No. 7833

UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND
and
DENMARK

Exchange of notes (with annex) constituting an agreement on the application of uniform testing rules for the structural fire protection of ships to comply with the requirements of the International Convention for the Safety of Life at Sea, 1960. London, 30 June 1964

Official text of notes: English.

Official texts of annex: English and Danish.

Registered by the United Kingdom of Great Britain and Northern Ireland on 18 June 1965.

ROYAUME-UNI DE GRANDE-BRETAGNE ET D'IRLANDE DU NORD
et
DANEMARK

Échange de notes (avec annexe) constituant un accord relatif à l'application de règles uniformes d'essai pour la protection contre l'incendie des structures de navires, en vue de remplir les conditions requises par la Convention internationale pour la sauvegarde de la vie humaine en mer de 1960. Londres, 30 juin 1964

Texte officiel des notes: anglais.

Textes officiels de l'annexe: anglais et danois.

Enregistré par le Royaume-Uni de Grande-Bretagne et d'Irlande du Nord le 18 juin 1965.

No. 7833. EXCHANGE OF NOTES CONSTITUTING AN AGREEMENT[1] BETWEEN THE GOVERNMENT OF THE UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND AND THE GOVERNMENT OF THE KINGDOM OF DENMARK ON THE APPLICATION OF UNIFORM TESTING RULES FOR THE STRUCTURAL FIRE PROTECTION OF SHIPS TO COMPLY WITH THE REQUIREMENTS OF THE INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1960.[2] LONDON, 30 JUNE 1964

I

The Danish Ambassador at London to the Secretary of State for Foreign Affairs

ROYAL DANISH EMBASSY

London, 30th June, 1964

Sir,

1. I have the honour to refer to the recent negotiations between representatives of the Government of the Kingdom of Denmark and the Government of the United Kingdom of Great Britain and Northern Ireland regarding the question of applying uniform testing rules in order to ensure that constructions and materials for use in connection with structural fire protection of ships when tested at a testing laboratory, recognised by the Government in the other Country, comply with the requirements laid down in the International Convention for the Safety of Life at Sea, open for signature at London on the 17th June, 1960.[2]

2. I now have to propose on behalf of the Danish Government that an agreement on this subject be concluded in the following terms :

(*a*) When constructions and materials for use in connection with structural fire protection of ships have been tested according to the rules laid down in the attached Annex, the results stated in the fire test report shall be accepted by the Administration of the other Contracting Government without further test as a basis for the issuing of a certificate of approval for these constructions and materials. For the purposes of this Agreement it is understood that the term Administration means in the case of the Danish Government the Handelsministeriet and in the case of the Government of the United Kingdom the Ministry of Transport.

[1] Came into force on 30 June 1964 by the exchange of the said notes.

[2] United Nations, *Treaty Series*, Vol. 536, p. No. 7794.

(*b*) Approval can only be granted if the fire test has been attended and reported upon by a representative of the Administration of the Country in which the test is carried out.

(*c*) The Administrations shall regularly verify that the approved types of constructions or materials still attain the approved standards and will exchange information on the general form of control.

(*d*) Information concerning approvals shall be exchanged between the Contracting Governments.

(*e*) Alterations and additions to the rules laid down in the above mentioned Annex may take place when agreed upon by both Contracting Governments.

3. If the foregoing proposals are acceptable to the Government of the Kingdom of Denmark and the Government of the United Kingdom of Great Britain and Northern Ireland I have the honour to suggest that this Note together with the Annex and your reply in that sense shall constitute an Agreement between the two Governments in this matter, which shall enter into force on this day's date.

I have, etc.

E. KRISTIANSEN

II

The Secretary of State for Foreign Affairs to the Danish Ambassador at London

FOREIGN OFFICE
S.W. 1

June 30, 1964

Your Excellency,

I have the hononr to acknowledge the receipt of Your Excellency's Note of the 30th of June, 1964, which reads as follows :

[*See note I*]

In reply, I have the honour to state that the foregoing proposals are acceptable to the Government of the United Kingdom of Great Britain and Northern Ireland, who therefore agree that Your Excellency's Note with its Annex and the present reply shall constitute an Agreement between the two Governments which shall enter into force on this day's date.

I have, etc.

For the Secretary of State :

Denys BROWN

ANNEX

RULES CONCERNING TESTING AND APPROVAL OF ERECTIONS AND MATERIALS FOR USE IN CONNECTION WITH CONSTRUCTIONAL FIRE PROTECTION OF SHIPS

FOREWORD

The International Conference on Safety of Life at Sea, London 1960, [1]recommended that Contracting Governments should provide IMCO with copies of any document setting out the test procedures they employ regarding, *inter alia*, "A" and "B" Class bulkheads with a view to achieving greater uniformity of practice in these matters.

In 1961, the Danish Testing Laboratory in co-operation with the Danish Ships Inspection Service drafted such rules taking into account the provisions laid down in Regulation 35 (*b*) of Chapter II of the International Convention for the Safety of Life at Sea, 1960, which specifies the dimensions of specimens of bulkheads or decks which are to be tested in a test furnace.

The Danish Testing Laboratory thereafter held consultations with the testing laboratories in the Netherlands, Norway, Sweden and the United Kingdom with a view to formulating uniform rules which could form the basis of mutual acceptance in these countries of test certificates for the materials and constructions in question.

The Shipping Administrations of the said countries and Finland thereupon decided that the draft should be discussed at a meeting of experts. An expert meeting on the subject was held in Copenhagen 3-4 September, 1962, followed by a further meeting in The Hague 17-19 April, 1963, during which the participants agreed on rules for Testing, Test Reports and Conditions for Approval.

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A. TESTING

(1) *General*

Under the provisions of the International Convention for the Safety of Life at Sea, London 1960, construction and materials for use in passenger ships as "A" Class

[1] United Nations, *Treaty Series*, Vol. 536, No. 7794.

bulkheads, "A"-doors, "B" Class bulkheads, "B"-doors shall have an insulating value to the satisfaction of and be approved by the Administration. Constructions and materials for use in cargo ships of 4000 gross tons and upwards as "B" Class bulkheads and "B"-doors shall be similarly approved.

Such approvals will be based upon reports from a Testing Laboratory, recognised by the Administration, of test results obtained at tests carried out with the construction and material in question, and therefore the manufacturer or agent must, if required, submit test specimens and information to the Testing Laboratory as laid down in (2) below. In all cases the manufacturer or agent should consult the Administration and the Testing Laboratory regarding details of construction and erection of test specimen, etc. This should be strictly in accordance with the practice to be used in ship-building procedure.

(2) *Nature, Size, and Erection of Test Specimens*

2.1. *Insulated "A" Class bulkhead*

2.1.1. Supporting material :

Steel or other equivalent material.

2.1.2. Dimensions of test specimen :

According to attached drawing No. I.[1]

Thickness	Steel : 4.5 mm Aluminium : 6.0 mm
Vertical stiffeners spaced at 600 mm intervals	Steel : 65 × 65 × 6 mm Aluminium : 75 × 75 × 9.5 mm

2.1.3. Insulating material :

The information below must be submitted :
Identification mark.
Specific weight at ambient temperature.
Specific heat at ambient temperature.
Heat conductivity at ambient temperature.
Principal details of composition.

2.1.4. Drawings :

A drawing of the test specimen giving measurements and the following details :
Insulation in way of stiffeners.
Means of fastening the insulation to the bulkhead and materials used for this purpose.

2.2. *"A"-doors and frames*

2.2.1. Materials :

Supporting material :
Steel or other equivalent material.

2.2.2. Erection of specimen :

Doors and frames must always be tested together.

[1] See p. 220 of this volume.

2.2.3. Insulating material :

The information below must be submitted :
Identification mark.
Specific weight at ambient temperature.
Specific heat at ambient temperature.
Heat conductivity at ambient temperature.
Principal details of composition.

2.2.4. Door frame :

Door frames to be fitted with anchorirons approx. 250 × 25 × 9 mm slit 100 mm, spaced approx. 500 mm, to be sunk into a concrete or similar surround in which the door is situated with the frame flush with the exposed face of the surround. Hinged doors to open away from the fire.

2.2.5. Drawings :

A drawing of the test specimen giving measurements and details of door frame and door together with information as to methods and materials used for securing insulation, if any.

2.3. *"B" Class bulkhead*

2.3.1. Materials :

The information below must be submitted :
Identification mark and panel widths to be nominated.
Principal details of composition and construction.
Whether the materials are combustible or incombustible.

2.3.2. Dimensions :

According to attached drawing No. II.[1] The test specimen must be constructed of panels at least one of which is the maximum width which may be used in practice, subject to at least one joint being incorporated.

2.3.3. Bulkheads should be tested without being painted or having superimposed finishes.

2.3.4. Drawings :

A drawing of the test specimen giving measurements and details of joints and all materials used.
A section through the bulkhead to be included.

2.4. *"B"-doors and door frames*

2.4.1. Materials :

The information below must be submitted :
Identification mark.
Whether the materials are combustible or incombustible.
Principal details of composition and construction.

2.4.2. Erection of test specimen :

Doors and frames must always be tested together.

[1] See p. 221 of this volume.

2.4.3. Door frames must be erected in a "B" Class bulkhead approved by the Administration and according to drawing No. II, or in a concrete or similar surround, in which the door is situated with the frame flush with the exposed face of the surround.
Hinged doors to open away from the fire.

2.4.4. Drawings :
A drawing of the test specimen showing all details of door and door frame and its connection to the bulkhead or surround to be submitted.

(3) *Methods of Testing*

3.1. *Fire Resistance Test of Structures*

This test to be carried out with the specimens mentioned under 2.1., 2.2., 2.3. and 2.4.

3.1.1. Conditions of test specimen :
Test specimens shall be conditioned to an equilibrium with an atmosphere of a relative humidity of 65 ± 5% and a temperature of 20° ± 5° C. For all types of specimen the appropriate time for testing shall be determined by measuring, either on the specimen or on a representative sample, the conditions of equilibrium of weight.

3.1.2. Means of fastening specimens in the furnace :
The specimens, constructed as mentioned under 2.1., 2.2., 2.3. and 2.4. shall be fitted in such a way as to give an exposed area of at least 244 centimetres high and at least 200 centimetres wide. The specimen shall be secured as follows :

"A" Class bulkhead : Along all sides.

"B" Class bulkhead : At the bottom and the vertical sides and housed in a channel along the top edge situated above the exposed area.

3.1.3. Test Procedure :
The furnace temperature is determined by means of 4 unprotected thermocouples not less than 0.75 mm dia. disposed at the centres of the quarter sections of the specimen and with their hot junctions abt. 100 mm from the exposed side of the specimen.
Specimens of construction which shall be required to withstand fire from either side shall be tested from each side if required by the Administration.
The furnace temperatures are continuously controlled so that they follow as far as possible those laid down in the standard time-temperature curve.

This standard time-temperature curve is indicated below :

538°C after 5 min.
704°C after 10 min.
843°C after 30 min.
927°C after 60 min.
1010°C after 120 min.

The accuracy of furnace control should be such that

(*a*) During the first 10 minutes of test the area under the curve of mean furnace temperature shall not vary by more than ± 15% of the area under the standard curve.

(*b*) During the first half hour of test the area under the curve of mean furnace temperature shall not vary by more than ± 10% of the area under the standard curve.

(*c*) For any period after the first half hour of test the area under the curve of mean furnace temperature shall not vary by more than ± 5% of the area under the standard curve.

(*d*) At any time of the first 10 minutes of test the mean furnace temperature does not differ from the standard curve by more than ± 100°C.

(*e*) At about one third of the height of the specimen the pressure in the furnace shall be equal to that in the laboratory.

(*f*) The initial temperature of the specimen must not exceed 40°C.

3.1.4. Smoke and gas penetration test :

Where cracks or other damage arises during the testing period an ignition test as prescribed in 4.1.1. and 4.2.1. shall take place immediately after the crack and damage arises followed by similar tests at appropriate intervals.

3.1.5. Observations during testing :

The surface temperature on the unexposed side shall be measured by at least 4 thermo-couples, each consisting of a circular 12 mm dia. 0,2 mm copper sheet into which are soldered 0,5 mm thermo-couple wires. The thermo-couples shall as far as possible be placed in the centre of each quarter section of the test specimen. They are to be covered and fastened by 30 mm square asbestos sheets 2 mm thick and the thermo-couple wires are placed so that they touch the face for 100 mm from the soldering point. A thermo-couple similarly constructed and held is placed at the vertical joint, if any, or in the centre of the surface of the specimen. The mean of the above mentioned five thermo-couples is used to give the mean temperature rise of the unexposed face. Further, thermo-couples of the same construction may be placed for the purpose of determining the temperature at points deemed likely to give a greater temperature rise than any of the 5 thermo-couples in the standard positions. When testing an "A" Class bulkhead of aluminium alloy fitted with insulation on both sides thermo-couples shall be fixed to the metal, in positions corresponding to the surface thermo-couples to determine its temperature.

3.1.6. Duration of Testing :

The testing shall continue at least until one of the limits given in (4) has been passed.

3.1.7. Test Results :

The test results are to be stated in a report in relation to the time reckoned from the commencement of the test during which the specimen satisfies the requirements laid down in (4) for the said construction.

3.2. *Combustibility Test of Materials*

This test is used for the specimens mentioned under 2.1., 2.2., 2.3., and 2.4., and is carried out as described in B.S. 476, Part I, Section One.

(4) *Required Results of Testing*

4.1. *"A" Class bulkheads and "A"-doors*

4.1.1. General requirements :

(*a*) Cracks and other damage which may arise and door clearances through which flames and hot gases may penetrate must not be such as to lead to ignition of cotton waste held at a distance of 2 to 3 centimetres horizontally from the opening in the specimen during the 60 minutes of testing.

(*b*) In order that a bulkhead may be described as A_{60} the rise of surface temperature on the unexposed side shall not exceed the following limits for 60 minutes :
The mean as defined under 3.1.5 : 139°C.
The maximum at any point : 180°C.

(*c*) The temperature rise on the unexposed side of a door shall not exceed the values, mentioned in (*b*) of this paragraph, through-going metal members excepted, unless the Administration permits lower insulation values.

(*d*) The report of the Testing Laboratory shall state whether an "A" Class door was capable of being opened and closed immediately following the standard fire test.

4.1.2. Special requirements :

Bulkheads of aluminium.
During the test the rise in metal temperature of an insulated load carrying aluminium "A" Class bulkhead must not (as described under 3.1.5.) exceed 200°C and for other such bulkheads 300°C.

4.2. *"B" Class bulkheads and "B"-doors*

4.2.1. General :

(*a*) Cracks and other damage which may arise and door clearances through which flames and hot gases may penetrate must not be such as to lead to ignition of cotton waste held at a distance of 2 to 3 centimetres horizontally from the opening in the specimen during the relevant time of testing.

(*b*) The rise of temperature on the unexposed side shall not exceed—as regards incombustible "B" Class bulkheads for 15 minutes and combustible "B" Class bulkheads for 30 minutes—the following limits :
The mean as defined under 3.1.5. : 139°C.
The maximum at any point including any joint : 225°C.

B. Test Reports

Test reports shall be in the National language and in English and shall contain :

Name of manufacturer.
Name of representative of Administration present at test.
The Rules which have to be complied with.
Description and drawing of the test specimen with manufacturer's identification mark.
Test conditions.
Testing procedure with observations during test, including photographs, if any.

Conclusion.

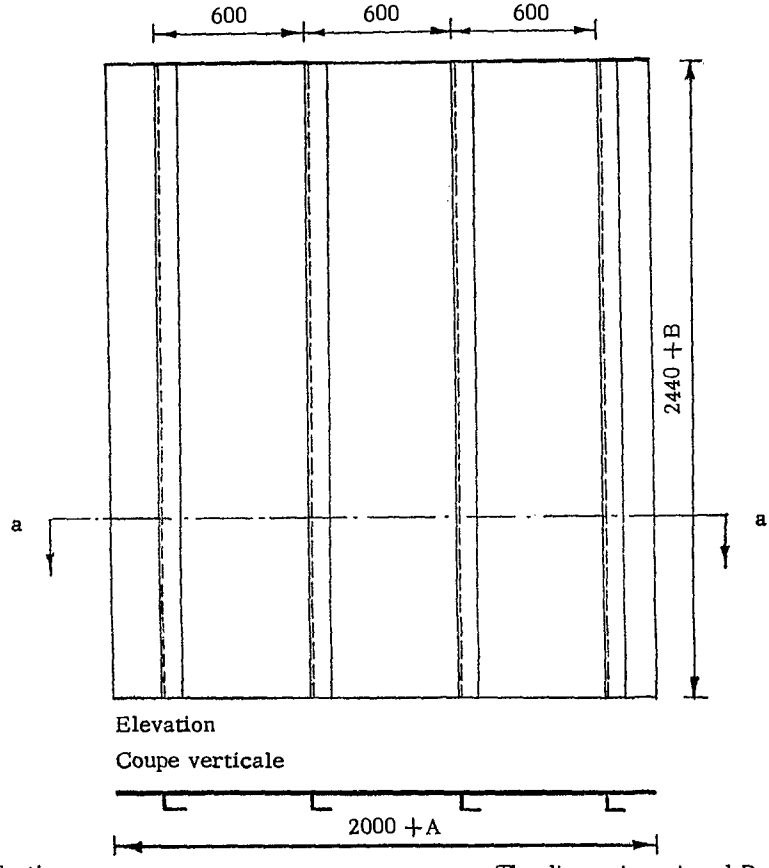
C. Conditions for Approval

1. Before the test can be commenced the manufacturer must forward to the Administration a signed declaration that an identical construction has not before been tested by any of the Testing Laboratories recognized by this Administration. A copy of this declaration together with an application for the test shall be forwarded to the Testing Laboratory.

2. When an identical construction has been submitted to more than one valid fire test of a given type at the Testing Laboratory, only the worst result must be considered for approval.

3. When constructions for use in connection with structural fire protection of ships have been tested according to the rules laid down in Part A, the fire test report shall be forwarded by the Testing Laboratory to the manufacturer. If a certificate of approval is required, a copy of this report shall be submitted by the manufacturer to the Administration of the country in which the test has been carried out.

DRAWING No. I — CROQUIS nº I



Section a-a
Steel: thickness 4.5 mm.
Steel: Stiffeners 65 x 65 x 6 mm.
Aluminium: thickness 6.0 mm.
Aluminium: Stiffeners 75 x 75 x 9.5 mm.

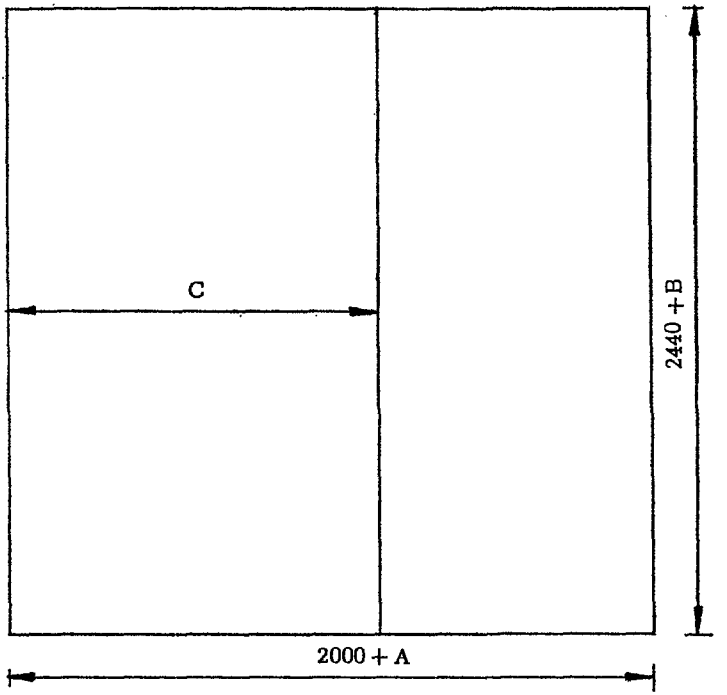
Section a-a
Acier: épaisseur 4,5 mm
Acier: armatures 65 x 65 x 6 mm
Aluminium: épaisseur 6 mm
Aluminium: armatures 75 x 75 x 9,5 mm

The dimensions A and B are determined by the size of the supporting frame available in the individual laboratory.

Les dimensions A et B sont fonction des dimensions du cadre de support utilisé par le laboratoire où l'essai est effectué

A-class Bulkhead Fire-test specimen Cloison du type A Echantillon d'essai au feu	Scale 1:20 Echelle 1:20

DRAWING No. II — CROQUIS nº II



Elevation

Coupe verticale

C-max. breadth used in practice.

C: largeur maximale utilisée dans la pratique

The dimensions A and B are determined by the size of the supporting frame available in the individual laboratory.

Les dimensions A et B sont fonction des dimensions du cadre de support utilisé par le laboratoire où l'essai est effectué

A-class Bulkhead fire-test specimen Cloison du type A Echantillon d'essai au feu	Scale 1:20 Echelle 1:20