TECHNICAL BULLETIN

Glass for use in lifts

BS EN 81, parts 1 and 2: 2009 are “Safety Rules for the construction and installation of lifts”. Part 1 is specific to electric lifts and Part 2 to hydraulic lifts and they apply to all new lift installations from. They are very lengthy standards of which only a fraction is concerned with glass. They give guidance on the strength and type of materials to be used in the walls of the lift well and the doors, walls and ceiling of the lift car. Basically the standards require glass that is used in lifts to be laminated and also sufficiently strong enough to withstand impact forces. If we are acting on a supply only basis our customer should provide the glass specification.

Walls of the lift well

The standard states that glass panels placed at points normally accessible to persons shall be made of laminated glass up to certain heights as follows:

- 3.5m at a landing door side
- 2.5m at other sides provided that the glass is at least 0.50 metres away from moving parts of the lift.

The thickness of the glass will depend on the sizes, support method and design loads relevant to the building occupancy but shall at least withstand a point load of 300 N without permanent deformation or full load deflection greater than 15mm.

Walls of the lift car

Walls with glass shall use laminated glass and shall withstand pendulum shock tests [including the impact test according to BS EN 12600:2002 - Glass in building. Pendulum test. Impact test method and classification for flat glass.] The standards advise that the pendulum shock tests need **not** be made if glass panels of a certain size and thickness are used. [See Table 1]. Car walls with glass placed within 1.10 metres from car floor level should have a handrail at a height between 0.90 metres and 1.10 metres. This handrail should be fastened independently from the glass. The standard also requires that the glass be marked with the following information:

a) name of the supplier and trademark
b) type of glass
c) Thickness (e.g. 8/8/0.76).

The first two pieces of information will be included as standard safety glass marking but the thickness of the glass will not be, therefore special provision for this must be made.

Roof of the car

Glass used for the car roof shall be laminated. Care should be taken if asked to specify a suitable glass thickness for use in lift car roofs as the standard requires that it should be capable of supporting two people at any point without permanent deformation.
The standard says that this equates to 2000 N acting on an area of 200mm^2.

Doors
For lifts that have manually operated doors, the user needs to know whether the lift is there or not before opening the doors. This is achieved by either installing small transparent vision panels or having an illuminated "car here" sign. Where vision panels are installed into the lift doors they shall be of a minimum thickness of 6mm and have a minimum area per landing door of $0.015m^2$ together with a minimum area of $0.01m^2$ per vision panel. The standard also states that they should have a width of at least 60mm but no more than 150mm. The lower edge of vision panels that are wider than 80mm shall be at least 1 metre above floor level. **This is only relevant for lifts that have manually operated doors.**

For all other cases glass used in doors shall be laminated and shall withstand the pendulum shock tests unless the glass is of a certain thickness and composition. [See table 2].
The glass should also be marked giving:
a) name of the supplier and trademark
b) type of glass
c) Thickness (e.g. 8/8/0.76).
The first two pieces of information will be included as standard safety glass marking but the thickness of the glass will not be, therefore special provision for this must be made.

The glass should be fixed in such a way as to ensure that it cannot slip out of the fixings. The standard does not provide any further detail than this but we would suggest that minimum edge coverage to the glass should be 15mm.
** The standard talks about the enclosure being 'Imperforate'. Based on the response by some Local Authorities we understand 'Imperforate' as being interpreted as having no gaps between the glass and the surrounds – so we are generally looking at fully framed systems.*

To avoid the dragging of children's hands by automatic power operated sliding doors made of glass, the standard suggests making the glass opaque up to a height of 1.10 metres or "other equivalent measures" which seems to be more the responsibility of the lift manufacturer.

Exceptions from the pendulum shock tests:

The pendulum shock tests do not have to be carried out if glass according to tables 1 and 2 are used because they are known to conform to the tests. However the standard advises that national building regulations may demand higher requirements.

Table 1 – Plane glass panels to be used in walls of the car

Type of Glass	Widths up to max. 1 metre Minimum thickness (mm)	Widths up to max. 2 metres Minimum thickness (mm)

Laminated Toughened	8 (4 + 4 + 0.76)	10 (5 + 5 + 0.76)
Laminated Annealed	10 (5 + 5 + 0.76)	12 (6 + 6 +0.76)

Table 2 – Plane glass panels to be used in horizontally sliding doors

Type of glass	Minimum thickness (mm)	Width (mm)	Max. Free door height (m)	Fixing of the glass
Laminated Toughened	16 (8 + 8 + 0.76)	360 to 720	2.1	Top and bottom only
Laminated Annealed	16 (8 + 8 + 0.76)	300 to 720	2.1	Top, bottom and one vertical side
Laminated Annealed	10 (5 + 5 + 0.76) 10 (6 + 4 + 0.76)	300 to 870	2.1	Full four edge support

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For further advice on the thickness of glass suitable for use in and around lifts contact your local sales representative.

For enquiries concerning price and availability of supply only glass for use in floors and stairs please contact our Hayes branch on Tel. 01895 424900.