

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Window and Glass Partition**

with type designation(s)

A60 CLASS FIRE RESISTANT RECTANGULAR WINDOW (JG-A60-320)

Issued to

Jung Gong Ind. Co., Ltd.
Busan, Republic of Korea

is found to comply with

Det Norske Veritas' Offshore Standards**Det Norske Veritas' Rules for Classification of Ships****Det Norske Veritas' Interpretation of SOLAS 1974 Convention as Amended****Application :****Approved for use as an integrated part of fire-retarding bulkheads of class A-60.****Maximum size of exposed fire technical glazing unit: 2000 x 1500 mm (width x height).****Restricted application: Fire against toughened glass (from outside/weather side).****This certificate is recognized by Transport Canada.****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**This Certificate is valid until **2019-06-30**.Issued at **Høvik** on **2015-09-08**DNV GL local station: **Pusan**for **DNV GL**Approval Engineer: **Ragnar Tonjer**

Petter Langnes
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

Product description

"A60 CLASS FIRE RESISTANT RECTANGULAR WINDOW (JG-A60-320)"

a window composition constructed of a 8 mm toughened pressure glass (from Jeong-Am Safety Glass) and a 27 mm fire resistant glass type "Contraflam N2" (from Vetrotech Saint-Gobain) spaced 12 mm apart by an air gap (dehydrated air). The window composition, including sealing and stuffing materials, is mounted inside a steel framing. This steel framing consist of a fire glass frame that is bolted to a window main frame on one side, and capped with a fire glass retaining frame on the opposite side.

The window main frame is welded to the bulkhead. Total glass thickness is 47 mm.

The window box is made of 1.2 mm thick mild steel, and is silicone sealed to the glass frame on the window side and screwed to the wall panel on the wall side. The inside of the window box is to be filled with approved A-60 class insulation.

For further details, see the below Type Approval documentation.

Application/Limitation

The window has only been evaluated with respect to fire technical properties (e.g. strength requirements have not been considered). Arrangement and location of any window is subject to approval from relevant authority in each case.

External windows to comply with ISO 3903 (Ref. DNV Rules Pt. 3, Ch.3, Sec. 6 L104).

Hose stream test was carried out with satisfactory results according to IMO Res. A.754(18) Appendix A.1.5.

Each product is to be supplied with its manual for installation, use and maintenance.

Type Approval documentation

Certification in accordance with Standard for Certification No. 1.2, Type Approval, January 2013.

Test report No. 0402_2010-0082 dated 16 November 2010 from Fire Insurers Laboratories of Korea (FILK), Gyeonggi-Do, Korea.

Drawing no. JG-A60-320 dated 16 October 2010 from Jung Gong Ind. Co., Ltd.

Tests carried out

Tested according to IMO FTPC Part 3 (IMO Res. A.754(18)) and in compliance with IMO 2010 FTP Code Ch. 8.

Marking of product

The product or packing is to be marked with name of manufacturer, type designation and fire-technical rating.

Transport Canada Approval

Based on the procedures laid down in the Transport Canada Publication entitled "*Approval Procedures for, Life Saving Equipment and Structural Fire Protection Products (TP 14612)*", DNV GL confirms that the product/s listed in this certificate is/are in accordance with Transport Canada's requirements.

Periodical assessment

DNV GL's surveyor is to be given permission to perform Periodical Assessments at any time during the validity of this certificate and at least every second year. The arrangement is to be in accordance with procedure described in Standard for certification No. 1.2 Type Approval Item 4.