Correction of Editorial Errors related to Materials and Welding

Object of Amendment

Rules for the Survey and Construction of Steel Ships Parts K and M Guidance for the Survey and Construction of Steel Ships Part K Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use

Reason for Amendment

Requirements related to steel castings, steel forgings and the approval of associated welding procedures are respectively stipulated in Chapters 5 and 6 of Part K and Chapter 4 of Part M of the Rules for the Survey and Construction of Steel Ships.

Some of these requirements contained editorial errors with respect to things such as examples of standard values corresponding to the required tensile strength of steel castings, the acceptance criteria for Charpy impact testing, the relaxation requirements for steel forgings, and the number of specimens to be taken for the approval tests for welding procedures, etc. or in other ways differed from actual practice.

Accordingly, relevant requirements are amended so that they reflect actual practice.

Outline of Amendment

The main contents of this amendment are as follows:

- (1) Amends indication examples for values corresponding to the required tensile strength of steel castings to so that they are expressed in SI units.
- (2) Clarifies the acceptance criteria for Charpy impact testing.
- (3) Clarifies the relaxation requirements and references related to steel forgings.
- (4) Amends the number of specimens to be sampled for the fracture tests of fillet welded joints conducted during approval tests for welding procedures from two specimens to one.

Effective Date and Application

Effective date of this amendment is 1 January 2026.

An asterisk (*) after the title of a requirement indicates that there is also relevant information in the corresponding Guidance.

ID:DD25-03

Amended	Original	Remarks
RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS	RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS	
Part K MATERIALS	Part K MATERIALS	
Chapter 5 CASTINGS	Chapter 5 CASTINGS	
5.1 Steel Castings	5.1 Steel Castings	
5.1.6 Mechanical Properties	5.1.6 Mechanical Properties	

		Amend	L				Original Original	Remarks	
			Table K	5.2 Mechanic	al Properties o	f Steel Castir	ng		
Kii	nd	Grade (4)	Tensile strength_(1)	Yield point or proof stress	Elongation $(L = 5.65 \sqrt{A})$ $(\%)$	Reduction of area (%)	Charpy V-note	h impact test (2)	
			(N/mm ²)	(N/mm ²)			Test temperature (°C)	Minimum average energy (5) (J)	
		KSC400	400 min.	200 min.	25 min.	40 min.			Adds acceptance criteria
		KSC440	440 min.	220 min.	22 min.	30 min.			for Charpy impact test
Steel	Carbon	KSC480	480 min.	240 min.	20 min.	27 min.			(Same as in Remark (3)
castings	steel	KSC520	520 min.	260 min.	18 min.	25 min.			of Table K3.4)
not	castings	KSC560	560 min.	300 min.	15 min.	20 min.	(T)		
intended		KSC600	600 min.	320 min.	13 min.	20 min.	$AT^{(3)}$		
for		KSCA550	550 min.	340 min.	16 min.	35 min.			
welding	Alloy	KSCA600	600 min.	400 min.	16 min.	35 min.			
	steel	KSCA650	650 min.	450 min.	14 min.	32 min.			
	castings	KSCA700	700 min.	540 min.	12 min.	28 min.		27	
		KSC400W	400 min.	200 min.	25 min.	40 min.		27	
	G 1	KSC440W	440 min.	220 min.	22 min.	30 min.			
a. 1	Carbon	KSC480W	480 min.	240 min.	20 min.	27 min.			
Steel	steel	KSC520W	520 min.	260 min.	18 min.	25 min.			
castings intended	castings	KSC560W	560 min.	300 min.	15 min.	20 min.	0		
for		KSC600W	600 min.	320 min.	13 min.	20 min.	U		
welding	Alloy	KSCA550W	550 min.	355 min.	18 min.	30 min.			
	steel	KSCA600W	600 min.	400 min.	16 min.	30 min.			
	castings	KSCA650W	650 min.	450 min.	14 min.	30 min.			
	Ü	KSCA700W	700 min.	540 min.	12 min.	28 min.			
	(2) Specia to Soci (3) AT refe	l consideration m lety approval. ers to the ambient	ay be given to alto temperature spec	ified in <i>ISO</i> 148-1	ents for Charpy V-1 :2016 (i.e. 23 °C ±	5 °C).	s, depending on design and		

- (5) When the absorbed energy of two or more test specimens among a set of test specimens is less in value than the specified minimum mean absorbed energy or when the absorbed energy of a single test specimens is less in value than 70 % of the specified minimum mean absorbed energy, the test is considered to be failed.

Amended	Original	Remarks
5.1.12 Marking* 1 Steel castings which have satisfactorily complied with the required tests are to be marked with the identification mark in accordance with 1.5.1. For steel castings to which 5.1.6-2 have been applied, the value corresponding to the required tensile strength employed is to be used to the grade mark. (e.g.	5.1.12 Marking*	Remarks
Where the required tensile strength employed is 430 N/mm ² , "KSC430" is to be indicated) (Same)	employed is to be used to the grade mark. (ex. Where the required tensile strength employed is 430 N/mm ² , "KSC44" is to be indicated) 2 The grade of material and the manufacturer's name or	Changes to SI units
	trade mark are to be cast stamped or marked by some other appropriate method on all cast steels. In addition, cast number and test number are to be stamped or marked by some other appropriate method on all cast steels greater than 250 kg in	
	weight. The Society's brand indicating satisfactory compliance with the Rule requirements is to be stamped on all cast steels in the neighbourhood of the above mentioned marks.	

<u> </u>	Requirements Comparison mended	Table (Correct			
		CL	Origi		Remarks
Chapter 6	STEEL FORGINGS	Ch	napter 6 STI	EEL FORGINGS	
6.1 Steel Forgings		6.1 Steel	Forgings		
0.1 Steel Forgings		0.1 Steel	Torgings		
6.1.2 Manufacturing	Process*	6.1.2 N	Ianufacturing Pro	ocess*	
	Table K6.	.1 Forging Ratio	,	-	
	Туре	Dimension (1)	Forging ratio (2)	_	
	Forgings made from ingots or from	L > D	S=3		
	forged blooms or billets	$L \leq D$	S=1.5		
	Forgings made from rolled products	L- <u>≤</u> > D	S=4		
	Forgings made from foned products	<i>L</i> →≤ <i>D</i>	S=2		Corrects typo errors to
	Forgings made by upsetting (3)	-	U=1/3		align with the Rules for Japanese-flagged ships.
	Rolled bars	-	S = <u>6</u> 3		
	products. (2) Forging ratio is to be $S = \frac{A}{a}, U = \frac{1}{L_i / L_j}$ where: $A : \text{Mean section}$ $a : \text{Sectional area}$ $L_i : \text{Length before}$ $L_f : \text{Length after to}$ (3) In the case of an initial	calculated by the follow f f all area of original ingot a of the portion after for e upsetting (m) upsetting (m)	(m^2) rging (m^2) t $S = 1.5$, the forging ratio		

Amended	Original	Remarks
6.1.4 Chemical Composition	6.1.4 Chemical Composition	
(Same)	1 Steel forgings are to have the chemical composition	
	given in Table K6.2(a) and Table K6.3(b).	
(Same)	2 For steel forgings intended for welded constructions,	
	"W" is to be suffixed to their respective grade markings (e.g.	
	KSF440W and KSFA600W-H).	
3 For steel forgings for rudder stocks and pintles,	3 For steel forgings for rudder stocks and pintles,	
chemical composition is to be of a weldable quality. In this	chemical composition is to be of a weldable quality. <u>In cases</u>	1 0
case, " \underline{W} " is to be suffixed to the markings.	where high strength carbon steel forgings are used, -2 above	Amends reference
	may be relaxed subject to approval by the Society. In this case,	(Transfer to Remarks in Table K6.2(a) and
	" (\underline{W}) " is to be suffixed to the markings.	K6.2(b))
(Same)	4 Steel forgings may be added with Al, Nb or V element	10.2(0))
	for greater grain refining of the metal crystal.	
(Same)	5 The manufacturer is to make an analysis of each melt	
	in ladles (multiple heats tapped into a common ladle are	
	considered as one heat.) and the results are to be reported to	
	the surveyor.	

	Amended								Origina	al		Remarks
	Table	K6.2(a)	Chemi	cal Com			chinery Composition		orgings			
K	ind	С	Si	Mn	Р	S	Cr (2)	Mo ⁽²⁾	Ni ⁽²⁾	Cu (2)	Total residual elements	
Steel forgings	Carbon steel forgings	0.65 max. ⁽⁴⁾	0.45 max.	0.30~ 1.50	0.035 max.	0.035 max.	0.30 max.	0.15 max.	0.40 max.	0.30 max.	0.85 max.	
not intended for welding	Alloy steel forgings	0.45 max.	0.45 max.	0.30~ 1.00	0.035 max.	0.035 max.	0.40 min. ⁽³⁾	0.15 min. ⁽³⁾	0.40 min. ⁽³⁾	0.30 max.	_	Deletes relaxation requirement for the carbon content of carbon
Steel forgings	Carbon steel forgings	0.23 max. ⁽⁴⁾	0.45 max.	0.30~ 1.50	0.035 max.	0.035 max.	0.30 max.	0.15 max.	0.40 max.	0.30 max.	0.85 max.	steel forgings.
intended for welding	Alloy steel forgings (5)	0.25 max.	0.45 max.	0.30~ 1.00	0.035 max.	0.035 max.	0.40 min. ⁽³⁾	0.15 min. ⁽³⁾	0.40 min. (3)	0.30 max.	_	
Notes: (1) (2) (3) (4)	Where other elem Elements conside be intentionally a One or more of the Carbon content m	ered to be readed to the ne elements nay be incre	sidual ele steel. The is to com ased in ca	ments exce contents of ply with the ses where t	ept in case of residual e minimum he carbon	s where a elements m content equivaler	minimum are to be α . In (C_{eq}) specifically specifically specifically are (C_{eq}) .	value is incolescribed in cified in 1.5	the test re 5.2-2(6) is	esidual eler esults. less than (0.41 %. <u>In cases</u>	
(5)	where high strengequivalent (<i>Ceq</i>) rof " <i>W</i> ". The chemical cor	nay be relax	xed subjec	t to approv	al by the	Society. In	n this case.	"(W)" is to	be suffixe	ed to the m		Transfers the relaxation requirements from 6.1.4-3

Ki	Ta	ble K6.2	(1)									Remarks
Ki			(b) Che	emical C		tion of		eel Forgin	ngs			
	nd	С	Si	Mn	Р	S	Cr (2)	Mo ⁽²⁾	Ni ⁽²⁾	Cu (2)	Total residual elements	
Steel forgings	Carbon steel forgings	0.65 max. ⁽⁴⁾	0.45 max.	0.30~ 1.50	0.035 max.	0.035 max.	0.30 max.	0.15 max.	0.40 max.	0.30 max.	0.85 max.	
not intended for welding	Alloy steel forgings (5)	0.45 max. ⁽⁶⁾	0.45 max.	0.30~ 1.00 ⁽⁶⁾	0.030 max.	0.030 max.	0.40~ 3.50 (3)(6)	0.15~ 0.70 (3)(6)	0.40~ 3.50 (3)(6)	0.30 max.	_	Deletes relaxation requirement for the carbon content of carbon
Steel forgings	Carbon steel forgings	0.23 max. ⁽⁴⁾	0.45 max.	0.30~ 1.50	0.035 max.	0.035 max.	0.30 max.	0.15 max.	0.40 max.	0.30 max.	0.85 max.	steel forgings.
intended for welding	Alloy steel forgings (5)	0.25 max. ⁽⁶⁾	0.45 max.	0.30~ 1.00 ⁽⁶⁾	0.035 max.	0.035 max.	0.40 min. (3)(6)	0.15 min. ⁽³⁾⁽⁶⁾	0.40 min. (3)(6)	0.30 max.	-	
(2)	Where other elen Elements consider be intentionally a One or more of the	ered to be red dded to the ne elements	esidual ele steel. The is to com	ments exce contents of ply with the	ept in case of residual e minimum	s where a elements m content	minimum are to be	value is ind described in	licated. Re the test re	esidual eler esults.		
	Carbon content methods where high strenge equivalent (C_{eq}) methods of " W ".	gth carbon	steel forgi	ngs for ruc	der stock	s and pin	les are us	ed, limits of	f the carbo	on content	and the carbon	Transfers the relaxati
	The chemical cor Specification is to	-		_	_				te by the S	Society.		requirements from 6.1

7 Hill	Amended Amended							011 01	Origin		<u>u to 1/1</u>	accitai	Remarks
		Tal	ole K6.3(a)	Mechanical	Propert	ies of N	lachin	ery Ste	el Forgings				
Kin	d	Grade (78)	Tensile strength (1)	Yield point or proof stress	Elongat 5.65	$ ion (L = \sqrt{A}) $	Reduc	tion of ea	Brinell hardness ⁽²⁾ HBW	Charpy V-note	ch impact	test ^(6<u>7</u>)	
			(N/mm ²)	(N/mm ²)	L	T	L	T		Test temperature (°C)	average (J)	imum e energy	
											L	T	Adds acceptance criteria for Charpy impact test
		KSF400-M	400 min.	200 min.	26 min.	19 min.	50 min.	35 min.	110~150				(Same as in Remark (3)
		KSF440-M	440 min.	220 min.	24	18	50	35	125~160				of Table K3.4)
		KSF480-M	480 min.	240 min.	min. 22	min. 16	min. 45	min. 30	135~175				
		KSF520-M	520 min.	260 min.	min. 21	min.	min. 45	min. 30	150~185				
		1101 320 W	320 mm.	200 11111.	min.	min.	min.	min.	100 100				
	Carbon	KSF560-M	560 min.	280 min.	20 min.	14 min.	40 min.	27 min.	160~200				
	steel forgings	KSF600-M	600 min.	300 min.	18	13	40	27	175~215				
	Torgings				min.	min.	min.	min.					
For		KSF640-M	640 min.	320 min.	17 min.	12 min.	40 min.	27 min.	185~230	(210)			
machinery (8 <u>9</u>)		KSF680-M	680 min.	340 min.	16	12	35	24	200~240	$AT^{(910)}$	27	18	
		WGE 70 0 14	720 :	260 :	min.	min.	min.	min.	210~250				
		KSF720-M	720 min.	360 min.	15 min.	11 min.	35 min.	24 min.	210~230				
		KSF760-M	760 min.	380 min.	14	10	35	24	225~265				
		VGE1600 14	(00 :	260 :	min.	min.	min.	min.	175 - 215				
		KSFA600-M	600 min.	360 min.	18 min.	14 min.	50 min.	35 min.	175~215				
	Alloy	KSFA700-M	700 min.	420 min.	16	12	45	30	205~245				
	steel	VGE4000 3.5	900 :	400	min.	min.	min.	min.	225 - 275				
	forgings	KSFA800-M	800 min.	480 min.	14 min.	10 min.	40 min.	27 min.	235~275				
		KSFA900-M	900 min.	630 min.	13	9 min.	40	27	260~320				
					min.		min.	min.					

	Amend	led						Origin	al		Remarks
	KSFA1000-	1000 min.	700 min.	12	8 min.	35	24	290~365			
	M			min.		min.	min.				
	KSFA1100-	1100 min.	770 min.	11	7 min.	35	24	320~385			
	M			min.		min.	min.				
Notes:	_			•							
(1)	For steel forgings whose specified. For steel forging be specified. Hardness values are stan-	ngs whose spec	fied minimum to	ensile strer	ngth is 900						
(3)	The letters "L" and "T" refer to longitudinal and tangential respectively and indicate the direction in which the specimen is to be taken with respect										
(-)	to the product.										
<u>(4)</u>	When the absorbed energ		_	_		-			-		
	*		_	_		-			-		
	When the absorbed energy energy or when the absor	rbed energy of a	a single test spec	imens is le	ess in valu	e than 70	% of the	specified minin	um mean absorbed	energy, the test is	
(4)	When the absorbed energy energy or when the absorbed considered to be failed.	oon steel forging alloy steel forg	a single test spec gs is applicable t gings is applicab	imens is lo	ess in value	e than 70 rmali <u>s</u> ed,	% of the	specified mining	um mean absorbed	energy, the test is appered.	

 $(9\underline{10})$ AT refers to the ambient temperature specified in ISO 148-1:2016 (i.e. 23 °C ± 5 °C).

(89) For steel forgings complying with the table, "-M" is to be suffixed to their respective grade markings (e.g. KSF400-M and KSFA600W-M)

			ended			`		Original				Remarks
			Table K6	6.3(b) Mech	anical Prope	rties of Hul	l Steel Forg	gings				
Ki	nd	Grade (67)	Tensile strength (1)	Yield point or proof stress	Elongation (L			on of area	Charpy V-note	h impact	test (5 <u>6)</u>	
			(N/mm^2)	(N/mm ²)	L	T	L	T	Test temperature (°C)	aver	mum rage 7 (J) ⁽²⁾ 33)	Adds acceptance criteria for Charpy impact test (Same as in Remark (3)
		KSF400-H	400 min.	200 min.	26 min.	19 min.	50 min.	35 min.				of Table K3.4)
		KSF440-H	440 min.	220 min.	24 min.	18 min.	50 min.	35 min.				
	Carbon	KSF480-H	480 min.	240 min.	22 min.	16 min.	45 min.	30 min.				
	steel forgings	KSF520-H	520 min.	260 min.	21 min.	15 min.	45 min.	30 min.				
For hull (7 <u>8</u>)		KSF560-H	560 min.	280 min.	20 min.	14 min.	40 min.	27 min.	0	27	18	
		KSF600-H	600 min.	300 min.	18 min.	13 min.	40 min.	27 min.				
	A 11	KSFA550-H	550 min.	350 min.	20 min.	14 min.	50 min.	35 min.				
	Alloy	KSFA600-H	600 min.	400 min.	18 min.	13 min.	50 min.	35 min.				
	forgings	KSFA650-H	650 min.	450 min.	17 min.	12 min.	50 min.	35 min.				

	Amended	Original	Remarks
Notes:			
(1)		less than $600 \ N/mm^2$, a tensile strength range of $120 \ N/mm^2$ may additionally be ength is $600 \ N/mm^2$ or more, a tensile strength range of $150 \ N/mm^2$ may additionally	
(2)	The letters " L " and " T " refer to longitudinal and tangential respect product.	ctively and indicate the direction in which the specimen is taken with respect to the	
(3)		a set of test specimens is less in value than the specified minimum mean absorbed less in value than 70 % of the specified minimum mean absorbed energy, the test is	
(<u>34</u>)	The requirement for carbon steel forgings is applicable to those a	nnealed, normalised, normalised and tempered, or quench and tempered.	
(4 <u>5</u>)	The requirement for low alloy steel forgings is applicable to thos mechanical properties are subject to Society approval.	se quenched and tempered. In cases where they are normalised and tempered, their	
(<u>56</u>)	Special consideration may be given to alternative requirements for Society approval.	or Charpy V-notch impact test, depending on design and application, and subject to	
(6 <u>7</u>)	For steel forgings complying with 6.1.4-2, "W" is to be suffixed t	o their respective grade markings.	
(7 <u>8</u>)	For steel forgings complying with the table, "-H" is to be suffixed	d to their respective grade markings (e.g. KSF400-H and KSFA600W-H)	

Amended	Original	Remarks
Part M WELDING Chapter 4 WELDING PROCEDURE AND RELATED SPECIFICATIONS	Part M WELDING Chapter 4 WELDING PROCEDURE AND RELATED SPECIFICATIONS	
4.3 Tests for Fillet Weld Joints	4.3 Tests for Fillet Weld Joints	
4.3.7 Fracture Tests 1 In cases where the test assembly is a plate, <u>a</u> test specimen <u>is</u> to be taken from the remainder of the test assembly after the macro-structure specimen has been removed. (Same)	 4.3.7 Fracture Tests 1 In cases where the test assembly is a plate, two (2) test specimens are to be taken from the remainder of the test assembly after the macro-structure specimen has been removed. 2 In cases where the test assembly is a pipe (or tube), an appropriate number of test specimens is to be taken from the remainder of the test assembly after the macro-structure specimen has been removed. 3 The test assemblies are to be broken by pressing as shown in Fig. M4.6, without cracks, poor penetrations, blow holes and injurious defects in the fractured surface. Where, however, the sum of lengths having blow holes (include poor penetrations), except at both ends of the specimen (only for plate test assemblies), is not greater than 10% of the total welded length, the test may be regarded as satisfactory. 	

Amended Amended	Original	
	Original	Remarks
GUIDANCE FOR THE SURVEY AND	GUIDANCE FOR THE SURVEY AND	
CONSTRUCTION OF STEEL SHIPS	CONSTRUCTION OF STEEL SHIPS	
Part K MATERIALS	Part K MATERIALS	
K6 STEEL FORGINGS	K6 STEEL FORGINGS	
K6.1 Steel Forgings	K6.1 Steel Forgings	
K6.1.2 Manufacturing Process	K6.1.2 Manufacturing Process	
(Same)	1 The wording "unless otherwise deemed appropriate by	
	the Society" in 6.1.2-4(4), Part K of the Rules means the	
	requirements may be suitably modified at the discretion of the	
	surveyor according to the size or form, or the use for which they are intended, except for compression deformations of	
	steel ingots or forging materials in the longitudinal direction	
	(i.e. upsetting).	
2 In relation to 6.1.2-6, Part K of the Rules, where gas	2 In relation to 6.1.2-7, Part K of the Rules, where gas	Amends reference
workings are being carried out on the parts subjected to high	workings are being carried out on the parts subjected to high	
stress such as mass removal of crankshaft, the data related to	stress such as mass removal of crankshaft, the data related to	
the processes (including pre-heating) and change of material	the processes (including pre-heating) and change of material	
due to working are to be submitted approval of the Society.	due to working are to be submitted approval of the Society.	

	tole (Correction of Editorial Errors related to Materials	
Amended	Original	Remarks
GUIDANCE FOR THE APPROVAL OF	GUIDANCE FOR THE APPROVAL <u>AND</u>	
MATERIALS AND EQUIPMENT FOR	TYPE APPROVAL OF MATERIALS AND	
MARINE USE	EQUIPMENT FOR MARINE USE	
Part I GENERAL	Part I GENERAL	
Part 1 METALLIC MATERIALS	Part 1 METALLIC MATERIALS	
Fatt I WIETALLIC WIATERIALS	Fait I WIETALLIC MATERIALS	
Chapter 3 APPROVAL OF MANUFACTURING	Chapter 3 APPROVAL OF MANUFACTURING	
PROCESS OF STEEL CASTINGS AND STEEL	PROCESS OF STEEL CASTINGS AND STEEL	
FORGINGS	FORGINGS	
3.1 General	3.1 General	
3.1 General	3.1 General	
3.1.1 Scope	3.1.1 Scope	
(Same)	1 This chapter applies to the testing and inspection for	
	the approval of manufacturing castings and forgings (except	
	those of casting and forging equipment specified in Part L of the Rules), specified in the provisions of Chapter 5 and	
	Chapter 6, Part K of the Rules for the Survey and	
	Construction of Steel Ships (hereinafter referred to as "the	
	Rules"), in accordance with the provisions of 1.2, Part K of	
	the Rules.	
2 This chapter applies also to the case where the surface	2 This chapter applies also to the case where the surface	Amends reference
of steel castings and forgings are subjected to hardening	of steel castings and forgings are subjected to hardening	
process in accordance with the provisions of 5.1.2-4 and 6.1.2-	process in accordance with the provisions of 5.1.2-4 and 6.1.2-	
<u>5, Part K of the Rules.</u>	7, Part K of the Rules.	

Amended	Original	Remarks
(Same)	3 This chapter applies correspondingly to the testing and inspection for the approval of manufacturing process of casting and forging which being required approval by the Society in accordance with the requirements of 1.1.1-3, Part K of the Rules. 4 The requirements of this chapter correspondingly apply to tests and inspection for the approval of semi-finished products such as ingot, slab and billet for the steel forgings specified in preceding -1 through -3.	
1. The effective date of the amendments is 1 January 2026.		