter of the steel wire rope; and

(c) must have thimbles fitted to each end; and

(d) must be periodically inspected and maintained in good working order, including—

(i) by taking precautions to reduce wear and tear; and including re-lubrication as necessary to prevent corrosion; and

(ii) applying discard criteria provided by the manufacturer, or in the absence of instructions provided by the manufacturer, the discard criteria in *ISO 4309*.

Additional requirements for fibre rope cables

(9) A fibre rope cable fitted to a ship must be in good condition and free from sunlight damage, abrasions, and hockles.

2.8 Length, diameter, and breaking load of cables and accessories

Ships of 24 metres or more in LLL

(1) A cable fitted to a ship of 24 metres or more in LLL must have the minimum length and the minimum diameter that correspond with the ordinary stockless weight of the cable's anchor in Appendix 2.

Ships of less than 24 metres in LLL that are not sailing ships or barges

(2) A cable fitted to a ship of 7 metres or more in LOA but of less than 24 metres in LLL that is not a sailing ship or a barge must have—

(a) the minimum diameter that corresponds with the ordinary stockless weight of the cable's anchor, specified in Table 4 of Appendix 3; and

(b) the minimum length that corresponds with the overall length of the ship in Table 5 of Appendix 3.

(3) A cable that is fitted to a ship of less than 7 metres in LOA that is not a sailing ship or a barge—

(a) must have the minimum diameter that corresponds with the ordinary stockless weight of the cable's anchor, specified in Table 4 of Appendix 3; and

(b) must be of a length determined by a surveyor, having regard to the arrangements for the ship and the ship's operating area; and

(c) must have a minimum length that is the longer of either—

(i) 5 times the ship's LOA; or

(ii) 30 metres.

Sailing ships of less than 24 metres in LLL

(4) A cable that is fitted to a sailing ship of less than 24 metres in LLL must—

(a) have the minimum diameter that corresponds with the ordinary stockless weight of the cable's anchor in Appendix 4; and

(b) have the minimum length of—

(i) 60 metres, for the first cable; or

(ii) 40 metres, for the second cable; and

(c) be fitted with a pendant with a minimum length that is the greater of—

(i) the overall length of the ship; and

(ii) the applicable length specified in clause 2.7(7).

Barges of less than 24 metres in LLL

(5) A cable fitted to a barge of less than 24 metres in LLL must have the minimum length and the minimum diameter that corresponds with the ordinary stockless weight of the cable's anchor and the grade of chain cable in Appendix 5.

(6) If a barge to which subclause (5) applies does not proceed beyond restricted limits, the minimum length of a cable that is fitted to the barge must have 50 percent of the minimum length in subclause (5).

Breaking load of cable accessories

(7) An accessory must have the minimum breaking load that is equal to or greater than that required, under clause 2.8, of the cable to which the accessory is fitted.

Diameter of pendant

(8) A pendant must be of the diameter that would be required for anchor chain cable under clause 2.8.

2.9 Securing the end of the cable

(1) The bitter end of an anchor's cable must be secured to the ship with sufficient strength to withstand loads at least equal to the breaking strength of the cable.

(2) A cable must be able to be released from the ship when under load in an emergency.

Section 3 Approval, markings, and certification

3.1 Application of requirements for approval, markings, and certification

This Section specifies requirements for approval, markings, and certification of anchors, cables, and accessories for the purposes of rule 3J: C3.1 to 3J: C3.4.

3.2 Requirements for approval

For the purposes of rule 3J: C3.1(2)(b) an HHP or a SHHP anchor fitted to a ship must be type approved.

3.3 Certificate of test requirements

Certificate of test requirements for anchors

(1) For the purposes of rule 3J: C3.2, the certificate of test for an anchor must include the following:

(a) the manufacturer's name:

(b) the details of the inspecting organisation and the local office that issued the certificate:

(c) the certificate number:

(d) the type of anchor:

(e) the mass of the anchor:

(f) for a stocked anchor, the mass of stock:

(g) the grade of materials of which the anchor is constructed:

(h) the results of the proof test load:

(i) any heat treatment:

(j) markings applied to the anchor:

(k) dimensions of the anchor:

(l) fluke and shank identification numbers.

Certificate of test requirements for cables and accessories

(2) For the purposes of rule 3J: C3.2, the certificate of test for a cable or accessory must include the following:

(a) the manufacturer's name:

(b) the details of the inspecting organisation and the local office that issued the certificate:

(c) the certificate number:

(d) the results of the proof test load and breaking test loads, as applicable:

(e) the markings applied to the cable or accessory:

(f) the nominal diameter and weight:

(g) the length of cable:

(h) mechanical test results:

(i) for chain cables:

(i) the grade of steel:

(ii) the chemical composition of the steel (including total aluminium content):

(iii) details of any heat treatment used in manufacturing:

(j) for a steel wire rope cable:

(i) the details of the rope construction:

(ii) the ore material used:

(iii) the grade of zinc coating applied:

(iv) the adhesion test results:

(v) the method of the breaking load testing:

(k) for a fibre rope cable:

(i) rope type:

(ii) rate of straining.

3.4 Manufacturer's certificate requirements

For the purposes of rule 3J: C3.3, a manufacturer's certificate for an anchor, cable, or accessory must include the applicable information in clauses 3.3(1) and 3.3(2), except that—

(a) clauses 3.3(1)(b) and 3.3(2)(b) are not required for a manufacturer's certificate; and

(b) for an anchor, the manufacturer's certificate must include the reference number of the type approval and the name of the inspecting organisation that issued it, if applicable.

3.5 Markings

Marking requirements for anchors

(1) For the purposes of rule 3J: C3.4, an anchor, cable, or accessory for which a certificate of test or a manufacturer's certificate is issued must be permanently marked with—

(a) the mass of the anchor; and

(b) identification numbers, including test numbers or certificate numbers; and

(c) the manufacturer's mark; and

(d) for an anchor that is test approved, the inspecting organisation's stamp.

Marking requirements for cables and accessories

(2) For the purposes of rule 3J: C3.4, a cable or accessory for which a certificate of test or a manufacturer's certificate is issued,—

(a) for a chain cable, must be marked with permanent markings—

(i) specifying the grade of steel of which it is constructed; and

(ii) specifying the certificate number; and

(iii) for a cable or accessory that is test approved, the inspecting organisation's stamp; and

(b) for a steel wire rope cable, must be marked with labels affixed to each coil of rope at the time of purchase that—

(i) specify the material, construction, diameter, and length of the cable; and

(ii) if a certificate of test is issued, the inspecting organisation's stamp; and

(c) for a fibre rope cable, must be marked with labels affixed to each coil of rope at the time of purchase that specify the rope type, diameter, and length of the cable.

Section 4 Windlasses, capstans, and winches

4.1 Application of requirements for windlasses, capstans, and winches

This Section specifies requirements for windlasses, capstans, and winches for the purposes of rule 3J: C4.1.

4.2 Requirements for windlasses, capstans, and winches

(1) Windlasses, capstans, or winches fitted to a ship must—

(a) be capable of raising and lowering any anchor that is fitted to the ship; and

(b) include a powered windlass, capstan, or winch, if the ship has an anchor weighing 50 kilograms or more.

Appendix 1 Calculation of the EN of barges and ships of 24 metres or more in LLL

1. For the purposes of this MTI, the EN of a ship that is a barge or is of 24 metres or more in LLL is calculated by reference to the following:

   (a) If the ship is a monohull:

   $$EN = \Delta^{2/3} + 2(D_h + B_0\alpha_1) + 0.1A$$

   (b) If the ship is a twin hull:

   $$EN = \Delta^{2/3} + 2\left(D_h + B_0\alpha_1 + 2G_aB_1\right) + 0.1A$$

   (c) If the ship is a trimaran:

   $$EN = \Delta^{2/3} + 2\left(D_h + B_0\alpha_1 + G_a(2B_1 + B_2)\right) + 0.1A$$

2. For the purposes of the calculations in 1, the symbols used have the following meanings:

   b_i = mean breadth of deckhouse or superstructure tier, in metres:

   h_i = mean height of deckhouse or superstructure tier, in metres:

   A = area, in square metres, in profile view of the hull, superstructure and deckhouses above the design waterline. Deckhouses with breadth less than *B/4* must be ignored:

   B_0 = the greatest moulded breadth, in metres, or for craft of composite construction, the extreme breadth excluding rubbing strakes or other projections:

   B_1 = the greatest breadth of the outer hulls of a multi-hull craft, in metres. It is to be measured between the points of intersection of the extension of the hull sides to the normal line of the wet deck:

   B_2 = the greatest breadth of the centre hull in trimaran type craft, in metres. It is to be measured between the points of intersection of the extension of the hull sides to the normal line of the wet deck:

   D_h = the sum of b_i, h_i, $\cos\theta_i$ for all deckhouses and superstructures tiers:

   G_A = air gap, which is the minimum distance, in metres, from the static design waterline to the underside of the cross deck (wet deck) structure:

   α_1 = **for mono-hull ships** is the distance in metres, from the waterline to the underside of the first tier of deckhouse or superstructure:

   for multi-hull ships is the distance in metres, from the underside of the cross-deck structure to the underside of the first tier of the deckhouse or superstructure:

   θ_i = angle of inclination aft, of tier of deckhouse front with a line perpendicular to the static load waterline:

   Δ_i = loaded displacement, in tonnes.

Appendix 2 Anchors and cables for ships of 24 metres or more in LLL

EN		Anchors		Stud-link Chain Cable		
Exceeding	Not Exceeding	Number of Anchors	Weight per Anchor (kilograms)	Total Length (metres)	Mild Steel Diameter (millimetres)	Special Steel Diameter (millimetres)
50	60	2	120	192.5	12.5	
60	70	2	140	192.5	12.5	
70	80	2	160	220	14	12.5
80	90	2	180	220	14	12.5
90	100	2	210	220	16	14
100	110	2	240	220	16	14
110	120	2	270	247.5	17.5	16
120	130	2	300	247.5	17.5	16
130	140	2	340	275	19	17.5
140	150	2	390	275	19	17.5
150	175	2	480	275	22	19
175	205	2	570	302.5	24	20.5
205	240	2	660	302.5	26	22
240	280	2	780	330	28	24
280	320	2	900	357.5	30	26
320	360	2	1020	357.5	32	28
360	400	2	1140	385	34	30
400	450	2	1290	385	36	32
450	500	2	1440	412.5	38	34
500	550	2	1590	412.5	40	34
550	600	2	1740	440	42	36
600	660	2	1920	440	44	38
660	720	2	2100	440	46	40

Notes to Appendix 2

1. If the parameters of the ship fall between the values shown in the tables, the anchor weight must be determined by interpolation.

Note: Sailing ships of 24 metres or more in LLL are not included in the application of this MTI. See rule 3J: C2.1(2).

Appendix 3 Anchors and cables for ships of less than 24 metres in LLL that are not sailing ships or barges

Table 1 Minimum anchor weights (kilograms) for ships of less than 24 metres in LLL, operating within enclosed water limits, that are not sailing ships or barges.[1]

	Height (metres)													
LOA (metres)	**0.5**	**1.0**	**1.5**	**2.0**	**2.5**	**3.0**	**3.5**	**4.0**	**4.5**	**5.0**	**5.5**	**6.0**	**6.5**	**7.0**
4			6	8										
5		6	8	9.5	11									
6	6	8	9.5	11	12.5	14								
7	7	9	11	12.5	14.5	16	18							
8	8	10.5	12.5	14.5	16.5	18.5	21	23.5						
9	9.5	12	14	16.5	18.5	21.5	24.5	28	31					
10	11	13	16	18.5	21.5	25	28.5	32	35	40				
11	12.5	15	18	21	24.5	28.5	32.5	36	41	45.5	50			
12	13	16.5	20	23.5	28	32.5	36.5	42	46	52	58	64		
13	15	18.5	22.5	27	31.5	36	42	47	53	60	66	73	81.5	
14	17	20.5	25	30.5	35	41.5	47	53	60.5	68	74.5	84.5	92	99
15	19	23	29	33.5	40	46	53	60.5	68	77	86	94	103	112
16	21	26	32	37.5	44.5	51.5	59.5	68	77	87	95.5	104.5	114.5	125
17	23	30.5	35	42.5	49	58	66.5	76	87	95.5	105	116.5	127	138
18	26.5	32.5	39	47	55.5	64.5	74.5	85.5	96	105	117	128.5	140	151
19	29	36	44	52	62	72	83.5	96	106	117	129	141	153	164
20	32.5	40	48	58.5	68.5	81	92	104	115	128	141	153.5	166	180
21	35.5	44.5	53.5	64.5	76	88.5	100	113	126	138	153	166.5	181	195
22	40	49	60	71.5	85	96.5	111	124	138	152	165	181	195.5	211
23	44	54	66.5	79	93	106	120	135	149	163	180	195	211	230
24	48	60.5	73	88	100	116	131	146	162	175	196	210	229	250

[1] See the notes to Appendix 3 on page 19.

Table 2 Minimum anchor weights (kilograms) for ships of less than 24 metres in LLL, operating within inshore limits, inshore fishing limits or coastal limits, that are not sailing ships or barges.[2]

	Height (metres)													
LOA (metres)	**0.5**	**1.0**	**1.5**	**2.0**	**2.5**	**3.0**	**3.5**	**4.0**	**4.5**	**5.0**	**5.5**	**6.0**	**6.5**	**7.0**
4			7	10										
5		7	10	12	14									
6	7	10	12	13	15	18								
7	9	11	14	16	18	20	22.5							
8	10	12.5	15	17.5	20	22.5	25	30						
9	12	15	17.5	20	22.5	27.5	30	35	40					
10	14	17	20	22.5	27.5	30	35	40	45	50				
11	15	20	22.5	25	30	35	40	45	50	55	60			
12	17	20	25	30	35	40	45	50	57.5	65	72.5	80		
13	20	25	30	35	40	45	50	60	67.5	75	82.5	90	100	
14	20	25	32.5	37.5	45	50	57.5	67.5	75	85	95	105	115	125
15	22.5	30	35	42.5	50	57.5	65	75	85	95	110	120	130	140
16	25	32.5	40	47.5	55	65	75	85	97.5	110	120	130	140	155
17	30	37.5	45	52.5	62.5	72.5	85	95	110	120	130	145	160	175
18	32.5	40	50	60	70	80	92.5	105	120	130	145	160	175	190
19	35	45	55	65	77.5	90	105	120	130	145	160	175	190	205
20	40	50	60	72.5	85	100	115	130	145	160	175	190	205	225
21	45	55	67.5	80	95	110	125	140	160	175	190	210	225	245
22	50	60	75	90	105	120	135	155	175	190	205	225	245	265
23	55	70	85	100	115	130	150	170	190	205	225	245	265	290
24	60	75	90	110	125	145	165	180	200	220	240	260	285	320

[2] See the notes to Appendix 3 on page 19.

Table 3 Minimum anchor weights (kilograms) for ships of less than 24 metres in LLL, operating within offshore limits, that are not sailing ships or barges.[3]

	Height (metres)													
LOA (metres)	**0.5**	**1.0**	**1.5**	**2.0**	**2.5**	**3.0**	**3.5**	**4.0**	**4.5**	**5.0**	**5.5**	**6.0**	**6.5**	**7.0**
8	12	15	18.5	21	24.5	27	31	35						
9	14	17	21	24	28	32	36	41	46					
10	16	19	23.5	27	32	37	42	47	52	59				
11	18	22	26	31	37	42	48	54	61	67.5	75			
12	20	24.5	29	35	41	48	54	62	69.5	77	87	96		
13	22	27	33	40	46.5	53.5	62	70	80.5	90	99.5	110	121	
14	24	30.5	37.5	45	52	61	70	81	91	102	113	124.5	138	148
15	27	35	42	50	59	69	79	91	102	115	128	141	154	167.5
16	31	39	47	56	66	77	90	102	115	129	142	156	171	186
17	35	43	52	63	74	87	100	114	129	143	158	174	190	206
18	39	48	58	70	83	97	111	127	142	158	175	191	210	226
19	43	53	65	78	93	108	124	140	156	175	192	211	227.5	246
20	48	59	72	87.5	103	120	137	154	172.5	191	211	229	248	268
21	53	66	80	97	114	132	149	169	189	208	228	248	269.5	291
22	59	73	90	107	126	144.5	164	185	206	226	247	269.5	292	318
23	65	82	100	118	138	158	180	201	223	244	268	291	318	347
24	72	90	109	130	150	172	195	218	240	264	289	318	343.5	388

[3] See the notes to Appendix 3 on page 19.

Table 4 Cables for ships of less than 24 metres in LLL that are not sailing ships or barges[4]

Anchor Weight (kilograms)	Short-link Chain Cable Diameter – Mild Steel (millimetres)	Manila Rope Cable Diameter (millimetres)	Polyester Rope Cable Diameter (millimetres)	Nylon Rope Cable Diameter (millimetres)	Chain pendant length (if applicable)
Under 8	8	14	12	10	3 metre chain shackled between steel wire rope or fibre rope cable and anchor
8-13	8	16	12	10	
13-18	8	18	14	11	
18-25	8	20	16	12	
25-32	10	24	16	14	6 metre chain shackled between steel wire rope or fibre rope cable and anchor
32-38	10	24	18	14	
38-44	10	24	22	16	
44-51	13	30	24	18	
51-76	14	34	28	20	
76-89	14	38	32	22	
89-100	15	40	34	24	
100-130	15				
130-178	16				9 metre chain shackled between steel wire rope or fibre rope cable and anchor
178-226	17				
226-274	19				
274-322	20				
322-370	21				
370-432	21				

Table 5 Minimum length of cables fitted to a ship of less than 24 metres in LLL that is not a sailing ship or a barge

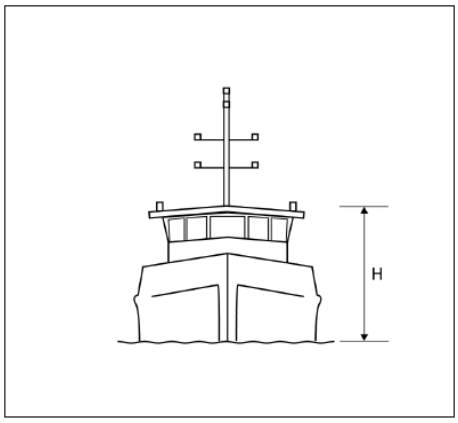
LOA of Ship (metres)	Length of Cable (metres)
4-6	See *clause 2.7(3)*
7-9	45
10-11	55
12-14	70
15-17	82
18-20	96
21-24	110

[4] See notes to Appendix 3 on page 19.

Notes to Appendix 3.

1. In Tables 1 to 3, a ship for which a non-shaded value applies must be fitted with a minimum of 1 anchor. A ship for which a shaded value applies must be fitted with a minimum of 2 anchors.
2. In Tables 1 to 3, height is the height from the waterline to the top of the highest tier of a superstructure above the main deck that has a breadth greater than 15 percent of the ships maximum beam. See Figure 1 (above).
3. If the parameters of the ship fall between the values shown in the tables, the anchor weight must be determined by interpolation.
4. In Tables 1, 2 and 3, “H” is the height in metres from the waterline to the top of the highest tier of a superstructure, deckhouse or similar structure above the main deck that has a breadth greater than 25 percent of the ship’s maximum beam.

Figure 1 – height determination for Tables 1, 2 and 3.



Appendix 4 Anchors and cables for sailing ships of less than 24 metres in LLL

Table 1 Anchors and cables for sailing ships of less than 24 metres in LLL

Average Length (metres)	Anchor weight		Cable Diameter			
	First (kilograms)	Second (kilograms)	First		Second	
			Short-link Chain – Mild Steel (millimetres)	Nylon Rope (millimetres)	Short-link Chain – Mild Steel (millimetres)	Nylon Rope (millimetres)
≤6	11		8	10		
≤7	12		8	10		
≤8	13		8	11		
≤9	15		8	11		
≤10	17		8	11		
≤11	20		8	12		
≤12	24	12	8	12	8	12
≤13	28	13	10	14	8	12
≤14	32	16	10	14	8	12
≤15	36	17	10	14	8	12
≤16	40	20	10	16	8	12
≤17	45	23	13	18	8	12
≤18	51	25	13	18	10	14
≤19	56	28	14	20	10	14
≤20	63	31	14	20	10	14
≤21	69	35	14	20	10	14
≤22	76	37	14	20	10	14
≤23	82	41	14	22	10	16
≤24	90	45	15	24	13	18

Notes to Appendix 4.

1. If a ship is of more than 24 metres in LOA but less than 24 metres in LLL, the values required in Table 1 must be determined by extrapolation. [This is because, while uncommon, there can be a significant difference between LOA and LLL of up to ~3 metres].

2. For intermediate values, the minimum requirements in the Table must be determined by interpolation

Appendix 5 Anchors and cables for barges of less than 24 metres in LLL

EN	Anchors		Stud-link Chain Cable		
	Number of Anchors	Weight (kilograms)	Total length (metres)	Diameter – Mild Steel (millimetres)	Diameter – Special Steel (millimetres)
≤30	2	80	165	11	
≤40	2	100	195	11	
≤50	2	120	195	12.5	
≤60	2	140	195	12.5	
≤70	2	160	220	14	12.5
≤80	2	180	220	14	12.5
≤90	2	210	220	16	14
≤100	2	240	220	16	14
≤110	2	270	250	17.5	16
≤120	2	300	250	17.5	16
≤130	2	340	275	19	17.5
≤140	2	390	275	19	17.5
≤150	2	480	275	22	19
≤175	2	570	305	24	20.5
≤205	2	660	305	26	22
≤240	2	780	330	28	24
≤280	2	900	360	30	26
≤320	2	1020	360	32	28
≤360	2	1140	385	34	30
≤400	2	1290	385	36	32
≤450	2	1440	415	38	34
≤500	2	1590	415	40	34
≤550	2	1740	440	42	36
≤600	2	1920	440	44	38

Note to Appendix 5.

If the parameters of the ship fall between the values shown in the tables, the anchor weight must be determined by interpolation.

Appendix 6

Codes of practice and official standards

AS means Australian Standard, in the following:

AS 3569-10: Steel wire ropes – Product specification

BS EN means joint *British and European Standard*, in the following:

BS EN 12385-4:2002+A1:2008: Steel wire ropes. Safety. Stranded ropes for general lifting applications

AS/NZS 1530.1:1994: Methods for fire tests on building materials, components and structures - Combustibility test for materials

ISO means *International Organization for Standardization*, in the following:

ISO 2408:2017 Steel wire ropes – Requirements

ISO 4309:2017 Wire ropes – Care and maintenance, inspection and discard