

Maritime Rules

Part 41 – Anchors and chain cables

Effective 4 September 2008

Maritime Rules

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History of Part 41

This part first came into force on 1 February 2001 and now incorporates the following amendments:

Amendment 1

Maritime (Various Amendments) Rules 2008

Effective date

4 September 2008

Summary of amendments

41.7(1) – amended subrule

41.7(4) – amended subrule

41.7(5) – amended subrule

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Part objective

Part 41 of the maritime rules deals with the manufacture, testing, examination, marking and certification of larger anchors and chain cables which are to be fitted to New Zealand ships. It requires that those anchors and chain cables manufactured overseas have a certificate of test which must be sighted by a ship surveyor before the anchor or cable can be used on a New Zealand ship. For anchors and chain cables manufactured in New Zealand Part 41 sets out the responsibilities of the manufacturer, testing establishment, inspecting organisation and ship surveyor in addition to requirements concerning their manufacture, testing, examination, marking and certification.

Part 41 will replace present legislation made under the Shipping and Seamen Act 1952, in particular the Shipping (Anchors and Chain Cables) Rules 1972, which are dated and do not reflect current international standards or the regulatory inspection systems for the maritime industry introduced by the Maritime Transport Act 1994.

Authority for making Part 41 is found in section 36(1)(s) and (1)(t) of the Maritime Transport Act 1994.

Extent of consultation

On 9 September 2000, the Maritime Safety Authority published in each of the daily newspapers in the four main centres of New Zealand a notice inviting comments on the proposed Part 41. A notice was also published in the *New Zealand Gazette* on 7 September 2000. Two hundred and seventy six copies of the draft Part 41, the invitation to comment, and the accompanying advisory circular were then sent automatically to interested parties. Comments on the Part were requested to be made by 1 November 2000.

Four submissions were received on Part 41. All submissions were considered and, where appropriate, the proposed rules were amended to take account of the comments made.

Commencement

Part 41 as amended was referred to and signed by the Minister of Transport.

Part 41 will come into force on 1 February 2001.

General

41.1 Entry into Force

Part 41 comes into force on 1 February 2001.

41.2 Definitions

In this Part –

"**Accessory**" means any accessory used in the chain cable assembly which includes, but is not limited to swivels, shackles and links of special design:

"**Anchor**" means an instrument for the purpose of holding a ship when it is at sea–

- (a) in moderate sea conditions; and
- (b) where the depth of water and sea bed is suitable for the anchor and chain cable; and
- (c) where there are no other means of securing the ship:

"**Chain cable**" means a chain made up of links and is the means by which the anchor is attached to the ship:

"**Certificate of test**" means a document issued by an inspecting organisation certifying that an anchor, chain cable or accessory has, after its manufacture, satisfactorily passed its load testing and examination in accordance with the requirements of this Part:

"**Certified accessory**" means an accessory which has been designed, manufactured and tested in accordance with the requirements of this Part and the rules of an inspecting organisation and for which a certificate of test has been issued by the inspecting organisation:

"**Certified anchor**" means an anchor which has been designed, manufactured and tested in accordance with the requirements of this Part and the rules of an inspecting organisation and for which a certificate of test has been issued by the inspecting organisation:

"**Certified chain cable**" means a chain made up of links which has been designed, manufactured and tested in accordance with the requirements of this Part and the rules of an inspecting organisation and for which a certificate of test has been issued by the inspecting organisation:

"**Director**" means the person who is for the time being the Director of Maritime Safety under section 439 of the Maritime Transport Act 1994:

"**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 stud link chain:

"**High holding power anchor**" means an anchor having a holding power at least twice that of an ordinary stockless anchor:

"**Inspecting organisation**" means –

- (a) in relation to any anchor, chain cable or accessory manufactured, examined and tested in New Zealand, a classification society which has entered into a memorandum of agreement with the Director in compliance with the International Maritime Organisation Assembly Resolution A.739(18) and the annexes thereto entitled *Guidelines for the Authorisation of Organisations Acting on Behalf of the Administration*; or
- (b) in relation to any anchor, chain cable or accessory manufactured, examined and tested in a country other than New Zealand, a classification society which is a current full member of the International Association of Classification Societies:

"**New anchor**" means an anchor manufactured on or after the coming into force of this Part:

"**New chain cable**" means a chain cable manufactured on or after the coming into force of this Part:

"**New Zealand ship**" means a ship that is registered under the Ships Registration Act 1992; and includes a ship that is not registered under the Act but is required or entitled to be registered under the Act:

"**Rules of the inspecting organisation**" means the rules for the manufacture, examination and testing of anchors, chain cables and accessories published by the inspecting organisation:

"**Surveyor**" means a person who has been recognised by the Director under rule 46.29 for the purpose of surveying a ship and its equipment for compliance with the maritime rules:

"**Testing establishment**" means any laboratory complying with the requirements of rule 41.7.

41.3 Application

- (1) Subject to rule 41.3(2), this Part applies to all anchors and chain cables for use in New Zealand ships that are –
 - (a) anchors of 75 kilograms mass or greater where –
 - (i) for stockless anchors, the mass includes the total mass of the anchor and its shackle; and
 - (ii) for stocked anchors, the mass includes the mass of the anchor and its shackle but excludes its stock; and
 - (b) chain cables with links that are 12.5 millimetres or more in diameter, and any accessories to such chain cables.
- (2) This Part does not apply to anchors, chain cables, or their accessories used in –
 - (a) pleasure craft; or
 - (b) ships of the New Zealand Defence Force, provided they are not operating commercially.

Section 1 - Anchors and cables manufactured overseas

41.4 Anchors

The owner of a ship must not fit an anchor that is manufactured outside New Zealand to the ship unless the anchor has been examined and tested by an inspecting organisation and the surveyor has –

- (a) sighted the original or a certified copy of the certificate of test; and
- (b) verified that markings on the anchor are consistent with the certificate of test.

41.5 Chain cables and accessories

The owner of a ship must not fit a chain cable or any accessory that is manufactured outside New Zealand to the ship unless that chain cable or accessory has been examined and tested by an inspecting organisation and the surveyor has –

- (a) sighted the original or a certified copy of the certificate of test; and
- (b) verified that markings on the chain cable or accessory are consistent with the certificate of test.

Section 2 - Anchors and cables manufactured in New Zealand

Responsibilities

41.6 Anchor and chain cable manufacturer

Any person who manufactures any anchor, chain cable or accessory within New Zealand must –

- (a) notify an inspecting organisation of that person's intention to commence the manufacture of any anchor, chain cable or accessory; and
- (b) if intending to change the design or specification of any anchor, chain cable or accessory that is manufactured by that person –
 - (i) notify an inspecting organisation of the change; and
 - (ii) obtain the approval of the inspecting organisation for the change before commencing manufacture to the changed design or specification; and
- (c) permit an inspecting organisation to inspect that person's facilities for the purpose of inspecting the manufacturing process and witnessing any tests required by this Part; and
- (d) keep a record for a period of not less than 15 years from the date of the test required by rule 41.12, of any anchors, chain cable or accessories manufactured and issued with a certificate of test; and
- (e) ensure that the record required by rule 41.6(d) provides –
 - (i) the name of the inspecting organisation; and
 - (ii) the number of the certificate of test; and
 - (iii) the month and year of the test; and –
 - (iv) for anchors –
 - (aa) the mass of the anchor; and
 - (bb) an indication as to whether it is a high holding power type; and
 - (cc) the identification mark which will enable the full history of the anchor to be traced; and
 - (v) for chain cable, a description of the chain cable including –

- (aa) the dimensions of the chain cable; and
- (bb) the grade of the chain cable; and
- (f) make the record available for examination by the Director on demand.

41.7 Testing establishment

- (1) An inspecting organisation that examines an anchor or chain cable for the issue of a certificate of test must ensure that any testing establishment or laboratory in New Zealand used for testing the anchor or chain cable, or for testing mechanical specimens taken from the anchor or chain cable, is accredited under the Testing Laboratory Registration Act 1972 by International Accreditation New Zealand to International Standards Organisation/International Electrotechnical Commission (ISO/IEC) 17025:2005 *General requirements for the competence of calibration and testing laboratories*.
- (2) An inspecting organisation that examines chain cable for the issue of a certificate of test must ensure that any test machine used for the breaking and proof load tests of chain cable is –
 - (a) constructed to test chain cable lengths of not less than 27.5 metres at any one time, and so constructed that the straining arrangement allows such lengths of chain cable to be tested without the need to take a fresh hold to complete the test; and
 - (b) manufactured and installed to the satisfaction of the inspecting organisation.
- (3) An inspecting organisation that examines an anchor or chain cable for the issue of a certificate of test must ensure that the accuracy of calibration for any chain cable breaking load or proof load test machine or anchor proof load test machine used for the examination is –
 - (a) established before the machine is put into use; and
 - (b) verified –
 - (i) at intervals not exceeding 12 months; and
 - (ii) after any major overhaul; and
 - (iii) when any part affecting the accuracy of the machine is repaired or replaced, or when the machine is moved to

another site; and

- (c) within a tolerance of plus or minus one percent.
- (4) An inspecting organisation that examines an anchor or chain cable for the issue of a certificate of test must ensure that the accuracy of the calibration of any tensile, impact and hardness testing machine used in the examination is verified in accordance with the following standards –

Tensile testing machine	AS 2193:1978 - <i>Methods for Calibration and Grading of Force-Measuring Systems of Testing Machines</i> ; or BS EN ISO 7500-1:2004: Part 2 <i>Verification of the Force Measuring System of the Tensile Testing Machine</i> .
Impact testing machine	AS 1544.2:1989 - <i>Methods for Impact Test on Metals Charpy V-notch</i> ; or BS 131:1972: Part 4 - <i>Calibration of Pendulum Impact Testing Machines for Metals</i> and BS EN 10045-2:1993 <i>Method for the verification of impact testing machines</i> , as appropriate.
Hardness testing - Brinell	AS 1816:1990: <i>Metallic Materials - Brinell Hardness Test</i> ; or BS EN ISO 6506-2:2005 Part 2 - <i>Metallic Materials. Brinell Hardness Test - Verification of Brinell Hardness Testing Machines</i> .
Hardness testing -Vickers	AS 1817:1991: <i>Metallic Materials - Vickers Hardness Test</i> ; or BS EN ISO 6507: Part 2 <i>Metallic Materials. Vickers Hardness Test - Verification of Testing Machines</i> .
Hardness testing - Rockwell	AS 1815:1991: <i>Metallic Materials - Rockwell Hardness Test</i> ; or BS EN ISO 6508-2:2005 Part 2 - <i>Verification of Rockwell Hardness Testing Machines (Scales A, B, C, D, E, F, G, H, K, N, T)</i> .

- (5) An inspecting organisation that examines an anchor or chain cable for the issue of a certificate of test must ensure that any non-destructive testing used in the examination is carried out in accordance with the following standards –

Penetrant flaw detection	<p>BS EN 571-1:1997 <i>Non-destructive Testing - Penetrant Testing - General Principles</i>; or</p> <p>AS 2062:1997 <i>Non-destructive Testing - Permanent Testing of Products and Components</i>.</p>
Magnetic Particle Flaw Detection	<p>BS 6072:1981 <i>Method for Magnetic Particle Flaw Detection</i>;</p> <p>BS EN ISO 9934-1:2001 <i>Non-destructive testing - Magnetic Particle Testing- Part 1: General principles</i>; or</p> <p>AS 1171:1998 <i>Non-destructive Testing - Magnetic Particle Testing of Ferromagnetic Products, Components and Structures</i>.</p>
Ultrasonic testing	<p>AS 1065:1988 <i>Non-destructive Testing -Ultrasonic Testing of Carbon and Low Alloy Steel Forgings</i>; or</p> <p>AS2574:2000 <i>Non-destructive Testing - Ultrasonic Testing of Ferritic Castings</i>; or</p> <p>BS EN 10228-4:1999 <i>Non-destructive Testing of Steel Forgings - Ultrasonic Testing of Austenitic-ferritic Stainless Steel Forgings</i></p> <p>BS EN 1714:1998 <i>Non -destructive Examination of Welded Joints - Ultrasonic Examination of Welded Joints</i>.</p>
Radiographic testing	<p>AS 3507-1:2003 <i>Non-destructive Testing - Guide to Radiography for Ferrous Casting and</i></p> <p>AS 3507-2:2003 <i>Non-destructive Testing - Radiography Determination of Quality Ferrous Castings</i>; or</p> <p>BS EN 444:1994 <i>Non-destructive Testing - General Principles for Radiographic Examination of Metallic Materials by X-ray and Gamma Rays</i>; or</p> <p>BS EN 1435:1997 <i>Non -destructive Examination of Fusion Welds -Radiographic Examination of Welded Joints</i>.</p>
Visual inspection	<p>AS 3978:2003 <i>Non-destructive Testing - Visual Inspection of Metal Products and Components</i>; or</p> <p>BS EN 970:1997 <i>Non -destructive Examination of Fusion Welds - Visual Examination</i>.</p>

41.8 Inspecting organisation

- (1) An inspecting organisation undertaking the examination and testing of anchors, chain cables and accessories manufactured in New Zealand must –
 - (a) undertake the examination and witnessing of any testing for the issue of a certificate of test for any anchor, chain cable or accessory in accordance with the requirements of this Part; and
 - (b) issue a certificate of test on satisfactory examination and test of any anchor, chain cable or accessory in accordance with the requirements of this Part; and
 - (c) ensure that the anchor, chain cable or accessory is marked with the identification requirements of rule 41.13(1) or 41.17(1) as applicable, on issue of a certificate of test.

- (2) Before issuing a certificate of test, the inspecting organisation must –
 - (a) approve the design, drawings, calculations and specifications of a new anchor, chain cable or accessory to verify that they comply with the requirements of this Part and any rules of that inspecting organisation; and
 - (b) satisfy itself, by inspecting such facilities as are necessary, that the manufacturer's works facilities are sufficient for proper production of the anchor, chain cable or accessory; and
 - (c) satisfy itself that the testing establishment and its facilities comply with the requirements of this Part; and
 - (d) supervise where necessary, and witness, the proof and breaking load tests of the anchor, chain cable and accessory, and any other mechanical tests that may be required by this Part.

- (3) The inspecting organisation must, within one month after marking the anchor, chain cable or accessory in accordance with rule 41.8(1)(c), deliver a certificate of test showing the details required by rules 41.13(2) or 41.17(2) as applicable to the person on whose application the tests were conducted.

- (4) An inspecting organisation undertaking the examination and testing of anchors, chain cables and accessories manufactured in New Zealand must retain –
 - (a) any records relating to refused applications for a period of 5 years from the date of refusal; and
 - (b) any records relating to approved applications for a period of 25 years

from the date of approval.

- (5) The records maintained by an inspecting organisation under rule 41.8(4) must include –
- (a) copies of applications for a certificate of test, all drawings, any calculations and specifications supplied in connection with each application, and evidence of design approval by the inspecting organisation; and
 - (b) details of all examinations and testing, and copies of each certificate of test issued.
- (6) Copies of any documents issued notifying design approval, and copies of any certificate of test issued, must be made available by the inspecting organisation, on request, to –
- (a) any owner of the anchor or chain cable other than the person to whom the documents or certificate were initially issued; and
 - (b) the person to whom the documents or certificate were initially issued, if the documents or certificate are lost; and
 - (c) the Director.

41.9 Surveyors

A surveyor must not permit any anchor, chain cable or accessory that is manufactured in New Zealand to be fitted to a ship unless the anchor has been examined and tested by an inspecting organisation and the surveyor has –

- (a) sighted the original or a certified copy of the certificate of test; and
- (b) verified that markings on the anchor are consistent with the certificate of test.

Anchors

41.10 Manufacture

The manufacturer of an anchor must ensure that –

- (a) the design of the anchor is approved by an inspecting organisation; and
- (b) the anchor is manufactured and tested in accordance with the requirements of this Part and the rules of the inspecting organisation;

and

- (c) the mass of the anchor is measured by weighing or other means acceptable to the inspecting organisation prior to the issue of a certificate of test for the anchor by an inspecting organisation; and
- (d) the surface finish of the anchor parts are of sufficient smoothness to allow good visual examination and the use of non-destructive testing; and
- (e) where an inspecting organisation requires the shank of an anchor to undergo ultrasonic non-destructive testing the profile of the shank design allows for test results that may be easily interpreted.

41.11 Inspection before testing

- (1) Before testing any anchor, the inspecting organisation must be satisfied with the quality of the materials from which the anchor is manufactured and the method of its manufacture.
- (2) The inspecting organisation must visually examine the anchor before application of the proof load test to ensure that it is free from defects that might impair the testing, or its proper workability, use and strength. Subject to the agreement of the inspecting organisation, surface defects may be removed by grinding.

41.12 Testing

- (1) All anchors must be tested at a testing establishment complying with rule 41.7(1), in the presence of the inspecting organisation.
- (2) The anchor, including its shackle, shackle pins, and welded or bolted connections, if any, must be tested by subjecting it to the proof load specified by the rules of the inspecting organisation. That test must be undertaken on a proof load testing machine complying with rule 41.7(3).
- (3) After proof load testing, the anchor, including its shackle, shackle pins, and welded or bolted connections, if any, must be visually re-examined and, where considered appropriate by the inspecting organisation, subjected to non destructive testing to the relevant standards referred to in rule 41.7(5).
- (4) The anchor, including its shackle, shackle pins, and welded or bolted connections, if any, is satisfactory if, after application of the test and its examination, the inspecting organisation considers that it is without material deformation, significant defect or other weakness.

- (5) If required by the rules of the inspecting organisation, a high holding power anchor must be subjected to sea bed tests to demonstrate the anchor's effective hold.

41.13 Identification and certification after testing

- (1) Following a satisfactory examination and test, the following details must be stamped on one side of the anchor which is to be reserved solely for this purpose –
 - (a) the details of the inspecting organisation and its local office that is issuing the certificate of test; and
 - (b) the number of the certificate of test issued for the anchor; and
 - (c) the month and year of test; and
 - (d) the mass in kilograms; and
 - (e) the letters HHP, if approved as a high holding power anchor; and
 - (f) in the case of stocked anchors, the mass of stock in kilograms.
- (2) The anchor's certificate of test must include the following particulars for the anchor –
 - (a) the purchaser's name and order number; and
 - (b) the type of anchor; and
 - (c) the mass in kilograms; and
 - (d) the mass of stock in kilograms (in the case of stocked anchors); and
 - (e) the proof load applied in tonnes; and
 - (f) the identification mark that will enable the full history of the anchor to be traced; and
 - (g) the material from which the anchor is manufactured and the chemical composition of that material; and
 - (h) the dimensions of the anchor.
- (3) Where appropriate, the certificate of test must also include a list of all the accessories, together with their grade of steel, the name of the steel maker, any heat treatment used during manufacture, and the purchase order number.

Chain cable and accessories

41.14 Manufacture

- (1) The manufacturer of any grade of chain cable and any accessories must ensure that the chain cable and accessories are manufactured in accordance with procedures approved by the inspecting organisation at works approved by the inspecting organisation.
- (2) The manufacturer of any grade of chain cable and any accessories must ensure that the chain cable and accessories are cleaned and any paint, anti-corrosive coating or heavy oxidation scale resulting from heat treatment used during manufacture is removed before any inspections and test are carried out.
- (3) The manufacturer of any grade of chain cable and any accessories must ensure that the chain cable and accessories undergo dimensional inspection to ensure that the links meet the tolerances specified by the rules of the inspecting organisation before or after testing the chain cable and accessories.

41.15 Inspection before testing

- (1) Before testing any chain cable or accessories, the inspecting organisation must –
 - (a) be satisfied with –
 - (i) the quality of the materials from which the chain cable or accessories are manufactured; and
 - (ii) the method of their manufacture; and
 - (b) ascertain the grade of the chain cable in accordance with the requirements of the rules of that inspecting organisation.
- (2) Before testing any chain cable or accessories, the inspecting organisation must visually examine the chain cable or accessories before application of any testing to ensure that they are free from internal and surface defects that might impair the testing, or their proper workability, use and strength.
- (3) With the agreement of the inspecting organisation, grinding may be carried out to –
 - (a) remove surface defects, provided tolerances specified by the inspecting organisation are not exceeded; or

- (b) improve the link profile.

41.16 Testing

- (1) All chain cables or accessories must be tested at a testing establishment complying with rule 41.7(1), in the presence of the inspecting organisation.
- (2) The chain cable or accessories must be tested by subjecting them to a breaking load test as follows –
 - (a) the chain cable or accessories must be subjected to a breaking load test in a breaking load test machine complying with rule 41.7(3) and in accordance with the requirements of the rules of the inspecting organisation; and
 - (b) if, after application of the minimum breaking test load specified by the rules of the inspecting organisation, the sample is unbroken and in the opinion of the inspecting organisation is without material flaw or other defect, the sample has satisfactorily withstood the breaking load test; and
 - (c) if the selected sample fails to satisfactorily withstand the minimum breaking test load specified by the inspecting organisation, procedures adopted for additional tests or other requirements, if any, must be in accordance with the requirements of the rules of the inspecting organisation; and
 - (d) where the required breaking test load specified by the inspecting organisation is greater than the capacity of any available test machine, an alternative testing procedure may be accepted by the inspecting organisation.
- (3) Following a satisfactory breaking load test carried out in accordance with rule 41.16(2), the chain cables and accessories must then be tested by subjecting them to a proof load test as follows –
 - (a) samples of the chain cable and the accessories must be tested by subjecting them to the proof load specified by the rules of the inspecting organisation. That test must be undertaken on a proof load test machine complying with rule 41.7(3); and
 - (b) after proof load testing, the samples of chain cable and accessories must be visually re-examined and, where considered appropriate by the inspecting organisation, subjected to non-destructive testing to the relevant standards referred to in rule 41.7(5); and
- (4) The chain cable or accessory is satisfactory if, after the application of the test and examination under (3), it is, in the opinion of the inspecting organisation,

without material deformation, significant defects or other weakness.

- (5) Mechanical testing to determine the ultimate tensile strength, related elongation, hardness and impact value of the material from which the chain cable or accessories are manufactured must be undertaken in accordance with the requirements of the rules of the inspecting organisation.

41.17 Identification and certification after testing

- (1) Following a satisfactory test and examination, each length of chain cable and each accessory must be stamped with the following identification marks –
 - (a) the details of the inspecting organisation and its local office that is issuing the certificate of test; and
 - (b) the number of the certificate of test issued for the chain cable or accessory; and
 - (c) the proof load of the chain cable and accessory; and
 - (d) the grade of chain cable.
- (2) The chain cable or accessory certificate of test must include the following particulars in respect of the cable or accessory –
 - (a) the purchaser's name and order number; and
 - (b) a description and the dimensions of the chain cable or accessory; and
 - (c) the grade of chain cable; and
 - (d) an identification mark that will enable the full history of the chain cable or accessory to be traced; and
 - (e) the chemical composition of the steel from which the chain cable or accessory is manufactured; and
 - (f) the details of any heat treatment used in manufacturing the chain cable or accessory; and
 - (g) the mechanical test results; and
 - (h) the breaking test load; and
 - (i) the proof load.
- (3) Where accessories are to be used with any chain cable, the certificate of test for the chain cable must include a list of all accessories together with their grade of steel, the name of the steel maker, the heat treatment used during manufacture and the purchase order number.