Certificate Number: 01-BK210553/1-PDA

This Confirmation of Product Type Approval is valid only as of 18/AUG/2008 for the below listed product.

This is to certify that, pursuant to the Rules of American Bureau of Shipping (ABS), on 18/AUG/2008 the manufacturer of the below listed product held a valid Manufacturing Assessment (MA) and a valid Product Design Assessment (PDA) for the below listed product, entitling the product to type approval.

The validity of the Manufacturing Assessment is dependent on satisfactory audits as required by the Rules.

The Product Design Assessment is valid only for products intended for use on ABS classed vessels, MODUs or facilities which are in existence or under contract for construction on the date of the ABS Rules used to evaluate the Product. For Date of ABS Rules used for evaluation; Please refer to the ABS Rules below. ABS makes no representations regarding type approval of the Product for use on vessels, MODUs or facilities built after the date of the ABS Rules used for evaluation.

Due to wide variety of specifications used in the products ABS has evaluated for Type Approval, it is part of our contract that; whether the standard is an ABS Rule or a non-ABS Rule, the Client has full responsibility for continued compliance with the standard.

Please refer to the "Service Restrictions" shown below to determine if Unit Certification is required for this product.

Jung Gong Ind. Co., Ltd.
Model Name(s): JG-A0-340

Presented to:
Jung Gong Ind. Co., Ltd.
546, Shinpyong-Dong
Saha-Ku
Busan
Korea, Republic of

Intended Service:	For use on Ships and Offshore Installations
Description:	JG-A0-340: A-0 Class Window (Size: 1700mm X 2000mm)
Ratings:	"A" Class Division
Service Restrictions:	Unit Certification is not required for this product.
Comments:	Our approval is based on that the above materials have been tested and certified by Fire Insurers Laboratories of Korea (FILK)
Notes / Documentation:	
Term of Validity:	Certificate 01-BK210553/1-PDA, dated 28/Jul/2006 is valid for 5 years from date of issue or until the applicable Rules or standards are revised (whichever occurs first). Product use on or after 1 January 2007, will be subject to compliance with the ABS Rules or specifications in effect when the vessel, MODU or facility is contracted.
ABS Rules:	2006 Steel Vessel Rules 1-1-4/7.7
National Standards:	
International Standards:	IMO Resolution A. 754 (18) in conjunction with SOLAS 1974, as amended
Government Authority:	
EUMED:	
Others:	

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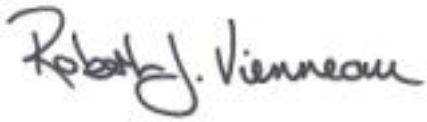

Manager, ABS Programs

ABS has used due diligence in the preparation of this certificate and it represents the information on the product in the ABS Records as of the date and time the certificate was printed. Type Approval requires Drawing Assessment, Prototype Testing and assessment of the manufacturer's quality assurance and quality control arrangements. Limited circumstances may allow only Prototype Testing to satisfy Type Approval. The approvals of Drawings and Products remain valid as long as the ABS Rule, to which they were assessed, remains valid. ABS cautions manufacturers to review and maintain compliance with all other specifications to which the product may have been assessed. Further, unless it is specifically indicated in the description of the product; Type Approval does not necessarily waive witnessed inspection or survey procedures (where otherwise required) for products to be used in a vessel, MODU or facility intended to be ABS classed or that is presently in class with ABS. Questions regarding the validity of ABS Rules or the need for supplemental testing or inspection of such products should, in all cases, be addressed to ABS.

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MARINE DIVISION

17 bis Place des Reflets - La Défense 2
92400 Courbevoie - France

Tel. 33 1 42 91 52 91
Fax. 33 1 42 91 28 94
www.veristar.com

Certificate number: 10128/B0 EC

File number : ACI 6000/024/006

Annex A1 Item number : A.1/3.25

This certificate is not valid when presented without the full attached schedule composed of 7 sections

EC TYPE EXAMINATION CERTIFICATE

as per Module B of European Union Council Directive 96/98/EC on marine equipment as last amended by Commission Directive 2002/75/EC of 2 September 2002

This certificate is issued to

JUNG GONG IND. CO., LTD.

BUSAN - KOREA (REPUBLIC OF)

for the type of product

WINDOWS AND SIDE SCUTTLES

A-0 Class Fire Resisting Fixed Window - Type "JG-A0-340"

Regulations and standards :
SOLAS 74 Convention, as amended by SOLAS Amendments 2000, Regulation II-2/9.4.1.3 - IMO Resolution A.754(18) - IMO Resolution MSC. 61(67)[FTP Code] Annex 1, Part 3.

This certificate is issued under the French Maritime Authority to attest that BUREAU VERITAS did undertake the relevant type-examination procedures for the product identified above which was found to comply with the relevant requirements of the Council Directive 96/98/EC of 20 December 1996 as amended

This certificate is valid until : 12 Dec 2010

At Paris la Défense, on : 19 Dec 2005

For BUREAU VERITAS, Notified Body N°0062
By order of the Secretary

J.BENOIT

Approval office

Local office : BV PUSAN
Surveyor : K. Lee

This certificate does not allow to issue the Declaration of Conformity and to affix the mark of conformity (wheelmark) to the products corresponding to this type. To this end, the production-control phase module (D, E or F) of Annex B of the Directive is to be complied with and controlled by a written inspection agreement with a notified body.
This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with BUREAU VERITAS. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. BUREAU VERITAS S.A. is designated by the French Maritime Authority as a "notified body" under the terms of the French Regulations Division 140 Chapter 140-2. This certificate is issued within the scope of the General Conditions of BUREAU VERITAS Marine Division. Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against BUREAU VERITAS for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION :

A-0 Class Fire Resisting Fixed Window - Type "JG-A0-340"

The window construction consists of a fire glass "CONTRAFLAM LITE N2" 16 mm thick and a pressure glass "Toughened glass" 8 mm thick separated by a spacer made up of aluminium alloy and an air gap both 12 mm thick.
These glasses are mounted into a mild steel main frame and a mild steel glass retaining frame. Frames are fixed one to each other with M6 screws. Insulation between glasses and steel frames is made by means of a silicon rubber gasket.

Maximum clear size: 1700 mm x 2000 mm (width x height)
Maximum spacing between M6 screws : 75 mm
Fire against fire glass side.

2. DOCUMENTS AND DRAWINGS :

2.1 - As per the Manufacturer's drawings.

2.2 - Manual(s) for installation, use and maintenance is/are to be stamped by the Society's Surveyor and supplied in the language prescribed by the Maritime National Administration to whom the ship is registered.

2.3 - Manufacturing documentation to be stamped by the Society's Surveyor.

3. TEST REPORTS :

Test report N° 2000466 dated 6th November 2000 as per IMO Resolution A.754 (18) from F.I.L.K., Korea.

4. APPLICATION / LIMITATION :

Application / Limitation of use:
- Approval valid for ships having to comply with Regulations stated on the front page of the certificate, and for units having to comply with IMO Resolution A.649 (The "MODU Code").
- Materials and/or components mentioned in paragraph 4 may be replaced by other equivalent ones (to be EC type approved and to bear the ⚙ mark) subject to the Society's approval.

Materials and components required to be type approved or type tested:
- Surface linings to be EC type approved and to bear the ⚙ mark.

Other materials and/or components:
- Fire resistant glass: "Contraflam Lite N2" manufactured by Vetrotech Saint-Gobain International Export, Belgium.
- Pressure glass: "Toughened glass manufactured by Hankuk Glass Industries Co. Ltd., Korea.

On board installation & Maintenance requirements:
- The Manufacturer's instruction manual should be kept on board.
- Flame spread, smoke characteristics and calorific value of the lining to be as per Rule requirements.
- The fitting aboard to be the same as used for the test.

5. PRODUCTION SURVEY REQUIREMENTS :

5.1 - The production conformity assessment module shall either be "D, Production-Quality Assurance" or "E, Product-Quality Assurance" or " F, Product Verification".

5.2 - Each equipment or batch of equipment is to be supplied with its manual (or instructions) for installation, use & maintenance in the language required by the Ship's Flag Administration.

6. MARKING OF PRODUCT :

Every item, or batch of items, or their packing to bear the following marking:
- ⚙ conformity mark and number of the Notified Body undertaking surveillance module (where BV, 0062).
- Last two digits of year mark affixed.

BUREAU VERITAS - DISTRICT OF KOREA - PARIS 1828 - INTERNATIONAL REGISTER

7. OTHERS :

7.1 - This approval is given on the understanding that the Manufacturer will accept full responsibility for informing shipbuilders or their sub-contractors of the proper methods of fitting and general maintenance of the approved equipment and the conditions of this approval.

7.2 - This Certificate supersedes EC Type Examination Certificate N° 10128/A0 EC issued on 12/12/2000 by the Society.

***** END OF CERTIFICATE *****

DET NORSKE VERITAS

TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. F-18863
This Certificate consists of 2 pages

This is to certify that the

Window and Glass Partition

with type designation(s)

A-0 CLASS WINDOW (JG-A0-340)

Manufactured by

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

is found to comply with
Det Norske Veritas' Rules for Classification of Ships
Det Norske Veritas' Offshore Standards
Det Norske Veritas' Interpretation of SOLAS 1974 Convention as Amended

Application
The window is approved for use as an integrated part of fire retarding bulkheads of class A-0. Fire against internal side (against fire resistant glass).
Max. size of exposed fire technical glazing unit:1700 mm x 2000 mm (width x height).

Place and date
Høvik, 2008-12-03
for DET NORSKE VERITAS AS

Petter Langnes
Head of Section

Local Office
DNV Pusan Station

This Certificate is valid until
2012-12-31

Amir Dzaferi
Surveyor

Notice: 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.

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million.In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.

Cert. No.: F-18863
File No.: 471.75
Case No.: 262.1-006655-1

Product description

"A-0 CLASS WINDOW (JG-A0-340)"
constructed of a 10 mm toughened pressure glass and 16 mm (6+4+6) fire proof glass, type "Contraflam Lite N2" spaced 12 mm apart by an air gap containing dehydrated air. The window pane is fitted in a steel profile frame with silicone rubber gasket. Retaining frame is made from 5 x 38 mm steel fixed to the frame with screws (distance between screws: max. 75 mm).

Total window thickness is 38 mm.

For more details, see the approved drawing listed under "Type Approval documentation".

Applications/Limitations

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.

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

Type Approval documentation

Certification in accordance with Certification Note No. 1.2, Type Approval, December 1996.

Test report No. 2000466 dated 6 November 2000 from FILK, Kyunggi-Do, Korea.

Drawing No. JG-A0-340 dated 19 January 2006 from Jung Gong Ind Co., Ltd.

Certificate Retention Survey Report dated 05 November 2008 from DNV Pusan.

Tested according to IMO FTPC Part 3, IMO Res. A.754(18)

Marking of product

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

Certificate retention survey

Det Norske Veritas' surveyor is to be given permission to perform Certification Retention Surveys at any time during the validity period of this certificate and at least every second year. The arrangement is to be in accordance with procedure described in item 4.3, Certification Note No. 1.2.

END OF CERTIFICATE

Approval Certificate

Germanischer Lloyd

This is to certify, that the product identified below has been tested in accordance with the relevant procedures as contained in the Fire Test Procedure Code (IMO-Res. MSC.61(67)) and was found in compliance with the applicable performance criteria contained in the specified standard.

Certificate No.	**17 309 - 00 HH**
Company	**Jung Gong Industri Co.,Ltd** **546 Shinpyong-Dong, Saha-ku** **Pusan, Korea**
Product Description	**Class A-0 fire resistant window type JG-A0-340**
Product Type	**Class A-0 window**
Approval Standard	**-IMO Res.A.754(18)** **-IMO Res.MSC.61(67), Annex 1, Part 3**
Documents	**Test report no. 2000466 dated 2000-11-06 issued by Fire Insurers Laboratories of Korea**
Application	**The above product may be applied on ships classed with Germanischer Lloyd and on ships for which the Society is responsible for the issue of the relevant certificate required by the "International Convention for the Safety of Life at Sea, 1974" including amendments as authorized by contracting governments.**
Remarks	**None**
Valid until	**2010-11-07**
	The company must inform Germanischer Lloyd of any modification or changes to approved product in order to obtain a valid certificate.

Hamburg, 2005-11-08

Germanischer Lloyd

J. Schreiter A. Ullrich

The latest edition of the General Terms and Conditions of Germanischer Lloyd is applicable.
German law applies.

Approval Certificate

Germanischer Lloyd

principle components:

window consisting of 10 mm pressure glass and fire resistant glass Contraflam LITE N2 of 16 mm thickness mounted in a steel frame with an air gap of 12 mm in between; fire resistant glass on exposed side; max. nominal size (width x heigth): 1700 mm x 2000 mm

work instructions:

execution on board according to makers work instruction

marking of the window:

17309-00 HH

Certificate No. 17 309 - 00 HH

Hamburg, 2005-11-08

The latest edition of the General Terms and Conditions of Germanischer Lloyd is applicable.
German law applies.

TYPE APPROVAL CERTIFICATE

형 식 승 인 증 서

Certificate No. : GCH02198-FP007 **Date of Approval :** 12th December, 2000.

Product : Fire Protection Window

Manufacturer : Jung Gong Ind. Co., Ltd.
#546, Shinpyong-dong, Saha-gu, Busan, Korea

Product Description : Type : Fixed Square Window / JG-A0-340
- Grade : A-0 Class
- Nominal Size : 1700 mm x 2000 mm (W x H)
- Fire Glass : Contraflam N2 LITE (Thickness : 16 mm)
  / Manufactured by Vetrotech Saint-Gobain International Export
- Pressure Glass : Toughened (Thickness : 10 mm)
  / Manufactured by Hankuk Glass Ind. Co., Ltd.
- Drawing No. : JG-A0-340, JG-A0-340B

Approval Condition : 1. This approval is granted on the basis of the fire resistance test report No. 2000466 issued by Fire Insurers Laboratories of Korea.
2. No product certificate required.

THIS IS TO CERTIFY that the above-mentioned product has been approved in accordance with the relevant requirement of this Society's Rules and / or of the recognized standards as follows and entered in the "List of Approved Manufacturers and Type Approved Equipment".

Pt. 8, Ch. 1, Sec. 1 of the Rules for Classification of Steel Ships, IMO FTPC Part 3 and Res.A.754(18).

This Certificate is valid until 11th December, 2010.

Issued at Daejeon, Korea on 9th February, 2006.

한 국 선 급
KOREAN REGISTER OF SHIPPING

Mann-Eung Kim
General Manager of
Materials and Equipment Team

Note : *1 : The approval will be automatically suspended and the Certificate become invalid from the expiry date of the Certificate in the event that the extension has not been granted or is not under attendance for completion of the renewal survey.*
2 : Any significant changes of products and/or manufacturing process render this certificate invalid.

CERTIFICATE OF FIRE APPROVAL

This is to certify that

The product detailed below will be accepted for compliance with the applicable Lloyd's Register Rules and Regulations and with the International Convention for the Safety of Life at Sea, (SOLAS), 1974, as amended, for use on ships and offshore installations classed with Lloyd's Register, and for use on ships and offshore installations when authorised by contracting governments to issue the relevant certificates, licences, permits etc.

Manufacturer	Jung Gong Ind. Co. Ltd
Address	#546 Shinpyong-Dong Saha-Ku Pusan, 604-030 Republic of Korea,
Type	**A-0 WINDOW (STANDARD FIRE TEST)**
Description	Fire Resisting Window – Type: "JG-A0-340 Single Panel Window
Specified Standard	IMO Fire Test Procedures Code, Annex 1, Part 3

The attached Design Appraisal Document forms part of this certificate.
This certificate remains valid unless cancelled or revoked, provided the conditions in the attached Design Appraisal Document are complied with and the equipment remains satisfactory in service.

Date of issue	12 May 2006	Expiry date	11 May 2011
Certificate No.	SAS F060120	Signed	
Sheet No	1 of 2	Name	M. Farrier Surveyor to Lloyd's Register EMEA A Member of the Lloyd's Register Group

Korea Plan Approval Services, Busan
Lloyd's Register Asia
Lloyd's Register

Note:

This certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify Lloyd's Register of any modification or changes to the equipment in order to obtain a valid Certificate.

"Lloyd's Register, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as the 'Lloyd's Register Group'. The Lloyd's Register Group assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register Group entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract."

LLOYD'S REGISTER GROUP PAPER (01/2006)

Lloyd's Register EMEA
71 Fenchurch Street, London, EC3M 4BS
Telephone 020 7423 2940 Fax 020 7397 4246
Email dcg-stat@lr.org

Document number
SAS F060120

Issue number
1

DESIGN APPRAISAL DOCUMENT

Date	Quote this reference on all future communications
12 May 2006	LPA/SPS/FITA/MF

ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL NO. SAS F060120

This Design Appraisal Document forms part of the Certificate.

APPROVAL DOCUMENTATION

Fire Insurers Laboratory of Korea (FILK), Yojukun, Kyunggi-Do, Korea, Fire Test Report Ro. 2000466, dated 6 November 2000.

CONDITIONS OF CERTIFICATION

1. Maximum clear opening size: 1700mm wide x 2000mm high.
2. Application of Windows in locations where the higher fire risk is on the external side of the window, being considered at the design stage.
3. Glass panel consisting of: two 6mm thick fire resistant glasses (Contraflam Lite N2) with 4mm thick gel between; 12mm thick Aluminium Alloy spacer; 10mm thick toughened glass.
4. Glass fitted in windows and side scuttles for external use should, in addition to the required fire resisting ability, as appropriate, should be of toughened quality and suitable to satisfy the operational requirements of the location the glass is fitted. For example, consideration should be given to the 1966 Load Line Convention Regulation 20 – side scuttles.
5. Production items are to be manufactured in accordance with a quality control system which shall be maintained to ensure that items are of the same standard as the approved prototype.

PLACE OF PRODUCTION

Jung Gong Ind. Co. Ltd
#546 Shinpyong-Dong
Saha-Ku
Pusan, 604-030
Republic of Korea

Korea Plan Approval Services, Busan
Lloyd's Register Asia
Lloyd's Register

Martin Farrier
Lead Specialist
Safety & Pollution Services
London Plan Approval
Lloyd's Register EMEA

Supplementary Type Approval Terms and Conditions

This certificate and Design Appraisal Document relates to type approval, it certifies that the prototype(s) of the product(s) referred to herein has/have been found to meet the applicable design criteria for the use specified herein, it does not mean or imply approval for any other use, nor approval of any products designed or manufactured otherwise than in strict conformity with the said prototype(s).

LLOYD'S REGISTER GROUP PAPER (01/2005)

NIPPON KAIJI KYOKAI

Certificate

OF

APPROVAL

Certificate No.
06EQ81FPA(R)

Item	:	A-0 class window
Type	:	JG-A0-340
Specification	:	See Annex.
Manufacturer	:	Jung Gong Ind. Co., Ltd. #546, Shinpyong-dong, Saha-ku, Busan, Korea
Maximum size	:	1700mm×2000mm (width×height)
Limitation	:	Products of the type are not to be used for the spaces specified in Part C/23.5.1 of the Society's *Rules for Survey and Construction of Steel Ships*, unless they are certified to comply with the requirements given in the Part C/23.5.7 of the Society's *Rules for Survey and Construction of Steel Ships.*
Testing standard	:	IMO FTP Code Annex1 / Part 3
Test report		
Test laboratory	:	Fire Insurers Laboratories of Korea, Korea
Report number	:	2000466
Fire side	:	Insulation side

THIS IS TO CERTIFY that the above type of products has been approved by Nippon Kaiji Kyokai with type approval No. 01FPA4DA and that products of the type will be accepted for use onboard ships classed with the Society for compliance with the relevant requirements of the Society's *Rules for the Survey and Construction of Steel Ships* and those of the *International Convention for the Safety of Life at Sea, 1974, as amended,* subject to approval of the flag Administration and conditional upon that the manufacturer has a quality control system audited by a competent authority to ensure continuous compliance with the type approval conditions.

This certificate is valid from 13th February 2006 until 12th February 2011.
Issued at Tokyo on 15th February 2006.

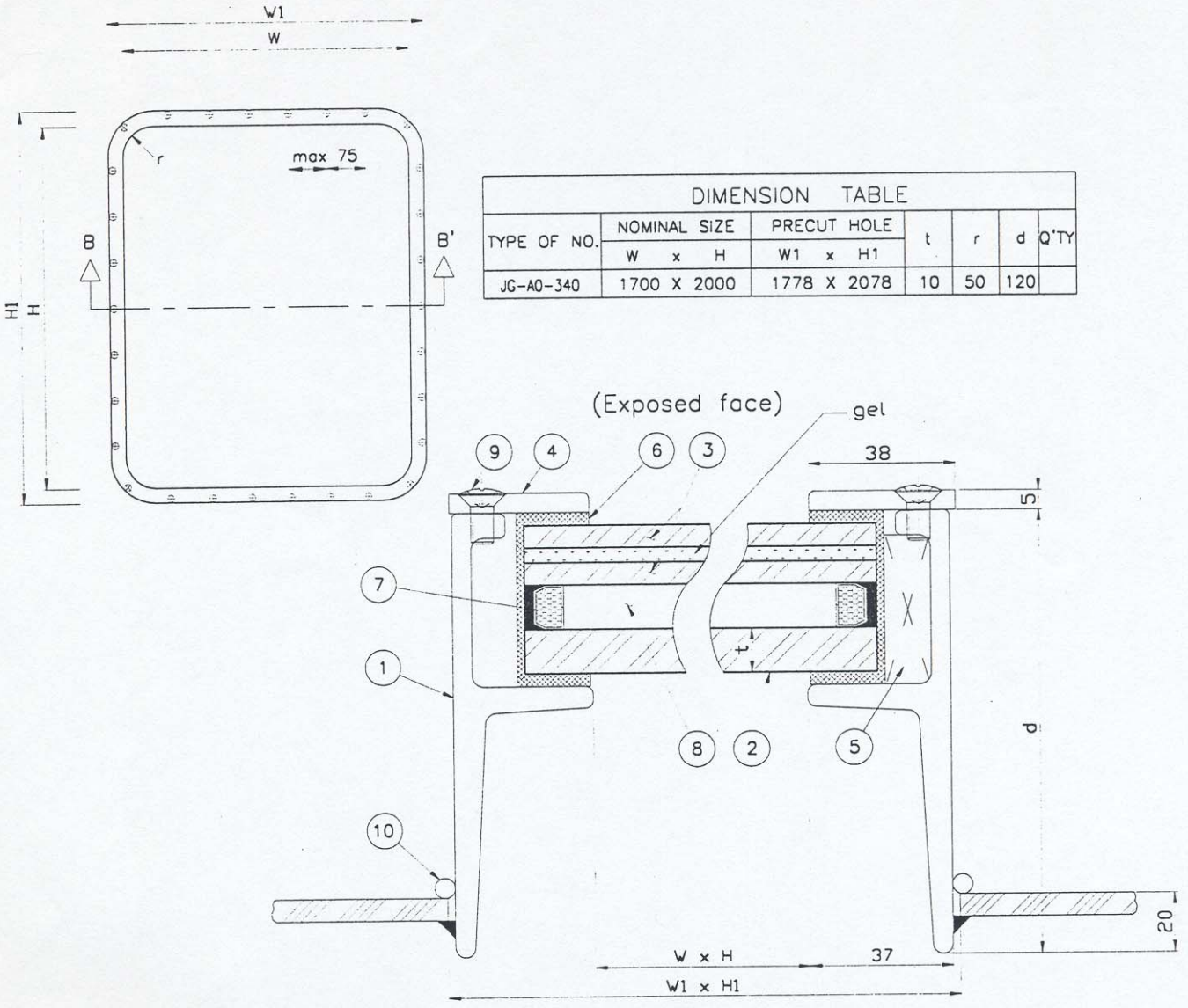
NIPPON KAIJI KYOKAI

H. Kitada
General Manager
Material and Equipment Department

Initial approval date : 13th February 2001

Annex to the Certificate No. 06EQ81FPA(R)

(Dimension : mm)



B–B' SECTION

DIMENSION TABLE						
TYPE OF NO.	NOMINAL SIZE W x H	PRECUT HOLE W1 x H1	t	r	d	Q'TY
JG-A0-340	1700 X 2000	1778 X 2078	10	50	120	

NO	DESCRIPTION	MATERIAL	Q'TY	REMARK
10	DEPTH SETTING	MILD STEEL		ø3x15L
9	SCREW	SUS 304		M6X12
8	SPACE	DEHYDRATED AIR		12mm
7	SPACER	AL. ALLOY		12mm
6	GASKET	SILICONE RUBBER		3T
5	SETTING BLOCK	HARDBOARD		10T
4	GLASS RETAINING FRAME	SUS 304	1	5Tx38
3	FIRE RESISTANT GLASS*1)	CONTRAFLAM LITE N2	1	(6+4+6)T
2	PRESSURE GLASS*2)	TOUGHENED	1	10T
1	MAIN FRAME	MILD STEEL	1	

*1) Brand name: CONTRAFLAM LITE N2
Thickness: toughened glass 6mm+gel 4mm+ toughened glass 6mm=14mm
Manufacturer: VETROTECH SAINT-GOBAIN INTERNATIONAL EXPORT, Belgium

*2) Brand name: Toughened Glass
Thickness: 10mm
Manufacturer: Hankuk Glass Industries Inc., Korea