Standardisation of Terminology Used for Yield Strength Standards

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

Reason for Amendment

Standards for mechanical properties of metallic materials and welded joints are specified in Parts K and M of the Rules for the Survey and Construction of Steel Ships. In addition, methods for determining yield strength values through tensile tests according to whether yield phenomena exist, and tables related to yield strength standards are specified.

The aforementioned tables, however, are not standardised, and various terms, such as “yield stress”, “yield point, “proof stress” or “proof strength”, are used to describe “yield strength”.

Accordingly, relevant requirements are amended to standardise the terminology used for yield strength standards.

Outline of the Amendment

The main details of this amendment are as follows:

(1) Amends relevant requirements to, in principle, refer to standards for the yield strength of metallic materials and welded joints as “yield point or proof stress” .
(2) Amends relevant requirements for metallic materials for which it is clear that the yield strength is measured by 0.2 % proof stress to refer to standards for yield strength as “proof stress”.

Effective Date and Application

Effective date of this draft amendment is [the date of establishment].

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

ID:DH24-11

Amended-Original Requirements Comparison Table (Standardisation of Terminology Used for Yield Strength Standards)

Amended	Original	Remarks
RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS **Part K MATERIALS** **Chapter 2 TEST SPECIMENS AND MECHANICAL TESTING PROCEDURES** **2.3 Mechanical Testing Procedures** **2.3.1 Tensile Test** **1** The value of yield point is to be measured at the first peak obtained during yielding. **2** When no well-defined yield phenomena exist, the proof stress is to be the strength of the 0.2% permanent elongation except where otherwise specified. **3** Where the value of yield point or proof stress is measured at tensile test, the test is to be carried out with an elastic stress rate, 2~20N/mm^2 *per sec*, for a material of which modulus of longitudinal elasticity is less than 150000N/mm^2 and, 6~60N/mm^2 *per sec*, for a material of which modulus of longitudinal elasticity is not less than 150000N/mm^2. (-4 is omitted.)	**RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS** **Part K MATERIALS** **Chapter 2 TEST SPECIMENS AND MECHANICAL TESTING PROCEDURES** **2.3 Mechanical Testing Procedures** **2.3.1 Tensile Test** **1** The value of yield stress is to be measured at the first peak obtained during yielding. **2** When no well-defined yield phenomena exist, the proof stress is to be the strength of the 0.2% permanent elongation. **3** Where the value of yield stress or proof stress is measured at tensile test, the test is to be carried out with an elastic stress rate, 2~20N/mm^2 *per sec*, for a material of which modulus of longitudinal elasticity is less than 150000N/mm^2 and, 6~60N/mm^2 *per sec*, for a material of which modulus of longitudinal elasticity is not less than 150000N/mm^2. (-4 is omitted.)	Amend to standardise the terminology used for yield strength standards. Amend to manage the case measuring proof stress by the strength of the 1.0% permanent elongation. Amend to standardise the terminology used for yield strength standards.

Amended-Original Requirements Comparison Table (Standardisation of Terminology Used for Yield Strength Standards)

Amended	Original	Remarks
Chapter 3 ROLLED STEELS **3.8 High Strength Rolled Steels for Offshore Structures** **3.8.11 Marking** Steels which have satisfactorily complied with the required tests are to be marked with identification mark in accordance with the requirements in **1.5.1**. In addition, for steels to which the requirements given in the provisions to **Notes (5)** and **(6)** in **Table K3.30** have been applied, "-*YP* [new yield point or proof stress value] *M* " is to be suffixed to the marking in cases where the yield point or proof stress value is changed, and "-*TS* [new tensile point value] *M* " is to be suffixed to the marking in cases where the tensile point value is changed. (Example: *KA*620-*YP*620*M*-*TS*700*M*)	**Chapter 3 ROLLED STEELS** **3.8 High Strength Rolled Steels for Offshore Structures** **3.8.11 Marking** Steels which have satisfactorily complied with the required tests are to be marked with identification mark in accordance with the requirements in **1.5.1**. In addition, for steels to which the requirements given in the provisions to **Notes (5)** and **(6)** in **Table K3.30** have been applied, "-*YP* [new yield point or proof stress value] *M* " is to be suffixed to the marking in cases where the yield point (proof stress) value is changed, and "-*TS* [new tensile point value] *M* " is to be suffixed to the marking in cases where the tensile point value is changed. (Example: *KA*620-*YP*620*M*-*TS*700*M*)	Amend to standardise the terminology used for yield strength standards.

Amended-Original Requirements Comparison Table (Standardisation of Terminology Used for Yield Strength Standards)

<table>
<tr><th>Amended</th><th>Original</th><th>Remarks</th></tr>
<tr>
<td>

Chapter 4 STEEL PIPES

4.4 Headers

4.4.5 Mechanical Properties

Table K4.24 Tensile Test

Grade	Symbol	Yield point or proof stress (N/mm^2)	Tensile strength (N/mm^2)	Elongation (%) ($L = 5.65\sqrt{A}$)	Reduction of area(%)
Grade 1	*KBH*-1	205 min.	410 min.	24 min.	38 min.
Grade 2	*KBH*-2	225 min.	450 min.	23 min.	40 min.
Grade 3	*KBH*-3	205 min.	380 min.	22 min.	40 min.
Grade 4	*KBH*-4	205 min.	410 min.	21 min.	40 min.
Grade 5	*KBH*-5	205 min.	410 min.	21 min.	40 min.
Grade 6	*KBH*-6	205 min.	410 min.	21 min.	40 min.

Note:
When test specimens are taken at right angle to the direction of rolling, the values of yield point or proof stress, and the values of tensile strength are to be as given in the above Table and the elongation is to take the value reduced by 5% from the percentage given in the above Table. The value of reduction of area may be only remained on records for reference.

</td>
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Chapter 4 STEEL PIPES

4.4 Headers

4.4.5 Mechanical Properties

</td>
<td>Amend to standardise the terminology used for yield strength standards.</td>
</tr>
</table>

Amended-Original Requirements Comparison Table (Standardisation of Terminology Used for Yield Strength Standards)

Amended	Original	Remarks
Chapter 5 CASTINGS **5.6 Spheroidal or Nodular Graphite Iron Castings** **5.6.3 Kinds**	**Chapter 5 CASTINGS** **5.6 Spheroidal or Nodular Graphite Iron Castings** **5.6.3 Kinds**	Amend to standardise the terminology used for yield strength standards.

Table K5.10 Kinds and Mechanical Properties of Iron castings

Material grade	Tensile test			Impact test	
	Tensile strength (N/mm^2)	Proof ~~strenth~~stress[2] (N/mm^2)	Elongation (%) ($L = 5.65\sqrt{A}$)	Testing temperature (℃)	Minimum mean absorbed energy (J)
*KFCD*37	360	235	17	—	—
*KFCD*40	390	255	12	—	—
*KFCD*45	440	285	10	—	—
*KFCD*50	490	325	7	—	—
*KFCD*60	590	370	3	—	—
*KFCD*70	680	420	2	—	—
*KFCD*80	780	480	2	—	—
*KFCD*36*S*	350	220	22	20	17(14)[3]
*KFCD*41*S*	400	250	18	20	14 (11)[3]

Notes:

(1) The standards given in this Table are for the test sample taken from iron casting separately cast. Where the test sample cast integral with the casting is used, the standards applied are left to the discretion of the Society.

(2) The proof ~~strength~~stress required in the Table is shown for reference.

(3) 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 specimen is less in value than shown in brackets in the Table, the test is considered to be failed.

Amended-Original Requirements Comparison Table (Standardisation of Terminology Used for Yield Strength Standards)

<table>
<tr><th>Amended</th><th>Original</th><th>Remarks</th></tr>
<tr>
<td>

5.7 Stainless Steel Propeller Castings

5.7.5 Mechanical Properties

Table K5.13 Mechanical Properties

Grade	Tensile test				Impact test(3)
	~~0.2% p~~Proof stress (N/mm^2)	Tensile strength (N/mm^2)	Elongation (L =5 d) (%)	Reduction of area (%)	Minimum mean absorbed energy(J)
*KSCSP*1	440 min.	590 min.	15 min.(4)	30 min.	20
*KSCSP*2	550 min.	750 min.	15 min.(4)	35 min.	30
*KSCSP*3	540 min.	760 min.	15 min.(4)	35 min.	30
*KSCSP*4	180 min.(2)	440 min.	30 min.	40 min.	20

Notes:

(1) The requirements specified in this Table apply to specimens cut from propeller casting itself. Where specimens cut from separately-cast samples, the requirements are to be deemed appropriate by the Society.

(2) ~~In case where~~The strength of the 1.0 % permanent elongation may be considered as the proof stress ~~is applied~~ of *KSCSP*4. In this case, the require proof stress is ~~not less than~~ 205 N/mm^2 min.

(3) This test is required only for propellers of ships with an ice class notation. The test temperature is to be -10℃. For the judgement of the test, **Note (1)** of **Table K5.4** is to be referred to.

(4) For propellers of ships with an ice class notation, the elongation is not to be less than 19%.

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5.7 Stainless Steel Propeller Castings

5.7.5 Mechanical Properties

</td>
<td>Clarify the requirement for measuring the proof stress by the strength of the 1.0% permanent elongation.</td>
</tr>
</table>

Amended-Original Requirements Comparison Table (Standardisation of Terminology Used for Yield Strength Standards)

Amended	Original	Remarks
Chapter 8 ALUMINIUM ALLOYS **8.1 Aluminium Alloy Plates and Extruded Shapes** **8.1.5 Mechanical Properties***	**Chapter 8 ALUMINIUM ALLOYS** **8.1 Aluminium Alloy Plates and Extruded Shapes** **8.1.5 Mechanical Properties***	Amend to standardise the terminology used for yield strength standards.

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

Material grade	Temper condition[2]	Thickness t (mm)	Tensile test		
			Proof ~~strength~~stress (N/mm^2)	Tensile strength (N/mm^2)	Elongation(%)[3] ($L = 5.65\sqrt{A}$)
5083*P*	*O*	$t \leq 50$	125 min.	275～350	14 min.
		$50 < t \leq 80$	120～195	275～345	14 min.
		$80 < t \leq 100$	110 min.	265 min.	
		$100 < t \leq 120$		260 min.	12 min.
		$120 < t \leq 160$	105 min.	255 min.	
		$160 < t \leq 200$	100 min.	250 min.	10 min.
	*H*111	$t \leq 50$	125 min	275～350	14 min.
	*H*112			275 min.	10 min.
	*H*116		215 min.	305 min.	
	*H*321	$t \leq 50$	215～295	305～385	10 min.
		$50 < t \leq 80$	200～295	285～380	9 min.
5383*P*	*O*	$t \leq 50$	145 min.	290 min.	17 min.
	*H*111				
	*H*116		220 min.	305 min.	10 min.
	*H*321				
5059*P*	*O*	$t \leq 50$	160 min.	330 min.	24 min.
	*H*111				
	*H*116	$t \leq 20$	270 min.	370 min.	10 min.
		$20 < t \leq 50$	260 min.	360 min.	
	*H*321	$t \leq 20$	270 min.	370 min.	
		$20 < t \leq 50$	260 min.	360 min.	
5086*P*	*O*	$t \leq 50$	95 min.	240～305	14 min.
	*H*111				
	*H*112	$t \leq 12.5$	125 min.	250 min.	—

Amended-Original Requirements Comparison Table (Standardisation of Terminology Used for Yield Strength Standards)

Amended			Original			Remarks
		12.5<*t*≤50	105 min.	240 min.	9 min.	
	*H*116	*t*≤50	195 min.	275 min.		
5754*P*	*O*	*t*≤50	80 min.	190～240	17 min.	
	*H*111					
5456*P*	*O*	*t*≤6.3	130～205	290～365	—	
	*H*116	*t*≤30	230 min.	315 min.	10 min.	
		30<*t*≤40	215 min.	305 min.		
		40<*t*≤50	200 min.	285 min.		
	*H*321	*t*≤12.5	230～315	315～405	—	
		12.5<*t*≤40	215～305	305～385	10 min.	
		40<*t*≤50	200～295	285～370		
6061*P*	*T*6	*t*≤6.5	245 min.	295 min.	—	

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

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

Amended-Original Requirements Comparison Table (Standardisation of Terminology Used for Yield Strength Standards)

Amended	Original	Remarks
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 : 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.		
8.1.12 Marking **2** In case of aluminum alloys applied to other standards in accordance with the provision of **Note (1)** of **Table K8.3**, "-*YP*", altered value and "*M*" where proof stress is altered or "-*TS*", altered value and "*M*" where tensile strength is to be put subsequent to the mark specified in **-1**, for example, "6005*AS-T5-M-YP200M*".	**8.1.12 Marking** **2** In case of aluminum alloys applied to other standards in accordance with the provision of **Note (1)** of **Table K8.3**, "-*YP*", altered value and "*M*" where proof strength is altered or "-*TS*", altered value and "*M*" where tensile strength is to be put subsequent to the mark specified in **-1**, for example, "6005*AS-T5-M-YP200M*".	Amend to standardise the terminology used for yield strength standards.

Amended-Original Requirements Comparison Table (Standardisation of Terminology Used for Yield Strength Standards)

<table>
<tr><th>Amended</th><th>Original</th><th>Remarks</th></tr>
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8.2 Aluminium Alloy Pipes

8.2.5 Mechanical Properties*

Table K8.7(a) Temper Conditions and Mechanical Properties(1) (Extruded pipes)

Material grade	Temper condition(2)	Thickness *t* (*mm*)	Tensile test			
			Sectional area (cm^2)	Proof ~~strength~~stress (N/mm^2)	Tensile strength (N/mm^2)	Elongation(%) ($L = 50$)
5083*TE*	*O*	*t*≤25	200 max.	110 min.	275～355	14 min.

Notes:
(1) Aluminium alloy seamless pipes 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

Table K8.7(b) Temper Conditions and Mechanical Properties(1) (Drawn pipes)

Material grade	Temper condition(2)	Thickness *t* (*mm*)	Tensile test		
			Proof ~~strength~~stress (N/mm^2)	Tensile strength (N/mm^2)	Elongation(%) ($L = 50$)
5083*TD*	*O*	0.6≤*t*≤12	110 min.	275～355	14 min.

Notes:
(1) Aluminium alloy seamless pipes 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

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8.2 Aluminium Alloy Pipes

8.2.5 Mechanical Properties*

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Amend to standardise the terminology used for yield strength standards.

Amend to standardise the terminology used for yield strength standards.

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</table>

Amended-Original Requirements Comparison Table (Standardisation of Terminology Used for Yield Strength Standards)

Amended	Original	Remarks
RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS **Part M WELDING** **Chapter 4 WELDING PROCEDURE AND RELATED SPECIFICATIONS** **4.2 Tests for Butt Welded Joints** **4.2.5 Tensile Tests*** Table M4.7 Tensile Test Requirements for Butt Welded Joint	**RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS** **Part M WELDING** **Chapter 4 WELDING PROCEDURE AND RELATED SPECIFICATIONS** **4.2 Tests for Butt Welded Joints** **4.2.5 Tensile Tests***	Amend to standardise the terminology used for yield strength standards.

Kind of test assembly	Grade of test assembly		Tensile test	
			Tensile strength (N/mm^2)	~~0.2 % p~~Proof stress (N/mm^2)
Rolled steels for low temperature service	*KL9N*53, *KL9N*60	*L*91 (7)	590 min. (1)	375 min.
			630 min. (2)	—
		*L*92 (7)	660 min. (1)	410 min. (1)
			670 min. (2)	—
Steel pipes for low temperature service	*KLP*9	*L*91 (7)	630 min.	—
		*L*92 (7)	670 min.	—
Aluminium alloys (3)	5086*P*-*H*112 (4)		240 min.	—
	5086*P*-*H*116			
	5083*P*-*H*116		275 min.	—
	5083*P*-*H*321			
	5383*P*-*H*116		290 min.	—
	5383*P*-*H*321			
	5456*P*-*H*116 (6)			—
	5456*P*-*H*321 (6)			

Amended				Original				Remarks
	5059*P*-*H*116	330 min.	—					
	5059*P*-*H*321							
	5086*S*-*H*111	240 min.	—					
	5383*S*-*H*112	290 min.	—					
	6061*P*-*T*6	170 min.	—					
	6005*AS*-*T*5 (5) ,6005*AS*-*T*6 (5)							
	6061*S*-*T*6 (5)							
	6082*S*-*T*5 (5) ,6082*S*-*T*6 (5)							

Notes:

(1) For test specimens in longitudinal direction

(2) For test specimen in transverse direction

(3) Grades of aluminium alloys have indication grade showing the temper condition.

(4) For test assembly thickness not more than 12.5 *mm*

(5) See **Notes (13)** of **Table M4.6**.

(6) When the thickness is 40 *mm* or less.

(7) The symbols for the welding consumables listed above indicate the materials specified in **Table M6.1**, **Table M6.12** and **Table M6.21**, and have same mark at the end. (For example, "*L*91" indicates *KMWL*91, *KAWL*91 and *KSWL*91)

Chapter 6 WELDING CONSUMABLES

6.2 Electrodes for Manual Arc Welding for Mild and High Tensile Steels and Steels for Low Temperature Service

6.2.6 Deposited Metal Tensile Test

3 The tensile strength, yield point or proof stress, and elongation of each test specimen are to comply with the requirements in **Table M6.5** appropriate to the kind of electrodes. Where the upper limit of tensile strength is exceeded, special consideration will be given to the approval of the electrode, taking the other mechanical properties shown in the test results and the chemical composition of deposited metal into consideration.

Chapter 6 WELDING CONSUMABLES

6.2 Electrodes for Manual Arc Welding for Mild and High Tensile Steels and Steels for Low Temperature Service

6.2.6 Deposited Metal Tensile Test

3 The tensile strength, yield point and elongation of each test specimen are to comply with the requirements in **Table M6.5** appropriate to the kind of electrodes. Where the upper limit of tensile strength is exceeded, special consideration will be given to the approval of the electrode, taking the other mechanical properties shown in the test results and the chemical composition of deposited metal into consideration.

Amend to standardise the terminology used for yield strength standards.

Amended-Original Requirements Comparison Table (Standardisation of Terminology Used for Yield Strength Standards)

Amended	Original	Remarks

Table M6.5 Tensile Test Requirements for Deposited Metal

Grade of electrode	Tensile Strength (N/mm^2)	Yield point or proof stress (N/mm^2)	Elongation (%)
*KMW*1	400～560	305 min.	22 min.
*KMW*2			
*KMW*3			
*KMW*52	490～660	375 min.	
*KMW*53			
*KMW*54			
*KMW*52*Y*40	510～690	400 min.	
*KMW*53*Y*40			
*KMW*54*Y*40			
*KMW*55*Y*40			
*KMW*63*Y*47	570～720	460 min.	19 min.
*KMWL*1	400～560	305 min.	22 min.
*KMWL*2	440～610	345 min.	
*KMWL*3	490～660	375 min.	21 min.
*KMWL*91	590 min.	375(1) min.	25 min.
*KMWL*92	660 min.	410(1) min.	

~~Note:~~
~~(1) 0.2% proof stress~~

Amend to standardise the terminology used for yield strength standards.

6.3 Automatic Welding Consumables for Mild Steels, High Tensile Steels and Steels for Low Temperature Service

6.3 Automatic Welding Consumables for Mild Steels, High Tensile Steels and Steels for Low Temperature Service

6.3.6 Deposited Metal Tensile Test with Multi-run Technique

2 The tensile strength, yield point or proof stress, and elongation of the deposited metal are to pass the requirements specified in **Table M6.17** according to the grade of automatic welding consumables. However, welding consumables whose

6.3.6 Deposited Metal Tensile Test with Multi-run Technique

2 The tensile strength, yield point and elongation of the deposited metal are to pass the requirements specified in **Table M6.17** according to the grade of automatic welding consumables. However, welding consumables whose tensile

Amend to standardise the terminology used for yield strength standards.

Amended-Original Requirements Comparison Table (Standardisation of Terminology Used for Yield Strength Standards)

Amended	Original	Remarks
tensile strength exceeds the upper limit of the requirements may pass the tests by giving consideration to other mechanical properties and chemical composition of the deposited metal.	strength exceeds the upper limit of the requirements may pass the tests by giving consideration to other mechanical properties and chemical composition of the deposited metal.	

Table M6.17 Tensile Test Requirements for Deposited Metal

Grade of welding consumable	Tensile strength (N/mm^2)	Yield point or proof stress (N/mm^2)	Elongation (%)
*KAW*1	400～560	305 min.	22 min.
*KAW*2			
*KAW*3			
*KAW*51	490～660	375 min.	
*KAW*52			
*KAW*53			
*KAW*54			
*KAW*52*Y*40	510～690	400 min.	
*KAW*53*Y*40			
*KAW*54*Y*40			
*KAW*55*Y*40			
*KAW*63*Y*47	570～720	460 min.	19 min.
*KAWL*1	400～560	305 min.	
*KAWL*2	440～610	345 min.	
*KAWL*3	490～660	375 min.	21 min.
*KAWL*91	590 min.	375(1) min.	25 min.
*KAWL*92	660 min.	410(1) min.	

~~Note:~~
~~(1) 0.2% proof stress~~

Amend to standardise the terminology used for yield strength standards.

6.4 Semi-automatic Welding Consumables for Mild Steels, High Tensile Steels and Steels for Low Temperature Service	**6.4 Semi-automatic Welding Consumables for Mild Steels, High Tensile Steels and Steels for Low Temperature Service**	
6.4.6 Deposited Metal Tensile Test **2** The tensile strength, yield point or proof stress, and elongation of each test specimens are to comply with the	**6.4.6 Deposited Metal Tensile Test** **2** The tensile strength, yield point and elongation of each test specimens are to comply with the requirements in **Table**	Amend to standardise the terminology used for

Amended-Original Requirements Comparison Table (Standardisation of Terminology Used for Yield Strength Standards)

<table>
<tr><th>Amended</th><th>Original</th><th>Remarks</th></tr>
<tr><td>requirements in Table M6.24 appropriate to the kind of welding consumables. Where the upper limit of tensile strength is exceeded, special consideration will be given to the approval of the semi-automatic welding consumables, taking the other mechanical properties shown in the test results and the chemical composition of deposited metal into consideration.</td><td>M6.24 appropriate to the kind of welding consumables. Where the upper limit of tensile strength is exceeded, special consideration will be given to the approval of the semi-automatic welding consumables, taking the other mechanical properties shown in the test results and the chemical composition of deposited metal into consideration.</td><td>yield strength standards.</td></tr>
<tr><td>Table M6.24 Tensile Test Requirements for Deposited Metal
<table>
<tr><th>Grade of welding consumable</th><th>Tensile Strength
(N/mm^2)</th><th>Yield point or proof stress
(N/mm^2)</th><th>Elongation (%)</th></tr>
<tr><td>KSW1</td><td rowspan="3">400～560</td><td rowspan="3">305 min.</td><td rowspan="11">22 min.</td></tr>
<tr><td>KSW2</td></tr>
<tr><td>KSW3</td></tr>
<tr><td>KSW51</td><td rowspan="4">490～660</td><td rowspan="4">375 min.</td></tr>
<tr><td>KSW52</td></tr>
<tr><td>KSW53</td></tr>
<tr><td>KSW54</td></tr>
<tr><td>KSW52Y40</td><td rowspan="4">510～690</td><td rowspan="4">400 min.</td></tr>
<tr><td>KSW53Y40</td></tr>
<tr><td>KSW54Y40</td></tr>
<tr><td>KSW55Y40</td></tr>
<tr><td>KSW63Y47</td><td>570～720</td><td>460 min.</td><td>19 min.</td></tr>
<tr><td>KSWL1</td><td>400～560</td><td>305 min.</td><td rowspan="2">22 min.</td></tr>
<tr><td>KSWL2</td><td>440～610</td><td>345 min.</td></tr>
<tr><td>KSWL3</td><td>490～660</td><td>375 min.</td><td>21 min.</td></tr>
<tr><td>KSWL91</td><td>590 min.</td><td>375(1) min.</td><td rowspan="2">25 min.</td></tr>
<tr><td>KSWL92</td><td>660 min.</td><td>410(1) min.</td></tr>
</table>
~~Note:~~
~~(1) 0.2% proof stress~~</td><td>Amend to standardise the terminology used for yield strength standards.</td></tr>
</table>

Amended-Original Requirements Comparison Table (Standardisation of Terminology Used for Yield Strength Standards)

<table>
<tr><th>Amended</th><th>Original</th><th>Remarks</th></tr>
<tr><td>

6.5 Electro-slag and Electro-gas Welding Consumables

6.5.6 Tensile Test

3 Tensile strength of each test specimen *U*2*A* or *U*2*B* is to comply with the requirements in **Table M6.32** according to the grade of welding consumable. Tensile strength, yield point or proof stress, and elongation of each longitudinal test specimen *U*1*A* are to comply with the requirements in **Table M6.33** according to the grade of welding consumable. Where the upper limit of tensile strength is exceeded, special consideration will be given to the approval of the welding consumables, taking the other mechanical properties in the test results and chemical composition of deposited metal into consideration.

</td><td>

6.5 Electro-slag and Electro-gas Welding Consumables

6.5.6 Tensile Test

3 Tensile strength of each test specimen *U*2*A* or *U*2*B* is to comply with the requirements in **Table M6.32** according to the grade of welding consumable. Tensile strength, yield point and elongation of each longitudinal test specimen *U*1*A* are to comply with the requirements in **Table M6.33** according to the grade of welding consumable. Where the upper limit of tensile strength is exceeded, special consideration will be given to the approval of the welding consumables, taking the other mechanical properties in the test results and chemical composition of deposited metal into consideration.

</td><td>Amend to standardise the terminology used for yield strength standards.</td></tr>
<tr><td>

Table M6.33 Longitudinal Tensile Test Requirement

Grade of welding consumable	Tensile Strength (N/mm^2)	Yield point or proof stress (N/mm^2)	Elongation (%)
*KEW*1 *KEW*2 *KEW*3	400～560	305 min.	22 min.
*KEW*51 *KEW*52 *KEW*53 *KEW*54	490～660	375 min.	
*KEW*52*Y*40 *KEW*53*Y*40 *KEW*54*Y*40 *KEW*55*Y*40	510～690	400 min.	
*KEW*63*Y*47	570～720	460 min.	19 min.

</td><td></td><td>Amend to standardise the terminology used for yield strength standards.</td></tr>
</table>

Amended-Original Requirements Comparison Table (Standardisation of Terminology Used for Yield Strength Standards)

Amended	Original	Remarks
6.6 One Side Automatic Welding Consumables for Mild Steels, High Tensile Steels and Steels for Low Temperature Service	**6.6 One Side Automatic Welding Consumables for Mild Steels, High Tensile Steels and Steels for Low Temperature Service**	
6.6.6 Butt Weld Test with One-run and Multi-run Technique	**6.6.6 Butt Weld Test with One-run and Multi-run Technique**	
3 Tensile strength of *U*2*A* or *U*2*B* test specimen is to be as given in **Table M6.19** of **6.3.8** according to the grades of one side automatic welding consumables. Tensile strength, yield point or proof stress, and elongation of *U*1*A* longitudinal tensile test specimens are to be as given in **Table M6.17** of **6.3.8** according to the grades of one side automatic welding consumables. Where the upper limit of tensile strength is exceeded, special consideration will be given to the approval of the welding consumables, taking the other mechanical properties shown in the test results and the chemical composition of deposited metal into consideration.	**3** Tensile strength of *U*2*A* or *U*2*B* test specimen is to be as given in **Table M6.19** of **6.3.8** according to the grades of one side automatic welding consumables. Tensile strength, yielding point and elongation of *U*1*A* longitudinal tensile test specimens are to be as given in **Table M6.17** of **6.3.8** according to the grades of one side automatic welding consumables. Where the upper limit of tensile strength is exceeded, special consideration will be given to the approval of the welding consumables, taking the other mechanical properties shown in the test results and the chemical composition of deposited metal into consideration.	Amend to standardise the terminology used for yield strength standards.

Amended-Original Requirements Comparison Table (Standardisation of Terminology Used for Yield Strength Standards)

Amended	Original	Remarks
6.7 Welding Consumables for Stainless Steel	**6.7 Welding Consumables for Stainless Steel**	
6.7.7 Deposited Metal Tensile Test	**6.7.7 Deposited Metal Tensile Test**	

Table M6.48 Tensile Test Requirements for Deposited Metal

Electrode for manual arc welding	*TIG* and *MIG* welding consumable	Flux wire for semi-automatic welding	Submerged arc welding consumable	Tensile strength (N/mm^2)	~~0.2% p~~Proof stress (N/mm^2)	Elongation (%)
*KD*308	*KY*308	*KW*308	*KU*308	550 min.	225 min.	35 min.
*KD*308*L*	*KY*308*L*	*KW*308*L*	*KU*308*L*	510 min.	205 min.	35 min.
*KD*308*N2*	*KY*308*N2*	*KW*308*N2*	-	690 min.	375 min.	25 min.
*KD*309	*KY*309	*KW*309	*KU*309	550 min.	225 min.	30 min.
*KD*309*L*	*KY*309*L*	*KW*309*L*	*KU*309*L*	510 min.	205 min.	30 min.
*KD*309*Mo*	*KY*309*Mo*	*KW*309*Mo*	*KU*309*Mo*	550 min.	225 min.	30 min.
*KD*309*MoL*	-	*KW*309*MoL*	-	510 min.	205 min.	30[(1)]min.
*KD*310	*KY*310	*KW*310	*KU*310	550 min.	225 min.	30 min.
-	*KY*310*S*	-	-	550 min.	225 min.	30 min.
*KD*310*Mo*	-	-	-	550 min.	225 min.	30 min.
*KD*316	*KY*316	*KW*316	*KU*316	550 min.	225 min.	30 min.
*KD*316*L*	*KY*316*L*	*KW*316*L*	*KU*316*L*	510 min.	205 min.	35 min.
*KD*317	*KY*317	*KW*317	*KU*317	550 min.	225 min.	30 min.
*KD*317*L*	*KY*317*L*	*KW*317*L*	*KU*317*L*	510 min.	205 min.	30 min.
-	*KY*321	-	-	550 min.	225 min.	30 min.
*KD*329*J*1	-	-	-	590 min.	390 min.	15 min.
*KD*329*J*4*L*	*KY*329*J*4*L*	*KW*329*J*4*L*	-	690 min.	450 min.	15 min.
*KD*2209	*KY*2209	*KW*2209	-	690 min.	450 min.	15 min.
*KD*347	*KY*347	*KW*347	*KU*347	550 min.	225 min.	30 min.

Note:
(1) Elongation of *KW*309*MoL* is not be less than 20(%).

Amend to standardise the terminology used for yield strength standards.

Amended-Original Requirements Comparison Table (Standardisation of Terminology Used for Yield Strength Standards)

Amended	Original	Remarks
6.9 Welding Consumables for High Strength Rolled Steels for Offshore Structures **6.9.6 Deposited Metal Tensile Test** **2** The tensile strength, yield point or proof stress, and elongation of each test specimen are to comply with the requirements specified in **Table M6.60** according to the grade of the welding consumables.	**6.9 Welding Consumables for High Strength Rolled Steels for Offshore Structures** **6.9.6 Deposited Metal Tensile Test** **2** The tensile strength, yield point (or proof stress) and elongation of each test specimen are to comply with the requirements specified in **Table M6.60** according to the grade of the welding consumables.	Amend to standardise the terminology used for yield strength standards.

Amended-Original Requirements Comparison Table (Standardisation of Terminology Used for Yield Strength Standards)

<table>
<tr><th>Amended</th><th>Original</th><th>Remarks</th></tr>
<tr><td>

GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

Part K MATERIALS

Annex K1.1.1-2 GUIDANCE FOR SEAMLESS FORGED STEEL DRUMS

1.3 Mechanical Properties

Table 2 Tensile Tests

Grade	Yield point or proof stress (N/mm^2)	Tensile strength (N/mm^2)	Elongation (%) (L =5D)	Reduction of area (%)
KSFB 42	205 min.	410 min.	24 min.	38 min.
KSFB 53	255 min.	520 min.	22 min.	40 min.

EFFECTIVE DATE AND APPLICATION

1. Effective date of this amendment is [the date of establishment].

</td><td>

GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

Part K MATERIALS

Annex K1.1.1-2 GUIDANCE FOR SEAMLESS FORGED STEEL DRUMS

1.3 Mechanical Properties

</td><td>Amend to standardise the terminology used for yield strength standards.</td></tr>
</table>