CGI INTERNATIONAL LIMITED

Manufacturers and suppliers of

FIRE and SECURITY GLASSES to International Standards

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"The range of fire glasses offered by CGII is the widest available from any single manufacturer in the world."

Welcome to CGI International Ltd

Here at CGI International Ltd our aim is to bring solutions to all of your fire glazing requirements.

Our products can be used in many demanding applications including fire-rated partitions, fire-rated screens, doors & floors. Available in single-, double- and triple-glazed units as required.

CGI International (CGII) is a leading manufacturer and supplier of specialist glasses to the glazing markets. Our main products are available and supplied in stock sheets. This gives you our customers the ability to cut and deliver fire glass to the market quickly and efficiently.

In addition to holding a substantial share of the fire glass market in the UK, the company enjoys a significant presence in many overseas markets. Indeed, in 2005 more than two thirds og CGII's sales were export sales. In recognition of its export sales growth CGII was awarded the Queen's Award for Enterprise: International Trade in 2004.

The range of fire glasses offered by CGII is the widest available from any single manufacturer in the world. The company's aim is to provide fire glass users with a 'one stop shop' for all of their requirements - from basic integrity-only wired glass, to a range of clear products, including fully insulating fire glasses with performances of 30/30; 60/30; 60/60; and 120/120.

CGII's own manufactured product, Pyroguard, is a leader in many markets.

CGII is a BSI registered company which has achieved BS EN ISO 9002 accreditation.

By 2007, CGII will achieve CE marking for its Pyroguard range of glasses.

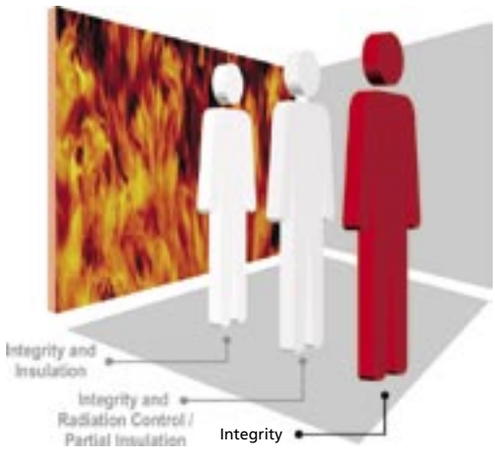
CGII's products have been used in many prestigious buildings throughout the world including:-

- *HEATHROW AIRPORT - TERMINAL FIVE*
- *HONG KONG AIRPORT*
- *STOCKHOLM INTERNATIONAL AIRPORT*
- *IBM BUILDING, SWITZERLAND*
- *APELOORM HOSPITAL, NETHERLANDS*
- *VENETIAN HOTEL, LAS VEGAS, USA*
- *HOUSES OF PARLIAMENT*
- *MANCHESTER AIRPORT*
- *RITZ HOTEL, LONDON*
- *MARKS & SPENCER*
- *NOMURA BANK*
- *GRANADA TV STUDIOS*
- *WARWICK CASTLE*

CGI INTERNATIONAL - HEAD OFFICE AND MANUFACTURING PLANT, HAYDOCK, MERSEYSIDE

Product Identifier

There are 3 levels of fire performance that glass can achieve. These are detailed below:-

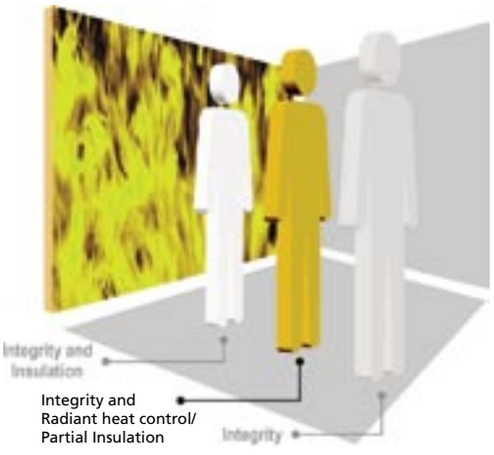


☐ INTEGRITY (E)

In summary this can be described as 'the ability of a specimen to contain a fire free from collapse, holes, cracks or sustained flaming on the unexposed face for a set time.'

Typically can be called for as
30/0 - 30 mins integrity/no insulation
60/0 - 60 mins integrity/no insulation

30 minutes Wood or Steel	60 minutes Wood or Steel	>120 minutes Steel
Pyroguard Clear -7mm Pyroguard Wired -7mm Pyrostem Wired Fireswiss (steel only) Pyroguard - 11mm	Pyroguard Clear -11mm Pyroguard Wired -11mm Pyroguard Wired Pyrostem Wired Fireswiss (steel only)	Pyrostem Wired

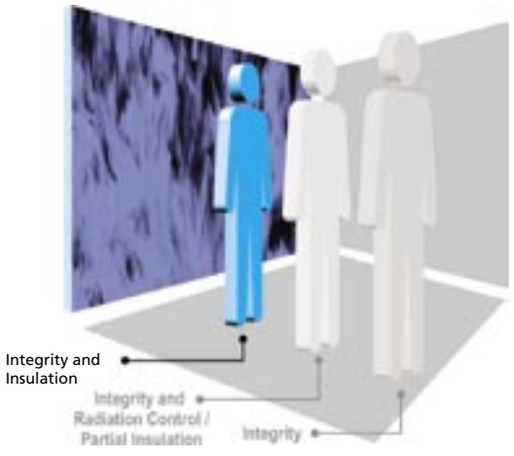


☐ INTEGRITY AND RADIANT HEAT CONTROL / PARTIAL INSULATION (EW)

In addition to integrity as above 'the ability to reduce the radiated heat level by a measurable amount for a set time/the ability to provide insulation for part of the set time.'

Typically can be called for as
30/15 - 30 mins integrity/ 15 mins insulation
60/30 - 60 mins integrity/ 30 mins insulation
30<15kW/m - 30 mins integrity/ 30 mins low radiation level

30 minutes Wood or Steel	60 minutes Wood or Steel
Pyroguard Clear -7mm Pyroguard Wired -7mm Pyroguard Clear -11mm	Pyroguard Clear -11mm Pyroguard Wired -11mm



☐ INTEGRITY AND INSULATION (EI)

In addition to integrity as above 'the ability of a specimen to restrict the surface measured heat rise to an average of 140°C for a set time'.

Typically can be called for as
30/30 - 30 mins integrity/ 30 mins insulation
60/30 - 60 mins integrity/ 30 mins insulation
60/60 - 60 mins integrity/ 60 mins insulation
120/120 - 120 mins integrity/ 120 mins insulation

30/30 minutes Wood or Steel	60/30 minutes Wood or Steel	60/60 minutes Wood or Steel	120/120 minutes Steel
15mm Fireswiss Foam 19mm Fireswiss Foam 22mm Paraflam	15mm Fireswiss Foam 19mm Fireswiss Foam	23mm Fireswiss Foam 27mm Fireswiss Foam 32mm Paraflam	38mm Paraflam 55mm Fireswiss Foam

NOTE : For 60 minutes in wooden frames all integrity glasses need special detailing and frame geometry.

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"CGII's aim is to provide fire glass users with a single supply source for all their needs."

Products

☐ **PYROSTEM – 7mm**
A traditional imbedded Georgian polished wired glass that can be cut from stock.
Fire tested to up to 90 minutes integrity - Class C impact safety to BS 6206 (UK) and class 3B3 to EN12600 (Europe).

☐ **FIRESWISS – various thicknesses**
Modified toughened fire glass in monolithic versions which are made to order. Developed especially for steel frame users to provide up to 60 minutes integrity. Class A impact safety (UK).

☐ **PYROGUARD 7.2mm WIRED**
3-ply laminated wired glass that can be cut from stock. Fire tested up to 60 minutes integrity plus added benefit of radiant heat control. Class B impact safety (UK) and class 2B2 (Europe).

(Because of the patented manufacturing process) a number of different finishes can be produced:
- The wire mesh can be painted in standard colours - white, red, blue, green and black.
- Available with satin, master and stippolyte finishes.

☐ **PYROGUARD 7.2mm CLEAR**
3-ply laminated clear glass that can be cut from stock. Fire rated to 30 minutes integrity plus added benefit of radiant heat control. Class B impact safety (UK) and 2B2 (Europe).
- Available with satin, master and stippolyte finishes.

☐ **PYROGUARD 11.4mm CLEAR**
5-ply laminated clear glass that can be cut from stock, using glass cutting equipment.
Fire rated to 60 minutes integrity with added benefit of radiant heat control. Class B impact safety (UK) and 2B2 (Europe).
- Available with satin, master and stippolyte finishes.

☐ **FIRESWISS FOAM - 15mm CLEAR (INTERNAL GRADE)**
7-ply laminated clear glass that can be cut from stock, using glass cutting equipment. Fire rated to 30 and 60 minutes integrity and 30 minutes insulation. Class A impact safety (UK) and Class 1B1 (Europe).

☐ **FIRESWISS FOAM - 19mm CLEAR (EXTERNAL GRADE)**
9-ply laminated clear glass that can be cut from stock, using glass cutting equipment. Fire rated to 30 and 60 minutes integrity and 30 minutes insulation. Class A impact safety (UK) and Class 1B1 (Europe).

☐ **FIRESWISS FOAM – 23mm CLEAR (INTERNAL GRADE)**
11-ply laminated clear glass that can be cut from stock, using glass cutting equipment.
Fire rated to 60 minutes integrity and insulation. Class A impact safety (UK) and Class 1B1 (Europe).

☐ **FIRESWISS FOAM - 27mm CLEAR (EXTERNAL GRADE)**
13-ply laminated clear glass that can be cut from stock, using glass cutting equipment.
Fire rated to 60 minutes integrity and insulation. Class A impact safety (UK) and Class 1B1 (Europe).

☐ **PARAFLAM – various thicknesses**
A insulating clear glass which is made to order. Manufactured by a process which forms a clear, salt-based gel layer between outer leaves of fully tempered glass. Fire performance from 30/30 to 120/120 minutes. Class A impact safety (UK).

☐ **K TAPE**
A ceramic tape which is ideal for glazing all types of fire glasses. The tape is produced in 10 metre rolls, self adhesive to one side with a removable backing paper which allows accurate and quick frame alignment. Available in 15mm and 20mm x 3.2mm and 6.4mm sizes.

FIRE SAFETY STANDARDS BS 476 PART 20 - 1987

Fire Tests on Building Materials & Structures...fire resistance...general principles

INTEGRITY

"The ability of a specimen of a separating element to contain a fire to specified criteria free from collapse, holes, cracks and fissures and sustained flaming on the unexposed face."

"NOTE 1. Irradiance from the surface of a test construction is a characteristic of the performance for which no criterion exists. There is, however, a need in the case of separating elements that have poor insulating characteristics to determine the amount of heat being radiated from the whole or part of the specimen being evaluated."

INSULATION

"The ability of a specimen of a separating element to restrict the temperature rise of the unexposed face to below specified levels."

A.9.4 - Radiation

"...of value when calculating safe storage distances..." "...measurement at a known distance...shape and size... irradiances at other distances...may be calculated." "...use of these irradiances...matter for the specialists... "The use of irradiance measurements, taken in conjunction with translucent specimens, should therefore be used with discretion."

C.11 Observations

"...shall be monitored by means of a radiometer."

IMPACT SAFETY STANDARDS

Fire glasses and wired glass can no longer be excluded from impact safety requirements. This is clearly set out in the Building Regulations 1991: Approved Document N for new constructions whilst many existing buildings fall under the remit of Health, Safety and Welfare Regulation 14.

In simple terms the use of any glazing in areas where its breakage is likely to cause injury to humans must be a tested safety glass material.

The British Standard (BS) 6206: 1981 defines impact safety testing using a 45kg lead bag and three drop heights to achieve a C (minimum), B or A classification. The European Standard EN 12600: 2002 uses a 50kg steel and tyre impactor with three classifications: 3 (minimum), 2 and 1. All fire glasses offered by CGI International Limited are safety glasses tested to BS 6206 and EN 12600. All our products achieve at least BS Class C and EN Class 3.

Impact Safety - Approved Document N

Any pane of glass which has an overlap with the shaded area must be one of:

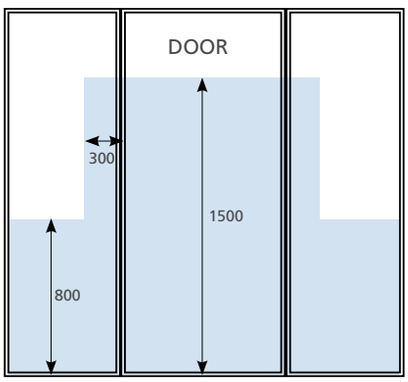
- ☐ Class C (sometimes Class B)
- ☐ A small pane
- ☐ Robust (commercial frontage)

Doors and side panels must be:

- ☐ Class B if the width is greater than 900mm
- ☐ Class C if the width is less than 900mm

Small panels must be:

- ☐ Width less than 250mm
- ☐ Area less than 0.5m



Document N Impact Safety requirements

CGII's Eurpoean Standards Impact Test Rig

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"CGII's own manufactured product, Pyroguard is a leader in many market places."

Pyroguard

PYROGUARD - E + EW

STOCKABLE, CUTTABLE RANGE OF FIRE RESISTING GLASSES DEVELOPED FOR INTEGRITY AND RADIANT HEAT CONTROL

The Pyroguard fire resisting glass range is manufactured exclusively by CGII at its purpose built factory in Haydock, UK. The unique laminating process allows the production of a variety of glass types, with differing fire performance and visual appearances.

DESCRIPTION

Pyroguard is a clear, multi–laminated fire resisting glass with a specially formulated resin interlayer which provides integrity, radiant heat control and impact safety.
The resin interlayer is UV stable and therefore can be used internally as well as externally.
Standard products available are 7.2mm (30 minutes) and 11.4mm (60 minutes).

PERFORMANCE

- ☐ Stops flames and some heat from spreading allowing safe passage and exit
- ☐ Certified up to 60 minutes integrity with radiant heat control
- ☐ Classified EW30 and EW60 to EN 13501-2
- ☐ Class B Impact Safety to BS 6206 and Class 2B2 to EN 12600
- ☐ Can be used in timber, steel with single glazing, double and triple glazed units
- ☐ Does not require edge taping
- ☐ Bevelled variant made to order

STOCK SHEET AVAILABILITY

TYPE	THICKNESS (mm)	IMPACT SAFETY	No.of SHEETS in END CAP	SHEET SIZE (mm)	AREA PER SHEEET	AREA PER END CAP	WEIGHT PER END CAP
PYROGUARD CLEAR	7.2	2B2	20	2700 x 1575	4.27m²	85.40m²	1402kg
PYROGUARD CLEAR	7.2	2B2	20	2500 x 1575	3.95m²	79.00m²	1299kg
PYROGUARD CLEAR	7.2	2B2	30	2410 x 1290	3.11m²	93.30m²	1546kg
PYROGUARD CLEAR	11.4	2B2	13	2500 x 1575	3.95m²	51.35m²	1399kg
PYROGUARD STIPPOLYTE	7.2	2B2	30	2110 x 1290	2.72m²	81.60m²	1356kg
PYROGUARD SATIN	7.2	2B2	20	2500 x 1575	3.95m²	79.00m²	1299kg
PYROGUARD MASTER	8.2	2B2	20	2500 x 1575	3.95m²	79.00m²	1502kg
PYROGUARD CLEAR	11.4	2B2	13	2500 x 1575	3.95m²	51.35m²	1340kg
PYROGUARD STIPPOLYTE	11.4	2B2	18	2110 x 1290	2.72m²	48.96m²	1347kg
PYROGUARD SATIN	11.4	2B2	13	2500 x 1575	3.95m²	51.35m²	1399kg
PYROGUARD MASTER	12.4	2B2	13	2500 x 1575	3.95m²	51.35m²	1504kg

FIRESWISS FOAM - EI

STOCKABLE, CUTTABLE RANGE OF FIRE RESISTING GLASSES FOR INTEGRITY AND INSULATION

Fireswiss Foam is manufactured by CGII's Swiss partner and is exclusively distributed in the UK and to specific regions worldwide.

DESCRIPTION

Fireswiss Foam is a clear multi-laminated product which is made up of layers of 3mm float glass with an intumescent (silicate) interlayer. The product has excellent visual clarity and stops flames, smoke and heat, allowing safe exit. A range of thicknesses are available in standard stock sheet sizes to British and European Standards in various glazing systems and applications. The product can be used internally and externally (with pvb interlayer added).

PERFORMANCE

- ☐ Provides a barrier to fire and heat to allow safe passage and exit
- ☐ Certified up to 60 minutes integrity and insulation
- ☐ Classified to EI60 to EN 13501-2
- ☐ Class 1B1 to EN 12600
- ☐ Excellent visual clarity
- ☐ Internal and external applications
- ☐ Must be edge taped

STOCK SHEET AVAILABILITY

TYPE	THICKNESS (mm)	RATING	IMPACT SAFETY	MAKE UP	NO. OF SHEETS IN PACK	SHEET SIZE (mm)	AREA PER SHEET (m^2)	AREA PER END CAP (m^2)	WEIGHT PER END CAP
FSF INTERNAL	15	EI 30/30 EI 60/30	CLASS 1B1	4 FLOAT X 3 INTERLAYER	11	3100 x 2125	6.60	72.60	2618kg
FSF EXTERNAL	19	EI 30/30 EI 60/30	CLASS 1B1	5 FLOAT X 4 INTERLAYER + 1Pvb	8	3100 x 2125	6.60	52.80	2856kg
FSF INTERNAL	23	EI 60/60	CLASS 1B1	6 FLOAT X 5 INTERLAYER	7	3100 x 2125	6.60	46.20	2541kg
FSF EXTERNAL	27	EI 60/60	CLASS 1B1	7 FLOAT X 6 INTERLAYER + 1Pvb	6	3100 x 2125	6.60	39.60	2904kg

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"CGII's products have been used in many prestigious buildings throughout the world."

PARAFLAM - EI
A HIGH PERFORMANCE FULLY INSULATING GLASS

INTRODUCTION

Paraflam is manufactured by a process which forms a clear, salt-based gel layer between the outer panes of fully tempered glass. Depending on the gel layer thickness, fire resistance and insulation periods can be provided from 30 minutes up to 120 minutes. This product is made to order.

PERFORMANCE

- ☐ Provides a barrier to fire and heat to allow safe passage and exit
- ☐ Certified up to 120 minutes integrity and insulation
- ☐ Tested to BS 476, Parts 20 & 72
- ☐ Class A to BS 6206

PARAFLAM PANEL THICKNESS (mm)	GEL LAYER THICKNESS (mm)	FIRE RESISTANCE MINUTES	HEAT RESISTANCE MINUTES	IMPACT SAFETY
22	12	30	30	A
32	22	60	60	A
38	28	90	90	A
55	45	120	120	A

FIRESWISS -
A MODIFIED TOUGHENED, CLEAR FIRE RESISTING GLASS FOR 30 AND 60 MINUTE INTEGRITY-ONLY APPLICATIONS

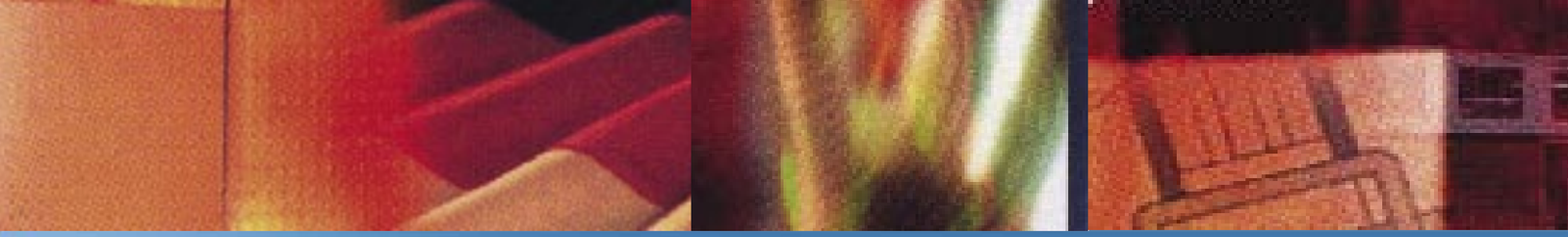
DESCRIPTION

Fireswiss is a traditional monolithic fire resistant glass, providing 'integrity only' performance in large panel sizes for both 30 and 60 minute applications and is principally used for steel framing systems. Fireswiss is a specially treated and toughened clear float glass which can be manufactured in single monolithic form (6mm, 8mm, 10mm etc), in laminated construction (3-ply 12.4mm thickness) or as double-glazed units from 20mm thickness and beyond. This product is made to order.

FIRE AND IMPACT PERFORMANCE

Fireswiss has been tested in the UK and Europe and other international countries. For the UK, tests to BS 476 Part 20 have been achieved for 30 and 60 minute periods.

All Fireswiss glasses are manufactured to meet Class A safety level to BS 6206 and exceed the requirements of BS 6262 Building Regulations Document N.



PYROSTEM -
A WIRED GLASS FOR INTEGRITY AND IMPACT SAFETY

STOCKABLE, CUTTABLE WIRED FIRE GLASS

DESCRIPTION

Pyrostem offers an easy to use solution to the present day need, in most situations, of combining integrity with impact safety. Pyrostem has been manufactured with a thin wire mesh to make the product easy to cut and process.

PERFORMANCE

- ☐ Stops flames and smoke
- ☐ Certified up to 60 minutes integrity
- ☐ Classified to EN 13501-2
- ☐ Class C Safety (BS 6206) - Class 3B3 (EN 12600)
- ☐ Tested with a wide range of framing systems and glazing applications.
- ☐ Available in stock cases or full containers

STOCK SHEET AVAILABILITY

THICKNESS	DELIVERY TYPE	STOCK SHEET SIZE	No. of SHEETS in END CAP	NUMBER OF CASES	AREA PER SHEET (m^2)	AREA PER END CAP	WEIGHT
PYROSTEM 7mm	BY CASE	2440 X 1830	20	1	4.47	89.40	1,700kg
PYROSTEM 7mm	CONTAINER	2440 X 1830	20	12	4.47	1072.80	20,400kg
PYROSTEM 7mm	BY CASE	3300 X 2140	15	1	7.06	105.90	2,012kg
PYROSTEM 7mm	CONTAINER	3300 X 2140	15	10	7.06	1059.00	20,000kg

K TAPE -
CERAMIC TAPE FOR USE IN GLAZING FIRE RESISTANT GLASSES

It is of utmost importance that all components in a fire-resistant glazing system are fire rated and compatible. Whole systems would be deemed to fail should any single item within them ignite on the cold face of the furnace for more than ten seconds or allow a small gap in a system through which flames or ignitable gases can pass.

CGII's ceramic tape is an ideal and economical method for glazing integrity and fully insulated fire resisting glasses. The tape is produced in 10 metre rolls, self adhesive on one side with removable backing paper to allow easy frame alignment. Straight-butted joints are acceptable for fire rating and for external weatherproofing, and can be capped with a non-combustible mastic.

K Tape has been extensively tested as part of glazed systems for steel and timber to British and European standards.

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"Like a corporate knighthood."

Queen's Award for Enterprise

QUEEN'S AWARD FOR ENTERPRISE

THE QUEEN'S AWARDS FOR ENTERPRISE: INTERNATIONAL TRADE 2004

CGII won the Queen's Award for Enterprise: International Trade in 2004 for increasing overseas sales of its range of fire resisting glasses. The award was presented to CGII by Alan W. Waterworth, Lord Lieutenant of Merseyside, in an official ceremony at the Haydock factory in June 2004. Tom Ritchie, Managing Director, commented :

"We are delighted to have achieved the Award which recognises the company's success in securing export contracts won in a competitive world-wide market place over a sustained number of years. Our UK activity is also important as we are the only substantial UK manufacturer of our glass type."

LEFT
CGII staff and guests at the Haydock factory.

BELOW LEFT
Tom Ritchie, CGII Managing Director, being presented with the award by Alan W. Waterworth, Lord Lieutenant of Merseyside.

BELOW RIGHT
Steve Brice, Secretary of The Queen's Awards Office, glass inspector Joe Painter, and CGII Sales and Marketing Director Phill Millward.

Playing host at its premises in Millfield Lane to Steve Brice, Secretary of The Queen's Awards Office, during a tour to encourage other North West firms to apply for this ultimate business accolade - described by one previous winner as being *'like a corporate knighthood'*

Said Sales and Marketing Director Phill Millward: *"Winning this Award certainly enhanced our business reputation in the glass industry, besides providing a tremendous morale boost for our staff."*

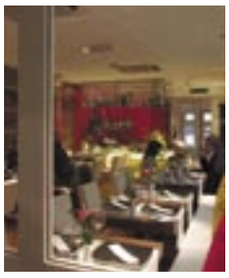
PROJECTS

Below are just some of the projects that CGII has been involved with in the past.

SUNLEY HOMES, KENT

SNOWDOME, TAMWORTH

ST MARY'S, AMBLESIDE



BIAGIO RESTAURANT, LONDON

ST GALLEN BUILDING, SWITZERLAND

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CGI INTERNATIONAL LTD

CGI International Ltd provides a complete range of fire glass products to fulfil a wide variety of performances and appearances enabling specifiers to obtain all of their requirements for fire and speciality glasses from a single source.

Please visit our website for the latest up to date information.

THE QUEEN'S AWARDS FOR ENTERPRISE: INTERNATIONAL TRADE 2004

BS EN ISO 9001:2000 FM 52586

Fireswiss

CGI INTERNATIONAL LTD

A Modified Toughened, Unwired Fire Resisting Glass For 30 and 60 Minute Integrity Fire Performance; With Class A Impact Safety

Manufacturers and Suppliers of Fire and Security Glasses to International Standards

Fireswiss is the label for CGI International's traditional monolithic fire resistant glass, providing 'integrity only' performance in large panel sizes for both 30 minute and 60 minute time duration. **Fireswiss** is designed principally for steel framing systems.

Fireswiss is a specially treated and toughened clear float glass which can be manufactured in single monolithic form, in laminated construction or as insulating glass (double glazing units) for a wide variety of size and frame applications.

CGI International Limited is a leader in the manufacture and provision of all types of fire resistant glasses, from georgian wired through unwired integrity only versions, radiation control and partially insulated, to fully insulated glasses for up to 2 hours time performance.

CGI International Limited is accredited to BS EN ISO 9001:2000.

'Integrity Only' glasses are the largest group sector of fire resistant glass applications; these glasses stop the spread of fire by their ability to contain against collapse, holes, cracks and the breakthrough of sustained flaming; they do not address heat transfer.

For radiation control, partially insulated or fully insulated glasses, please refer to **CGI International** for alternative glass types from their range.

IMPACT

All **Fireswiss** glasses are manufactured to meet Class A safety level (tested by BS6206) and exceed the requirements of BS6262, Building Regulations Document N and Health, Safety and Welfare Regulation 14.

Test House	Reference	Performance	Thickness
British Standards Institute	BG 003676	Class A	6mm

PROPERTIES

Fire-Integrity

Fireswiss has been tested in the UK, also in mainland Europe and other international countries.

For the UK, tests to British Standard 476 part 20 have been achieved at 30 and 60 minute time periods.

Specification

In standard form, **Fireswiss** fire resistant glass is monolithic 6mm thickness, other monolithic thicknesses of 8mm, 10mm etc are available.

In laminated format, the standard product is 3ply 12.4mm thickness. Insulating glasses (sealed units) are made from 20mm thickness and beyond.

FIRE RESISTANCE CERTIFICATION
To BS476 and equivalent

6mm Fireswiss

Test House	Reference	Frame	Panel wxh(mm)	Integrity mins
LPC	TE 87310	Steel multi-panel	1250x2000	39
LPC	TE 87752	Steel multi-panel	1100x1450	62
EMPA Switzerland	143.105	Steel multi-panel	1250x2000	53
LPC	CC87878	Various steel doors and frames	1400x2300	30
LPC	CC87878	Various steel doors and frames	1100x1450	60
LPC	CC87976	Jansen doors and screens	1100x1450	60
LPC	CC89950	Double action pair of steel doors in screens	750x2060	60

10mm Fireswiss

Test House	Reference	Frame	Panel wxh(mm)	Integrity mins
LPC	CC87878	Various steel systems	up to 5.13m²	30

12.4mm Laminated Fireswiss

Test House	Reference	Frame	Panel wxh(mm)	Integrity mins
EMPA Switzerland	130.081	Steel multi-panel	1200x2140	43
SISAR Singapore	Various	Stainless steel visionpanel	Various	74
LPC	TE 89007	visionpanel	240x730	73

20mm Insulating Glass (Double Glazing Unit)

Test House	Reference	Frame	Panel wxh(mm)	Integrity mins
EMPA Switzerland	144.066	Steel multi-panel	1250x2000	50

HOT SMOKE RESISTANCE
To BS7346

Test House	Reference	Frame/ Glass	Panel wxh(mm)	Integrity mins
Warrington Fire Research	69426	Steel brackets 10mm glass with holes	850x450	61
Warrington Fire Research	100178	Horizontal Steel frame 17mm laminated glass	890x890	70

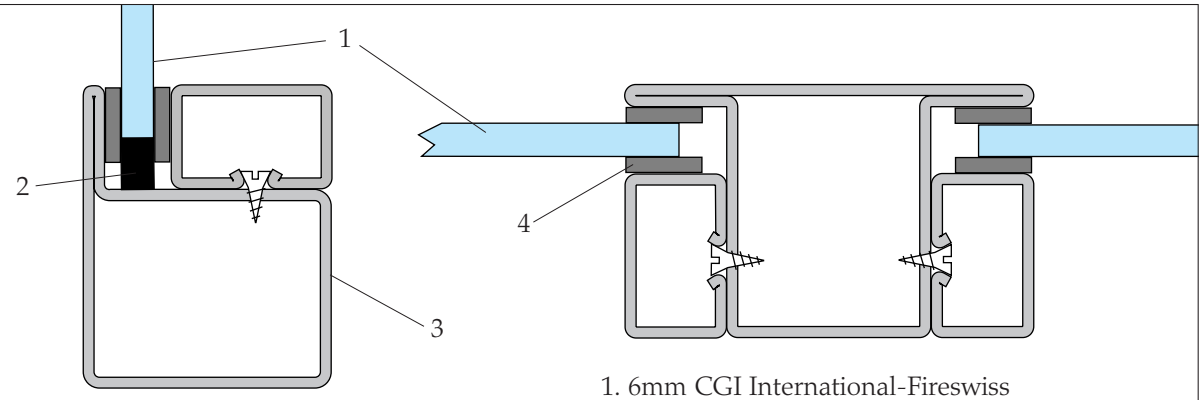
FRAME DETAILS

The frame details listed in the test reports show some of the specific types in which CGI International-Fireswiss has been tested. A variety of additional frame styles may be used subject to general or specific assessment by an approved test house or assessment authority.

Any non-authorised variations on frame types, glazing details or panel sizes may be outside the test certification of the product and the desired time performance level may not be reached.

GLAZING DETAILS

In all the listed tests, CGI International-Fireswiss is glazed in ceramic tape (CGI International 'K'tape or similar approved). The design edge cover to the glass (by the frame) is 10mm; for the tested sizes, the *minimum* edge clearance on each edge is 6mm, except on the bottom edge where two setting blocks of non-combustible material (CGI International Vermipan or similar approved) are used.



Scale: approx. 2/3 full size

1. 6mm CGI International-Fireswiss
2. CGI International Vermipan setting block
3. Rolled steel tubular frame (Jansen/Forster)
4. CGI International 'K'ceramic tape

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THE QUEEN'S AWARDS FOR ENTERPRISE: INTERNATIONAL TRADE 2004

BS EN ISO 9001:2000 FM 52586

Fireswiss Foam

CGI INTERNATIONAL LTD

A multi-layered fire resisting glass offering integrity and insulation for 30 and 60 minute from an ex-stock situation

Manufacturers and Suppliers of Fire and Security Glasses to International Standards

INTRODUCTION

This new addition to the CGI International stable of fire glasses provides a high quality, fully insulated fire glass, which can be cut from stock and supplied to meet the demanding needs of site programmes.

Fireswiss Foam is manufactured by a special laminating process which creates adjacent layers of glass and clear silicate built up to create a complete fire barrier to both the spread of **FIRE** and **HEAT**.

Depending on the overall glass thickness, fire performances of 30 minutes up to 60 minutes and beyond can be achieved in a wide range of suitable frame types.

A glazed fire resistant barrier meeting **INTEGRITY** and **INSULATION** standards must, in addition to stopping the breakthrough of fire and ignitable gases, limit the surface temperature of all elements of the barrier to an average temperature rise of 140°C or at any point to a temperature rise of 180°C.

PROPERTIES

For its basic 30, 45 and 60 minutes fire performances **Fireswiss Foam** is a multi-laminate of silicate and clear float glass layers, the number of reactive layers determining the fire performance as follows:

Fireswiss Foam Thickness (mm)	number of layers	fire resistance (mins)	heat resistance (mins)
15	7	30	30
23	11	60	60

Due to the overall glass thickness and laminated construction it is necessary to saw-cut glasses to finished size; this can be carried out by CGI International or a specialist distributor partner.

FEATURES

Fireswiss Foam is at the top performance level of fire glass, offering excellent fire and heat control properties together with a high impact safety rating.

Most tests have been carried out to the appropriate European Norm (EN) standard; the EN test evidence is completely acceptable as complying to regulation 7 of the current editions of The Building Regulations: Approved Document B: Fire Safety.

Fireswiss Foam has the following performance features:

- Quick availability from cutting stockholders
- Large tested sizes
- Unlimited small size, available by cutting
- High level of sound reduction, due to overall thickness and interlayers
- Wide range of approved framing types

TECHNICAL DATA

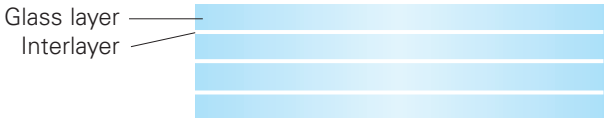
	Sound reduction Rw scale	approx. weight	light transmission
15mm Fireswiss Foam 30/30	38dB	36 kg/m^2	85%
23mm Fireswiss Foam 60/60	>40dB	55 kg/m^2	82%

SPECIFICATION

Fireswiss Foam is (currently) made in standard sizes up to 3100mm x 2125mm and is saw-cut to finished size by CGI International or by a number of specialist stockist partners.

The finished glass pane must be clearly and indelibly marked with the glass and supplier names, plus the fire and impact performance, in accordance with Building Regulations: Approved Document N and Glass & Glazing Federation (GGF) Best Practice Guide.

The make-up of **Fireswiss Foam** in 15mm format is shown for reference:



Each finished cut size must be edge taped with a specially designed foil tape to protect the interlayers from moisture/atmospheric attack.

TEST PERFORMANCES

All original fire resistance testing has been carried out to EN 1363-1:1999; a review of the available test evidence has been used to produce both a (potential) Notified Body's Classification Document and other certification approvals.

FIRE RESISTANCE CERTIFICATION To EN 1363, BS476 or equivalent

Glass Thickness	Test house/ Notified Body	Certification Reference	Frame	Glass Sizes mm	Integrity minutes	Insulation minutes
15mm	ift - Rosenheim	271 29283e	insulated steel	2000 x 2840 2840 x 2000	30	30
15mm	ift - Rosenheim	271 29283e	solid timber	2000 x 2840 2840 x 2000	30	30
15mm	BRE	221706	hardwood	1200 x 1200	60	30
23mm	ift - Rosenheim	271 29284e	insulated steel	1500 x 2500 2500 x 1500	60	60
23mm	Warrington Fire	tba	solid timber	tba tba	60	60

CLASSIFICATION DOCUMENTS have been issued by ift - Rosenheim in accordance with EN 13501-2: 2003. This classification is confirmed also to hold the status of a BRITISH STANDARD.

Some additional testing, for UK market use, will be to BS 472 : Part 22.

IMPACT PERFORMANCE

Impact tests on **Fireswiss Foam** have been carried out to EN 12600: 2002 and ALL THICKNESSES of at least 15mm and 23mm and other special make ups achieved the HIGHEST category of impact, with a laminated glass breakage pattern of breakage - CLASSIFICATION 1B1.

FRAME DETAILS

To meet the requirements of fire resistance testing, ALL elements of the glass and frame must provide INTEGRITY and INSULATION protection (INSULATION meaning a surface temperature rise limited to an average of 140° C and a 'spot' temperature rise of 180°C).

For STEEL FRAMES, this typically means an insulated frame type, suitable for holding this glass type for the specified time period.

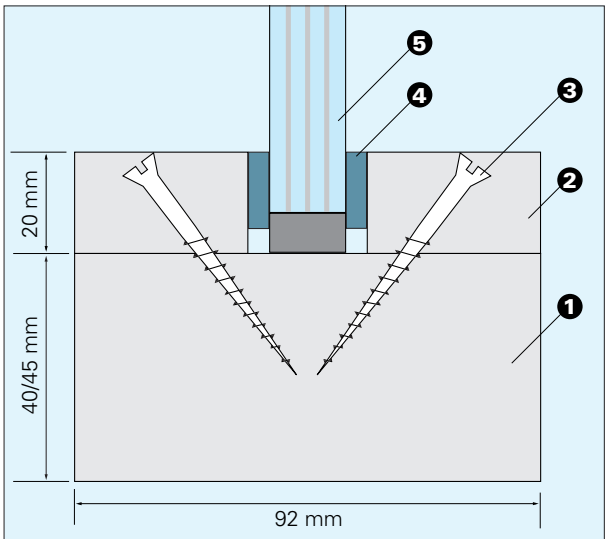
Insulated steel frame types by FORSTER, JANSEN and approved others are suitable.

The use of TIMBER FRAMES as glazed fire screens is widespread and, due to the high natural insulation given by timber, they can also provide INTEGRITY with INSULATION for up to 60 minutes at least.

The design of a timber 30 or 60-minute fire screen is critical, as there needs to be attention to several key elements:

- Selection of a suitable timber species (most dense timbers have a slower charring rate).
- Sufficient material/section size of the timber frame and beads, to allow for the charring during the desired fire period and still allow glass retention and freedom from 'burn-through'.
- Selection of compatible fire glass type.
- Position, size and frequency of bead fixings.
- Use of suitable and proven glazing system/medium.

Given the absence of a widely available 'proprietary' frame style, CGI International has worked together with various test houses to agree the following timber frame details which would serve as typical minimum dimensions as far as fire resistance is concerned. For structural design and other factors, other features of a frame may need to be considered.



1 Hardwood frame (min. density 640kg/m^3)
2 Hardwood bead (min. density 640kg/m^3)
3 50mm x 4mm steel screws @ 200mm centres
4 4mm ceramic 'K' Tape (or approved system)
5 Fireswiss Foam glass

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THE QUEEN'S AWARDS FOR ENTERPRISE: INTERNATIONAL TRADE 2004

BS EN ISO 9001:2000 FM 52586

Paraflam

CGI INTERNATIONAL LTD

A high performance fully insulated glass to provide resistance to fire and transmitted heat

Manufacturers and Suppliers of Fire and Security Glasses to International Standards

INTRODUCTION

In addition to its well known range of fire glasses which offer integrity, integrity with radiation control and partial insulation, CGI International now introduce a *new, fully insulated product,* **PARAFLAM**, to complete its matrix of glasses for various performances and time periods.

PARAFLAM is manufactured by an unique process which forms a clear, salt-based gel layer between the outer leafs of fully tempered glass. Depending on the gel layer thickness, fire resistance and insulation periods can be provided from 30 minutes to over 120 minutes.

PROPERTIES

In the event of a fire the gel layer within the **PARAFLAM** makeup will react to form a fire and heat resistant layer.

Depending on the gel layer thickness, resistance times from 30 minutes upwards can be achieved as follows:

Paraflam panel thickness (mm)	**Gel-layer** thickness (mm)	**Fire Resistance** minutes	**Heat Resistance** minutes
20 - 22	12	30	30
32	22	60	60
38	28	90	90
55	45	120	120

FEATURES

PARAFLAM offers a number of performance features over multi-layer insulating fire glasses including:

- high level of sound reduction achieved by the thick, absorbent layer.
- visual clarity is not affected by multiple glass discoloration, green-ness. High light transmission circa 85%.
- in higher fire grades,much lighter weight is achieved over glass multilayers due to thinner glass content.
- can be easily incorporated into a double glazing unit to provide thermal or solar performance.
- interlayers can **only** be reacted by fire temperatures, not by climatic conditions.
- robust, fully tempered outer layers mean less chance of accidental breakage.
- all grades meet Class A impact safety.
- operating temperature range -20°C - +50°C.
- gel layer is u.v. stable and can be used externally or internally.

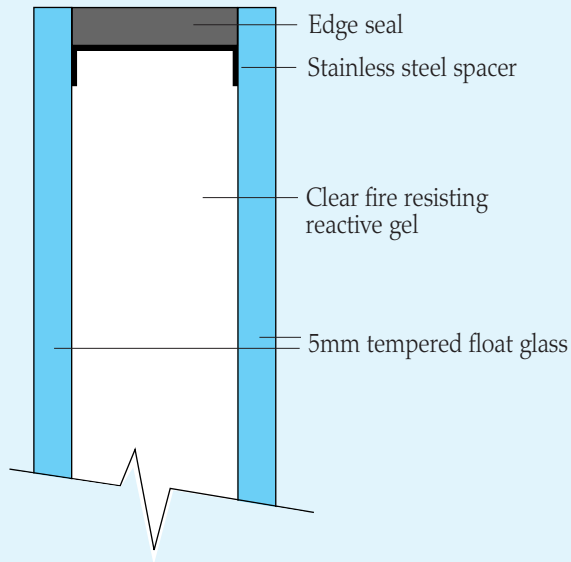
TECHNICAL DATA

	Sound Reduction	Weight kg/m²	Comparable multilayer glass kg/m²	
			internal	external
20/22mm Paraflam 30/30	42dB	35/40	36	44
32mm Paraflam 60/60	44dB	52	48	63
38mm Paraflam 90/90	46dB	60	85	93
55mm Paraflam 120/120	tba	81	97	121

SPECIFICATIONS

PARAFLAM is factory-made to specific sizes up to a manufacturing maximum of 1500mmx3500mm but should be used within the size parameters of the test data (see panel).

The make-up of the **PARAFLAM** panel is shown for the 32mm thick, 60/60 specification.



For alternative thickness/fire ratings, the spacer and gel layer are increased.

PARAFLAM, including its outer glass leaves, is manufactured to the highest standards and the plant is registered under ISO 9001.

Paraflam

A high performance fully insulated glass to provide resistance to fire and transmitted heat

TEST PERFORMANCES

Fire testing has been carried out to BS476 parts 20 &22 by UK test houses. Also in other European countries to the equivalent test standards which are similar or related to ISO834.

Test House	Reference	Frame	Panel wxh(mm)	Integrity mins	Insulation mins
Warrington	C108434	Various steel systems	1450x2250	30 60 90	30 60 90
		timber frame	1450x2250	30 60	30 60
Warrington	C107313	steel	1296x1996	60	60
Warrington	115844	steel	1300x2000	139	135
FMPA Stuttgart	25769 Wie/Ei	steel	1270x2010	31	37
FMPA Stuttgart	25770 Wie/Ei	steel	1270x2010	77	77
FMPA Stuttgart	25771 Wie/Ei	steel	1270x2010	96	96
I.B.S Linz	4042/00	Jamisol 2 steel	1258x2508	30	30
I.B.S Linz	4043/00	Forster Fuegolight	1250x2500	30	30

IMPACT PERFORMANCE

All **PARAFLAM** panels will achieve Class A impact rating to BS6206, due to the outer leaves being fully tempered glass.

FRAME DETAILS

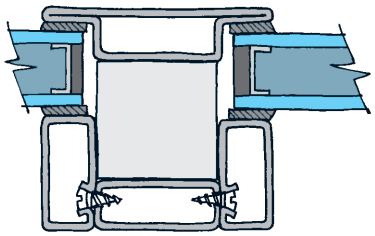
PARAFLAM has been tested and approved in a wide variety of approved frame types, some of these are depicted below for general information.

The use of compatible glasses, frames and glazing methods is essential to ensure that fire performance will be within the tested and approved parameters.

Typical Frame Details:

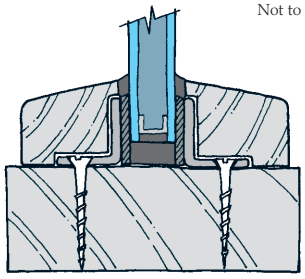
These details show some of the typical frame styles in which Paraflam has been specifically tested or assessed by CGI International. Other frame styles can also be used provided CGII, a frame system maker or others hold the relevant certification/approvals.

Not to scale



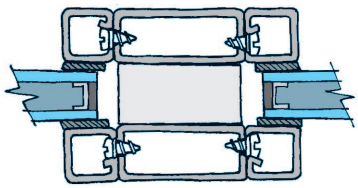
Detail 1 Wrightstyle Firestop 60/60 screen

Not to scale



Detail 2 Typical timber frame

Not to scale



Detail 3 Forster Fuegolight 30/30

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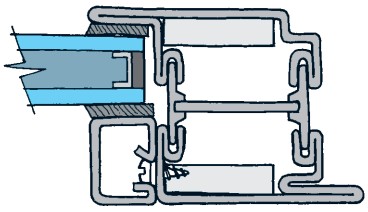
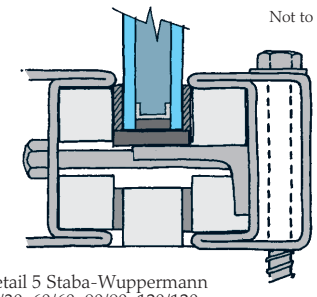


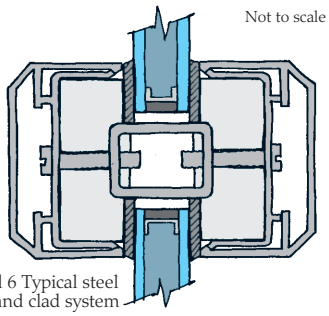
Detail 4 Janisol 2 30/30

Not to scale



Detail 5 Staba-Wuppermann 30/30, 60/60, 90/90, 120/120

Not to scale



Detail 6 Typical steel core and clad system

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