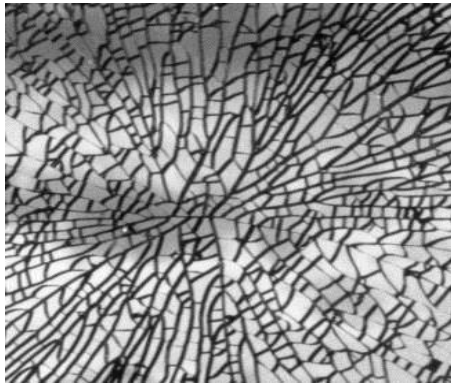



HEAT TREATED GLASS

	Tempered glass	Heat Strengthened glass
Characteristics	Is 4 times stronger than annealed glass.	Has twice the strength than annealed glass.
Breakage	Glass will break in small fragments that will probably break free of the frame. 	Glass will break in large spikes that will most of the time remain in their frame. 
Safety	Tempered glass is a security glass (ANSI Z97.1 – ASTM C1048 and CAN/CGSB-12.1-2017)	Heat strengthened glass is not considered a safety glass.

Size limitations for the tempering furnace

- ⌚ Minimum thickness 3.3mm (DST)
- ⌚ Maximum thickness 19mm (3/4")
- ⌚ Minimum size that may be heat treated is generally 16" diagonal
- ⌚ Maximum dimensions vary according to the glass thickness :

Thickness	Maximum Size
3.3 mm - DST	20 square feet
4 mm – 5/32"	30 square feet
5 mm – 3/16"	40 square feet
6 mm 1/4" to 19 mm 3/4"	41 square feet and more (subject to production validation)

Recommendations for hole drilling in heat treated glass according to ASTM-C-1048

1) Hole position:

For all glass thickness, the minimum distance from the edge of the hole to the edge of the glass shall be the greatest between: (SEE CHART 1)

a)

- i. 6 mm (1/4")
and
Twice the glass thickness

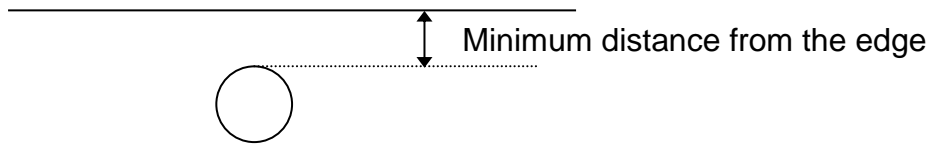
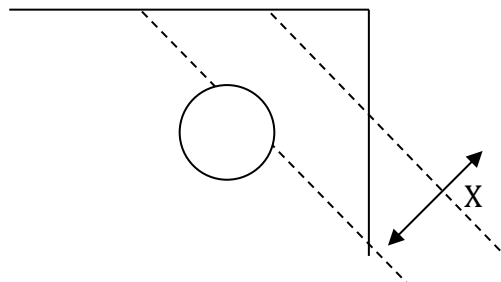


Chart 1

Glass Thickness	Minimum Distance
3.3 mm	7mm or 1/4"
4 mm	8mm or 5/16"
5 mm	8mm or 5/16"
6 mm	10mm or 3/8"
8 mm	12mm or 1/2"

Glass Thickness	Minimum Distance
10 mm	20mm or 13/16"
12 mm	24mm or 1"
15 mm	30mm or 1 3/16"
19 mm	38mm or 1 1/2"

- b) The minimum distance from the edge of the hole to the glass plate corner must be equal to 6.5 times the glass thickness when the corner is 90 degree and more.



X = minimum distance from the corner

Chart 2

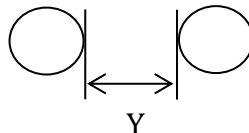
Glass thickness	Minimum distance (corner)
3.3 mm	21.5 mm or 7/8"
4 mm	26mm or 1"
5 mm	32.5mm or 1 1/4"
6 mm	39mm or 1 1/2"
8 mm	52mm or 2"

Glass Thickness	Minimum distance (corner)
10 mm	65mm or 2 9/16"
12 mm	78mm or 3"
15 mm	97.5mm or 3 7/8"
19 mm	123.5mm or 4 7/8"

2) Minimum distance between holes :

For all glass thickness, the minimum distance is the greater distance between:

- i. $Y = 10 \text{ mm}$
- and
- ii. $2 * E$



Y = Minimum distance
E = Glass thickness

3) Round hole sizes :

For all glass thickness, the minimum hole size must be the greater diameter between:

- i. 6.4 mm
- and
- ii. Glass thickness

CHART 3

Glass thickness	Minimum diameter
3.3mm	6.4mm (7mm bit required)
4mm	6.4 mm (7mm bit required)
5mm	6.4 mm (7mm bit required)
6mm	6.4 mm (7mm bit required)
8mm	8 mm

Glass thickness	Minimum Diameter
10mm	10 mm
12mm	12 mm
15mm	15 mm
19mm	19 mm

HEAT SOAK TEST

During the glass manufacturing process impurities, such as nickel sulphide are difficult to detect in the raw material. These impurities will expand during the tempering process and may cause spontaneous breakage of tempered glass.

The heat soak test is a method of subjecting the tempered glass to a controlled thermal cycle in a specialised oven. The tempered glass is heated then cooled slowly, in order to accelerate the expansion of nickel sulphite inclusions and cause breakage in the process, thus reducing the risk of spontaneous breakage when installed.

The Heat Soak Test is recommended for tempered glass that is to be installed in places that would be difficult to reach for replacement or that require a higher level of protection.