

# GUIDANCE FOR THE APPROVAL AND TYPE APPROVAL OF MATERIALS AND EQUIPMENT FOR MARINE USE

**Guidance for the Approval and Type Approval of Materials and Equipment for  
Marine Use** **2013 AMENDMENT NO.2**

Notice No.72      27th December 2013  
Resolved by Technical Committee on 29th July 2013

**ClassNK**  
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AMENDMENT TO THE GUIDANCE FOR THE APPROVAL AND TYPE APPROVAL OF MATERIALS AND EQUIPMENT FOR MARINE USE

“Guidance for the approval and type approval of materials and equipment for marine use” has been partly amended as follows:

Amendment 2-1

**Part 1 METALLIC MATERIALS**

**Chapter 1 APPROVAL OF MANUFACTURING PROCESS OF ROLLED STEELS**

**1.4 Approval Test**

Table 1.1-1 has been amended as follows.

Table 1.1-1 Standard Thickness and Dimensions of Test Samples

Material symbol		Deoxidation, grain refining etc.	Thickness <sup>(1)</sup> (mm)									
			0	10	20	30	40	50	60	70		
Rolled steels for hull	KA	Any method except rimmed			●		●					
	KB	Any method except rimmed			●		●					
	KD	Killed and fine grain treated			●		●					
	KE	Killed and fine grain treated			●		●	35				
	KA32	Killed and fine grain	without Nb and/or V		12.5	●		●				
	KA36		with Nb and/or V			●		●				
	KD32		without Nb and/or V			●		●				
	KD36		with Nb and/or V			●		●				
	KE32	KE36	Killed and fine grain treated			●		●				
	KA40	Killed and fine grain treated				●		●				
	KD40					●		●				
	KE40					●		●				
	KF32					●		●				
	KF36					●		●				
KF40					●		●					
KE47				●		●						
Rolled steels for low temperature service	KL24A	Aluminium treated killed and fine grain treated			●		●					
	KL24B				●		●					
	KL27				●		●					
	KL33				●		●					
	KL37				●		●					
	KL2N30				●		●					
	KL3N32				●		●					
	KL5N43				●		●					
	KL9N53				●		●					
	KL9N60				●		●					

(2)

(2)

70

Quenched and tempered high tensile rolled steels for structure	KA420, KD420 KE420, KF420	Killed and fine grain treated		●	●		(2)
	KA460, KD460 KE460, KF460			●	●		
	KA500, KD500 KE500, KF500			●	●		
	KA550, KD550 KE550, KF550			●	●		
	KA620, KD620 KE620, KF620			●	●		
	KA620N, KD620N KE620N, KF620N			●	●		
	KA690, KD690 KE690, KF690			●	●		
	KA690N, KD690N KE690N, KF690N			●	●		

Notes :

- (1) The colored portion (■ and ■) show the range or thickness for which normalizing of quenching and tempering treatment have been specified for steel plates respectively, while the uncolored portion shows the as-rolled condition. However, quenching and tempering is included for *KE40*, *KF32*, *KF36* and *KF40*, and normalizing and tempering is included for *KL2N30*, *KL3N32* and *KL5N43*, and *KL9N53* is to be double normalized and tempered.
- (2) See 1.4.2-3.

### 1.4.3 Details of Test

Table 1.1-2 has been amended as follows.

Table 1.1-2 Approval Test Items for Rolled Steels

Rolled steels		Kind of test (See Note <sup>(1)</sup> )																							
		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)	(u)	(v)	(w)	(x)
Rolled steels for hull	KA	○	○			○	○		○	○		○													○
	KB	○	○			○	○		○	○		○	○												○
	KD	○	○			○	○		○	○		○	○												○
	KE	○	○			○	○		○	○		○	○		○	≡	○	○	○	○					○
	KA32, KA36, KA40	○	○			○	○		○	○		○	○					○	○	○					○
	KD32, KD36, KD40	○	○			○	○		○	○		○	○					○	○	○					○
	KE32, KE36, KE40	○	○			○	○		○	○		○	○		○	≡	○	○	○	○					○
	KF32, KF36, KF40	○	○			○	○		○	○		○	○		○	≡	○	○	○	○					○
	KE47	○	○			○	○		○	○		○	○		○	○	○	○	○	○	○	○			
Rolled steels for boilers	KP42 ~ KPA56	○	○			○	○		○	○		○								○				○	





- (7) The *CTOD* test, the strain aging Charpy impact test are required by the Table for round of offshore chains, these tests may be omitted in case appropriate records prepared by the manufacture are available. In this case, such records and documents on heat treatment sensitivity, resistant to strain aging, temper embrittlement are to be submitted to the Society.
- (8) The *CTOD* test ~~and large scale brittle fracture~~ or deep notch test is, in principle, to be conducted in cases where thickness is more than 50mm.
- (9) The *CTOD* test and ~~large scale brittle fracture test~~ (double tension test, temperature gradient ESSO test, deep notch test etc.) as specified in the table are performed for the purpose of evaluating low temperature toughness, and these tests may be omitted in case appropriate records prepared by the manufacturer are available or in case the Society deems the tests unnecessary.
- (10) For the corrosion resistant steel for cargo oil tanks specified in **3.13, Part K of the Rules for the Survey and Construction of Steel Ships**, corrosion resistance test for cargo oil tanks is required in addition to those tests for rolled steels for hull given in the table.
- (11) Both *CTOD* tests and deep notch tests may be required in cases where deemed necessary by the Society.

Table 1.1-3 has been amended as follows.

Table 1.1-3 Approval Testing Method and Acceptance Criteria

Approval test item		Selected location of test samples (1)(2)	Length direction of test specimen (3)	Testing method	Acceptance criteria
Base metal test	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)
Brittle fracture test	<del><i>CTOD</i> test or deep notch Large scale brittle Fracture test</del>	Top	Parallel	To be consulted with the Society the dimension of test specimen, test condition etc. When newly performing tests at the time of approval.	To be as deemed appropriate by the Society.
	<u>Temperature gradient ESSO test or double tension test</u>	=	=	<u>Temperature gradient ESSO test is to be in accordance with Annex K3.12.2-1, Part K of the Rules.</u>	
	<i>NRL</i> drop weight test	Top	Parallel	<i>ASTM E 208</i> or equivalent method. <sup>(17)</sup>	
Weldability <sup>(18)</sup>	Butt welding tensile test <sup>(16)(19)</sup>	Top	Transverse for welding direction	Tensile test is to be carried out for one test specimen of <i>U2A</i> or <i>U2B</i>	In accordance with the requirements in <b>Chapter 4, Part M of the Rules.</b>
	Butt welding impact test <sup>(16)(19)</sup>	Top		One set of three <i>U4</i> test specimens is to be selected from at weld junction, 2 mm from weld junction, 5 mm from weld junction and 20 mm from weld junction of position of notch respectively, and tested at temperature in accordance with <b>Part K of the Rules.</b> <sup>(20)</sup>	To be as deemed appropriate by the Society.

Weldability <sup>(18)</sup>	Welding hardness test	Top	—	Rolled steels for hull Rolled steels for low temperature service High strength quenched and tempered rolled steel plates for structure (Each plate is including steel flats not less than 600 mm in width)	At section of butt welding joint, welding hardness test is measured 0.7 mm pitch by HV5 from weld junction to base metal along with the two parallel line which are 1 mm inside from the both surface of base metal.	In case of rolled steels for hull, the value of maximum hardness is not to be over 350. For <u>KE47</u> , the value is not to be over 380. For other steel plates are to be as appropriate by the Society.
				Rolled steels other than the mentioned above	JIS Z 3101 or equivalent method.	To be as deemed appropriate by the Society.
	<u>Y-shape weld crack test (Hydrogen crack test)</u>	Top	—	To be in accordance with internationally recognized standards such as JIS Z 3158, etc.	To be as deemed appropriate by the Society.	
	<u>CTOD test or deep notch test</u>	Top	Parallel	When performing tests at the time of approval, the Society is to be consulted about the dimensions of test specimens, test conditions, etc.	To be as deemed appropriate by the Society.	
Corrosion resistance test	Corrosion test	Top	—	JIS G 0575, G 0576 and G 0591 or equivalent method.	To be as deemed appropriate by the Society.	
Non-destructive test	Ultrasonic test or Eddy current test	All surface	—	Stainless crad steels	JIS G 0601 or equivalent method.	To meet the requirements of class F of JIS G 0601
				Steel with consideration for thickness directional characteristics	In accordance with the requirements in <b>Chapter 3, Part K of the Rules.</b>	In accordance with the requirements in <b>Chapter 3, Part K of the Rules.</b>
				Round bars for chains	JIS G 0801 and JIS G 0202 or equivalent method.	To be free from any defects deemed to have negative effect.
Corrosion resistance test for cargo oil tanks <sup>(20)</sup>		Top	—	In accordance with the requirements in <b>Annex 1.1.</b>	In accordance with the requirements in <b>Annex 1.1.</b>	

Notes :

((1) to (19) are omitted.)

(20) Test specimens are to be taken at a position of 1/4 thickness from the face side and the root side, and the transition temperature curve of the absorbed energy is to be determined. Test temperature is to include -40°C and the temperature interval is to be 10°C to 20°C.

(20) The chemical composition of test specimens for corrosion resistance test for cargo oil tanks is to be set in accordance with the documents specified in **1.2.2** to make it possible to confirm the validity of the chemical composition range (upper limit, lower limit) of the elements to be added for improving the corrosion resistance.

Table 1.1-4 has been amended as follows.

Table 1.1-4 Impact Test Temperature for Rolled Steel for Hull

	Grade	Direction of the test specimens	Test temperature (°C)			
Non stain aging specimens	<i>KA, KB, KA32, KA36, KA40</i>	Parallel	+20	0	-20	
		Transverse	+20	0	-20	
	<i>KD, KD32, KD36, KD40</i>	Parallel	0	-20	-40	
		Transverse	0	-20	-40	
	<i>KE, KE32, KE36, KE40, KE47</i>	Parallel	0	-20	-40	-60
		Transverse	-20	-40	-60	
<i>KF32, KF36, KF40</i>	Parallel	-20	-40	-60	-80	
	Transverse	-40	-60	-80		
Strain aging specimens	<i>KA32, KA36, KA40</i>	Parallel	+20	0	-20	
	<i>KD, KD32, KD36, KD40</i>	Parallel	0	-20	-40	
	<i>KE, KE32, KE36, KE40, KE47</i>	Parallel	-20	-40	-60	
	<i>KF32, KF36, KF40</i>	Parallel	-40	-60	-80	

## Chapter 1A WELDABILITY CONFIRMATION OF ROLLED STEELS FOR HULL

### 1A.4 Confirmation Test

#### 1A.4.3 Details of Test

Sub-paragraph -1 has been amended as follows.

**1** Test items, testing method and acceptance criteria for the confirmation test are to be accordance with **Table 1A.1**. However, when deemed necessary by the Society, the Society may request the increase of test piece, addition of test item (including *CTOD* test, deep notch test, cold cracking test, temperature gradient *ESSO* test, *HAZ* tensile test etc. other than those indicated in **Table 1A.1**) and submission of proper test organization after obtaining the approval of the Society.

## EFFECTIVE DATE AND APPLICATION (Amendment 2-1)

1. The effective date of the amendments is 1 January 2014.
2. Notwithstanding the amendments to the Guidance, the current requirements may apply to 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.

### 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.

## **Part 4 NON-METALLIC MATERIALS AND COATING MATERIALS FOR HULL**

### **Chapter 1 APPROVAL OF FIRE PROTECTION MATERIALS**

#### **1.13 Test Procedures**

Paragraph 1.13.3 has been amended as follows.

##### **1.13.3 Test for “A” and “B” Class Divisions**

**1** Test procedures are to be in compliance with the requirements for “A” and “B” class divisions specified in “Test for “A”, “B” and “F” class divisions” carried out in accordance with the *FTP* Code. ~~However,~~

**2** ~~¶~~The approval of fire doors of marginally larger dimensions than the standard specimen size (2,440mm width and 2,500mm height) is to be in accordance with *MSC.1/Circ.1319 “Recommendation for the Evaluation of Fire Performance and Approval of Large Fire Doors”*.

**3** In applying section 1.13 of APPENDIX 1, PART 3, ANNEX 1 to the FTP Code, “A” class division penetrations constructed without structural sleeves of minimum 3 mm thickness and minimum 60 mm length welded or bolted to the division and/or constructed with removable, soft or intumescent filling material are to be in accordance with IACS Unified Interpretation FTP6.

#### **EFFECTIVE DATE AND APPLICATION (Amendment 2-2)**

- 1.** The effective date of the amendments is 1 January 2014.
- 2.** Notwithstanding the amendments to the Guidance, the current requirements may apply to fire protection materials other than those for which the application for approval is submitted to the Society on or after the effective date.

## Part 6 MACHINERY

### Chapter 2 TYPE APPROVAL OF USE OF MACHINERY AND EQUIPMENT

#### 2.4 Approval Tests

##### 2.4.2 Details of Tests

Sub-paragraph -10 has been amended as follows.

**10** Air pipe automatic closing devices are to be designed and tested in accordance with (1) and (2) respectively.

(1) Materials and Construction

((a) is omitted)

(b) Construction

- i) Air pipe automatic closing devices are to be so designed that they will withstand both ambient and working conditions, and be suitable for use at inclinations up to and including  $\pm 40$  degrees.
- ii) Air pipe automatic closing devices are to be constructed to allow inspection of the closure and the inside of the casing as well as changing the seals.
- iii) Efficient ball or float seating arrangements are to be provided for the closures. Bars, cage or other devices are to be provided to prevent the ball or float from contacting the inner chamber in its normal state and made in such a way that the ball or float is not damaged when subjected to water impact due to a tank being overfilled.
- iv) Air pipe automatic closing devices are to be self-draining.
- v) The clear area through an air pipe closing device in the open position is to be at least equal to the area of the inlet.
- vi) An automatic closing device is to:
  - 1) Prevent the free entry of water into the tanks,
  - 2) Allow the passage of air or liquid to prevent excessive pressure or vacuum coming on the tank.
- vii) In the case of air pipe closing devices of the float type, suitable guides are to be provided to ensure unobstructed operation under all working conditions of heel and trim as specified in i).
- viii) The maximum allowable tolerances for wall thickness of floats are not to exceed  $\pm 10\%$  of thickness.
- ix) The inner and the outer chambers of an automatic air pipe head is to be of a minimum thickness of 6 mm.

(2) Testing

(a) Tightness tests during immersing/emerging in water

An automatic closing device is to be subjected to a series of tightness tests involving not less than two (2) immersion cycles under each of the following conditions :

- i) The automatic closing device is to be submerged slightly below the water surface at a velocity of approximately 4 m/min and then returned to the original

- position immediately. The quantity of leakage is to be recorded.
- ii) The automatic closing device is to be submerged to a point slightly below the surface of the water. The submerging velocity is to be approximately  $8\text{ m/min}$  and the air pipe vent head is to remain submerged for not less than  $5\text{ minutes}$ . The quantity of leakage is to be recorded.
  - iii) Each of the above tightness tests is to be carried out in the normal position as well as at an inclination of  $40\text{ degrees}$  under the strictest conditions for the device. In cases where such strictest conditions are not clear, tests are to be carried out at an inclination of  $40\text{ degrees}$  with the device opening facing in three different directions: upward, downward, and sideways (to the left or to the right). (See **Figure 6.2**).

The maximum allowable leakage per cycle is not to exceed  $2\text{ ml/mm}$  of nominal diameter of inlet pipe during any individual test.

(b) is omitted)

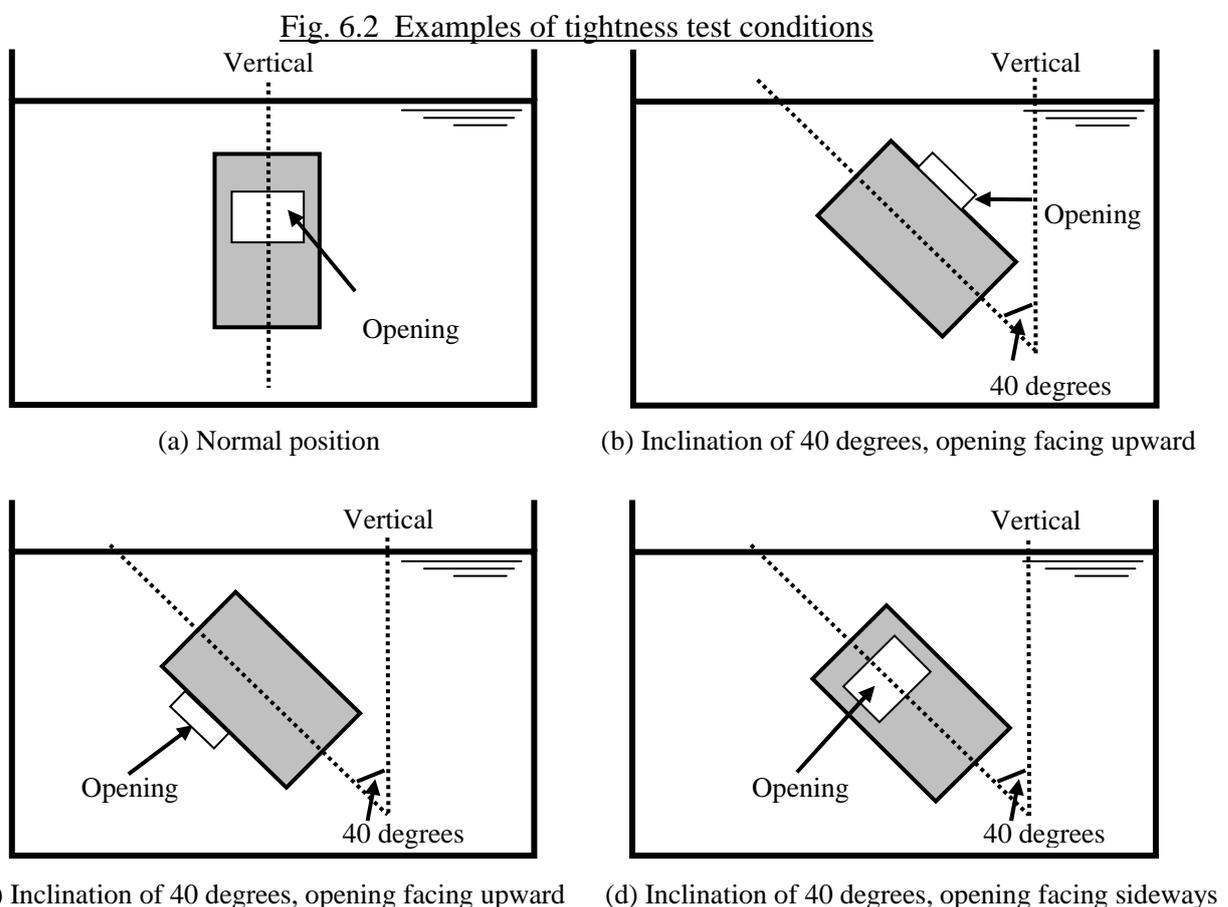
(c) Discharge / Reverse flow tests

The velocity of reverse flow which makes the air flow of the air pipe head blocking is to be confirmed to prevent excessive vacuum developing in the tank. A vacuum pump or another suitable device is to be connected to the opening of the air pipe leading to the tank. The flow velocity is to be applied gradually at a constant rate until the float gets sucked and blocks the flow. The velocity at the point of blocking is to be recorded.

(d) (omitted)

(e) (omitted)

Fig. 6.2 has been added as follows.



## 2.5 Approval

### 2.5.1 Notification and Announcement of Approval

Sub-paragraph -1 has been amended as follows.

1 The Society, when satisfied upon examination of the submitted documents as required per 2.2 to 2.4 and the attending surveyor's report, will issue a certificate of approval specifying the following (1) to (6) ~~approval number, approval date, items of approval and approval conditions~~, put approval stamps on those documents ~~as deemed necessary by the Society out of those submitted in accordance with 2.2.2 and 2.4.4 deemed necessary by the Society~~, and return them back to the applicant.

- (1) Approval number
- (2) Approval date
- (3) Approval items
- (4) Approval conditions
- (5) For air pipe automatic closing devices, 80% of the value of the flow velocity recorded in 2.4.2-10.(2)(c)
- (6) Other information considered necessary by the Society

#### EFFECTIVE DATE AND APPLICATION (Amendment 2-3)

1. The effective date of the amendments is 1 January 2014.
2. Notwithstanding the amendments to the Guidance, the current requirements may apply to air pipe automatic closing device for which the application for approval is submitted to the Society before the effective date.

## Part 6 MACHINERY

### Chapter 9 APPROVAL OF USE OF MECHANICAL JOINTS

#### 9.3 Approval Tests

##### 9.3.2 Details of Tests

Sub-paragraph (5) has been amended as follows.

(5) Pull-out test

Pipe length of suitable size is to be fitted to each end of the mechanical joints assembly test specimen. The test specimen is to be pressurized to design pressure. At the same time, an external axial load is to be imposed with ~~such that the axial loads imposed are of a~~ value calculated by the following formula:

$$F = \frac{\pi}{4} D^2 P$$

$D$  : pipe ~~outside~~inside diameter ( $mm$ )

$P$  : design pressure ( $N/mm^2$ )

$F$  : applied external axial load ( $N$ )

Both the pressure and the axial load are ~~is~~ to be maintained for a period of 5 minutes. During the test, pressure is to be monitored and relative movement between the joint assembly and the pipe measured. The mechanical joint assembly is to be visually examined for drop in pressure and signs of leakage or damage. There are to be no movement between mechanical joint assembly and the connecting pipes.

#### EFFECTIVE DATE AND APPLICATION (Amendment 2-4)

1. The effective date of the amendments is 1 January 2014.
2. Notwithstanding the amendments to the Guidance, the current requirements may apply to mechanical joint for which the application for approval is submitted to the Society before the effective date.

**Annex 1 PROCEDURES FOR PROTOTYPE TESTS FOR TYPE APPROVAL  
AND PRODUCTION TESTS OF LIFEBOATS**

**Chapter 2 PROCEDURES FOR PRODUCTION TESTS OF LIFEBOATS**

**2.1 Strength and Performance Tests**

Paragraph 2.1.3 has been amended as follows.

**2.1.3 Release gear test for lifeboats launched by falls [5.3.4]**

1 The connection of each release gear which is fixed to lifeboats launched by falls is to be subjected to a load equal to the weight of the lifeboat with its full complement of persons and equipment (or two times the weight of the lifeboat with its full complement of persons and equipment in the case of single fall systems). There is to be no damage to the release gear or its connection to the lifeboat.

2 The test specified in -1 above is not required for the secondary means of launching for freefall lifeboats.

**EFFECTIVE DATE AND APPLICATION (Amendment 2-5)**

1. The effective date of the amendments is 1 January 2014.
2. Notwithstanding the amendments to the Guidance, the current requirements may apply to life-saving appliances for ships the keels of which were laid or which were at *a similar stage of construction* before the effective date.  
(Note) The term “*a similar stage of construction*” means the stage at which the construction identifiable with a specific ship begins and the assembly of that ship has commenced comprising at least 50 tonnes or 1% of the estimated mass of all structural material, whichever is the less.