
RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

RULES

Part L **Equipment**

2015 AMENDMENT NO.1

Rule No.30 8th May 2015

Resolved by Technical Committee on 2nd February 2015

Approved by Board of Directors on 23rd February 2015

AMENDMENT TO THE RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

“Rules for the survey and construction of steel ships” has been partly amended as follows:

Part L EQUIPMENT

Chapter 2 ANCHORS

2.1 Anchors

Paragraph 2.1.11 has been amended as follows.

2.1.11 Visual Inspections and Non-destructive Tests

1 After the proof load test, ~~visual surface~~ inspection for anchors is to be carried out.

2 After the proof load test, components for cast anchors are to be examined by the dye penetrant testing or the magnetic particle testing, in way of areas where feeder heads and risers have been removed and where weld repairs have been carried out, in addition to ~~the visual surface~~ inspection specified above -**1**.

(-3 and -4 are omitted.)

5 If defects are detected by visual inspection and non-destructive test, repairs are to be carried out in accordance with **2.1.6-2** and -**3**.

Paragraph 2.1.14 has been amended as follows.

2.1.14 Test Certificate

((1) to (8) are omitted.)

(9) Visual Inspection and Non-destructive Test result

(10) Drop and Hammering Tests result, where applicable

Section 2.2 has been added as follows.

2.2 Anchors used for positioning systems

2.2.1 Application

1 Anchors used for the positioning systems of the mobile offshore drilling units, special purpose barges and floating offshore facilities, etc., or vessels engaged in specific work for a specified period at a specific location are to be in compliance with the requirements in this section or their equivalent. Mobile offshore drilling units, special purpose barges and floating offshore facilities, etc., (hereinafter referred to as “floating offshore facilities” in this section) refer to steel-made ships and floating structures generally positioned for a specified period at a specific sea area.

2 The kinds of anchors specified in this chapter are to be stockless anchors fabricated by welding rolled steel or stocked anchors and stockless anchors whose main components are cast steel.

2.2.2 Definitions

The wording “long periods of time” specified in this section refers to periods longer than 5 years.

2.2.3 Materials

1 Materials for anchors including anchor rings and head pins, etc., are to be approved according to requirements specified in **Part K**, except where deemed appropriate by the Society.

2 Cast steels for anchors are to be subjected to impact tests. The test assembly is to be integrally cast with the casting and one three-piece set of the V-notch impact test specimens specified in **Chapter 2, Part K** is to be taken. The minimum mean absorbed energy is not to be less than 27J at 0°C. The impact test is considered to be failed when either the absorbed energy of two or more test specimens among a set of test specimens is less than 27J, or the absorbed energy of a single test specimen is less than 19J.

3 Cast steels are not to be used for the head pins connecting anchor heads and shanks.

2.2.4 Processes of Manufacture and Constructions

1 Manufacturers are to obtain approval of manufacturing process from the Society in advance. Society approval, however, is not required for the manufacturing processes of anchors intended for use on vessels or floating offshore facilities fixed or positioned at specific sea areas for long periods of time.

2 For anchors intended for use on vessels or floating offshore facilities fixed or positioned at specific sea areas for long periods of time, detailed data relating to performance, etc. are to be submitted for Society approval in accordance with **Chapter 1A, Part 2 “Guidance for the Approval and Type Approval of Material and Equipment for Marine Use”**.

3 Anchors are to be appropriately fabricated in accordance with Society approved design drawings, etc.

4 Anchor structures and shapes are to be such that the anchor cannot be slid, uplifted, overturned, etc. by any anticipated mooring line tension, etc.

5 The welding for rolled steel fabricated anchors is to be in accordance with the requirements in **Part M**, except where deemed appropriate by the Society.

6 Anchor rings are to be equivalent in strength to that required for the accessories of offshore chains specified in **Chapter 3, Part L**.

7 When anchor pins, etc. are to be welded, manufacturers are to obtain Society approval in advance for the welding methods to be used.

2.2.5 Dimensions and Mass

Anchor dimensions and mass are to be measured by the manufacturer and relevant measurement data is to be made available to surveyors upon request.

2.2.6 Heat Treatment

1 Cast or forged components for anchors are to be properly heat treated in accordance with relevant requirements in **Part K**.

2 The welding for rolled steel fabricated anchors may require stress relief after welding as necessary. Manufacturers are to obtain Society approval in advance for any stress relief methods which may be used. Stress relief temperatures are not to exceed the tempering temperature of the base material.

2.2.7 Product Quality and Defect Repair

1 Anchors are to be free from cracks, notches, inclusions and other defects which may impair performance.

2 Any repairs needed for forged and cast anchors are carried out in accordance with the requirements in **Part K, 5.1.11** and **6.1.11**.

3 Any repairs needed to the welding of rolled steel fabricated anchors are to be carried out in accordance with the requirements in **Part M, 1.4.2**.

2.2.8 Drop and Hammering Tests

Main cast components of anchors are to be subjected to and pass the following tests before carrying out proof tests:

1 Drop tests

(1) Each cast steel component of an anchor is to be lifted to a height of 4 metres and then dropped onto a steel slab located on a hard surface. The component is to be found free of any cracks or other defects.

(2) Where shanks and arms for stock anchors are integrally cast as a single piece, said piece is first to be lifted to the specified height with the shank and arms in a horizontal position and then dropped onto a steel slab. The piece is then to be lifted to the specified height once again, but this time with the crown facing downwards. It is then to be dropped onto two steel blocks arranged on the slab in a way that places the force of the impact at the middle of each arm without allowing the crown to touch the slab.

(3) When the steel slab is broken by the impact of the component being tested, it is to be replaced and the component is to be retested using the new slab.

2 Hammering tests

After passing the drop tests specified in -1 above, the component to be hung clear of the ground and struck with a hammer whose mass is 3 kg or more. The component is to be found free of any cracks or other defects.

3 Repairs are not allowed to be made to components whose test results are unsatisfactory.

4 Drop and hammering tests need not be carried out when components pass additional non-destructive tests and impact tests deemed appropriate by the Society.

2.2.9 Proof Tests

1 Anchors intended for use on vessels or floating offshore facilities fixed or positioned at specific sea areas for up to 5 years are to be subjected to proof tests.

2 Proof test loads are to be applied at flukes of the anchor, either for each arm separately or for both arms simultaneously depending upon the construction of the anchor, and the anchor is to be found free from cracks, deformation or other defects.

3 Proof test loads are to be taken the greater of 50% of the minimum breaking strength of the mooring line or values obtained from dividing maximum holding capacity of the anchor by a safety factor separately specified by the Society.

4 Notwithstanding the requirement given in -1 above, proof tests need not be carried out when deemed appropriate by the Society.

2.2.10 Visual Inspections and Non-destructive Tests

1 Anchors are to be subjected to and pass visual inspections and the non-destructive tests specified in (1) to (4) below. Such inspections and tests are, however, to be carried out after proof tests are completed.

(1) Cast components of anchors are to be examined using dye penetrant testing or magnetic particle testing in way of feeder heads and risers and where weld repairs have been carried out.

(2) Cast components of anchors are to be examined using ultrasonic testing in way of feeder heads

and risers and then dye penetrant testing or the magnetic particle testing of all surfaces is to be carried out in addition to inspections specified in (1) above.

(3) Welded sections of rolled steel fabricated anchors are to be examined using dye penetrant testing or magnetic particle testing.

(4) For anchors complying with the requirements in Chapter 1A, Part 2 of the “Guidance for the Approval and Type Approval of Material and Equipment for Marine Use” or 2.2.9-4 above, ultrasonic testing is to be carried out for all full penetration welding in addition to the tests specified in (3) above.

2 Repairs are to be carried out in accordance with 2.2.7-2 and -3 for any defects detected through visual inspections and non-destructive tests.

2.2.11 Holding Power Tests

1 Anchors are to be subjected to and pass holding power tests designated by the Society.

2 Notwithstanding the requirement given in -1 above, holding power tests designated by the Society need not be carried out or need only be partially carried out when previous test results or documents verifying the results of equivalent tests carried out in accordance with standards deemed appropriate by the Society are submitted to the Society and deemed appropriate.

2.2.12 Marking

When anchors have passed the tests and inspections, they are to be stamped with the mass of anchor (excluding the mass of stock for stocked anchors) at the middle position of the shank and the Society’s brand, the test number and the manufacturer’s name (or symbol) at a position two-thirds of the length of arm from the tip of the fluke on the same side. When the anchor is formed with a separate shank and arms, the Society’s brand, the test number and manufacturer’s mark are also to be stamped on the shank in the neighbourhood of the head pin. For stocked anchors, the mass of stock, the Society’s brand, the test number, and the manufacturer’s name (or symbol) are to be stamped on the stock.

2.2.13 Painting

Anchors are not to be painted until all tests and inspections are finished.

2.2.14 Test Certificates

The Society issues certificates containing the following information for anchors which have passed specified tests and inspections.

(1) Manufacturer’s name

(2) Type

(3) Mass

(4) Grade of material

(5) Kind of heat treatment, where applicable

(6) Drop and hammering tests results, where applicable

(7) Proof test loads, where applicable

(8) Visual inspection and non-destructive test results

(9) Holding power test results

(10) Identification numbers for flukes and shanks

(11) Markings applied to the anchor

EFFECTIVE DATE AND APPLICATION

1. The effective date of the amendments is 8 May 2015.
2. Notwithstanding the amendments to the Rules, the current requirements may apply to anchors other than those for which the application for approval is submitted to the Society on or after the effective date.

GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

Part L **Equipment**

GUIDANCE

2015 AMENDMENT NO.1

Notice No.33 8th May 2015

Resolved by Technical Committee on 2nd February 2015

AMENDMENT TO THE GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

“Guidance for the survey and construction of steel ships” has been partly amended as follows:

Part L EQUIPMENT

L2 ANCHORS

L2.1 Anchors

Title of Paragraph L2.1.11 has been amended as follows.

L2.1.11 Visual Inspections and Non-destructive Tests

Section L2.2 has been added as follows.

L2.2 Anchors used for Position mooring systems

L2.2.8 Drop and Hammering Tests

1 The “additional non-destructive tests” specified in **2.2.8-4, Part L of the Rules** means the following:

(1) Ultrasonic testing in random areas of the casting selected by the attending surveyor. For example, the roots of arms, shanks, head pins, etc.

(2) The non-destructive tests specified in **2.2.10-1(2), Part L of the Rules.**

2 The “impact tests deemed appropriate by the Society” specified in **2.2.8-4, Part L of the Rules** means test conducted in accordance, mutatis mutandis, with the requirements of **2.2.3-2, Part L of the Rules.**

L2.2.9 Proof Tests

1 The “safety factor separately specified by the Society” means the safety factors for horizontal holding capacities of seabed mooring points specified in **Chapter 4, Part PS of the Rules.**

2 When the breaking strength of the mooring line is not known, the proof test load is to be the value obtained from dividing maximum holding capacity of the anchor by the safety factor specified for the seabed mooring points.

3 “When deemed appropriate by the Society” specified in **2.2.9-4, Part L of the Rules** means when documentation related to assessments of structural calculations of anchors carried out using suitable methods such as FEM, etc. is submitted, and it is verified the anchors have adequate strength.

4 The standard procedures for the FEM analysis specified in -3 above are as follows:

(1) The load used for analysis is to be the proof test load specified in **2.2.9-3, Part L of the Rule.**

(2) The allowable value used for von Mises stress is to be 90 % of the specified yield strength of the materials used for the anchor.

L2.2.10 Visual Inspections and Non-destructive Tests

The testing procedures and acceptable criteria for visual inspections and non-destructive tests are to be in accordance, mutatis mutandis, with the requirements specified in L2.1.11.

L2.2.11 Holding Power Tests

1 “Holding power tests designated by the Society” refers to the tests specified in 1.6.1(3), Part 2 of the “Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use”. For anchors intended to be used for vessels and floating offshore facilities fixed or positioned at specific sea areas for long periods of time, it means the tests specified in 1A2.2(3)(b), Part 2 of the “Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use”.

2 “Standards deemed appropriate by the Society” means standards such as API RP 2SK (American Petroleum Institute (API), Recommend Practice for Design and Analysis of Stationkeeping Systems for Floating Structures)

EFFECTIVE DATE AND APPLICATION

1. The effective date of the amendments is 8 May 2015.
2. Notwithstanding the amendments to the Guidance, the current requirements may apply to anchors other than those for which the application for approval is submitted to the Society on or after the effective date.