Pyroguard
A Saverto Company

Quality Guidelines

2026 EDITION

Quality Guidelines

1.1 Introduction

Attackguard, Pyrostem, Pyroguard Advance, Pyroguard Balustrades, Pyroguard Firesafe, Pyroguard Infinity, Pyroguard Marine, Pyroguard Protect, Pyroguard Rapide, Pyroguard Rapide+ and Smokeguard are ranges of high performance glasses which comply with the various national and international standards. All ranges of Pyroguard glasses can provide a barrier to smoke and flame up to 180 minutes insulation depending on the range used. All Pyroguard glasses provide high levels of light transmission and can be combined into an IGU to provide many additional technical features such as high thermal performance and advanced acoustic properties.

Attackguard, Pyrostem, Pyroguard Advance, Pyroguard Balustrades, Pyroguard Firesafe, Pyroguard Infinity, Pyroguard Marine, Pyroguard Protect, Pyroguard Rapide, Pyroguard Rapide+ and Smokeguard glasses are compliant to EN 12150 (toughened glass), EN 12543 (laminated safety glasses) and EN 14449 (laminated glasses) which form the basis for the CE marking of these products. There are further glass standards that are considered e.g. EN 1096-1 (coated glasses) and EN1279 (Insulating Glass Units) that are specific to these products as and when needed.

1.2 Scope

The purpose of this document is to provide the basis to assess the features of all the Pyroguard fire resistant glass ranges.

1.3 Observation Criteria

The observation criteria to be followed is described in EN 12543-6.

This states that; *the laminated glass is put in a vertical position, in front of and parallel to a matt grey screen, and is lit by diffuse daylight or equivalent. The laminated glass is visually inspected perpendicularly at a distance of 2 m from the glass, with a matt screen on the other side of the glass. Any visible defect that are disturbing shall be marked.*

If the fire resistant glass has been incorporated into an IGU with a coated glass as the counterpane, then the inspection distance is increased to 3 m in accordance with EN 1096-1.
The diagram and tables on subsequent pages describe the details of the defect according to its position within the glass and the allowable criteria based on this positioning.

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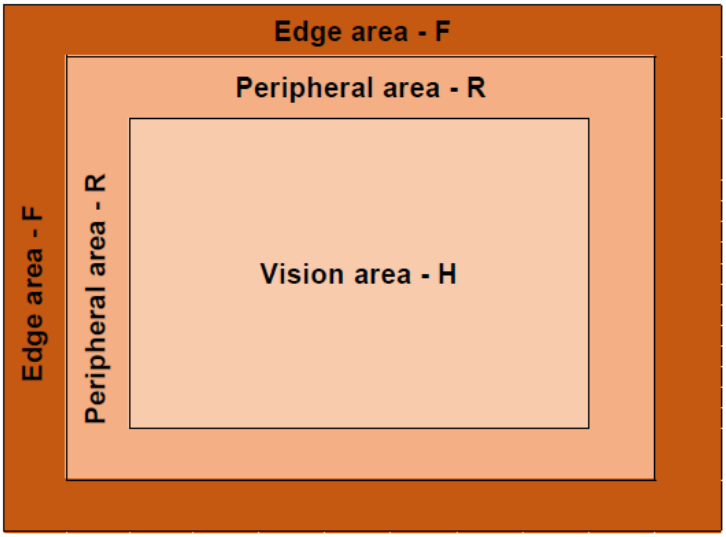
Attackguard, Pyrostem, Pyroguard Advance, Pyroguard Balustrades, Pyroguard Firesafe, Pyroguard Infinity, Pyroguard Marine, Pyroguard Protect, Pyroguard Rapide, Pyroguard Rapide+ and Smokeguard:

Edge area – F

The edge area extends to 20 mm, taken from the glass edge. Within this zone, no visual assessment is made. Any damage to the periphery does not impair the glass strength. The seal that creates the sightline for Pyroguard Protect and Pyroguard Infinity glasses falls within this zone.

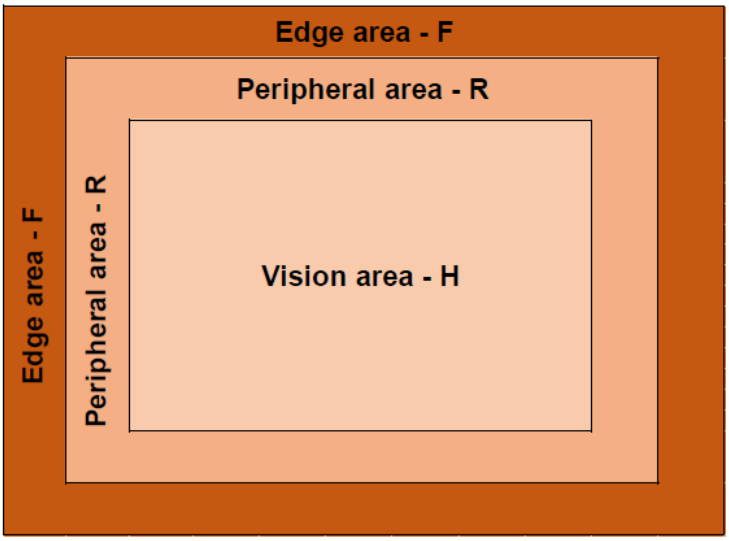
Peripheral area – R

The peripheral area covers the 10% between the edge area and the vision area. Within this area, streaks, bubbles, discolouration and lack of homogeneity of the interlayer are permitted. These do not affect the visual appearance of the glass. Scratches up to 30 mm are permitted with a total scratch length of 90 mm allowed.



Vision area – H

The vision area covers the main area of the glass that excludes the edge and peripheral area. The allowable spot defects depends on the following; size of the defect, frequency of the defect, size of the pane and the number of panes as components of a laminated glass.
The number of permissible defects in a pane shall be in accordance with the tables on the following page. Defects <0.5 mm shall not be considered, defects >3 mm shall not be permitted.



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Size of Defect **d** **mm**		**0.5 < d ≤ 1.0**	**1.0 < d ≤ 3.0**			
Size of pane **A** **m²**		For all sizes	A ≤1	1 < A ≤ 2	2 < A ≤ 8	A > 8
Number or density of permissible defects	2 panes 3 panes 4 panes ≥ 5 panes	No limitation; however, no accumulation of defects	1 2 3 4	2 3 4 5	1/m² 1.5/m² 2/m² 2.5/m²	1.2/m² 1.8/m² 2.4/m² 3/m²
NOTE: An accumulation of defects occurs if four or more defects are at a distance of <200mm from each other. The distance is reduced to 180mm for laminating glass consisting of three panes, to 150mm for laminating glass consisting of four panes and to 100mm for laminating glass consisting of five or more panes.						

Table 1: Permissible spot defects in the vision area.

The number of permissible defects in Table 1 shall be increased by one for each individual interlayer which is thicker than 2 mm.

Area of pane **m²**	**Number of permissible defects** **>30mm in length [a]**
≤5	Not allowed
5 to 8	1
>8	2
[a] Linear defects less than 30mm in length are allowed.	

Table 2: Number of permissible defects in the vision area

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1.3.1 General considerations:

- For Pyroguard Rapide, Pyroguard Rapide+, Pyroguard Protect and Pyroguard Infinity, small bubbles that appear at the edge of the glass will disappear and be absorbed into the fire resistant interlayer over time.

- For Pyroguard Rapide, Pyroguard Rapide+, Pyroguard Protect and Pyroguard Infinity, if the edge coverage provided by the framing system is less than 15 mm, the thermo-plastic spacer that creates the sightline may be visible.

- Any of the optical or physical defects described above do not affect the fire resistance of the glass.

- For Pyroguard Infinity, the material used to create the joint between 2 glass edges may have a slight colour variation compared to the thermo-plastic edge seal.

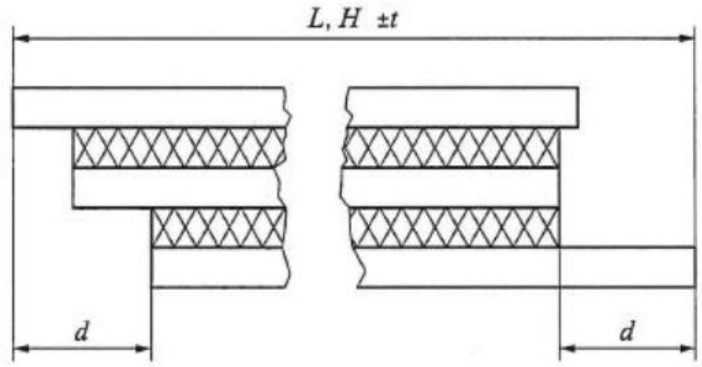
- Pyroguard Infinity has a ground edge compliant to EN 12543-5.

- For Pyroguard Infinity, shells and bubbles at the glass to glass joint are permissible if they do not become obvious. Interlayer defects i.e. extrusions and retractions are permissible.

1.3.2 Glass Tolerances:

Displacement of glass panes within fire resistant glass construction

The diagram below shows the measurement of displacement, d, on a glass construction.



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Table 3 details the maximum displacement, d, permissible for Pyroguard Rapide, Pyroguard Rapide+, Pyroguard Protect, Pyroguard Infinity and Smokeguard glasses:

Nominal dimension (mm) L or H	Maximum permissible displacement (mm) d
L, H ≤ 1000	2.0
1000 < L, H ≤ 2000	3.0
2000 < L, H ≤ 4000	4.0
L, H > 4000	6.0

Table 3. Information taken from EN 12543-5.

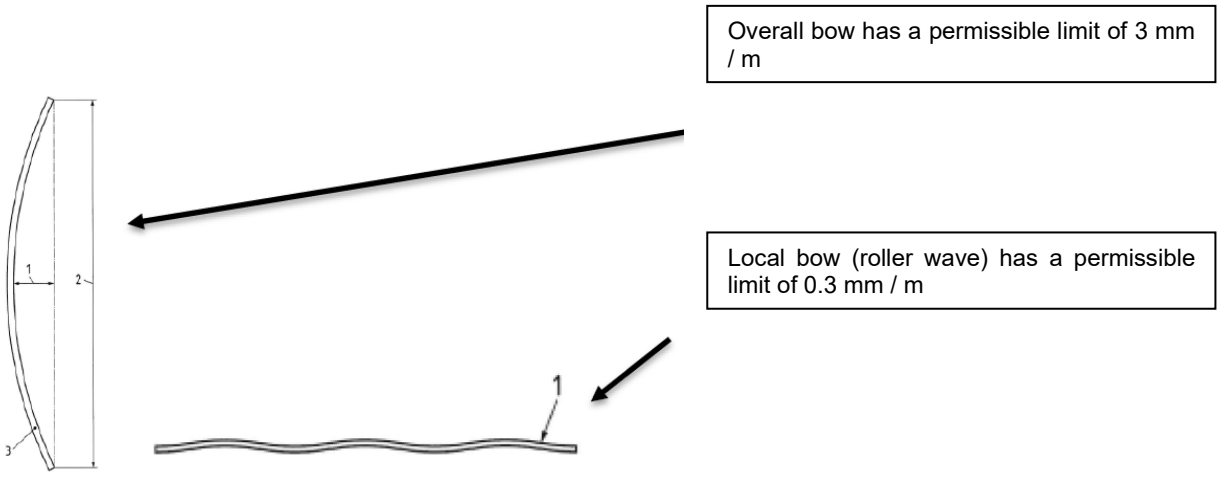
1.3.3 Diagonal limits

Attackguard, Pyrostem, Pyroguard Advance, Pyroguard Balustrades, Pyroguard Firesafe, Pyroguard Infinity, Pyroguard Marine, Pyroguard Protect, Pyroguard Rapide, Pyroguard Rapide+ and Smokeguard glasses are determined by measuring from one corner to the other and then repeating on the opposite corners. The difference between the 2 measurements must not exceed 3 mm.

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1.4 Local and overall bow (roller wave)

Attackguard, Pyrostem, Pyroguard Advance, Pyroguard Balustrades, Pyroguard Firesafe, Pyroguard Infinity, Pyroguard Marine, Pyroguard Protect, Pyroguard Rapide, Pyroguard Rapide+ and Smokeguard use thermally toughened glasses. The nature of this toughening process affects the flatness of the glass. The physical change can result in the glass having an overall bow and local bow (roller wave). The diagrams below show a representation of these two effects and the table details the permissible limits for both (information references EN 12150-1).



1.4.1 Glass thickness

Attackguard, Pyrostem, Pyroguard Advance, Pyroguard Balustrades, Pyroguard Firesafe, Pyroguard Infinity, Pyroguard Marine, Pyroguard Protect, Pyroguard Rapide, Pyroguard Rapide+ and Smokeguard glass thicknesses are referenced in the individual product datasheets. Refer to these datasheets for thickness tolerances.

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1.4.2 General notes:

- When glasses are being assessed, all considerations must be taken into account. These may include combinations with coated glasses, differing batch materials, films, light scattering and the effects of the surroundings in which the glass has been glazed.

- Pyroguard Rapide, Pyroguard Rapide+, Pyroguard Protect, Pyroguard Infinity and Smokeguard use thermally strengthened glasses. Inherent to this process, the physical and chemical appearance of the glass surface can change resulting in certain optical phenomena. This is unavoidable and any instance of this type of effect does not affect the fire performance of the glass.

- When Pyroguard Rapide, Pyroguard Rapide+, Pyroguard Protect and Pyroguard Infinity have been glazed into a low profile framing system, the seal may be visible when the frame has a rebate <15 mm.

- In some cases a bow may be induced in the glass during transport. This deflection will correct itself when installed and left over time. It is also possible to straighten the glass by placing it on a flat surface for a period of time.

- Overall bow has a permissible limit of 3 mm / m

- Local bow (roller wave) has a permissible limit of 0.3 mm / m

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Pyroguard
A Saverto Company

Pyroguard UK Ltd
Headquarters - International House
Millfield Lane - Haydock - St. Helens
Merseyside - WA11 9GA - United Kingdom

T: +44 (0) 1942 710 720
E: info@pyroguard.eu

www.pyroguard.eu

Pyroguard France SARL - Parc d'activités communautaire n°1
145 rue des Roseaux - 57455 Seingbouse - France
T: +33 (0)3 87 00 28 15 F: +33 (0)3 87 00 28 11 E: info.france@pyroguard.eu

Pyroguard Netherlands B.V. - ESP 260 C - 5633
AC Eindhoven - The Netherlands
T: +31 (0) 40 2888 525 E: info.nl@pyroguard.eu

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