



TITLE:

**TECHNICAL SPECIFICATION FOR
GLASS AND GLAZING**

SPECIFICATION NO. PE-TS-385-600-C001

VOLUME - II B

SECTION - D | SUB-SECTION – D6

REV.NO. 0

SHEET 1 OF 7

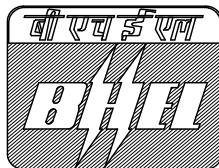
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Bharat Heavy Electricals Limited
Project Engineering Management
Power Sector, PPEI Building
Noida – 201 301



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GLASS AND GLAZING**1.00.00 SCOPE**

This section covers supplying and fixing of all glass and glazing & glazing with polycarbonate sheets including all clips, putty, mastic cement etc. wherever required as per specifications.

2.00.00 INSTALLATION**2.01.00 General**

The Contractor shall supply and install all glass and glazing as required for various doors, windows, sashes, ventilators and fixed louvers, miscellaneous glazing and partitions, from approved manufacturer like Hindustan Pilkinton or equivalent, having uniform refractive index and free from flaws, specks, and bubbles. The glass shall be brought to site in the original packing from the manufacturer and cut to size at site.

Materials

- a) Glare reducing or heat absorbing glass shall be "Calorex" of Hindustan Pilkinton or approved equivalent and special care shall be taken to grind smooth and round off the edges before fixing.
- b) Clear glass shall be flat draw sheet glass and shall be at least 4 mm thick. Sheet glass for doors shall be minimum 5.5 mm thick.
- c) Wired glass shall be thick- rolled glass with centrally embedded 42g wire mesh of Georgian type. This may be of clear or coloured glass, as required.
- d) Obscure glasses shall have a cast surface in one side.
- e) Coloured and figured glass shall be as per approved sample.
- f) In general, the putty shall conform to IS: 400 and be of best quality from approved manufacturer. It shall be brought to site in the manufacturer's original packing.
- g) Neoprene gaskets with snap-fit glazing beads shall be fixed as per manufacturer's instructions and shall sit snugly against glass to give a leak proof installation.
- h) Polycarbonate sheet multi (twin) wall fire retardant and ultra violet resistant with sealed open edges. as per IS: 14443.



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i) Patterned, figured or rolled glass :-It is a decorative and translucent glass with figures or patterns on one face. In addition to diffusing light and obstructing visibility from the outside, the figures soften the interior lighting. This type of glass is usually more fragile and less convenient to clean

j) Ground Glass :- Ground glass surface has been ground to produce a flat but rough (matte) finish. Glass surface has been ground or etched to create a roughened non transparent surface. this are similar as figured glass, obstructing visibility from the outside.

k) heat-reflecting type float glass:

A metallic coating is applied to one side of the glass in order to significantly increase the amount of reflection by the glass of both the visible and infra-red (light and heat) range of the electromagnetic spectrum. This metallic coating can be applied to clear or body tinted glass. The reflective glass imparts a mirror like appearance to the exterior of buildings under most daytime conditions. Due to the coating of metal oxides on the glass, they are widely applied in buildings for its highly reflective surface and its wide palette of colours. It reduces heat gain and glare from the exterior and allows optimum visible light transmission to the interior. An exceptional property of solar reflective glass is that the coating of metal oxides on the glass can be achieved without affecting the transparency of the glass.

Density : 2.4 – 2.5 g/cm³

l) Laminated glass:

Laminated glass is composed of two or more layers of glass with one or more layers of a transparent/ pigmented and specially treated plastic Polyvinyl Butyral [PVB] sandwiched between the glass layers. The glass panes (layers) can be either normal glass or tempered glass. When the glass is broken, fragments tend to adhere to the plastic [PVB] interlayer thereby reducing the risk of injury and helping to resist further damage by weather.

Laminated glass retains its colour and strength for the life of the building and is as easily cleaned as any conventional glass.

When exposed to heat, laminated glass breaks but stays in place longer. The risk of thermal breakage is avoided only when heat strengthened / tempered laminated glass is used.

Density (approximate) : 2.42 – 2.52 g/cm³

Tensile strength : 32 N/sq. M

Compressive strength : 1000 N /mm²

Modulus of elasticity : 70 GPa

Coefficient of linear expansion: 9×10^{-6} m / mK

U value : 2.84 W/sq. m. K for 3 mm thick clear to 5.96 W/sq. m. K



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for 6 mm thick clear

UV transmittance : 30% for bronze 6 mm thick to 80% for 6 mm thick clear.

Shading co-efficient : 0.5% for 6 mm thick gray to 0.9% for 6mm thick clear.

Visible light transmittance : 25% for 6mm thick bronze to 90% for 6mm thick clear
(product specific information to be referred)

2.03.00 Glazing, Setting, and Finish

All glazing clips, bolts, nuts, putty, mastic cement etc. as required shall be supplied by the Contractor.

All glass shall be thoroughly cleaned before putting in position. Each glass pane shall be held in place by special glazing clips of approved type. As specified in relevant I.S. Codes, four glazing chips shall be provided per glass pane, except for large panes where six or more clips shall be used as per engineer's instructions. All holes that may be necessary for holding the clips glazing heads and all other attachments shall be drilled by, the Contractor.

Glass panes shall be set without springing, and shall be bedded in putty and back puttied, except where mouldings or gasket are specified, putty, mastic cement etc. shall be smoothly finished to the even line and figured glass shall be set with smooth side out.

Where owner will supply glass, the Contractor shall cut it to size and fix them in the same as specified above.

The Contractor shall supply necessary glazing clips, putty, mastic cement etc.

After completion of glazing, the Contractor shall remove all dirt stains, excess putty etc. clean glass panes and leave the work in perfectly acceptable condition. All broken cracked or damaged glass shall be replaced by new ones at the contractor's own cost.

3.00.00 ACCEPTANCE CRITERIA

- All installation shall be free from cracked, broken, or damaged glass. Edges of large panes of thicker glass and heat absorbing glass shall be inspected carefully for chipped, cracked, or underground edges.
- Glazing shall be carefully done to avoid direct contact with metal frames.
- All glass shall be embedded in mastic or fixed by neoprene gaskets to give



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a leak proof installation.

- d) At completion, the panes shall be free from dirt, stains, excess putty etc. to the complete satisfaction of the Engineer.

4.00.00

I.S. CODES

Following are some of the important I.S.Codes relevant to this Section:

IS: 3548 - Code of practice for glazing in building.

IS: 1081 - Code of practice' for fixing and glazing metal doors, windows ventilators.

IS: 2553 PART-I- Code of practice for safety glass, toughened or laminated glass.

IS: 2835 – 1987-Code of practice for sheet glass, flat transparent sheet glass.

IS: 14443-Code of practice for polycarbonate sheet specification.

IS: 5437- Code of practice for figured rolled and wired glass.



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5.00.00

RATES

Rates of glass and glazing are included in respective items for supply and installation of window, ventilator, and partitions. No separate payment shall be made for glazing clips, mastic cement, putty, screws; rails, etc. nor for drilling holes in frames for inserting glazing clips.