

## TUFF-LITE Tempered Glass :

### ■ THE CRASH OF...

Glass shattered into large and fatally dangerous pieces is the most common result due to a vandal's rock or wind-blown debris during a heavy storm or tornado.

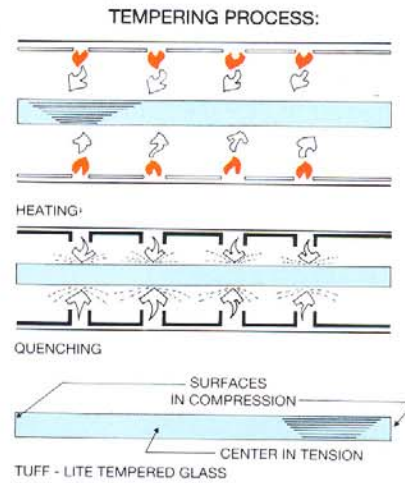
In eighty percent of these cases, people are seriously injured by the large pieces of glass debris from the ruins of their windows. However, the victims soon forget the aftermath and replace their windows with structurally weak glass, with no thought of the future nor any remembrance of the past.

However, what about the remaining twenty percent?

### ■ A BREED APART...

TGSG recommended the use of TUFF-LITE Tempered Glass to this twenty percent as a means of countering this threat.

TGSG manufactures high grade tempered glass by employing a microprocessor controlled tempering unit, developed and manufactured by Glastech of the U.S.A.



### ■ GIRDING UP...

The tempering process uses annealed, clear float, heat absorbing or selected reflective glasses. These glasses are heated up to approximately 650 degrees centigrade after which, a sustained blast of cooling air is applied to the surfaces in a process called "Quenching".

The application of intense heat and the rapid cooling of the surfaces afterwards, produces a compression within the glass which strengthens it.



Strong and safe entrance doors with TUFF-LITE Tempered Glass

Since the process is done horizontally, this eliminates any metal tong marks that are usually common and are considered as aesthetic flaws by average consumers who search for product excellence.

The end result of this complicated process is TGSG's TUFF-LITE Tempered Glass

## ■ TUFF ENUFF...

TGSG's TUFF-LITE Tempered Glass has a very high static load resistance (3 to 5 times) as well as a very high impact resistance (5 to 10 times) compared to ordinary glass. TUFF-LITE also has a very high resistance to one of ordinary glass most common weakness, thermal shock.

In the very rare event of breakage, however, the TUFF-LITE unit will shatter into tiny dice-like particles which minimize serious or fatal injuries, unlike the case of ordinary glass.

TGSG's TUFF-LITE Tempered Glass conforms with International Standards such as that of the American National standard, the GTA Engineering Standard, the British Standard Specifications and just recently, The Australian Standard Mark.

TGSG's credentials of quality and safety from International Standards are more than enough to convince the clients of its product's capabilities.



*TUFF-LITE Tempered Glass as a facade of a Tower in Bangkok*



*TUFF-LITE fractures into small pieces which are likely harmless because of no sharp splinters and jagged edges*

## ■ APPLICATIONS :

TUFF-LITE Tempered Glass is applied as a replacement for other glass products especially in places requiring increased strength and reduced likelihood of injuries in the event of breakage. The following are the most common applications of TGSG's TUFF-LITE Tempered Glass :

1. Doors with and without frames
2. Shower and tub enclosures
3. Interior partitions
4. Storm doors
5. Balustrades
6. Windows and spandrel areas
7. Squash ball courts
8. Showcases and display windows

## ■ TECHNICAL DATA :

Minimum Thickness : 4 mm

Maximum Thickness : 19 mm

Maximum Size : 2440 mm x 4000 mm

The maximum size is only applicable for glass thickness of 8 mm and above.

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**AS/NZS ISO 9002:1994**

Quality system - Model for quality assurance  
 in production installation and servicing



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