RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

RULES

Part K Materials

2007 AMENDMENT NO.1

Rule No.12 1st February 2007

Resolved by Technical Committee on 17th November 2006

Approved by Board of Directors on 19th December 2006

Rule No.12 1st February 2007
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 MATERIALS

Amendment 1-1

Chapter 5 CASTINGS

5.1 Steel Castings

5.1.13 Additional Requirements for Crank Throws

In Sub-paragraph -2, the wording "special manufacturing methods" has been amended to "the manufacturing processes using the surface treatments".

Chapter 6 STEEL FORGINGS

6.1 Steel Forgings

6.1.13 Additional Requirements for Crankshafts

Sub-paragraph -2 has been amended as follows.

2 For solid crankshafts manufactured adopting the special forging processes, semi-built-up crank throws and full-built-up crank webs, the preliminary tests instructed by the Society are to be carried out, in connection with the manufacturing processes and the selection of test specimens.

In Sub-paragraph -3, the wording "special manufacturing processes" has been amended to "the special forging processes".

EFFECTIVE DATE AND APPLICATION (Amendment 1-1)

1. The effective date of the amendments is 1 February 2007.

Amendment 1-2

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*112	$t \le 50$	125min	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*116		220min.	305min.	10min.
	*H*321				
5059*P*	*O*	$t \le 50$	160min.	330min.	24min.
	*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*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.
5456*P*	*O*	$t \le 6.3$	130～205	290～365	—
		$6.3 < t \le 50$	125～205	285～360	14min.
	*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.

		$40<t\leq 50$	200～295	285～370	
6061*P*	*T*6	$t\leq 6.5$	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*	$t\leq 50$	110min.	270～350	12min.
		$50<t\leq 130$	110min.	275～355	10min.
	*H*111	$t\leq 50$	165min.	275min.	
	*H*112		110min.	270min.	
5383*S*	*O*	$t\leq 50$	145min.	290min.	17min.
	*H*111				
	*H*112		190min.	310min.	13min.
5059*S*	*H*112	$t\leq 50$	200min.	330min.	10min.
5086*S*	*O*	$t\leq 50$	95min.	240～315	12min.
	*H*111		145min.	250min.	10min.
	*H*112		95min.	240min.	
6005*AS*	*T*5	$t\leq 50$	215min.	260min.	8min.
	*T*6	$3<t\leq 10$			—
		$10<t\leq 50$	200min.	250min.	6min.
6061*S*	*T*6	$t\leq 50$	240min.	260min.	8min.
6082*S*	*T*5	$t\leq 50$	230min.	270min.	6min.
	*T*6	$3<t\leq 5$	250min.	290min.	—
		$5<t\leq 50$	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:
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.

EFFECTIVE DATE AND APPLICATION (Amendment 1-2)

1. The effective date of the amendments is 1 July 2007.

2. Notwithstanding the amendments to the Rules, the current requirements may apply to materials other than those for which the application for survey is submitted to the Society on and after the effective date.

GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

GUIDANCE

Part K Materials

2007 AMENDMENT NO.1

Notice No.10 1st February 2007

Resolved by Technical Committee on 17th November 2006

Notice No.10 1st February 2007
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 1-1

K1 GENERAL

Section K1.2 has been newly added as follows.

K1.2 Manufacture and Approval of Materials

K1.2.1 Manufacture of Materials

For primary materials of steel pipes specified in **Chapter 4**, **Part K of the Rules**, primary materials manufactured by the works specified in **(1)** to **(3)** can be used, in addition to the works specified in **1.2.1-1** and **-2**, **Part K of the Rules**:

(1) For primary materials of steel tubes for boilers and heat exchangers specified in **4.1**, **Part K of the Rules**, steel pipes for pressure piping in **4.2**, **Part K of the Rules** and headers specified in **4.4**, **Part K of the Rules**, the works having the approved manufacturing process of rolled steels for hull, rolled steel plates for boilers and rolled steel plates for pressure vessels specified in **Chapter 3**, **Part K of the Rules**.

(2) For primary materials of stainless steel pipes specified in **4.3**, **Part K of the Rules**, the works having the approved manufacturing process of rolled stainless steels specified in **3.5**, **Part K of the Rules**.

(3) For primary materials of steel pipes for low temperature service specified in **4.5**, **Part K of the Rules**, the works having the approved manufacturing process of rolled steels for low temperature service specified in **3.4**, **Part K of the Rules**.

K5 CASTINGS

K5.1 Steel Castings

Paragraph K5.1.13 has been newly added as follows.

K5.1.13 Additional Requirements for Crank Throws

The wording "the preliminary tests instructed by the Society" in **5.1.13-2, Part K of the Rules** means the tests in accordance with **Chapter 4, Part 1 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use**.

K6 STEEL FORGINGS

K6.1 Steel Forgings

K6.1.13 Additional Requirements for Crankshafts

Sub-paragraphs -3 and -4 have been newly added as follows.

3 The wording "the special forging processes" in **6.1.13-2** and **-3, Part K of the Rules** means continuous grain flow forging methods (*e.g*. RR forging, TR forging or stamp forging), other than the free forging methods (block forging, upset & twisting forging and upsetting forging) used for the manufacture of solid crankshafts and block forging methods used for the manufacture of semi-built-up crankshafts.

4 The wording "the preliminary tests instructed by the Society" in **6.1.13-2** and **-3, Part K of the Rules** means the tests in accordance with **Chapter 3** and **Chapter 4, Part 1 of the Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use** respectively.

EFFECTIVE DATE AND APPLICATION (Amendment 1-1)

1. The effective date of the amendments is 1 February 2007.

Amendment 1-2

Chapter 8 ALUMINIUM ALLOYS

K8.1 Aluminium Alloy Plates and Extruded Shapes

Table K8.1.5-1 and Table K8.1.5-2 has been amended as follows.

Table K8.1.5-1 The Standard for Elongation

(a) Rolled Products

Material grade	Temper grade	Thickness *t* (*mm*)	Elongation (%)
5083*P*	*O*	$12.5<t\leq 50$	16min.
		$50< t\leq 100$	16min.
		$100<t\leq 160$	14min.
		$160<t\leq 200$	11min.
	*H*112	$12.5<t\leq 50$	11min.
	*H*116		
	*H*321	$12.5<t\leq 80$	11min.
5383*P*	*O*	$12.5<t\leq 50$	19min.
	*H*116		11min.
	*H*321		
5059*P*	*O*	$12.5<t\leq 50$	27min.
	*H*116		11min.
	*H*321		
5086*P*	*O*	$12.5<t\leq 50$	16min.
	*H*112		10min.
	*H*116		
5456*P*	*O*	$12.5<t\leq 50$	16min.
	*H*116		11min.
	*H*321		
5754*P*	*O*	$12.5<t\leq 50$	19min.

(b) Extruded Shapes

Material grade	Temper grade	Thickness *t* (*mm*)	Elongation (%)
5083*S*	*O*	12.5<*t*≤50	14min.
		50<*t*≤130	11min.
	*H*111	12.5<*t*≤50	
	*H*112		
5383*S*	*O*	12.5<*t*≤50	19min.
	*H*111		
	*H*112		15min.
5059*S*	*H*112	12.5<*t*≤50	11min.
5086*S*	*O*	12.5<*t*≤50	14min.
	*H*111		11min.
	*H*112		
6005*AS*	*T*5	12.5<*t*≤50	9min.
	*T*6		7min.
6061*S*	*T*6	12.5<*t*≤50	9min.
6082*S*	*T*5	12.5<*t*≤50	7min.
	*T*6		9min.

Table K8.1.5-2 The Standard for Elongation

(a) Rolled Products

Material grade	Temper grade	Thickness *t* (*mm*)	Elongation (%)
5083*P*	*O*	*t*≤12.5	16min.
	*H*112		12min.
	*H*116		10min.
	*H*321		12min.
5383*P*	*H*116	*t*≤12.5	10min.
	*H*321		
5059*P*	*H*116	*t*≤12.5	10min.
	*H*321		
5086*P*	*O*	*t*≤12.5	16min.
	*H*112		8min.
	*H*116	*t*≤6.3	8min.
		6.3< *t*≤12.5	10min.
5754*P*	*O*	*t*≤12.5	18min.
5456*P*	*O*	*t*≤12.5	16min.
	*H*116		10min.
	*H*321		12min.
6061*P*	*T*6	*t*≤6.5	10min.

(b) Extruded Shapes

Material grade	Temper grade	Thickness t (*mm*)	Elongation (%)
5083*S*	*O*	$t \leq 12.5$	14min.
	*H*111		12min.
	*H*112		
5383*S*	*O*	$t \leq 12.5$	17min.
	*H*111		
5086*S*	*O*	$t \leq 12.5$	14min.
	*H*111		12min.
	*H*112		
6005*AS*	*T*5	$t \leq 12.5$	9min.
	*T*6		8min.
6061*S*	*T*6	$t \leq 12.5$	10min.
6082*S*	*T*5	$t \leq 12.5$	8min.
	*T*6	$3 < t \leq 5$	6min.
		$5 < t \leq 12.5$	10min.

EFFECTIVE DATE AND APPLICATION (Amendment 1-2)

1. The effective date of the amendments is 1 July 2007.

2. Notwithstanding the amendments to the Guidance, the current requirements may apply to materials other than those for which the application for survey is submitted to the Society on and after the effective date.