

The new advanced toughened glass

Pilkington **Pyroclear**[®]

Fire-resistant Glass





Pilkington **Pyroclear**[®],
fire-resistant screens
in the façade: a typical
containment application
for integrity E30 glazing.

Pilkington **Pyroclear**[®] – The new generation of Pilkington fire-resistant glass

Pilkington **Pyroclear**[®] is an advanced toughened fire-resistant glass for use as an integrity barrier. It is based on a new technology development which we've been perfecting and crafting for several years, built on an in-depth understanding of the behaviour of glass in fire, including new knowledge of the detail that influences probability of glass failure.

With nearly two hundred years of manufacturing experience, the Pilkington brand has developed a reputation for innovation in glass, and for leading the way in the development of fire-resistant glass. Pilkington **Pyroclear**[®] continues in that unique tradition, setting new benchmark standards for its category in terms of improved reliability and consistency of performance in fire.

Pilkington **Pyrostop**[®], Pilkington **Pyrodur**[®], and Pilkington **Pyroshield**[™] 2 are well established products with an excellent reputation for reliable fire protection. Pilkington **Pyroclear**[®] now extends and complements the range.

Our intent is to provide a complete product range of cost effective solutions to suit the requirements of modern risk-based and performance-based fire safety design. The variety of choice in the Pilkington range allows individual fire safety objectives to be met for building owners, authorities and insurance regarding life safety, property protection and protected emergency services access.

All of this can be achieved with flexibility for the balancing of budgets, peace of mind and performance value.

Product selection can readily be tailored to fit the individual fire risk profile of the application, occupancy and design.

The new advanced toughened fire-resistant glass

The impressive performance of Pilkington **Pyroclear**[®] is based on the intergration of several key elements.

This has been demonstrated with repeated passes, including in timber frames.

Pilkington **Pyroclear**[®] is manufactured to high quality control standards, combining the best available expertise in both automotive and architectural premium glass processing. It is based on NSG proprietary technology, new R&D insights on the factors that affect the probability of premature failure of advanced toughened glass in fire (long acknowledged as a weakness of this type), and our proprietary accumulated technical experience on glass and glazing systems for integrity fire resistance from years of extensive fire testing and experience in fire safety.

Pilkington **Pyroclear**[®] is cost effective and readily available for use in a variety of both timber and metal framed assemblies. It has been developed according to stringent performance criteria in fire testing, and has an established track record of over 15 years of use in Japan and since 2009 across Europe.

Main features:

- Integrity 30 and 60 minutes (E30 and E60 to BS EN 13501-02)
- Integrity with reduced heat radiation (EW30) for IGUs, if required
- Unique product design and system description, manufacturing process and quality assurance system
- Superior visual quality and flatness: mean roller wave <0.1 mm, bow 1.5 mm/metre length (1.5%) – a factor of two times better than standard values given for toughened glass in standard BS EN 12150
- Special processing, high quality toughening and high quality process control
- Has achieved a target of more than 50 consecutive successful fire tests in timber framed systems

- Designed for compatible edge cover of up to 20 mm for metal frames and 15 mm for timber (NB. Typical value for modified toughened is commonly given as 10 mm +/- 1 mm to minimise the risks of unpredictable failure)
- Exploits our developed proprietary R&D knowledge and expertise on glazing systems in timber frames (system design, materials, glazing arrangements)
- Large pane size capability in metal systems (e.g. 1.8 m x 3.5 m – E30)
- Practical sizes and glazing arrangements for use in timber frames for doors and screens
- Produced at our premier architectural glass processing site in the UK to the highest of quality control standards

*Permanent product mark:
Pilkington product brand name
with product code (fire resistance
in minutes followed by a three
digit product code), applicable
standard, impact rating,
manufacturing site and the year
of production.*



*External façade comprising
Pilkington **Pyroclear**[®]
as barrier against hot smoke,
flames and fumes (integrity).*



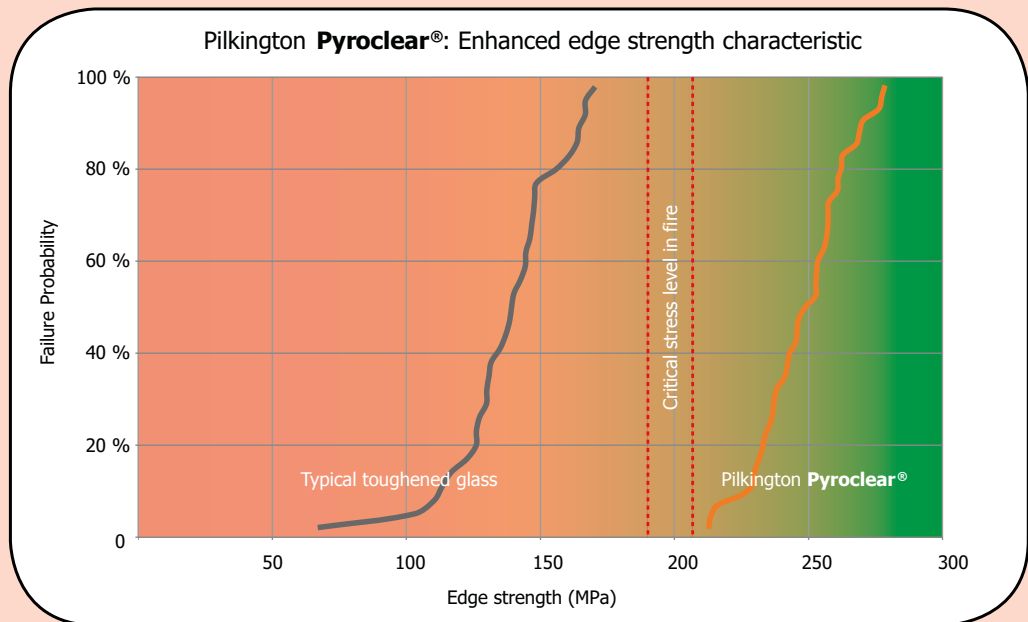
Pilkington **Pyroclear**[®]: Enhanced strength characteristic

Pilkington **Pyroclear**[®] is engineered to withstand the thermal stress in fire conditions reducing the risk of fatal failure to a minimum. Pilkington **Pyroclear**[®] has shown in tests that it is capable of resisting a critical temperature failure differential up to 50% greater than that

which normally applies to toughened glass in fire. And, for greater flexibility in glazed systems, Pilkington **Pyroclear**[®] has also been designed for larger edge cover allowances than is normally the case for commonly used modified toughened fire-resistant glass.

Pilkington **Pyroclear**[®] has distinctive features that give it a higher strength across the range of possible thermal stresses in fire and therefore it has a lower probability of stress and thermal shock failure in fire conditions.

Note: Edge stress is not the same as surface compressive stress and requires special measurement techniques.



Pilkington **Pyroclear**[®] in door and screen providing integrity and fire separation for a lift and stair lobby.



*Large area double leaf door with top light - a good example of how Pilkington **Pyroclear**[®] provides reliable integrity without compromising open design.*

Application

The importance of risk profile

Pilkington **Pyroclear**[®] is recommended for use as a physical barrier against flames, smoke and fumes. Its prime purpose should be for fire containment to protect against the risks that occur during the early stages of fire, before conditions become untenable. This is commonly taken by designers to be the relatively short period for protected escape to a place of safety before major fire development occurs (typically the first 15 to 30 minutes). That includes the ignition, alarm, reaction and escape stages during initial fire growth leading to flashover (i.e. before the fire fills the compartment of origin and starts to spread).

Pilkington **Pyrostop**[®] and Pilkington **Pyrodur**[®] are available for use at flashover where the risks are likely to be greater, where both a flame and heat barrier, to various degrees, is a valued enhanced benefit. That could be, for example, in developed fire or rapid fire growth conditions, also for higher risk occupancies and more

difficult and uncertain escape situations (e.g. schools, hospitals, nursing homes, hotels, airports and tall buildings), for property protection, enhanced protection for emergency services, and for situations where extended exposure is a possibility.

The occurrence of fire is frequently unexpected, its development uncertain and the consequences potentially catastrophic. Product selection should be determined by the risk profile of the building (its type and design), the occupancy characteristics, the anticipated fire hazards and the likely developed fire condition should fire break out. In that respect, the product risk profile should be a key consideration to fit the risk profile of the application and the requirements of the fire safety objectives.

*Pilkington **Pyroclear**[®] used in external façades of commercial office buildings and high-rise apartment towers to contain flames and limit spread to upper floors or adjacent areas.*





Range of applications

- Doors and screens with side and top lights
- Skylights and roof glazing, including sloped options
- External façades (to limit the risk of flame break out)
- Atrium interior side glazing
- Smoke barriers and screens

Note: Special new tested blast-resistant formulations are available on request. Pilkington **Pyroclear**[®] is supplied with special edge tape, which as an integral part of the product must not be removed or substituted. Standard glass tapes are not acceptable.

Note: Production of Pilkington **Pyroclear**[®] is only allowed according to the specified proprietary NSG production system for Pilkington **Pyroclear**[®], fully quality assured and audited to comply with the defined product and processing system description and the required quality specification.

With Pilkington **Pyroclear**[®] Pilkington extends its range of transparent fire-resistant glass products with a reliable integrity only fire-resistant glass (class E).



This publication provides only a general description of the product. Further, more detailed information may be obtained from your local supplier of Pilkington products. It is the responsibility of the user to ensure that the use of this product is appropriate for any particular application and that such use complies with all relevant legislation, standards, code of practice and other requirements. To the fullest extent permitted by applicable laws, Nippon Sheet Glass Co. Ltd. and its subsidiary companies disclaim all liability for any error in or omission from this publication and for all consequences of relying on it. Pilkington, "Pyrostop", "Pyrodur" and "Pyroclear" are trademarks owned by Nippon Sheet Glass Co. Ltd., or a subsidiary thereof.

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CE marking confirms that a product complies with its relevant harmonised European Norm.
The CE marking label for each product, including declared values, can be found at www.pilkington.com/CE



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