

Guideline No.: C-03(201510)



# **C-03**

# **FIRE WINDOWS**

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**Foreword:**

CCS Product Inspection and Testing Guideline (hereinafter referred to as this Guideline) contains the technical requirements, inspection and testing criteria related to classification and statutory survey of marine products to be applied for CCS approval/inspection.

This Guideline frees the users to adopt other test methods and requirements which are equivalent to or are stricter than this Guideline.

This Guideline is published and updated by CCS, and is released at <http://www.ccs.org.cn>. Your comments or suggestions are welcomed and may be sent to our email addressed [mp@ccs.org.cn](mailto:mp@ccs.org.cn).

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## **FIRE WINDOWS**

### **1 Application**

1.1 This Guideline applies to the windows and side scuttles fitted in bulkheads of ships and offshore installations according to the requirements of “A” and “H” class fire divisions.

### **2 Normative references**

2.1 The approval and inspection of fire windows are to be based on the following documents and their subsequent amendments:

- (1) Regulations 3 and 9, Chapter II-2 of the International Convention for the Safety of Life at Sea, 1974 and the amendments thereof;
- (2) IMO Resolution MSC.307(88) - the International Code for Application of Fire Test Procedures, 2010 (IMO 2010 FTP Code);
- (3) Chapter 1, PART SEVEN of CCS Rules for the Construction and Classification of Mobile Offshore Units;
- (4) ISO/TR 834-3:1994 “Fire-resisting Tests – Elements of Building Construction – Part 3: Commentary on Test Method and Test Data Application”.
- (5) Regulation 3-12, Chapter II-1 of Amendments to 1974 SOLAS Convention, as Amended
- (6) IMO MSC.337(91), Code on Noise Levels on Board Ships
- (7) Chapter 4, Part 3 of CCS Guidelines for Noise Control and Testing of Ships and Products

### **3 Plans and technical documents**

3.1 To apply for the type approval of fire windows, the following drawings and technical documents are to be submitted in triplicate to CCS for approval:

- (1) General arrangement of fire window;
- (2) Drawing of main window frame;
- (3) Drawings of sash frame and clamp batten (if any);

- (4) Fireproof glass and toughened glass;
- (5) Fire test arrangement (including thermocouples);
- (6) Type test program;
- (7) List of qualified suppliers of major raw materials/components and parts;
- (8) Product installation specifications.

#### **4 Materials and components**

4.1 Materials and components are to comply with relevant requirements of CCS Rules

4.2 The window frame is to be made of approved steel or other equivalent materials, furnished with the quality certificate of the manufacturer; the insulation materials are to be of approved non-combustible materials like rock wool, ceramic fiber and calcium silicate boards; glass is to be fireproof or be made into fireproof glass unit by grouting the toughened glass with fire-resistant fluid, and relevant CCS products/approval certificates are to be provided.

#### **5 Design technical requirements**

5.1 A class fire windows are to comply with the relevant requirements in 2.1(1) and (2) of this Guideline in terms of structural design, integrity and insulation.

5.2 H class fire windows are to comply with the relevant requirements in 2.1(2), (3) and (4) of this Guideline in terms of structural design, integrity and insulation.

5.3 Major raw materials of fire windows are to comply with the following requirements:

- (1) Insulation materials (non-combustible materials such as ceramic fiber, rock wool and calcium silicate boards): the non-combustibility is to comply with Part 1 of IMO 2010 FTP Code.
- (2) Fireproof glass is to comply with the relevant national or international standards.
- (3) Toughened glass is to comply with the relevant national or international standards.
- (4) Non-metallic materials used in fire windows are to be free of asbestos.

## 6 Type test

6.1 Selection of typical samples: The standard fire test may be conducted on a window of the maximum size (with the largest pane size) and the type of the glass pane and/or the minimum thickness of the glass pane or panes and gaps (i.e. the minimum thickness and gap of each type of the glass), constructed on the basis of approved drawings.

6.2 The type test items are given in Table 6.2.

**Table 6.2**

No.	Test item	Type test	Routine test
1	Review of material quality certificates	√	√
2	Examination of external size and manufacturing tolerance	√	√
3	Surface quality examination	√	√
4	Tightness test		
	Hose test	√	√
	Hydraulic test	√	√
5	Standard fire test (Note: additional thermal radiation test is to be carried out for A-0 class windows)	√	—
6	Strength test	√	—
7	Air acoustic noise index test	√	—

### 6.3 Test methods and requirements

- (1) Review of material quality certificates: Main raw materials of fire windows are to be furnished with: the manufacturer's quality certificate for steel/copper/stainless steel, CCS products certificates for insulation materials and fireproof glass.
- (2) Size examination: The external size is to comply with the approved drawings.
- (3) Surface quality examination: The surface of samples is to be smooth and free from burrs and cracks, and the paint is to be applied evenly without drainage, wrinkling, and breakdown (if painted).
- (4) Tightness test

- ① Hose test: The manufacturer is to carry out 100% hose test for the products to be delivered. No water trace is to be detected on the inspected areas after 3 to 5 min of test with a nozzle of not less than 12.5 mm in diameter, to a pressure not less than 250 KPa and from a distance not exceeding 1.5 m. In addition to the confirmation of the test report, CCS Surveyor will randomly take 10% of the tested windows as the samples for unit/batch hose test.
- ② Hydraulic test: 10% of the products are to be taken randomly for hydraulic test during unit/batch inspection. The test pressure is 25 KPa for rectangular fire windows, 150 KPa for A class fire side scuttles, 75 KPa for B class ones and 35 KPa for C class ones (all with glass being fitted and deadlight opened). No water trace is to be detected on the inspected areas after 1 min of test.
- (5) The standard fire test is to be carried out in accordance with the relevant requirements in Part 3 of IMO 2010 FTP Code or ISO/TR834-3 & Part 3 of IMO 2010 FTP Code; the thermal radiation test for A-0 Class fire windows is to be carried out in accordance with the requirements in Part 3 of IMO 2010 FTP Code.
- (6) Strength test: The window is to be placed on the test platform and a load (test pressure being 75 KPa for type E, 35 KPa for type F, 240 KPa for type A and 120 KPa for type B) applied on the batten of the window frame, and the glass is to be examined for integrity and damage and the frame for deformation when the load is removed after 5 min.
- (7) Non-metallic materials used in products are to be free of asbestos and are to provide asbestos free statement or approval certificate.
- (8) The products which met the requirements Regulations 6.2 Chapter 6 of IMO MSC.337(91) The Code on Noise Levels on Board Ships should be tested for acoustic noise index at the test and inspection institutes approved by CCS. The specific testing methods, please see to Chapter 4 Part 3 CCS Guidelines for Noise Control and Testing for Ships and Products.

#### 6.4 Test report

- (1) The non-combustibility test report for insulation materials is to comply with the requirements in Part 1 of IMO 2010 FTP Code. The term of validity of non-combustibility test report for insulation materials of A and H class fire windows is not to be beyond 24 months before the date of the insulation test, or valid CCS certificates for insulation materials are to be furnished with.
- (2) The standard fire test report is to comply with Part 3 of IMO 2010 FTP Code or ISO/TR834-3 & Part 3 of IMO 2010 FTP Code.

- (3) Test reports for application are not to be more than 5 years old. If the approval depends on several test reports with different dates, the date of the oldest report governs. However, a type approval certificate may be renewed without retesting provided that the test report is not more than 15 years old and that no alternation of components or construction has been made to the product.
- (4) Prior to 1 July 2013, fire tests may still be carried out in accordance with the older edition of FTP Code (1996 FTP Code). The term of validity period of test reports is not to exceed 15 years.
- (5) The test and inspection institutes approved by CCS should provide uniform acoustic test report format by CCS.

## **7 Unit/batch inspection**

7.1 The unit/batch inspection of fire windows is to be carried out upon type approval. The inspection scope is shown in column “Routine test” of Table 6.2.

7.2 The product certificate is to be issued to fire windows which are found to be in compliance with the relevant requirements upon inspection and test.

7.3 Products are to comply with the asbestos free requirement and provide asbestos free statement or approval certificate.