HEAT SOAK TOUGHENED GLASS & SPONTANEOUS BREAKAGE

The use of toughened glass may involve a relatively small risk of breakage resulting from Nickel Sulphide (NiS) contamination. Nickel is a metallic substance that sometimes contaminates the raw stock of float glass. The Nickel combines with Sulphur during float glass manufacturing to form Nickel Sulphide (NiS) stones. These microscopic stones can cause the spontaneous breakage after toughening of glass, but does not affect ordinary annealed float, annealed laminated and heat strengthened glass. A process called Heat Soaking can lessen the chances of spontaneous breakage of toughened glass. Heat Soaking involves heating toughened glass in a special oven at temperatures close to 260°C for several hours to induce breakages that may be caused by contaminants in the glass. However heat soaking does not guarantee detection of all inclusions or contaminants that may lead to spontaneous breakages.

FEATURES & BENEFITS

- Reduces the chances of spontaneous breakage caused by NiS contaminants;
- Grade 'A" safety glass per AS 2208:2023 Safety glazing materials in buildings.

APPLICATIONS

Residential and commercial glazing over 5metres from finished floor or ground level, or where there is a requirement to reduce the risk of spontaneous breakage.

RANGE

Available 4–19mm thicknesses.

SIZE LIMITS

Maximum Size – Heat soak oven size 5050mm x2600mm

Minimum Size – 100mm x 400mm

MANUFACTURING STANDARDS

National Glass manufactures toughened safety glass to AS 2208:2023 Safety glazing materials in buildings. Heat Soaking of toughened glass is processed to EN 14179-1:2016 Glass in building - Heat soaked thermally toughened soda lime silicate safety glass.

DESIGN & GLAZING NOTES

Should I use Heat Soaked toughened when not required by Australian Standards?

An assessment should be undertaken in respect of risk to persons/public in the event of breakage where glass is likely to fall out of the opening. In addition, consideration should be given to the difficulty of reglazing a broken panel and associated costs. Toughened laminated glass will have the same possible risks of NiS breakage if individual toughened panels are not Heat Soaked. The use of Heat Strengthened panels in laminated glass (where surface compression is less than 52MPa) does not require Heat Soaking as it's not subject to the effects of NiS.

What to do if NiS spontaneous breakage is suspected?

National Glass will only warrant glass that has been heat soaked and as per the conditions within our Heat Soaked Toughened Warranty document. It must be proven that NiS is the cause of the breakage and the panel inspected by one of our representatives in situ. Glass can also break for other reasons, unrelated to NiS, including poor installation, accidental impact or deliberate acts.

How is Heat Soaked toughened glass identified?

A small and permanent etched corner verification stamp states both AS 2208:2023 and EN 14179-1:2016 compliance.

Heat Soaked toughened glass corner stamp verification

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Where should I use Heat Soak toughened glass?

Australian Standards AS 1288-2021 Glass in buildings – Selection and installation Clause 3.8 outlines where Heat Soaked toughened should be used (see extract below).

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3.8 SELECTION OF GLASS FOR MINIMIZING THE RISK DUE TO GLASS SPONTANEOUS FRACTURE

3.8.1 General

The use of toughened glass and some heat treated glasses may involve a relatively small risk of breakage resulting from nickel sulphide. In addition to the other requirements of this Standard, such glass shall be selected to minimize the risk in accordance with Clause 3.8.2.

Class 1 and Class 10 buildings are exempt from the requirements of this Clause.

3.8.2 Requirements to minimize the risk

All monolithic toughened glass and heat strengthened glass, (with a surface compression greater

than 52 MPa), shall be heat soaked in accordance with Clauses 3, 5, 6 and 12 and Annex A of

European Standard EN 14179:2016. The heat soaked glass shall be marked in compliance with EN 14179:2016. A certificate supplied by the manufacturer providing verification that the toughened glass has been heat soaked in accordance with this clause shall be a suitable alternative to marking in compliance with EN 14179:2016.

Heat soaking in accordance with this Clause is not required in glazing that conforms to any one of the following:

a. No part of the glass is glazed more than 5 m from the finished floor or ground level.

b. Suitable protection by a balcony, awning or the like is provided such that, in the event of glass fracturing, the risk of injury or property damage is minimized.

c. Laminated glass, (including toughened laminated and heat strengthened laminated) is used.

NOTES:

1. For insulating glass units glazed vertically, greater than 5 m from the ground level, a laminated, monolithic annealed or monolithic heat strengthened outer or inner pane as appropriate may be considered to provide suitable protection.
2. For insulating glass units glazed in sloped overhead glazing greater than 3 m from the finished floor or ground level a laminated inner (lower) pane may be considered to provide suitable protection.
3. A balcony that extends from the building a minimum 2/3 of the height of the adjacent panel may be considered to be suitable to minimize the risk. For example, for a 2700mm high panel, the balcony or protection should extend a minimum of 1800mm from the building.
4. Heat soaking will significantly reduce but not totally eliminate tl1e small risk of fracture due to nickel sulphide.

HOW TO SPECIFY

- Specify National Glass Heat Soaked Toughened Glass;
- Select appropriate thickness and glass type;
- All glass to be selected and installed in accordance but not exclusively to the following Australian Standards;

AS 1288 Glass in buildings – Selection and installation

AS 2208 Safety glazing materials in buildings

AS 4666 Insulating glass units

AS/NZS 4667 Quality requirements for cut-to-size and processed glass

AS 1170 Wind & Structural Design Actions