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 2007 AMENDMENT NO.1

Notice No.13 1st February 2007
Resolved by Technical Committee on 17th November 2006

ClassNK
NIPPON KAIJI KYOKAI

Notice No.13 1st February 2007
AMENDMENT TO THE GUIDANCE FOR THE APPROVAL AND TYPE APPROVAL OF MATERILAS AND EQUIPMNET FOR MARINE USE

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

Amendment 1-1

Part 4 NON-METALLIC MATERIALS AND COATING MATERIALS FOR HULL

Chapter 1 APPROVAL OF FIRE PROTECTION MATERIALS

1.2 Definitions

1.2.12 *FTP* Code

Sub-paragraphs (3) and (4) have been renumbered to (4) and (5) respectively, and sub-paragraph (3) has been added as follows.

(3) Appendix.I/2.2 of *IMO Resolution A.*754(18)
Windows to be fitted at the forward bulkhead of accommodation block on tankers are to correspond to prototype subject to the "*A*" class standard fire test with the fire against its external side (i.e. the side which, after the installation on board, will be exposed to the weather). The insulation of the bulkhead used along with the window's specimen is to be fitted on the unexposed face of the structural core.

EFFECTIVE DATE AND APPLICATION (Amendment 1-1)

1. The effective date of the amendments is 1 January 2007.
2. Notwithstanding the amendments to the Guidance, the current requirements may apply to windows for ships other than ships for which the application for Classification Survey during Construction is submitted to the Society on and after the effective date.

Amendment 1-2

Part 1 METALLIC MATERIALS

Chapter 1 APPROVAL OF MANUFACTURING PROCESS OF ROLLED STEEL

1.2 Approval Application

1.2.2 Documents to be Submitted

Sub-paragraph -1(2)(b) has been amended as follows.

(b) Data on quality control system
  i) Organization and number of staff employed of the quality control department
  ii) Qualification of the personnel involved in activities related to the quality of the products
  iii) Items and methods for quality control system
  iv) Outline of system used for identification of materials
  v) Outline of testing machines and relevant calibration procedures and records
  vi) Outline of equipment for chemical analyses and metallography and relevant calibration procedures
  vii) Outline of equipment for non-destructive tests and relevant calibration procedures
  viii) Certification of compliance of the quality system with *ISO* 9001 and 9002, if any

Chapter 2 APPROVAL OF MANUFACTURING PROCESS OF STEEL PIPES

2.1 General

2.1.1 Scope

Sub-paragraph -3 has been newly added as follows.

3 The requirements of this chapter correspondingly apply to tests and inspection for the approval of manufacturing process for primary materials of steel pipes specified in preceding **-1** and **-2**.

2.4 Approval Test

2.4.2 Details of Test

In Table 1.2-1, notes(6) has been newly added as follows.

(6) Approval test items for primary materials of steel pipes are to be chemical analysis, sulphur print and macro-structure

Chapter 3 APPROVAL OF MANUFACTURING PROCESS OF STEEL CASTINGS AND STEEL FORGINGS

3.2 Application Procedure

3.2.2 Data to be Submitted

Sub-paragraph -1(1) has been amended as follows.

(1) Approval test plan, if required (For crankshafts, crank throws or crank webs, the related engine types are to be indicated.)

3.4 Approval Test

Paragraph 3.4.1 has been amended as follows.

3.4.1 General

For the materials listed below, approval tests are to be carried out in accordance with the test plans approved by the Society.

(1) Crankshafts, crank throws or crank webs listed in **6.1.13-2, Part K of the Rules for the Survey and Construction of Steel Ships**

(2) Others designated by the Society

Paragraphs 3.4.3 and 3.4.4 have been renumbered to 3.4.4 and 3.4.5 respectively.

Paragraph 3.4.3 has been newly added as follows.

3.4.3 Details of Test

Details of the tests for those listed in **3.4.1(1)** are as follows.

(1) Kinds of Steel

The tests are to be carried out for each kind of steels as the standard practice. Even within the category of steel forgings, normalized steels (including annealed steels or annealed steels after normalization) and quenched and tempered steels are to be considered different kinds of steels. However, for example, in case where approval for carbon steel forgings in both *KSF* 50 and *KSF* 60 is applied, tests on *KSF* 60 which has a higher tensile strength are to be carried out as the standard practice.

The same principle is to be applied in dealing with *Cr-Mo* steel forgings and *Ni-Cr-Mo* steel forgings.

(2) Test specimens

The test specimen is to have a crank throw with the maximum diameter manufactured or close thereto, as the standard practice.

(3) Tests

The tests consist of the following items are to be carried out on the test specimens, as the standard practice:

(a) Sulphur print test and macro-structure analysis (The specimens are to be taken from sections *A-A, B-B* and *C-C* specified in **Fig. 1.3-1**.)

(b) Chemical composition analysis test (The specimens are to be taken from the positions asterisked in **Fig. 1.3-1**.)

(c) Micro-structure analysis (The specimens are to be taken from the positions asterisked in **Fig. 1.3-1**.)

(d) Hardness test (Positions in the vicinity of pin or journal surface. In the case of quenched and tempered steels, hardness distribution from the surface to the shaft centre.)

(e) Tensile test and bend test (or impact test)(Test specimens are to be taken as specified in **Fig. 1.3-2**.)

(f) Non-destructive testing (The requirements specified in **5.1.10** or **6.1.10, Part K of**

the Rules for the Survey and Construction of Steel Ships apply correspondingly.)

(g) Other tests deemed necessary by the Society

Fig. 1.3-1 and Fig. 1.3-2 have been newly added as follows.

Fig. 1.3-1 Sampling Positions

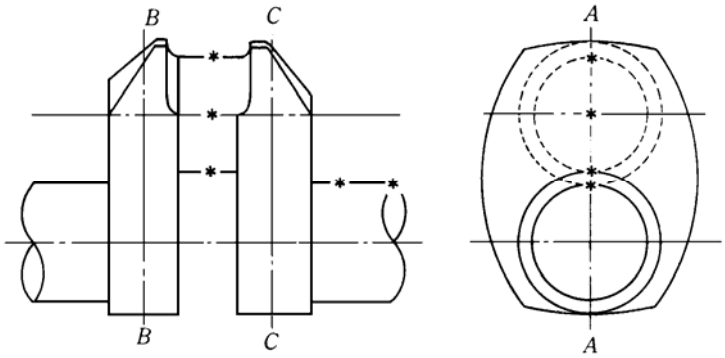
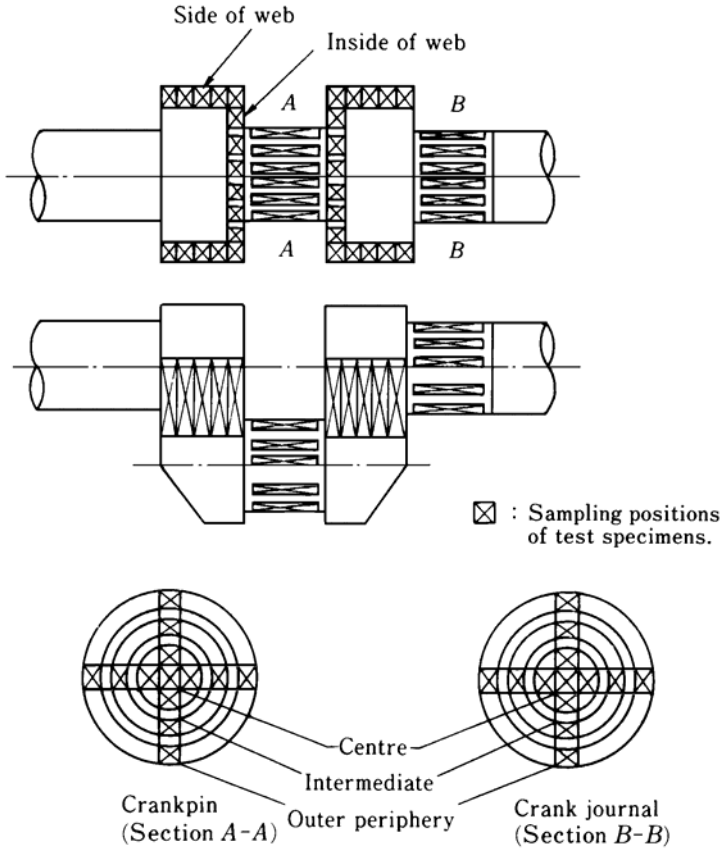


Fig. 1.3-2 Sampling Positions of Test Specimens



3.5 Approval

3.5.1 Notification and Announcement of Approval

In Sub-paragraph -1, the wording “3.4.3” has been amended to “3.4.5”.

Chapter 4 has been amended as follows.

Chapter 4 APPROVAL OF MANUFACTURING PROCESS OF CRANKSHAFTS UNDER SPECIAL REQUIREMENTS

4.1 General

4.1.1 Scope

1 The requirements of this chapter apply to the tests and inspection carried out for the approval of the manufacturing processes specified in the following **(1)** or **(2)** in order to reduce the crankshafts dimensions in accordance with the requirements of **2.3.1-1 of Part D**, **5.1.13-2** and **6.1.13-3 of Part K of the Rules for the Survey and Construction of Steel Ships** (hereinafter referred as “the Rules”):

(1) The special forging processes specified in **K6.1.13-3, Part K of the Guidance for the Survey and Construction of Steel Ships**.

(2) The manufacturing processes using the surface treatments such as induction hardening, cold-rolling and nitriding.

2 Unless otherwise specially specified in this Chapter, the requirements in **Chapter 3** are to be applied.

4.2 Application Procedures

4.2.1 Data to be Submitted

The manufacturer who applies for an approval of the manufacturing process mentioned in **4.1.1-1(2)** is to submit three copies of the data showing the details of surface treatment in addition to those listed in **3.2.2-1**.

4.3 Approval Tests

4.3.1 General

Approval tests are to be carried out in accordance with **3.4** to adopt the manufacturing process mentioned in **4.1.1-1(1)** or **(2)**. In this regard, the requirements in **3.4.3** are to be applied as follows.

(1) Approval test for special forged crankshafts

The test items listed below are to be added to those listed in **3.4.3(3)**.

(a) Microscopic testing method for the non-metallic inclusions (as per *JIS G* 0555) (The specimens are to be taken from the positions asterisked in **Fig. 1.3-1**.)

(b) Bending fatigue test on actual crank throw
The number of test specimens is to be at least 2.

(c) Rotational bending fatigue test on small-size test specimens (Dia. 10～20 *mm*)
The number of test specimens is to be not less than 10 and they are to be taken from the positions described in **Fig. 1.4-1** as the standard practice. In cases of approval for carbon steel forgings or where previous data on this test is available, this test may be omitted subject to approval by the Society.

(2) Approval test for crankshafts with surface treatments

(a) The requirements in this **(2)** apply to cases where the fillets of a crankshaft are applied with induction hardening, cold-rolling, nitriding, etc. In cases where surface treatment is applied to all over the crankpins, journals and fillets, consideration will be given for testing procedure in each case.

(b) Tests
Instead of the items listed in **3.4.3(3)**, the tests are to consist of the followings:

i) Non-destructive testing (The conditions of defects on the surface of the test specimens before and after the surface treatment are to be examined. The detection is to be either by magnetic particle test or liquid penetrant test.)

ii) Examination of the hardness distribution, depth of hardening and residual stress (Examination is to be carried out on the surface treated areas and their vicinity. Further, in case where cold-rolling is carried out, measurements for the deformation on the cold-rolling area are to be included.)

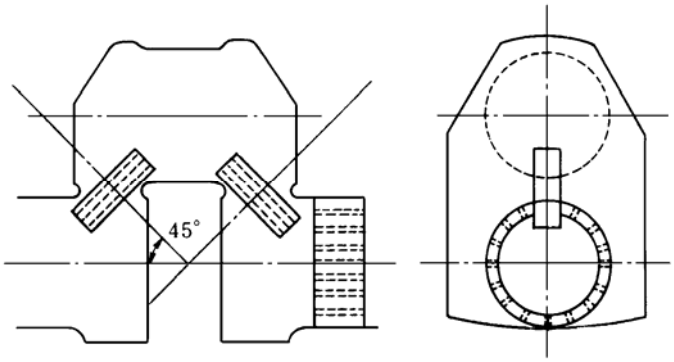
iii) Surfer print test, microstructure test and macroscopic test (to be carried out on the sectional area in the direction of hardening depth.)

iv) Bending fatigue test on actual crank throw (Tests are, in principle, to be carried out on both the crank throws with and without surface treatments. In this case, the number of test specimens is to be sufficient to verify the strength improvement ratio ρ specified in **2.3.1-1, Part D of the Rules**. In this connection, the torsional fatigue tests on the actual crank throws or the test specimens having sizes similar to them are also to be carried out.)

v) Tensile test and bend test (or impact test) (one set of test specimens are to be taken from the end portion of crankshaft with surface treatment.)

vi) Other tests deemed necessary by the Society

Fig. 1.4-1 Sampling Positions of Bend Test Specimens



4.4 Approval

4.4.1 Notification

The requirements in **3.5.1-1** are to be applied as follows to adopt the manufacturing process mentioned in **4.1.1-1(1)** or **(2)**.

(1) Judgement of test results on special forged crankshafts

The manufacturing process can be approved in case where the results of the tests carried out in accordance with **4.3.1(1)** prove that the grain flow is continuous, the product quality is judged stable and the fatigue strength obtained from **4.3.1(1)(b)** have been improved by 20% or more when compared with the fatigue strength of a free-forged crankshaft σ_W (N/mm^2) calculated by the following formula :

When $D \leq 100$,

$$\sigma_W = 196\left[1+\frac{2}{3}\left(\frac{T_S}{440}-1\right)\right]$$

When $100<D<200$,

$$\sigma_W = \left(216-\frac{D}{5.1}\right)\left[1+\frac{2}{3}\left(\frac{T_S}{440}-1\right)\right]$$

When $D \geq 200$,

$$\sigma_W = 177\left[1+\frac{2}{3}\left(\frac{T_S}{440}-1\right)\right]$$

D : diameter of test specimen (mm)

T_S : specified minimum tensile strength (N/mm^2)

(2) Judgement of test results on crankshafts with surface treatments

The manufacturing process can be approved in case when the results of the tests carried out in accordance with **4.3.1(2)(b)** prove that the product quality is judged stable and excellent improvement in the fatigue strength are obtained.

(3) Approval for special forged crankshafts with surface treatments

In case where the crankshaft manufactured under the special forging process mentioned in **4.1.1-1(1)** is applied with the surface treatment mentioned in **4.1.1-1(2)**, the judgement for acceptance is to be determined by considering the results of the tests for free-forged crankshaft with surface treatment and the strength of the crankshaft at the positions other than fillets.

Part 2 EQUIPMENT

Chapter 4 APPROVAL OF RAW TEXTILES FOR SYNTHETIC FIBRE ROPES

4.1 General

4.1.1 Scope

Existing text has been amended as follows.

The approval of the manufacturing process of raw textiles for synthetic fibre ropes specified in the provisions of **5.1.3-1, Part L of the Rules for the Survey and Construction of Steel Ships** (hereinafter referred to as "the Rules") and **L5.1.3, Part L of the Guidance for the Survey and Construction of Steel Ships** is to be carried out in accordance with the provisions of this chapter.

EFFECTIVE DATE AND APPLICATION (Amendment 1-2)

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

Amendment 1-3

Part 1 METALLIC MATERIALS

Chapter 5 APPROVAL OF MANUFACTURING PROCESS OF ALUMINIUM ALLOYS

5.2 Approval Application

5.2.2 Data to be submitted

Table 1.5-1 has been amended as follows.

Table 1.5-1 Approval Test Items for Aluminium Alloys

Products	Material grade	Temper grade	Kind of Test[1], [2]									
			Chemical analysis	Macrostructure	Microstructure	Tensile test at room temperature	Tensile test at low temperature[3]	Tensile test of notched round bar[3]	Tensile test in the direction of	Bend test	Tear test[3][5]	Corrosion test[6]
Rolled Products	5083*P*	*O*	○	○	○	○	○	○	○	○	○	
		*H*112	○	○	○	○				○		
		*H*116	○	○	○	○				○		○
		*H*321	○	○	○	○	○	○		○	○	○
	5086*P*	*O*	○	○	○	○				○		
		*H*112	○	○	○	○				○		
		*H*116	○	○	○	○				○		○
	5383*P*	*O*	○	○	○	○				○		
		*H*116	○	○	○	○				○		○
		*H*321	○	○	○	○				○		○
	5059*P*	*O*	○	○	○	○				○		
		*H*116	○	○	○	○				○		○
		*H*321	○	○	○	○				○		○
	5754*P*	*O*	○	○	○	○				○		
	5456*P*	*O*	○	○	○	○				○		
		*H*116	○	○	○	○				○		○
		*H*321	○	○	○	○				○		○
	6061*P*	*T*6	○	○	○	○				○		

Extruded shapes	5083*S*	*O*	○	○	○	○	○	○	○	○		
		*H*111	○	○	○	○				○		
		*H*112	○	○	○	○				○		
	5086*S*	*O*	○	○	○	○				○		
		*H*111	○	○	○	○				○		
		*H*112	○	○	○	○				○		
	5383*S*	*O*	○	○	○	○				○		
		*H*111	○	○	○	○				○		
		*H*112	○	○	○	○				○		
	5059*S*	*H*112	○	○	○	○				○		
	6005*A S*	*T*5	○	○	○	○				○		
		*T*6	○	○	○	○				○		
	6061*S*	*T*6	○	○	○	○				○		
	6082*S*	*T*5	○	○	○	○				○		
		*T*6	○	○	○	○				○		

(Note)

(1) Each test item indicated with a ○ mark in the Table are to be performed for approval tests for each aluminium alloys.

(2) When deemed necessary by the Society, tests related to fatigue tests, weld joint tests, corrosion resistance tests, stress corrosion cracking tests etc., or submission of reference data relating to these tests are requested.

(3) This test is carried out for aluminium alloys used at extremely low temperature such as tanks for liquefied gas carrier.

(4) This test is carried out for test sample with thickness more than 100*mm*.

(5) Other tests may be applied, subject to the approval by the Society.

(6) This test is carried out for aluminium alloys intended for use in marine hull construction or in marine applications where frequent direct contact with seawater is expected.

EFFECTIVE DATE AND APPLICATION (Amendment 1-3)

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.

Amendment 1-4

Part 7 CONTROL AND INSTRUMENTATION EQUIPMENT AND ELECTRICAL INSTALLATIONS

Chapter 7 has been added as follows.

Chapter 7 APPROVAL OF USE OF GAS DETECTION EQUIPMENT

7.1 General

7.1.1 Scope

1 The requirements in this Chapter apply to the flammable or toxic gas detection equipment of fixed type and portable type provided for gas detection in accordance with the requirements in **4.5.7** and **4.5.10 Part R**, **13.1.4** and **13.6.1 Part N**, **13.2.1 Part S** of the Rules for the Survey and Construction of Steel Ships. However, where the tests are conducted for individual fixed type gas detection equipment, no approval may be required for its use.

2 In cases where application of the requirements in this Chapter is difficult, they are to be dealt with in each case.

7.2 Application

7.2.1 Application Form

The manufacturer, who intends to obtain the approval of use, is to submit an application (Specimen **Form 7-9**) filled in with necessary data and information to the Society (Head office).

7.2.2 Documents

The documents listed **(1)** through **(11)** below, each in triplicate, are to be submitted together with the application form specified in **7.2.1**.

(1) Approval test plan (the place of test and scheduled date of test are to be entered)
(2) Outline plans
(3) Sectional assembly
(4) Installation procedure
(5) Instruction manual
(6) Strength calculation sheets of structural members (thermal stress calculations are to be included where deemed necessary)
(7) List of spare parts
(8) List of cargoes suitable for detection and detecting ability
(9) Data relating to the compatibility of the materials used for the gas detection equipment with the cargoes
(10) General instruction manual including the periodical inspection and maintenance.
(11) Other plans and documents deemed necessary by the Society depending on the type of the equipment, etc.

7.3 Preliminary Examination

7.3.1 Approval of Test Plan

The Society examines the approval test plan submitted under the requirements of **7.2.2(1)**, and where deemed appropriate, the plan is approved and returned to the applicant. When the Society examines the documents prescribed in **7.2.2** and considers appropriate, a part of the test items may be omitted.

7.3.2 Confirmation of Manufacturing and Quality Control Procedure

When deemed necessary, the Society may request an on-site investigation of the manufacturer.

7.4 Approval Test

7.4.1 Materials

The materials of the detection equipment are to have corrosion resistance or to be subjected to corrosion-resisting processing. Particularly, those parts liable to be exposed to cargo vapour are to be suitable for use in the atmosphere of these vapours.

7.4.2 Construction

1 The detection equipment is to be provided with an indication device capable of clearly showing that the equipment is in service when it is in operation.

2 The detection equipment, which is used in a flammable atmosphere, is to have necessary explosion proof performance.

3 In the detection equipment provided with a suction pump, the capacity of such a pump is to be sufficient to draw detecting object mixture gas in a volume sufficient for detection and measurement.

4 Sampling heads are to be arranged by taking into account the properties of the detecting object mixture gas.

5 The sampling lines from each sampling head to the detection device are to be independent with each other.

6 Means are to be provided so that gas detection can be made automatically at least once every 30 *minutes* for each sampling head.

7 The gas detection equipment is to be provided with a function to display location of the sampling head under detection and to identify the alarm point when alarm is issued.

8 For the gas detection equipment serving to detect one sampling point and portable gas detection equipment, the requirements in the preceding **-5** to **-7** do not apply.

7.4.3 Gas Concentration Indicator

1 Each gas detection equipment, except for cases specifically approved by the Society, is to be provided with gas concentration indicator conforming to the following requirements **-2** to **-4**.

2 The flammable gas detection equipment is to be capable of indicating gas concentration, at least, up to the lower explosive limit (the same definition of "flammability limits" as given in **Part N** of the Rules and hereinafter referred to as "*LEL*"). However, the flammable gas detection equipment provided in cargo containment systems other than independent tanks is to be also capable of indicating the gas concentration up to 100% in volume.

3 The toxic gas detection equipment is to be capable of indicating gas concentration, at least, up

to twice the threshold limiting value (hereinafter referred to as "*TLV*").

4 Notwithstanding the requirements in the preceding **-2** and **-3**, the Society may accept the lower indicating range in consideration of the construction and the purpose of use of the gas detection equipment. However, it is to be capable of indicating, at least, up to the concentration corresponding to the preset alarm value.

7.4.4 Alarm Systems

1 The gas detection equipment is to be provided with audible and visible alarm systems capable of issuing alarms when the setting value is exceeded.

2 The setting values of alarm are to be changeable as necessary, and they are to be readily recognizable.

3 The setting value of alarm of the flammable gas detection equipment is to be not more than 30% *LEL*.

4 The setting value of alarm of the toxic gas detection equipment is, as a rule, to be not more than the *TLV*

5 The alarm systems are to be in accordance with the following requirements **(1)** through **(4)**:

(1) Alarms are to continue until resetting is caused even when the gas concentration assumes a value lower than the setting value of alarm.

(2) Audible alarms are to be so arranged that temporary alarm stop can be made.

(3) Alarms are to resume when the gas concentration of other sampling point exceeds the setting value of alarm even when audible alarms are temporarily in a state of alarm stop.

(4) The alarm system is to be capable of issuing alarm in the event of failure of the system such as loss of power supply and parting of wiring. The visible alarm issued in such an event is to be capable of being distinguished from those issued in cases as given in the preceding **-1**.

6 For portable system, alarm function may not be provided, but means are to be provided to verify the effectiveness of the batteries.

7.4.5 Performance

1 The detection equipment is to be capable of functioning in the environmental conditions of ships including varying temperature and humidity, vibrations and ship motions generally conceivable in ships.

2 For the detection equipment of suction type, no significant effects are to be given on the indicating accuracy and alarming accuracy, or means are to be provided to compensate or correct these differences in temperature or humidity even when differences in temperature or humidity are caused between the sampling heads and detection equipment.

3 The detection equipment is to be capable of becoming ready for detection with least possible delay time when the power supply switch is turned on.

4 The accuracy of the gas concentration indicator is to conform to the following requirements **(1)** or **(2)**:

(1) Flammable gas detection equipment

(a) for the equipment with a full scale value exceeding 50% *LEL* or volume, the error is to be ±5% of the full scale or ±10% of the concentration of the detected gas, whichever is the greater.

(b) for the equipment with a full scale value not exceeding 50% *LEL* or volume, the error is to be ±10% of the full scale value or ±20% of the concentration of the detected gas, whichever is the greater.

(c) a gas concentration corresponding to 20% *LEL* in either range is to be capable of being indicated with an error not exceeding ±20%.

(2) Toxic gas detection equipment
The accuracy is determined individually considering property of the detected gas, the specification of the detection equipment, etc. In General, it is to be within +30% and -10% of *TLV*.

5 The alarming error is to be within ±25% of the alarm set value. However, in the toxic gas detection equipment, the alarming error is to be within +15% and -30% respectively.

7.4.6 Test Standards

1 Visual inspection
In visual inspection, it is to be verified that the construction, materials and dimensions are as specified on the drawings and specifications.

2 Performance test
On all the vapours to be detected, the following tests **(1)** through **(7)** are to be conducted. However, in the flammable gas detection equipment, when approved by the Society, the number of test gas may be reduced or replacement test gas may be used in the test. The concentration of the gas used in the test is to be analysed by gas chromatography or similar other equally effective method.

(1) Verification of indicating accuracy
It is to be verified that the indicating accuracy at least at three different concentrations of vapour adequately set conforms to that stated in the specification. In cases where ranges of measurement can be altered, verification is to be made for each range.

(2) Verification of alarming accuracy
By gradually raising the concentration of a vapour, it is to be verified that the concentration when alarm is issued is within the allowable range of error. In cases where points of alarm set can be altered, verification is to be made at least at three set points.

(3) Verification of reproducibility
Tests identical with the preceding **(1)** and **(2)** are to be conducted with drawing of the gas and air repeated alternately at proper intervals. In the case of the portable gas detection equipment, making and breaking of power supply are to be included in the test.

(4) Verification of response performance
By introducing the test gas, the period before the indication of gas concentration reaches 90% of the value of final indication is to be measured. Further, a test gas with a concentration corresponding to 115% of the alarm set value is to be induced whereby the period before issuing an alarm is to be measured. In either case, the period is to be not more than 30 *seconds*. However, the period may be modified to not more than 1 *minute* in case where the vapour pressure of the test gas at a temperature of 37.8℃ is not more than 0.28*MPa*, and to not more than 3 *minutes* in the case of toxic gas detection equipment. In the case of portable type, the pointer is to start moving in 3 *seconds*.

(5) Verification of operation of alarm system
It is to be verified that the alarm system functions properly for each cause of alarm.

(6) Verification of initiation of operation
The test specified in the preceding **(2)** is to be conducted after an elapse of the period given in the specification on the detection equipment which had been placed in normal operation once, then break the power supply and make it after it was left for 24 *hours*.

(7) Verification of suction pump capacity
It is to be verified that the capacity of the suction pump satisfied the specification.

3 Environmental Tests

(1) The detection equipment is to be subjected to the tests specified in the preceding **-2(1)** and **(2)** under the environment given in the following **(a)** through **(e)** and pass the testing

requirements. In the case of the fixed type gas detection equipment, the following test **(b)** may be omitted:

(a) Psychrometric test
(b) Drop test
(c) Vibration test
(d) Inclining test
(e) Power supply variation test

(2) The testing procedures of each test are to be in accordance with the following requirements:

(a) Psychrometric test
The detection equipment is to be placed in a thermostatic tank of which environmental conditions are adjusted to 90-95% of humidity and 50±2℃ of temperature, and then left for 8 hours. The temperature of the thermostatic tank is to be adjusted to -10±2℃ with the humidity left unadjusted, and then left for another 8 hours. This cycle is to be repeated 3 *times*.

(b) Drop test
With the outer protective casing of the gas detection equipment removed (excluding those used with the case fitted), the test object is to be dropped freely in various directions excluding the faces incorporating lenses and glasses onto the floor laid with a 50*mm* thick sheet of cedar on top from a height of 100*mm*.

(c) Vibration test
The gas detection equipment is to be fixed in the vibration testing machine and vibrations with a frequency in a range from 5 to 16*Hz* (double amplitude : 2*mm*) and another frequency in a range from 16 to 60*Hz* (acceleration : 1*G*) are to be applied in the vertical, horizontal transverse and longitudinal directions for 30 *minutes* in each direction (tests are to be progressed from low vibration to high vibration at 10 *minutes* cycle and again from low to high). However, for the fixed type gas detection equipment, the requirements in 3.5 of *JIS F* 0807 "General Rules for Environmental Test on Automatic Control for Marine Use" or in equivalent standards.

(d) Inclining test
The requirements in 3.6 of *JIS F* 0807 or in equivalent standards are to be complied with.

(e) Power supply variation test
The requirements in 3.7 of *JIS F* 0807 or in equivalent standards are to be complied with.

4 Tests for explosion-proof performance
The requirements in **Chapter 5, Part 8** of this Guidance are to be complied with.

7.4.7 Shipboard Inspection

In the case of the fixed type gas detection equipment, operating test is to be conducted after completion of all the piping systems and accessories on board the ship. In this time, at least issuing alarm is to be verified to draw the test gas from each sampling headers.

7.4.8 Witness of Tests

As a rule, the approval tests are to be carried out at the present of the Society's surveyor. However, attendance of the Society's surveyor may not be necessary in case the said tests are carried out at a recognized official organization deemed appropriate by the Society.

7.4.9 Test Records

1 After completion of the approval test, the manufacturer is to prepare a record of the approval test and is to submit three copies to the Society after verification by the attending surveyor.

2 Where the provision of **7.4.8** applies, the verification by the surveyor may not be required for the test record prepared by the recognized organization.

3 The records relating to quality control implemented during the production of the test specimen are to be attached to the record of the approval test in **-1** above.

7.5 Approval

7.5.1 Notice of Approval and Publicity

1 The Society, when satisfied upon examination of the submitted documents as required per **7.2** to **7.4** and the attending surveyor's report, will approve the use of the gas detection equipment. In this case, the Society will issue a certificate of approval specifying the approval number, approval date, items of approval and approval conditions, and put approval stamps on the documents as deemed necessary by the Society out of those submitted in accordance with **7.2.2** and **7.4.9**, and return them back to the applicant.

2 The Society will make public the approval of the gas detection equipment.

7.5.2 Term of Validity

The term of validity of the approval of gas detection equipment is not to exceed five years from the date of approval.

7.5.3 Renewal of Approval

1 In case where renewal of validity is intended, the manufacturer is to submit the existing certificate, and to apply in accordance with the requirements of **7.2**. In this case, the data required per **7.2** may be limited to the portion subjected to modification only.

2 Where approval is given for the partial modifications in the contents of approval, expiration date will not be renewed, in principle.

7.5.4 Revocation of Approval

In case where either of the following **(1)** to **(4)** applies, the Society will revoke the approval for use of gas detection equipment, and give notice to the manufacturer.

(1) When renewal procedures were not undertaken without any special reason.

(2) In association with the implementation or revision of international conventions, laws and regulations, the machinery and equipment for which the approval was granted do not deserve the approval any longer.

(3) When serious shortcomings are found in structure or quality of the gas detection equipment already approved after being installed in ships.

(4) When an application for revocation is made by the manufacturer.

7.6 Handling after Approval

7.6.1 Tests and Inspection on the Individual Product

Tests and inspection at the manufacturing plant of gas detection equipment which have been obtained the approval for use may be limited to those specified in the approved certificate mentioned in **7.5.1-1** notwithstanding the relevant requirement of the Rules and their Guidance.

7.6.2 Marking and Maintenance/Inspection

1 The gas detection equipment is to be marked with the following items **(1)** through **(5)**:
(1) Name of manufacturer, date of manufacture and type number
(2) In the case of explosion-proof construction, the type and explosion-proof performance
(3) The type of detectable gas and measuring range
(4) Rated voltage and frequency (or type and number of batteries)
(5) Alarm set values

2 The gas detection equipment is to be provided with instruction manuals and where necessary, correction tables or equations for temperature corrections.

3 The details of periodical inspection and maintenance checks necessary for the maintenance of the performance of the detection equipment are to be noted in the instruction manual. Further, record books of periodical inspection and maintenance checks, also necessary test gases and associated fittings are to be provided.

Form 7-9

APPLICATION FOR APPROVAL OF USE OF
GAS DETECTION EQUIPMENT

(☐Initial ☐Renewal ☐Modification)

To: Material & Equipment Department, NIPPON KAIJI KYOKAI
4-7, Kioi-cho, Chiyoda-ku, Tokyo 102-8567, JAPAN

Ref. No.:
Date:

Name of Applicant

Address:

Phone No./ Fax.No.:

We hereby apply for type approval of the following arrangement in accordance with the requirements of Chapter 7, Part 7 of the Guidance for the Approval of Materials and Equipment for Marine Use of Nippon Kaiji Kyokai.

Names/Types of arrangement		
Type approval Nos. If Available		
Particulars		
Names of Manufacturer and Production Site		
Intended for (service)		
Drawings and Documents Attached	Drawings	
	Documents	
Date of Tests/Inspections and Places		

Notes:
1. Use additional sheets if necessary
2. ☐Tick off where appropriate

EFFECTIVE DATE AND APPLICATION (Amendment 1-4)

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

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