RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

RULES

Part K Materials

2012 AMENDMENT NO.2

Rule No.53 15th November 2012

Resolved by Technical Committee on 27th July 2012

Approved by Board of Directors on 25th September 2012

Rule No.53 15th November 2012
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 K MATERIAL

Amendment 2-1

Chapter 1 GENERAL

1.5 Marking and Test Certificate

1.5.2 Test Certificate

Sub-paragraph -2 has been amended as follows.

2 The test certificate specified in **-1** are to contain, in addition to the dimensions, mass, etc., of the steel material, at least items **(1)** through **(9)** of the following particulars:

(1) Purchaser's order number and if known the ship number which the material is intended;
(2) Identification number or symbol;
(3) Identification of manufacturer;
(4) Identification of grade of material (including the brand name in the case of the corrosion resistant steel for cargo oil tanks specified in **3.13**);
(5) Chemical Composition (ladle analysis on elements specified in the requirement and added when necessary) (including additive elements for improving corrosion resistance in the case of the corrosion resistant steel for cargo oil tanks specified in **3.13**);
(6) Carbon equivalent (C_{eq}) or cold cracking susceptibility (P_{cm}) calculated from the following formula using ladle analysis (only in such a case as specified in this Part.);

$$C_{eq} = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Ni + Cu}{15} \quad (\%)$$

$$P_{cm} = C + \frac{Si}{30} + \frac{Mn}{20} + \frac{Cu}{20} + \frac{Ni}{60} + \frac{Cr}{20} + \frac{Mo}{15} + \frac{V}{10} + 5B \quad (\%)$$

(7) Mechanical test results (including any standards, in cases where standards differing from those specified in this Part are used);
(8) Condition of heat treatment (e.g. normalized or controlled roll except for as rolled); and
(9) Deoxidation practice is to be stated (rimed steel only).

Chapter 3 ROLLED STEELS

Section 3.13 has been added as follows.

3.13 Additional Requirements for Corrosion Resistant Steel for Cargo Oil Tanks

3.13.1 Application

1 The requirements are to apply to the corrosion resistant steel used in the cargo oil tanks of crude oil tankers required by **25.2.3(2), Part C** or **22.4.3(2), Part CS**.

2 The requirements are to apply to corrosion resistant steel not exceeding 50*mm* in thickness.

3 The requirements other than those specified in **3.13** are to apply to **3.1** and **3.11**.

3.13.2 Kinds

The steels are classified into kinds and grades as given in **Table K3.40**.

Table K3.40 Kinds of Corrosion Resistant Steel for Cargo Oil Tanks

Kind	Grade
For upper decks	The grade is to be indicated by adding the suffix "*RCU*" to the grade specified in **Table K3.1** (*ex. KA*36-*RCU*)
For inner bottom plating	The grade is to be indicated by adding the suffix "*RCB*" to the grade specified in **Table K3.1** (*ex. KA*36-*RCB*)
For both upper decks and inner bottom plating	The grade is to be indicated by adding the suffix "*RCW*" to the grade specified in **Table K3.1** (*ex. KA*36-*RCW*)

3.13.3 Chemical Composition

1 The chemical composition of corrosion resistant steel for cargo oil tanks is to be within the range specified for rolled steels for hull. In addition, elements to be added for improving the corrosion resistance are to not exceed 1% in total.

2 The chemical composition range of elements to be added for improving corrosion resistance is to be approved by the Society during approval of manufacturing process.

EFFECTIVE DATE AND APPLICATION (Amendment 2-1)

1. The effective date of the amendments is 15 November 2012.

Amendment 2-2

Chapter 8 ALUMINIUM ALLOYS

8.1 Aluminium Alloy Plates and Extruded Shapes

Table K8.3 has been amended as follows.

Table K8.3(a) Temper Conditions and Mechanical Properties[1] (Rolled Products)

Material Grade	Temper condition[2]	Thickness t (mm)	Tensile test		
			Proof strength (N/mm^2)	Tensile strength (N/mm^2)	Elongation(%)[3] ($L=5.65\sqrt{A}$)
5083*P*	*O*	$t \le 50$	125min.	275～350	14min.
		$50<t \le 80$	120～195	275～345	14min.
		$80<t \le 100$	110min.	265min.	
		$100<t \le 120$		260min.	12min.
		$120<t \le 160$	105min.	255min.	
		$160<t \le 200$	100min.	250min.	10min.
	*H*111	$t \le 50$	125min	275～350	14 min.
	*H*112			275min.	10min.
	*H*116		215min.	305min.	
	*H*321	$t \le 50$	215～295	305～385	10min.
		$50<t \le 80$	200～295	285～380	9min.
5383*P*	*O*	$t \le 50$	145min.	290min.	17min.
	*H*111				
	*H*116		220min.	305min.	10min.
	*H*321				
5059*P*	*O*	$t \le 50$	160min.	330min.	24min.
	*H*111				
	*H*116	$t \le 20$	270min.	370min.	10min.
		$20<t \le 50$	260min.	360min.	
	*H*321	$t \le 20$	270min.	370min.	
		$20<t \le 50$	260min.	360min.	
5086*P*	*O*	$t \le 50$	95min.	240～305	14min.
	*H*111				
	*H*112	$t \le 12.5$	125min.	250min.	—
		$12.5<t \le 50$	105min.	240min.	9min.
	*H*116	$t \le 50$	195min.	275min.	
5754*P*	*O*	$t \le 50$	80min.	190～240	17min.
	*H*111				
5456*P*	*O*	$t \le 6.3$	130～205	290～365	—
	*H*116	$t \le 30$	230min.	315min.	10min.
		$30<t \le 40$	215min.	305min.	
		$40<t \le 50$	200min.	285min.	
	*H*321	$t \le 12.5$	230～315	315～405	—
		$12.5<t \le 40$	215～305	305～385	10min.
		$40<t \le 50$	200～295	285～370	
6061*P*	*T*6	$t \le 6.5$	245min.	295min.	—

Table K8.3(b) Temper Conditions and Mechanical Properties[1] (Extruded Shapes)

Material grade	Temper condition[2]	Thickness t (*mm*)	Tensile test		
			Proof strength (N/mm^2)	Tensile strength (N/mm^2)	Elongation(%)[3] ($L=5.65\sqrt{A}$)
5083*S*	*O*	$t \le 50$	110min.	270～350	12min.
		$50<t \le 130$	110min.	275～355	10min.
	*H*111	$t \le 50$	165min.	275min.	
	*H*112		110min.	270min.	
5383*S*	*O*	$t \le 50$	145min.	290min.	17min.
	*H*111				
	*H*112		190min.	310min.	13min.
5059*S*	*H*112	$t \le 50$	200min.	330min.	10min.
5086*S*	*O*	$t \le 50$	95min.	240～315	12min.
	*H*111		145min.	250min.	10min.
	*H*112		95min.	240min.	
6005*AS*	*T*5	$t \le 50$	215min.	260min.	8min.
	*T*6	$3<t \le 10$			—
		$10<t \le 50$	200min.	250min.	6min.
6061*S*	*T*6	$t \le 50$	240min.	260min.	8min.
6082*S*	*T*5	$t \le 50$	230min.	270min.	6min.
	*T*6	$3<t \le 5$	250min.	290min.	—
		$5<t \le 50$	260min.	310min.	8min.

Notes:

(1) Aluminium alloy may be subject to any other standards in lieu of the requirements given in this Table where they are approved by the Society.

(2) Indication symbols used in temper condition are as follows. Furthermore, although the mechanical properties of *O* and *H*111 of rolled products are the same, a separate notation is used to indicate that their qualities are different.

O : Annealing
*H*111 : Work hardened
*H*112 : As manufacturing process
*H*116 : Stabilizing treatment after work hardened
*H*321 : Stabilizing treatment after work hardened
*T*5 : Artificial age hardening treatment after elevated temperature working and succeeding cooling
*T*6 : Artificial age hardening treatment after solution treatment

(3) The standards for elongation given in this Table applies to the tensile test using the proportional specimen for aluminium alloys whose thickness is more than 12.5 *mm*. Where test specimens other than the proportional specimens are applied to the tensile test or thickness of aluminium alloys is not more than 12.5 *mm*, the standards for elongation is subject to the discretion of the Society.

8.1.8 Corrosion Resistance Test

Sub-paragraph -1 has been amended as follows.

1 For aluminium alloys specified in **Table K8.3(a)** in the *H*111, *H*112, *H*116 and *H*321 tempers intended for use in marine hull construction or in marine applications where frequent direct contact with seawater is expected, corrosion resistance test is to be carried out.

EFFECTIVE DATE AND APPLICATION (Amendment 2-2)

1. The effective date of the amendments is 1 January 2013.

2. Notwithstanding the amendments to the Rules, the current requirements may apply to materials for which the application for survey is submitted to the Society before the effective date, or materials used for ships for which the date of contract for construction* is before the effective date.

*"contract for construction" is defined in the latest version of IACS Procedural Requirement (PR) No.29.

3. Notwithstanding the amendments to the Rules, the current requirements may apply to manufacturing process for which the application for approval is submitted to the Society before the effective date.

IACS PR No.29 (Rev.0, July 2009)

1. The date of "contract for construction" of a vessel is the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. This date and the construction numbers (i.e. hull numbers) of all the vessels included in the contract are to be declared to the classification society by the party applying for the assignment of class to a newbuilding.

2. The date of "contract for construction" of a series of vessels, including specified optional vessels for which the option is ultimately exercised, is the date on which the contract to build the series is signed between the prospective owner and the shipbuilder.

For the purpose of this Procedural Requirement, vessels built under a single contract for construction are considered a "series of vessels" if they are built to the same approved plans for classification purposes. However, vessels within a series may have design alterations from the original design provided:

(1) such alterations do not affect matters related to classification, or

(2) If the alterations are subject to classification requirements, these alterations are to comply with the classification requirements in effect on the date on which the alterations are contracted between the prospective owner and the shipbuilder or, in the absence of the alteration contract, comply with the classification requirements in effect on the date on which the alterations are submitted to the Society for approval.

The optional vessels will be considered part of the same series of vessels if the option is exercised not later than 1 year after the contract to build the series was signed.

3. If a contract for construction is later amended to include additional vessels or additional options, the date of "contract for construction" for such vessels is the date on which the amendment to the contract, is signed between the prospective owner and the shipbuilder. The amendment to the contract is to be considered as a "new contract" to which **1.** and **2.** above apply.

4. If a contract for construction is amended to change the ship type, the date of "contract for construction" of this modified vessel, or vessels, is the date on which revised contract or new contract is signed between the Owner, or Owners, and the shipbuilder.

Note:
This Procedural Requirement applies from 1 July 2009.

GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

GUIDANCE

Part K Materials

2012 AMENDMENT NO.2

Notice No.82 15th November 2012

Resolved by Technical Committee on 27th July 2012

Notice No.82 15th November 2012
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 K MATERIALS

Amendment 2-1

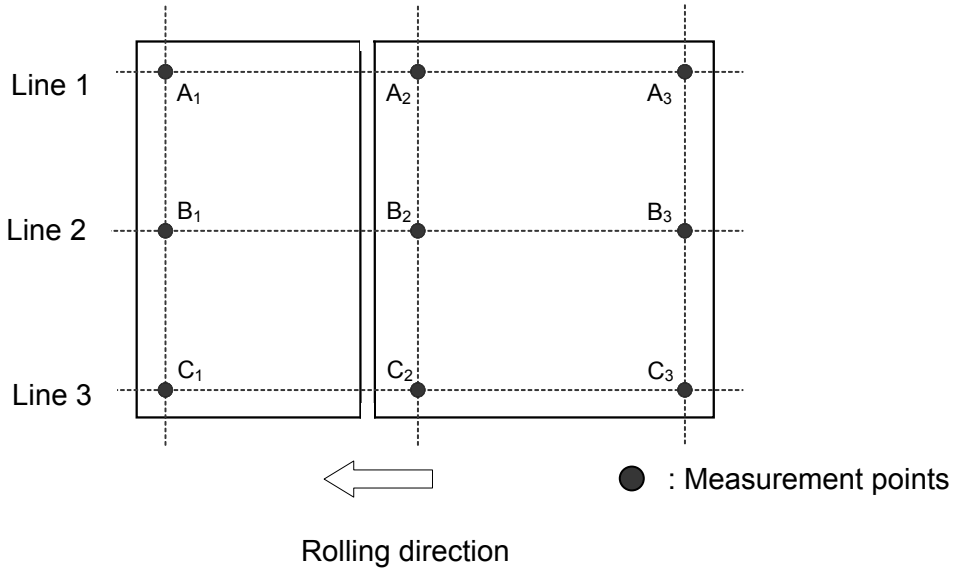
K3 ROLLED STEELS

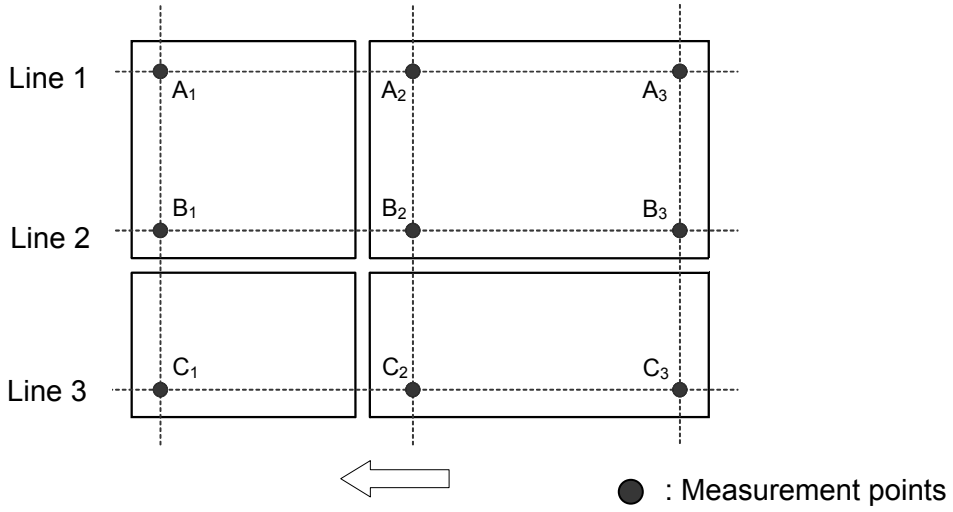
K3.1 Rolled Steels for Hull

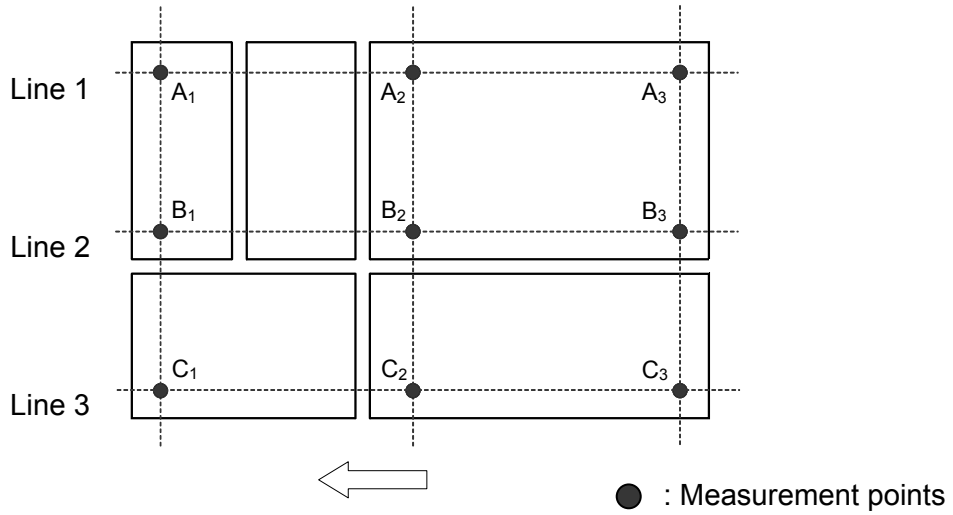
K3.1.8 Surface Inspection and Verification of Dimensions

Fig. K3.1.8-2 has been amended as follows.

Fig. K3.1.8-2 Locations of Thickness Measuring Points for the Cut Steel Products







EFFECTIVE DATE AND APPLICATION (Amendment 2-1)

1. The effective date of the amendments is 15 November 2012.

Amendment 2-2

K8 ALUMINIUM ALLOYS

K8.1 Aluminium Alloy Plates and Extruded Shapes

Paragraph K8.1.8 has been amended as follows.

K8.1.8 Corrosion Resistance Test

Testing method and judging criteria of corrosion resistance test are to comply with the following requirements.

(1) Metallographic examination
Metallographic examination is to be performed in accordance with *ASTM B* 928 9.6.1 or other standard which is left to the discretion of the Society.

(2) Corrosion test
Corrosion test is to be performed with respect to both exfoliation and intergranular corrosion resistance ~~in accordance with *ASTM* G 66 and *ASTM* G 67 or other standard which is left to the discretion of the Society. When subjected to the test described in *ASTM* G 66, the samples are to have exhibited no evidence of exfoliation corrosion and a pitting rating of *N*, *PA* or *PB*. When subjected to the test described in *ASTM* G 67, the samples are to have exhibited resistance to intergranular corrosion at a mass loss no greater than 15 *mg/cm*^{2}.~~
, and the test requirements are in accordance with the following **(a)** or **(b)**:

(a) *ASTM G* 66 and *ASTM G* 67 carried out under the conditions specified in *ASTM B* 928
The evaluation criteria are as follows:
i) When subjected to the test described in *ASTM G* 66, the samples are to have exhibited no evidence of exfoliation corrosion and a pitting rating of *N*, *PA* or *PB*.
ii) When subjected to the test described in *ASTM G* 67, the samples are to have exhibited resistance to intergranular corrosion at a mass loss no greater than 15 *mg/cm*^{2}.

(b) Standards deemed appropriate by the Society

EFFECTIVE DATE AND APPLICATION (Amendment 2-2)

1. The effective date of the amendments is 1 January 2013.

2. Notwithstanding the amendments to the Guidance, the current requirements may apply to materials for which the application for survey is submitted to the Society before the effective date, or materials used for ships for which the date of contract for construction* is before the effective date.

*"contract for construction" is defined in the latest version of IACS Procedural Requirement (PR) No.29.

3. Notwithstanding the amendments to the Guidance, the current requirements may apply to manufacturing process for which the application for approval is submitted to the Society before the effective date.

IACS PR No.29 (Rev.0, July 2009)

1. The date of "contract for construction" of a vessel is the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. This date and the construction numbers (i.e. hull numbers) of all the vessels included in the contract are to be declared to the classification society by the party applying for the assignment of class to a newbuilding.

2. The date of "contract for construction" of a series of vessels, including specified optional vessels for which the option is ultimately exercised, is the date on which the contract to build the series is signed between the prospective owner and the shipbuilder.

For the purpose of this Procedural Requirement, vessels built under a single contract for construction are considered a "series of vessels" if they are built to the same approved plans for classification purposes. However, vessels within a series may have design alterations from the original design provided:

(1) such alterations do not affect matters related to classification, or

(2) If the alterations are subject to classification requirements, these alterations are to comply with the classification requirements in effect on the date on which the alterations are contracted between the prospective owner and the shipbuilder or, in the absence of the alteration contract, comply with the classification requirements in effect on the date on which the alterations are submitted to the Society for approval.

The optional vessels will be considered part of the same series of vessels if the option is exercised not later than 1 year after the contract to build the series was signed.

3. If a contract for construction is later amended to include additional vessels or additional options, the date of "contract for construction" for such vessels is the date on which the amendment to the contract, is signed between the prospective owner and the shipbuilder. The amendment to the contract is to be considered as a "new contract" to which **1.** and **2.** above apply.

4. If a contract for construction is amended to change the ship type, the date of "contract for construction" of this modified vessel, or vessels, is the date on which revised contract or new contract is signed between the Owner, or Owners, and the shipbuilder.

Note:
This Procedural Requirement applies from 1 July 2009.