BRITISH STANDARD

BS 8000-7:1990

Workmanship on building sites —

Part 7: Code of practice for glazing

CAWS L40

Confirmed
November 2008

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Council for Building and Civil Engineering (B/-) to Technical Committee B/146, upon which the following bodies were represented:

Building Employers' Confederation

Chartered Institute of Building

Consumer Policy Committee of BSI

Department of the Environment (Building Research Establishment)

Department of the Environment (Property Services Agency)

Federation of Associations of Specialists and Sub-Contractors

Institute of Clerks of Works of Great Britain Inc

Institution of Civil Engineers

Institution of Structural Engineers

National Building Specification Ltd.

National Council of Building Materials Producers

National House Building Council

Royal Institute of British Architects

Royal Institution of Chartered Surveyors

Society of Chief Architects of Local Authorities

This British Standard, having been prepared under the direction of the Council for Building and Civil Engineering, was published under the authority of the Board of BSI and comes into effect on 30 November 1990

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Contents

Foreword

This part of BS 8000 has been prepared under the direction of the Council for Building and Civil Engineering. It makes recommendations and gives guidance on basic workmanship for conventional types of building work.

The recommendations given are not necessarily comprehensive; particular project documents, e.g. project specifications, may need to cover particular recommendations not dealt with by this code of practice.

This code of practice is unique in that, unlike other British Standards, it draws together recommendations given in other codes of practice.

The purpose of this code of practice is to encourage good workmanship by providing the following:

a) the most frequently required recommendations on workmanship for building work in a readily available and convenient form to those working on site;
b) assistance in the efficient preparation and administration of contracts;

c) recommendations on how designer's requirements for workmanship may be satisfactorily realized;

d) definitions of good practice on building sites for supervision and for training purposes; this guidance is not intended to supplant the normal training in craft skills;

e) a reference for quality of workmanship on building sites.

It is recognized that design, procurement and project information should be conducive to good workmanship on site.

During the preparation of this code of practice the Building Industry's Co-ordinating Committee for Project Information (CCPI) produced a Common Arrangement of Work Sections (CAWS) for building work. This code of practice has generally been arranged in accordance with the Common Arrangement so that it can be used easily with project specifications and bills of quantities using this arrangement. Other major documents are being restructured in accordance with the Common Arrangement.

NOTE The CCPI was sponsored by the Association of Consulting Engineers, the Building Employers' Confederation, the Royal Institution of Chartered Surveyors and the Royal Institute of British Architects.

When complete BS 8000 will comprise the following parts.

— *Part 1: Code of practice for excavation and filling*;
— *Part 2: Code of practice for concrete work*;
— *Part 3: Code of practice for masonry;*
— *Part 4: Code of practice for waterproofing;*
— *Part 5: Code of practice for carpentry, joinery and general fixings;*
— *Part 6: Code of practice for roof, slate, tile covering and cladding;*
— *Part 7: Code of practice for glazing;*
— *Part 8: Code of practice for plasterboard partitions and dry linings;*
— *Part 9: Code of practice for cement/sand floor screeds and concrete floor toppings;*
— *Part 10: Code of practice for plastering and rendering;*
— *Part 11: Code of practice for wall and floor tiling;*
— *Part 12: Code of practice for decorative wallcoverings and painting;*
— *Part 13: Code of practice for above ground drainage and sanitary appliances;*
— *Part 14: Code of practice for below ground drainage;*
— *Part 15: Code of practice for hot and cold water services (domestic scale).*

Technical Committee ECB/4, Glazing in buildings, has also participated in the preparation of this part of BS 8000 and the content is based on and consistent with that of BS 6262. However, BS 6262 covers the subject matter more comprehensively and includes design, materials, safety and other related aspects in addition to workmanship on site.

The text of this part of BS 8000 includes commentaries and figures. These commentaries are separately identified and are intended to be for guidance only and do not form part of the recommendations. They refer, unless otherwise stated, to the clause which immediately precedes each commentary.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 34, an inside back cover and a back cover.

The BSI copyright notice displayed in this document indicates when the document was last issued.

Section 1. General

1.1 Scope

This part of BS 8000 gives recommendations on basic workmanship on building sites and covers those tasks which are frequently carried out in relation to glazing.

This code does not cover off-site glazing (e.g. factory glazing), specialist glazing techniques or systems (e.g. patent glazing), specialist applications (e.g. greenhouses and barriers/balustrades), roof glazing and glazing of furniture and fittings. Additionally it does not apply to bent, profiled and corrugated glass/plastics sheet material, or to glass blocks or lens lights.

For design aspects of glazing, including safety, reference should be made to BS 6262.

NOTE This code of practice includes supplementary elements in the form of commentaries to assist in its use and understanding. Compliance with the commentaries is not necessary in order to be able to claim conformity with the standard.

1.2 References

1.2.1 Normative references

This part of BS 8000 incorporates, by reference, provisions from specific editions of other publications. These normative references are cited at the appropriate points in the text and the publications are listed on the inside back cover. Subsequent amendments to, or revision of, any of these publications apply to this part of BS 8000 only when incorporated in it by amendment or revision.

1.2.2 Informative references

This part of BS 8000 refers to other publications that provide information or guidance. Editions of these publications current at the time of issue of this standard are listed on the inside back cover, but reference should be made to the latest editions.

1.3 Definitions

For the purposes of this part of BS 8000, the definitions given in BS 6100-1.3.5:1988 and BS 6100-1.4.1:1990 apply.

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Section 2. Materials handling and preparation

2.1 Checking, handling and site storage of materials

2.1.1 Checking

Check delivery tickets and certificates against specification and examine marks and labels and condition of materials and components. If not satisfied, refer to the supplier immediately.

In particular check glazing sheets and units as follows.

a) Generally inspect glass cut edges for excessive feathering or shelling.

b) Generally inspect edges of plastics sheets for splits.

c) Generally inspect all surfaces for signs of damage by etching or any mechanical damage.

d) Check if there is moisture between individual sheets.

e) Inspect edge tapes for damage when supplied on flush-edged insulating units where the tapes are intended to serve as a barrier to moisture. Similarly inspect edge tapes for damage on stepped edge insulating units. Ensure that damaged tapes on such units are repaired before units are used for glazing.

COMMENTARY. *Because thermal breakage of glass normally results from the development of tensile stress in, and parallel to, the glass edge, the resistance of glass to breakage is frequently dependent on the extent and position of flaws in the edges.*

Any glass stock that shows signs of dampness should be separated and dried as moisture trapped between sheets may rapidly become alkaline and attack the surfaces. However, if the condition has existed for more than a few weeks, irreversible damage may already have occurred.

Edge tapes supplied on flush-edged insulating glass units are normally only intended to facilitate handling. It is the responsibility of the manufacturer to advise if tapes on such units are intended to serve as moisture barriers. Tapes on stepped edge units are intended to protect the seal from the effects of ultraviolet radiation to which it will usually be exposed in service.

2.1.2 Handling

Handle all units and sheets carefully to avoid breaking or chipping the glazing materials and injury to people on site. Use serviceable equipment. Upon receipt of the consignment read carefully any warning labels affixed and take action accordingly.

COMMENTARY. *Comprehensive advice on handling, storage and transport of glass is given in the code of practice booklet:* [*1*] *issued by the Glass and Glazing Federation.*

Glazing materials by their nature are vulnerable until fixed. It is of prime importance therefore that facilities for handling and hoisting and scaffolding provisions are safe and adequate. Appropriate safety clothing should be worn and safe working practices followed by operatives at all times.

2.1.3 Storage of material

2.1.3.1 *Storing units and glazing sheets*

Prepare storage area and store units and sheets as agreed. Generally:

a) ensure that the area is level and adequately firm to support the weight;

b) locate the storage area so that the units and sheets are not liable to accidental damage and are not a hazard to the site;

c) provide shade and shelter from the sun and rain, and keep insulating glass units and plastics glazing sheets away from heat sources;

d) store all units and all types of sheets on edge within 10° of a vertical position on adequate wood bearers or platform clear of hard ground so that the edges are not damaged, and provide soft support at the rear bearing;

e) do not allow units or sheets to come in contact with hard materials such as concrete, brick and steel or with alkaline materials such as cement and lime;

f) ensure that the units or sheets are kept dry and that moisture is not trapped between them in store;

g) follow the manufacturer's sitework instructions for storage requirements over and above those given.

2.1.3.2 *Storing associated bedding and sealing materials*

Store materials under cover and in accordance with the manufacturer's sitework instructions.

COMMENTARY. *Generally the materials will need to be stored in the dry, kept out of direct sunlight and at temperatures not exceeding* 25 °C. *See also* ***2.2.6***.

2.2 Preparation of work, materials and components

NOTE Recommendations for a basic range of glazing techniques with varieties of materials used for bedding and sealing single glass sheets, insulating units and plastics glazing sheets are included in section 3 of this part of BS 8000. General items in this clause apply to all these installation techniques including minor variants of technique which might be specified for the project. Bedding and sealing material references are identified in Table 1.

2.2.1 General

In order that the technical requirements for satisfactory glazing may be correctly carried out and to ensure that window openings are ready for glazing check that:

a) frame fixing is completed, and all the beads and other materials and fittings required for glazing are available on site;

b) protective coatings or tapes have been removed from the frame;

c) rebates are free from obstruction and debris;

d) timber frames and concrete surrounds are free from excessive moisture content; suspend glazing until drying out has occurred;

e) for drained glazing all fabrication holes and frame section junctions are properly sealed and drain holes and channels are clear to operate;

f) when required, appropriate and safe scaffolding and hoisting provisions have been made.

2.2.2 Compatibility of materials

When using materials specified by general description ensure that they are compatible for use in the particular glazing system or technique used. Refer to the material manufacturers and follow their sitework instructions on the use of their products.

COMMENTARY. *Edge seals of insulating units can be attacked by certain solvents contained in glazing materials. Likewise certain glazing materials can cause deterioration of the interlayer used in laminated glass. Whereas deterioration of the edge of laminated glass having a thin interlayer is limited to a few millimetres and hidden within the rebate cover, on thicker interlayers greater penetration can occur. Plastics glazing sheets and frames may also be attacked by certain solvents in compounds. Similarly the use of plasticized polyvinyl chloride (PVC) glazing blocks with plastics glazing sheets should be specifically checked.*

2.2.3 Preparation of surrounds

2.2.3.1 *General*

Clean and dry surround surfaces in contact with glazing materials. Remove all spillage and contamination and any protective tape. Where required, prime or seal all surfaces of rebate, bead and glass in contact with bedding material. Allow to dry. Use cleaners, primers and sealers that are compatible with the glazing system and follow the manufacturer's sitework instructions.

COMMENTARY. *The general requirements for priming, sealing or other preparation are to provide surfaces suitable for adhesion, setting or curing as the case may be for the variety of bedding and sealant materials.*

2.2.3.2 *Wood priming and sealing*

Prime softwood rebates, and beads where used, if not already primed or when the primer applied has been damaged or weathered away. Allow to dry before glazing.

If not already sealed, seal rebates and beads of hardwood with one or two coats of sealer as directed and in accordance with the sitework instructions of the manufacturer of the bedding material to be used. Allow to dry between coats and before glazing.

COMMENTARY. *Primer for putty type 0 (see Table 1) is used to reduce the absorbency of softwoods but not to the point that it prevents or excessively retards setting of the putty. See* ***2.2.6.2***.

2.2.3.3 *Metals*

First check with the bedding manufacturer if degreasing, priming or sealing is advised for the particular situation and choice of materials, then apply in accordance with the manufacturer's sitework instructions.

Check that any primer that has been applied is sufficiently dry before glazing. Test with a rag and white spirit; primer is sufficiently dry if none is removed when lightly rubbed with white spirit on the rag. Similarly check galvanized steel priming and then use putty type 1 (see Table 1).

COMMENTARY. *Rebates do not have to be primed to receive putty if galvanized protection is sound and is dulled by natural weathering or has been passivated.*

2.2.3.4 *Concrete*

Carefully inspect concrete surfaces and remove all loose and weak friable material by wire brushing or mechanical abrasion and clean away particles. Make good to blow holes and like imperfections with an external quality filler or cement mortar with a polymer additive and allow to dry. Prepare and prime/seal rebate, bead and glass contact surfaces to compounds and sealants with cleaners and primers supplied by the manufacturer of the particular sealant or compound used and in accordance with the manufacturer's sitework instructions.

2.2.3.5 *Plastics*

Prepare plastics surrounds in accordance with the frame manufacturer's sitework instructions.

Table 1 — Bedding and sealing materials

Type	Description	Basic components	Uses	Wind pressure resistance (single glazing) (see note 1)	Comments
0	Linseed oil putty	Linseed oil	Bedding and fronting	Up to 2 000 N/m^2	Paint protection essential. Life dependent on paint maintenance.
1	Metal casement putty	Drying oils	Bedding and fronting	Up to 2 000 N/m^2	Paint protection essential. Life dependent on paint maintenance.
2a	Non-setting compound	Oils, plasticizers, polymers	Bedding glass and beads	Up to 2 300 N/m^2	Paint protection not essential, but painting prolongs life. Inspect and maintain as necessary. Sealer required for porous surround.
2b	Preformed mastic tape (non-load bearing)	Oils, plasticizers, polymers	Bedding	Up to 2 300 N/m^2	Limited load bearing capability. Use with distance pieces.
3	Gun-grade sealant, solvent release type	Synthetic rubber and plasticizers	Heel bead or bedding beads	Up to 2 000 N/m^2	
4a	Preformed mastic tape load bearing	Synthetic rubber and plasticizers	Bedding glass	Generally exceeds 2 300 N/m^2, and varies according to design and materials	Effective drainage is generally required for insulating glass units and laminated glass.
4b	Solid sections	Vulcanized synthetic rubber or PVC	Bedding glass	Generally exceeds 2 300 N/m^2, and varies according to design and materials	Effective drainage is generally required for insulating glass units and laminated glass. Life varies according to materials: consult manufacture.
4c	Expanded section	PVC, or neoprene, or polyurethane	Bedding glass	Generally exceeds 2 300 N/m^2, and varies according to design and materials	
5a	Curing gun-grade sealant, one-part	Solvent release acrylic sealants, polysulphide, silicone, polyurethane	Heel bead and capping	Generally exceeds 2 300 N/m^2, and varies according to design and materials	Cure may be slow owing to concealed position of sealant.
5b	Curing gun-grade sealant, two-part	Polyurethane, polysulphide, flexibilized epoxide	Heel bead and capping	Generally exceeds 2 300 N/m^2, and varies according to design and materials	cure is unaffected by being in concealed positions.
6	Two-part rubberizing compound	Synthetic rubber, plasticizers	Bedding glass and beads	Generally exceeds 2 300 N/m^2, and varies according to design and materials	Compound is load bearing when cured.

Table 1 — Bedding and sealing materials (*concluded*)

Type	Description	Basic components	Uses	Wind pressure resistance (single glazing) (see note 1)	Comments
7	Reinforced mastic tap	Foil or fabric, coated or impregnated with mastic compound	covering joints	Up to 1 000 N/m^2	Generally used as a repair system, lapped over glass and frame.
8a	Extruded sections structural gaskets	Vulcanized synthetic rubber	Bedding glass	Varies according to design and materials	Effective drainage is generally required for insulating glass units and laminated glass.
8b	Extruded sections non-structural gaskets	Vulcanized synthetic rubber or PVC	Bedding glass	Varies according to design and materials	Effective drainage is generally required for insulating glass units and laminated glass. Joint should be sealed.
9a	Self-adhesives fabric tape	Cotton or other fibre	Bedding glass	Internal use only	
9b	Self-adhesives velvet tape	Velvet	Bedding glass	Internal use only	
9c	Extruded mastic tape	Vegetable oils	Bedding glass	Internal use only	
9d	Fire resisting tape	Calcium silicate or other suitable materials	Bedding	Normally internal use only	Used in glazing of fire doors and partitions usually incorporating a suitable mastic sealant.
10	Fire resisting channel	Calcium silicate or other suitable materials	Bedding	Normally internal use only	Used in glazing of fire doors and partitions usually incorporating a suitable mastic sealant.

NOTE 1 These figures refer to situations where the glazing materials are used individually. Higher limits may be accepted when various glazing materials are used in combination.

NOTE 2 For large panes, lower wind loading limits may apply and the glazing material manufacturer should be consulted.

NOTE 3 For insulating glass units, lower wind loading limits may apply and the insulating glass manufacturer and the glazing material manufacturer should be consulted.

2.2.4 Glazing clearances

2.2.4.1 *General*

Before glazing, check that clearances are appropriate for the thickness of glazing material.

2.2.4.2 *Glass*

Check that all glass sheet or insulating glass unit thicknesses in normal usage have all round edge clearances of not less than:

a) 3 mm for length or width of glass up to 2 m;

b) 5 mm for length or width of glass over 2 m.

2.2.4.3 *Plastics*

Check that all plastics glazing sheet material in normal usage has a cut size smaller than the tight surround size of not less than:

a) 3 mm for side lengths up to 1 m;

b) 5 mm for side lengths between 1 m and 2 m;

c) 7 mm for side lengths between 2 m and 3 m.

COMMENTARY. *In the case of glass, clearances are primarily to ensure that the glass does not touch the rebate edge and so lead to breakage. In the case of plastics sheets the clearances are primarily to accommodate thermal expansion. Tinted glasses and plastics including solar control insulating glass units may need greater clearances so the manufacturers should be consulted.*

2.2.5 Checking condition

Check glass and plastics sheets immediately before fixing for damage and imperfections in case these have not been noticed in the general check on condition at delivery or damage has been inflicted after delivery. Do not use damaged units or sheets. Check that any edge tapes which provide a barrier to moisture [see **2.1.1**e)] are not damaged or displaced and repair as appropriate.

2.2.6 Bedding and sealing materials

2.2.6.1 *General*

Basic descriptions of glazing materials are given in Table 1 to help identification of the most common materials used for site glazing.

COMMENTARY. *The descriptions are typical. Different manufacturers' data may vary in detail, and should be consulted in specific cases.*

2.2.6.2 *Using putty*

Use putty type 1 on most non-absorbent surfaces, such as steel (non-stainless) and sealed wood and sealed concrete (but not with PVC). Use putty type 0 only on primed softwood (but not with microporous stain finishes).

Immediately before glazing, prepare putty for use by working to a smooth consistency free from lumps and with separated oils thoroughly mixed in.

2.2.6.3 *Using curing sealants and curing compounds*

Immediately before glazing check that materials are suitable for use within the shelf-life marked on the containers.

Follow the manufacturer's sitework instructions regarding mixing, application time, and temperature, moisture and preparation conditions for the particular material to be used.

Observe the safety and toxicity warnings given by the manufacturer of the particular sealant, compound, primer and cleaner.

COMMENTARY. *Sitework instructions vary with product and manufacturer. Generally, working time for two-part sealants is* 1 h to 2 h *and for curing compounds* 4 h *or more depending on temperature. Sealant application temperatures are in the range of* 5 °C to 50 °C. *They can be applied at colder temperatures with special provision. Contact of sealants, particularly polysulphides and silicones, with skin should be avoided.*

Section 3. Glazing techniques

COMMENTARY. *Selection of glazing method depends on a number of factors such as size of glazing sheet, exposure, degree of movement, type of frame material and profile, accessibility, etc. and there may be detail variants required of the methods given.*

NOTE Figures are drawn with the convention showing the outside on the left hand side.

3.1 Glazing blocks

3.1.1 General

Incorporate setting and location blocks and distance pieces to provide support in relation to the size of sheet or unit, technique of glazing and condition of use. See Figure 1 and Figure 2.

3.1.2 Setting blocks

Always use setting blocks, except when glazing single panes of glass less than 0.2 m^2 with putty or plastic glazing compound, or with certain types of gasket, or with plastics glazing sheet materials. Use setting blocks which are rot-proof, non-absorbent and load bearing, capable of maintaining the requisite edge clearance without presenting local areas of stress to the glass through being incompressible or unresilient.

Position setting blocks as shown in Figure 2 using sizes as follows.

a) *Length.* The minimum length of each block per square metre of glazing depends on the block material as follows:

1) sealed hardwood of suitable density (e.g. teak, mahogany), 10 mm/m^2;

2) hammered lead or extruded PVC, 25 mm/m^2;

3) plasticized PVC (with a softness number of 35 to 45 [see BS 2571:1990)] or neoprene (with a Shore A hardness number of 80 to 90), 30 mm/m^2.

COMMENTARY

i) *No block should be less than* 25 mm *long.*

ii) *The length of a single setting block in vertically pivoted windows should be twice the length calculated from item a).*

iii) *Hammered lead should not be used in metal frames with drained glazing systems.*

b) *Width.* The width is to be equal to either:

1) the thickness of the sheet or unit plus back clearance if used with adjacent distance pieces; or

2) the thickness of the sheet or unit only if used with load bearing tapes:

c) *Thickness.* The thickness is to be as required to centralize the sheet or unit in the opening. Use setting blocks for plastics glazing sheet only if they are required to centralize the sheet in the opening. In this case reduce the height of the sheet to allow space for the blocks.

3.1.3 Location blocks

Use location blocks only for opening light or door conditions glazed with glass. Do not normally use for plastics glazing sheets, but if considered necessary seek advice. Treat the blocks at the head of reversible horizontal pivoted windows as setting blocks.

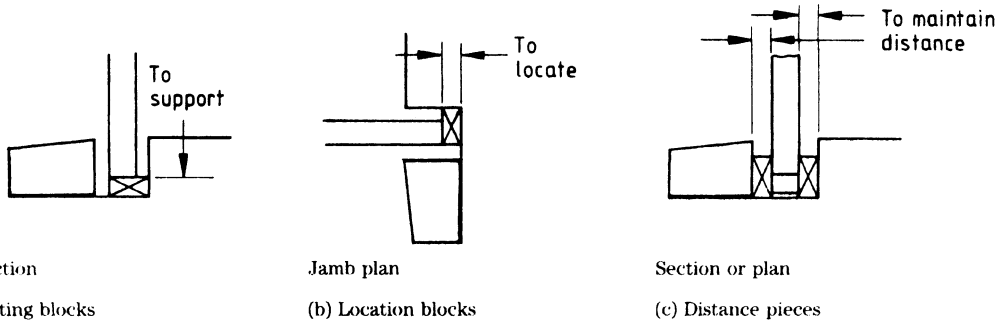
Use location blocks of a resilient non-absorbent material, generally of plasticized PVC with a softness number of 35 to 45 (see BS 2571:1990).

Position as shown in Figure 2 using sizes as follows:

a) *Length:* minimum 25 mm.

b) *Width:* equal to the thickness of the sheet or unit plus back clearance, unless used with load bearing tapes.

c) *Thickness:* equal to the actual edge clearance.

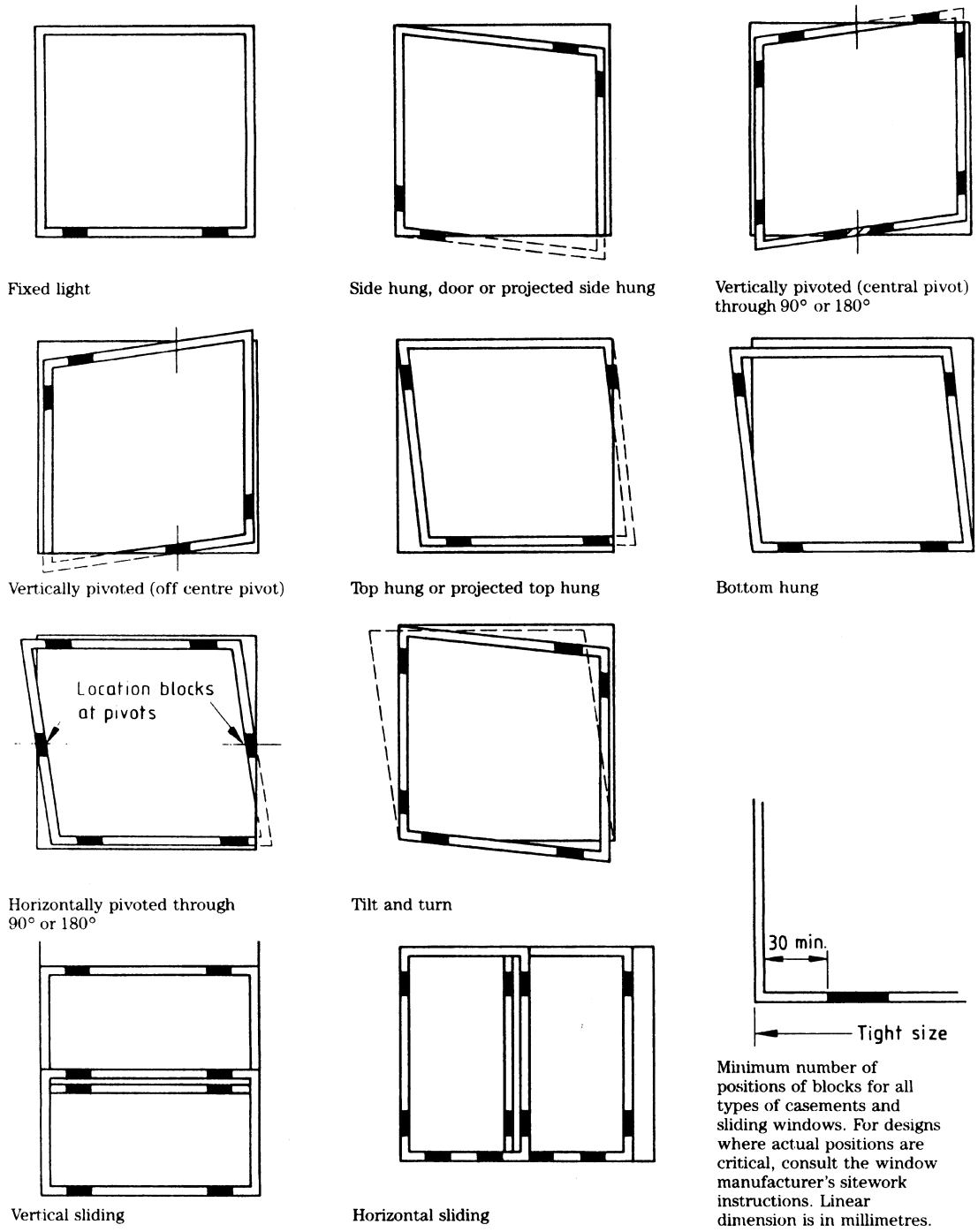


Sill section — (a) Setting blocks

Jamb plan — (b) Location blocks

Section or plan — (c) Distance pieces

Figure 1 — Setting and location blocks and distance pieces



NOTE On vertically pivoted windows (central or off centre pivots) setting blocks may be placed on or immediately either side of the bottom pivot.

Figure 2 — Recommended positions of setting and location blocks

3.1.4 Distance pieces

Use distance pieces made of a resilient, non-absorbent material, such as plasticized PVC with a softness number of 35 to 45 (see BS 2571:1990). Place these to coincide on opposite sides of the sheet or unit, and at bead fixing points. Ideally space them at 300 mm centres and within 50 mm of corners. Avoid placing them to coincide with setting or locating blocks.

When distance spacers are supplied incorporated in bedding tape products, use sizes as follows.

a) *Length:* 25 mm.

b) *Width/height:* to suit the depth of rebate and the glazing technique, allowing at least 3 mm of cover for compound generally and 6 mm of cover where recommended in this part of BS 8000 for particular glazing techniques.

c) *Thickness:* equal to the actual front and back clearance dimensions between the glazing sheet and the rebate or bead.

3.2 Fixing timber beads

Fix timber beads as follows:

a) for screwed fixings, spaced at maximum centres of 300 mm, and within 50 mm of corners;

b) for pinned fixings, spaced at maximum centres of 150 mm, and within 50 mm of corners.

Ensure that the edges of insulating glass units and laminated glass are protected from moisture ingress between timber glazing bead and rebate platform. In particular, where insulating glass and laminated glass are used, ensure that external bottom timber glazing beads either project beyond the front edge of the rebate platform, or are sealed to the rebate platform with a thin smear of gun-grade sealant.

3.3 Glazing techniques for single glass

3.3.1 Into rebates without beads

3.3.1.1 ***Using putty fronting*** (see Figure 3)

a) Apply sufficient putty to the rebate so that approximately 1.5 mm width remains between the glass and the rebate upstand after bedding.

b) Place setting blocks in position as required (see **3.1.2**).

c) Set the glass, on blocks if used, centrally in the frame and press onto the back putty (see Figure 4). Insert location blocks as required (see Figure 2).

d) Check that there are no voids in the bedding and secure the glass with sprigs, clips or cleats.

e) Apply further putty to form the fronting, and finish at an angle from the edge of the frame to approximately 2 mm below the sight line (for painting onto the glass).

f) Remove surplus back putty, ensuring that the surface is not undercut where moisture might lodge.

g) Lightly brush all putties to seal them to the glass.

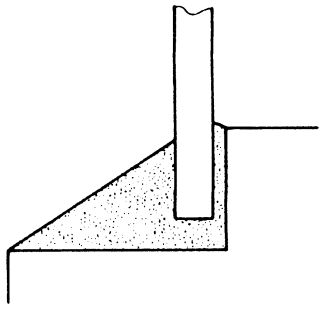


Figure 3 — Putty fronting

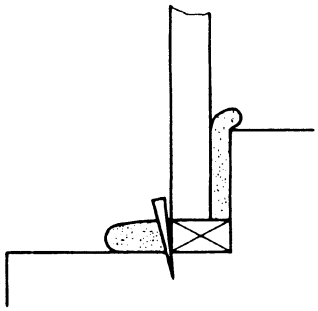


Figure 4 — Fixing glass onto back putty

3.3.1.2 ***Using plastic glazing compound***

a) Apply one coat of the manufacturer's recommended primer to the rebate, platform and upstand and allow to dry. No primer is required on factory finished steel.

b) Apply sufficient glazing compound to the rebate so that approximately 1.5 mm width remains between the glass and the rebate after bedding.

c) Place setting blocks in position as required (see **3.1.2**).

d) Set the glass, on blocks if used, centralize in the frame and press onto the back bedding, pressing back to achieve a bed approximately 1.5 mm wide. Insert location blocks as required (see Figure 2).

e) Check that there are no voids in the bedding and secure the glass with sprigs, clips or cleats.

f) Apply further glazing compound to form the fronting, finish at an angle from the edge of the frame to approximately 2 mm below the sight line, and strike off to a neat finish.

g) Remove surplus back bedding, striking off to form a chamfer to shed water.

h) On timber frames, lightly brush all frontings to dress the feather edges to the surface of the glass, taking care to ensure that the compound is sealed to the glass.

i) On factory finished metal frames, lightly brush with a soft brush wet with dilute detergent solution, dressing the compound back to the glass to ensure that it is sealed to the glass, and smoothing the surface of the compound to eliminate drag lines, blisters and other imperfections.

COMMENTARY. *Plastic glazing compounds form a skin in a few days, but remain soft for a prolonged period. Special care is necessary in cleaning the glass or frame to avoid damage to glazing compound.*

3.3.2 Single glazing with beads

3.3.2.1 ***Using putty*** (see Figure 5)

a) Apply sufficient putty to the rebate so that approximately 1.5 mm width will remain between the glass and the rebate upstand after bedding [see Figure 5a)]

b) Place setting blocks in position as required (see **3.1.2**).

c) Set the glass, on blocks if used, centralize in the frame and press onto the back putty [see Figure 5b)]. Insert location blocks as required (see Figure 2).

d) Where metal beads are to be applied to studs, fit the studs to the rebate.

e) Bed the beads against the glass with putty. Secure with pins or screws, or by snapping onto studs.

f) Make up putty lines and strip to an angle to shed moisture [see Figure 5c)].

g) Lightly brush all putties to seal them to the glass.

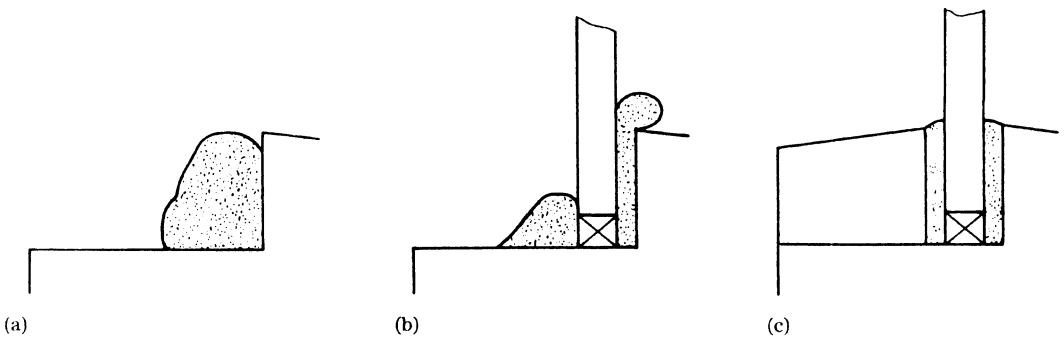


Figure 5 — Single glazing with beads using putty

3.3.2.2 ***Using non-setting compound*** (see Figure 6)

a) Apply two coats of the recommended sealer to the glazing surfaces of the timber rebates and beads, and allow to dry between coats. Do not use sealer on metal surfaces.

b) Apply sufficient compound to the rebate so that at least 3 mm width will remain between the glass and the rebate upstand after bedding [see Figure 6a)].

c) Place setting blocks and distance pieces on the rebate platform and upstand.

d) Set the glass on blocks, centralize in the frame and press onto the back compound [see Figure 6b)]. Insert location blocks as required (see Figure 2).

e) Make further application of the compound to the face of the glass or to the bead and insert distance pieces between the glass and the bead [see Figure 6c)].

f) Finish the compound at an angle to shed water [see Figure 6d)].

3.3.2.3 ***Using two-part rubberizing compound*** (see Figure 7)

a) Prime all the glazing surfaces, i.e. frame, bead and glass, with the specified primer and allow to dry before glazing, to obtain satisfactory adhesion to these surfaces.

b) Mix two-part compounds by hand or machine, and then apply by hand in a similar manner to non-setting compounds. Allow 7 days to 14 days for them to cure.

c) Clean and prime the rebate, the glazing face of bead, and the perimeter of glass up to the sight line on both sides, and allow to dry.

COMMENTARY. *Concrete rebates may need to be sealed before being primed.*

d) Mix the compound in accordance with the manufacturer's sitework instructions.

e) Apply a bed of compound to the rebate. Insert distance pieces and setting blocks.

f) Set the glass on the blocks and centralize in the frame. Press the glass against the back compound until it makes contact with the distance pieces.

g) Place location blocks in position as required (see Figure 2).

h) Apply further compound around the edge of the glass to ensure that the perimeter clearance is filled.

i) Apply compound to the face of the beads or to the face of the glass.

j) Insert distance pieces before or after fixing the beads. The beads should be securely fixed and the distance pieces should be firmly in contact with units and beads.

k) Fill any gaps and trim off compound to the sight lines, providing a smooth chamfer at the sill, both internally and externally, to shed water.

COMMENTARY. *Two-part rubberizing compound should not be painted with normal air drying paint as this will remain tacky for a long period.*

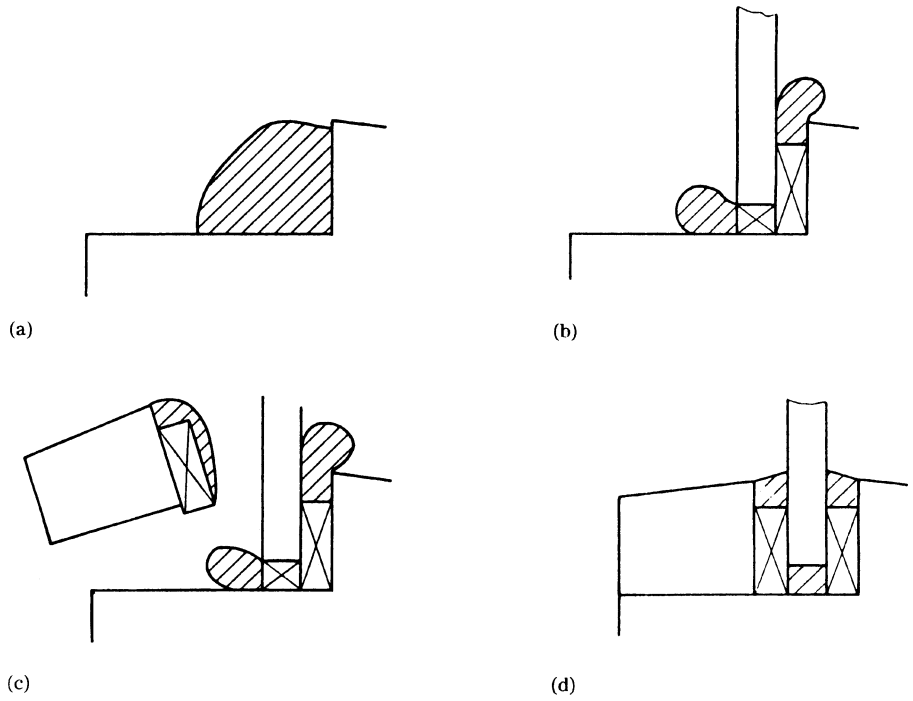


Figure 6 — Single glazing with beads using non-setting compound

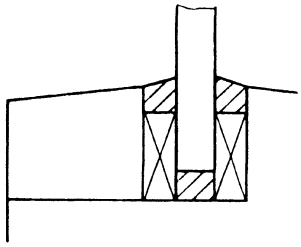


Figure 7 — Single glazing with beads using two-part rubberizing compound

3.3.2.4 ***Using preformed load bearing strips with sealant capping and beads*** (see Figure 8)

a) Clean and prime the rebates and beads, and allow to dry.

b) Press a strip of sufficient width and thickness against the upstand so that:

1) for inside glazing, the strip finishes not less than 6 mm below the sight line (3 mm below if silicone capping is to be used) and so that the external face clearance is not less than 3 mm;

2) for outside glazing, the strip is finished flush with the sight line.

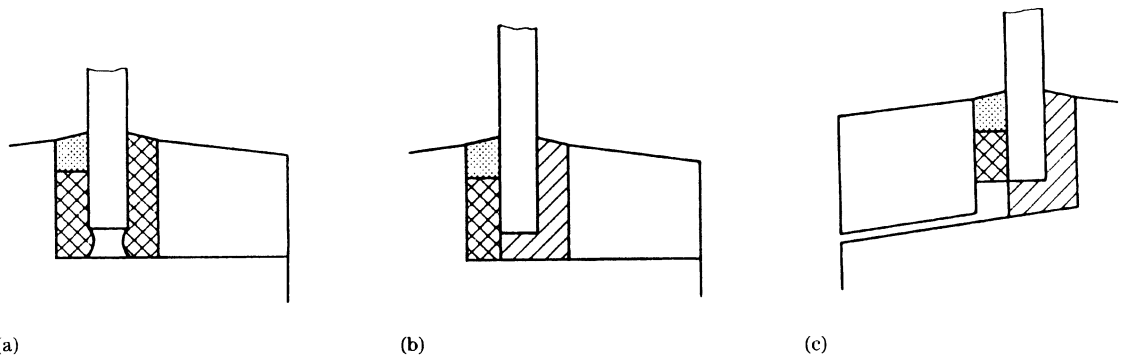


Figure 8 — Single glazing with beads using preformed load bearing strips with sealant capping

c) Insert setting blocks.

d) Clean the perimeter of the glass with a dry cloth. Insert and centralize the glass and bed it firmly against the strip.

e) Place location blocks in position as required (see Figure 2).

f) Apply a strip of sufficient width and thickness to the face of the beads so that:

1) for inside glazing, the strip is the full height of the bead;

2) for outside glazing, the strip is the height of the bead less 6 mm (3 mm if silicone capping is to be used) and so that the external face clearance is not less than 3 mm.

g) Fix the beads securely, ensuring that the strips are in compression.

h) Prepare the capping sealant and clean the face of the glass in the void provided for the capping. Prime where necessary, according to the capping material used.

i) Allow to dry before applying the sealant capping and finish to a smooth chamfer [see Figure 8a)].

COMMENTARY. *Where heavy condensation can be expected, the capping should be applied also to the internal strip, in which case the height of the strip should be the same as the one used externally.*

Where clip-on beads are used for inside glazing it is possible to use a combination (hybrid system) method, using a strip and capping sealant for the exterior with a non-setting compound for the interior [see Figure 8b)]. Similarly, where the rebate is of a complex profile and a suitable bead is used, it is possible to glaze with an external bead using strip and capping with a bedding of non-setting compound [see Figure 8c)]. Distance pieces should be used with non-setting compounds.

3.3.2.5 ***Using a heel bead seal*** (see Figure 9)

a) Clean the rebates and beads, and prime as necessary.

b) Press against the upstand a preformed load bearing strip to finish flush with the sight line and to allow at least 3 mm contact of heel bead sealant onto the external face of the glass.

c) Mix the sealant as required; apply the sealant between the strip and the glazing platform. Place setting blocks in position.

d) Clean the perimeter of the glass and apply primer as necessary. Centralize the glass in the frame and bed it firmly to ensure contact with the strip and sealant all round.

e) Place location blocks in position as required (see Figure 2).

f) Apply further sealant between the glass and the glazing platform, ensuring that the edge clearance is filled completely and forming a triangular fillet between the face of the glass and the glazing platform.

g) Fix the beads securely and either:

1) insert a synthetic rubber or PVC section between the glass and beads, ensuring that it is in compression; or

2) insert distance pieces and fill the space between the glass and bead with non-setting compound, finishing it at the sill to a smooth chamfer.

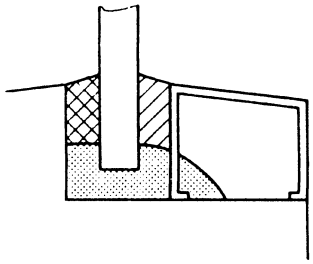


Figure 9 — Single glazing with beads using a heel head seal

3.3.2.6 ***Using sealant bedding*** (see Figure 10)

a) Clean and prime the rebates and beads, and allow to dry.

b) Prime the perimeter of the glass up to the sight line as necessary.

c) Mix the sealant as required, and apply a generous fillet to the rebate upstand.

d) Place setting blocks and distance pieces on the rebate platform and upstand.

e) Set the glass on the blocks and centralize in the frame. Press the glass against the back sealant until firmly in contact with the distance pieces. Insert location blocks as required (see Figure 2).

f) Apply further sealant to fill completely the void around the perimeter of the glass, followed by a substantial fillet to form the bedding between the bead and the glass. Insert distance pieces.

g) Bed the bead to the glass, squeezing the bulk of the sealant between the bead and the glass. Fix the beads, using adequate fixings to ensure that they cannot move or distort.

h) Apply further sealant to both sides of the glass to fill completely the spaces between the glass and upstand and glass and bead, forming a chamfer to shed water.

3.3.3 Single glazing into grooves using gaskets, compounds or sealants

COMMENTARY. *This method is sometimes referred to as channel, pocket or shuffle glazing. It is generally used for glazing into concrete, stone or timber frames (aluminium frames are more frequently designed to be glazed with gaskets in a drained system).*

In the following procedures it is assumed that there is a rebate and bead at the sill only. They may be varied to suit frames which have, for example, beads at the head and sill and grooves at the jambs.

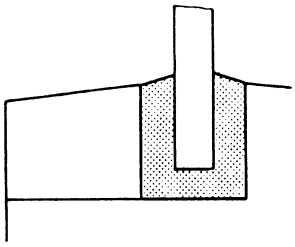


Figure 10 — Single glazing with beads using a sealant bedding

3.3.3.1 ***Using gasket sections***

As the systems vary, follow the frame supplier's sitework instructions.

COMMENTARY. *Some gaskets may have been designed for application to the surround before inserting the glass; others are used as continuous wedges after inserting the glass (see Figure 11).*

a) Clean the grooves and beads.

b) If the gasket sections have not been inserted in the surround and bead, cut the strips over length to ensure a tight fit at the corners. Insert any strips that are required to be inserted before glazing.

c) Insert the glass into the groove on one side of the frame (the deeper groove if they are of unequal depth), sufficiently to clear the frame on the opposite side, and manoeuvre the glass back into the opposite groove to equalize edge cover. Rest the glass on normal thickness setting blocks.

d) Lift the glass into the groove in the head, inserting thicker setting blocks to centralize it in the sight size of the frame.

e) Fit the sill bead and apply all remaining gasket sections so that the glass is bedded all round on both sides.

3.3.3.2 ***Using non-setting compound or two-part rubberizing compound*** (see Figure 12)

a) Clean the grooves and rebate in metal flames, prime as necessary and allow to dry. Clean the grooves and rebate in wood frames and concrete or stone surrounds, and seal and prime in accordance with the manufacturer's instructions. Allow sufficient drying time between application of coats and between application of the final coat and glazing. Clean and prime or seal beads according to their composition. Clean and prime the edge of the glass if required for the compound used.

b) Apply non-setting compound to the back of the rebate and the corresponding side of the groove, and place normal thickness setting blocks on the sill rebate.

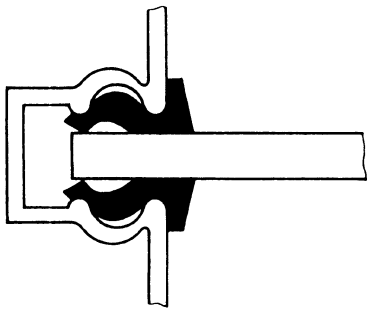


Figure 11 — Single glazing into grooves using gasket sections

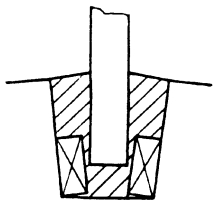


Figure 12 — Single glazing into grooves using non-setting compound or two-part rubberizing compound

c) Insert the glass into the groove on one side of the frame (the deeper groove if they are of unequal depth), sufficiently to clear the frame on the opposite side and manoeuvre it back into the opposite groove to equalize the edge cover.

d) Lift the glass into the groove in the head, inserting thicker setting blocks to centralize the glass in the sight size of the frame.

e) Fill the edge clearance with compound.

f) Insert distance pieces on both sides of the glass and fix the sill bead securely.

g) Fill any gaps and trim off compound to sight lines, providing a smooth chamfer at the sill, both internally and externally, to shed water.

3.3.3.3 ***Using sealant capping system*** (see Figure 13)

a) Clean the grooves and rebate in metal frames, prime as necessary and allow to dry. Clean the grooves and rebate in wood frames and concrete or stone surrounds, and seal or prime in accordance with the manufacturer's instructions. Allow sufficient drying time between application of coats and between application of the final coat and glazing. Clean and prime or seal beads according to their composition. Clean and prime the edge of the glass if required for the compound used.

b) Place the normal thickness setting blocks on the sill rebate.

c) Insert the glass into the groove on one side of the frame (the deeper groove if they are of unequal depth), sufficiently to clear the frame on the opposite side and manoeuvre it back into the opposite groove to equalize the edge cover.

d) Lift the glass into the groove in the head, inserting thicker setting blocks to centralize the glass in the sight size of the frame.

e) Insert expanded polyethylene strip (25 % to 40 % thicker than the clearance between the glass and frame) at the head and jambs and so that the top edge is at least 6 mm below the sight line.

f) Fix the sill securely, and insert expanded polyethylene strips between the sill bead and glass.

g) Apply the sealant to fill the recesses on either side of the glass, providing a smooth chamfer at the sill, both internally and externally, to shed water.

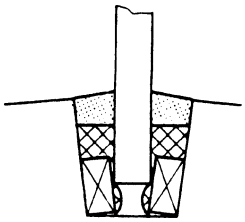


Figure 13 — Single glazing into grooves using sealant capping system

3.3.4 Single glazing using structural gaskets

3.3.4.1 *General*

Use setting blocks as described in **3.1.2** with single sided gaskets. In the case of "H" and "Y" shaped gaskets, consult the gasket manufacturer's sitework instructions regarding the need for, and the size of, blocks.

COMMENTARY. *The length of the blocks may need to be greater than usual to avoid undue deformation of the gasket.*

Ensure that the nibs, grooves and rebates to which the gaskets are to be fitted are smooth and free from pitting, splits, zinc runs, excess weld and bow, and that all welded joints are finished evenly and free from high and low spots. Ensure that the corners are in line. For concrete ensure that the surface finish in and adjacent to the grooves is smooth and free from holes and extraneous pieces of concrete, and debris.

3.3.4.2 *Using "H" shaped structural gaskets* (see Figure 14)

a) Check that the gasket is the right way round.

b) Fit the gasket to the frame, first at the corners, then ease the remainder onto the frame upstand, working from the centre towards the corners.

COMMENTARY. *This will put the gasket in slight compression even before the glass is inserted.*

c) Lubricate the glazing channel portion of the gasket with water or a dilute detergent solution, and insert setting blocks as required.

d) Clean the perimeter of the glass. Insert the glass into the gasket about 50 mm above the two bottom corners. Ease it gradually into the bottom of the gasket, lipping the gasket over the bottom edge of the glass by inserting hardwood, plastics or similar spatulas, and keeping the glass tilted towards the operatives at an angle of about 15° from the vertical.

e) Insert spatulas in the two vertical lips of the gasket, and insert the glass progressively towards the top until it is nearly upright.

f) Raise the lips at the side and top at one corner with spatulas and press the glass in. Repeat this at the other corner and ensure that the glass is properly located in the gasket all round.

g) Lubricate the zipper groove. Cut the zipper 50 mm to 75 mm longer than required and insert, using the special tool, up to the corners and overhanging at the ends.

h) Allow at least 24 h for retraction, then cut the zippers to mitres at the corners and push into position.

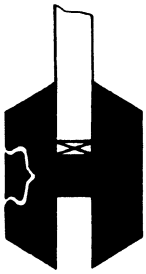


Figure 14 — Single glazing into grooves using "H" shaped structural gaskets

3.3.4.3 *Using ladder gaskets*

Follow the procedure described in **3.3.4.2**. Ensure that zipper strips are continuous along the long sides of each gasket. When the second piece of glass has been installed, fit the first transom or mullion with the zipper. Centralize the gasket and glass for each pane using setting blocks where necessary to ensure correct alignment.

3.3.4.4 ***Using "Y" shaped structural gaskets*** (see Figure 15)

a) Check that the gasket is the right way round.

b) Insert the two bottom corners of the gasket in the groove, ensuring that they are well pushed in, if necessary inserting a right-angled piece of timber in the corner and tapping with a mallet.

c) Locate the rest of the bottom of the gasket in the groove by tapping lightly with a wooden, rubber or hide mallet, working from the centre towards the corners.

d) Follow the same procedure with the rest of the gasket, i.e. insert the top two corners, etc., until the gasket is properly located in the frame all round.

e) Lubricate the glazing channel portion of the gasket with water or a dilute detergent solution, and insert the setting blocks if required.

f) Clean the perimeter of the glass. Insert the glass into the gasket about 50 mm above the two bottom corners. Ease it gradually into the bottom of the gasket, lipping the gasket over the bottom edge of the glass by inserting hardwood, plastics or similar spatulas and keeping the glass tilted towards the operatives at an angle of about 15° from the vertical.

g) Insert spatulas in the two vertical lips of the gasket, and insert the glass progressively towards the top until it is nearly upright.

h) Raise the lips at the side and top at one corner with spatulas and press the glass in. Repeat this at the other corner and ensure that the glass is properly located in the gasket all round.

i) Lubricate the zipper groove. Cut the zipper 50 mm to 75 mm longer than required and insert, using the special tool, up to the corners and overhanging at the ends.

j) Allow at least 24 h for retraction, then cut the zippers to mitres at the corners and push into position.

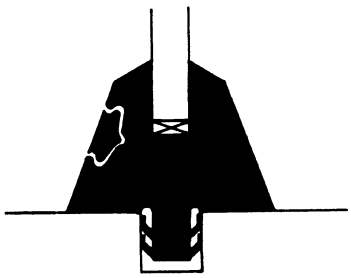


Figure 15 — Single glazing into grooves using "Y" shaped structural gaskets

3.3.4.5 ***Using single sided gaskets*** (see Figure 16)

a) Clean the rebates; prime or seal as necessary and allow to dry.

b) Apply the back bedding strip to the rebate upstand.

c) Insert setting blocks.

d) Clean the perimeter of the glass with a dry cloth. Insert and centralize the glass and bed it firmly against the strip.

e) Place location blocks in position as required (see Figure 2).

f) Push the gasket into the groove, first at the corners and then at the centre of each side, gradually easing it from the centre towards the corners.

g) Ensure that the gasket is properly fitted all round by tamping it down into the groove.

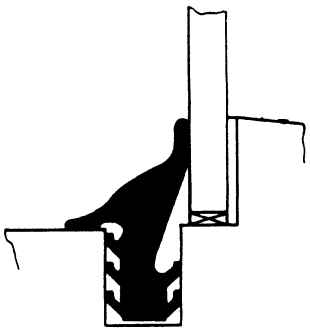


Figure 16 — Single glazing into grooves using single sided gaskets

3.3.5 Single glazing using non-structural gaskets

3.3.5.1 ***Using channel type gaskets and pressure beads*** (see Figure 17)

a) Clean metal rebates and beads.

b) Clean the perimeter of the glass. Fit the gasket over the edge of the glass. Insert setting blocks in slots in the gasket if required.

c) Fit the glass with gasket into the frame.

d) Before fitting the beads, fit location blocks between the glass and the rebate platform, i.e. where slots have been provided in the gasket.

e) Fit the beads according to the manufacturer's sitework instructions, providing the pressure required for the gasket to be displaced sufficiently to form a watertight seal. Seek advice on the pressure required from the frame manufacturer.

3.3.5.2 ***Using extruded gasket sections*** (see Figure 18)

a) Clean the rebates and beads.

b) Cut the strips over length to ensure a tight fit at the corners of the frame and beads.

c) Place setting blocks in the frame. Clean the perimeter of the glass and insert the glass.

d) Centralize the glass in the frame and fit location blocks as required (see Figure 2). Fit the beads in the manner intended by the frame manufacturer.

e) Apply pressure by inserting the wedge shaped gasket. Check that there are no gaps in the corners of the gasket.

Figure 17 — Single glazing using channel type gaskets and pressure beads

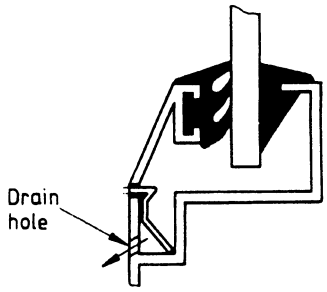


Figure 18 — Single glazing using extruded gasket sections

3.4 Glazing techniques for flush-edged insulating glass units

COMMENTARY. *The quality of workmanship for any of the glazing methods used for insulating glass is critical, particularly those methods described in **3.4.2**. With poor workmanship the edge seal of the insulating glass unit is likely to fail.*

3.4.1 Preferred methods

3.4.1.1 ***Using insert gasket sections*** (see Figure 19)

a) Clean the frame and beads.

b) Apply sealant to the frame corners if this is specified in the frame manufacturer's sitework instructions.

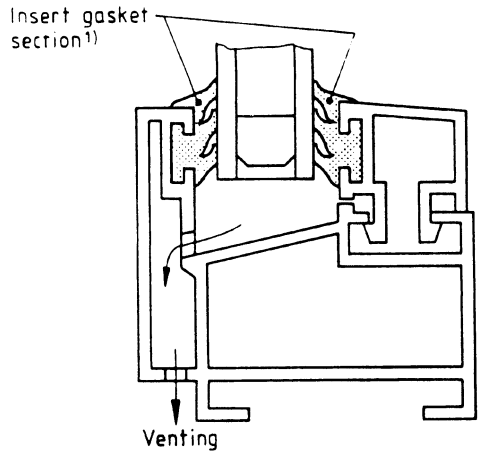
c) If the gasket sections have not been inserted in the frame and beads, cut the strips over length to ensure a tight fit at the corners of the frame and beads, and fit them into the grooves.

d) Place setting blocks in the frame.

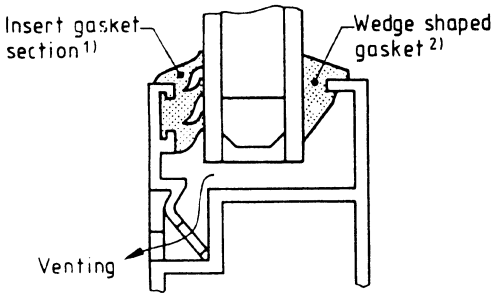
e) Clean the perimeter of the glass unit with a dry cloth and insert the unit.

f) Centralize the unit in the frame and fit location blocks if required (see Figure 2).

g) Apply pressure, either by inserting the beads or by applying the beads and inserting the wedge shaped gasket. When using pressure beads, seek advice on the pressure required from the frame manufacturer. Before applying full pressure, check that there are no gaps in the corners of the gasket.



(a) Drained and ventilated uPVC frame shown



(b) Vented aluminium frame shown

1) PVC or synthetic rubber extruded sections, profiled to fit into grooves in the frame upstand and in the beads.
2) PVC or synthetic rubber extruded section.

Figure 19 — Flush-edged insulating glass units using insert gasket sections

3.4.1.2 ***Using cellular adhesive sections or strips or pre-shimmed mastic tapes*** (see Figure 20)

a) Clean the rebates and beads.

b) Apply self-adhesive cellular section or strip to the rebate in line with the sight line; or apply pre-shimmed mastic tape to the recommended distance below the sight line.

c) Clean the perimeter of the glass unit with a dry cloth.

d) Centralize the unit on setting blocks and bed against the section, strip or tape.

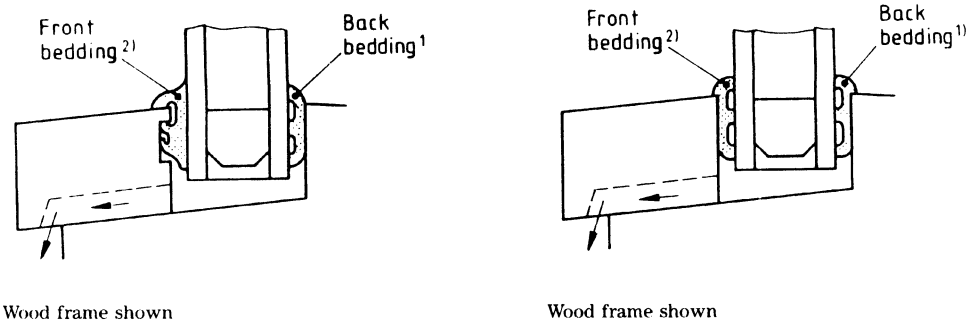
e) Carry out one of the following:

1) Apply self-adhesive section or strip to the bead in line with the sight line; bed the bead to the glass compressing both inside and outside sections or strips, and fix the bead in position.

2) Apply pre-shimmed tape to the bead in the recommended position, and fix the bead applying sufficient pressure to ensure that the shims are in compression between the bead and the glass.

3) Fix the bead in a pre-determined position, and insert the wedge section, compressing the glass against the cellular section until the wedge locates in the bead profile.

COMMENTARY. *Unless the units are relatively small, e.g. about* 1 m^2, *it may be difficult to provide sufficient compression unless the glazing is carried out in the factory.*



Wood frame shown

Wood frame shown

1) Profiled closed cell synthetic section with self-adhesive backing, closed cell PVC foam with self-adhesive backing or pre-shimmed mastic tapes.
2) Profiled closed cell synthetic section with self-adhesive backing, closed cell PVC foam with self-adhesive backing, wedge shaped section designed to lock into the bead by means of groove or nib or pre-shimmed mastic tapes.

Figure 20 — Flush-edged insulating glass units using cellular adhesive sections or strips or pre-shimmed mastic tapes

3.4.1.3 ***Using load bearing tapes or synthetic rubber sections, and sealant capping*** (see Figure 21)

a) Clean the rebates and beads, and prime as necessary with sealant primer.

b) Clean the perimeter of the glass unit and prime with sealant primer as required.

c) Apply mastic tape, cellular section or insert section to the rebate, set approximately 5 mm below the sight line.

d) Insert the unit, centralize on setting blocks, and bed against the tape or section.

e) Apply mastic tape, cellular section or insert section to the face of the bead, set 5 mm below the sight line, taking care that the drainage or ventilation is not obstructed.

f) Apply the bead to the glass, compressing the tape or section to the required degree and fix in position.

g) Apply sealant capping on both sides of the glass, and tool to a smooth chamfer to shed water.

3.4.1.4 ***Using moisture vapour permeable sealant bedding*** (see Figure 22)

3.4.1.4.1 *Outside glazing*

a) Clean the frame and beads to remove any contamination, dust, grease or other materials likely to prevent satisfactory adhesion.

b) Prime the glazing surfaces of the bead and frame as necessary.

c) Clean the perimeter of the glass unit and prime as necessary.

d) Apply the back bedding to the rebate.

e) Insert setting blocks and distance pieces as required, and insert the unit, pressing it back until firmly bedded. Insert location blocks (see Figure 2).

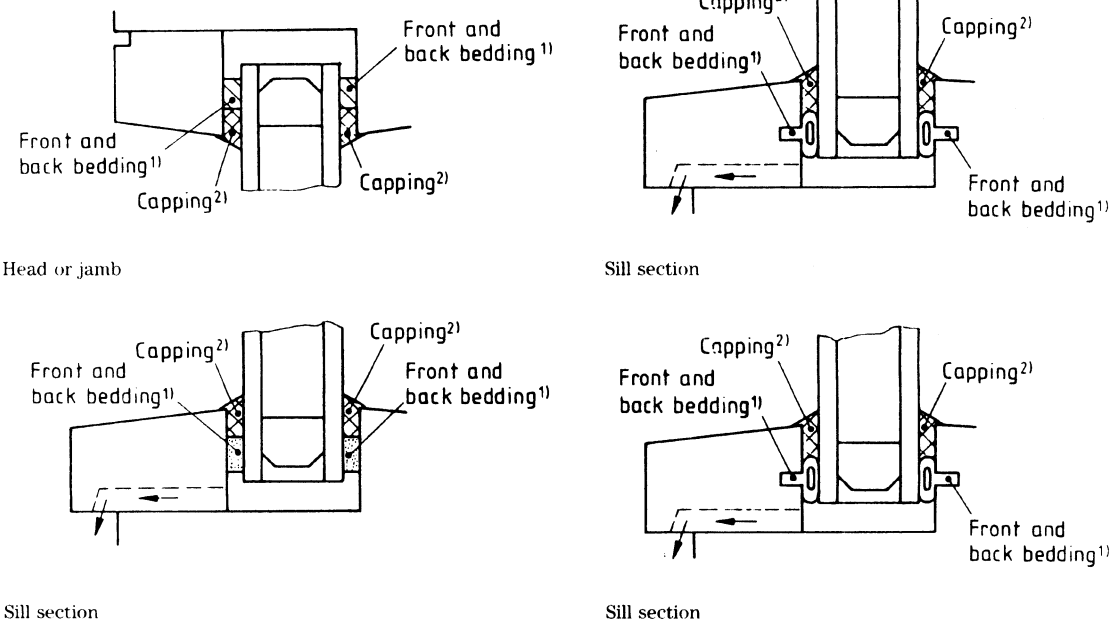
f) Apply moisture vapour permeable (mvp) sealant around the edge of the unit to fill completely the perimeter void; then apply a substantial fillet around the perimeter of the glass to form the bedding between the bead and the glass.

g) Insert distance pieces of the required thickness.

h) Bed the bead to the glass, squeezing the sealant up between the bead and the glass until the distance pieces are firmly held between the bead and the glass. Fix the beads in position using adequate fixings to ensure they cannot move or distort.

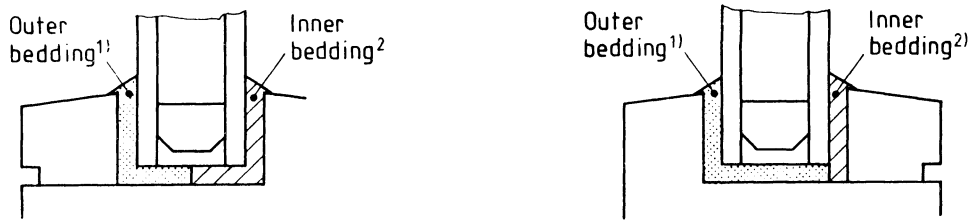
i) Apply further mvp sealant to fill the space between the bead and the glass, finishing with a chamfer to shed water, lipping onto the top edge of the bead.

j) Finish the internal bedding, trimming the tape or finishing the glazing compound to a smooth chamfer to shed water.



1) Load bearing mastic tapes, synthetic rubber self-adhesive cellular sections or insert sections.
2) One- or two-part curing sealants.

Figure 21 — Flush-edged insulating glass units using load bearing tapes or synthetic rubber sections and sealant cappings



1) Moisture vapour permeable sealant, e.g. suitable one-component silicone.
2) Low permeability sealant, e.g. load bearing tape, polysulphide sealant or non-setting compound.
An internal capping may be added for installations in severe condensation situations.

NOTE Inner bedding should always be less permeable than the outer bedding.

Figure 22 — Flush-edged insulating glass units using moisture vapour permeable (mvp) sealant bedding

3.4.1.4.2 *Inside glazing*

Follow the recommendations given in **3.4.1.4.1** but with the system reversed, bedding the unit in the mvp sealant, and bedding the bead to the glass with the less permeable material.

3.4.2 Other acceptable methods

3.4.2.1 ***Using vapour resistant sealant*** (see Figure 23)

a) Clean the frames to remove any contamination, dust, grease, or other materials likely to prevent satisfactory adhesion.

b) Prime the glazing surfaces of the frame and bead as necessary.

c) Clean the perimeter of the glass unit and prime if necessary.

d) Mix sealant (if required) and apply a generous fillet around the perimeter of the frame to form a bedding between the unit and the upstand. [See Figure 23, item i).]

e) Insert setting blocks and distance pieces and bed the unit into the sealant pushing back until it is firmly in contact with the distance pieces.

f) Apply further sealant to fill completely the void around the perimeter of the unit. [See Figure 23, item ii).]

g) Apply a substantial ribbon of sealant to form the bedding between the bead and the glass. [See Figure 23, item iii).]

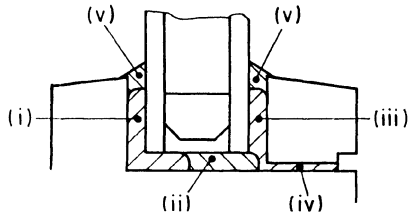
h) Insert distance pieces of the required thickness into this sealant.

i) Bed the bead to the glass squeezing the bulk of the sealant between the bead and the glass. Seal external beads to the rebate platform if appropriate [see **3.2**, and Figure 23, item iv).]

j) Fix the beads in position using adequate fixings to ensure that they cannot move or distort.

k) When the beads have been fixed, apply further sealant both sides of the glass to fill completely the spaces between the glass and rebate and glass and bead. [See Figure 23, item v).]

l) Tool the sight line to achieve a smooth even finish and a chamfer to shed water.



Wood frame shown

NOTE 1 The bedding can be any one- or two-part curing sealant or compound, e.g. silicone, polysulphide, polyurethane, polybutadiene or epoxy-polysulphide.

NOTE 2 See **3.4.2.1**.

Figure 23 — Flush-edged insulating glass units using vapour resistant sealant

3.4.2.2 ***Using load bearing tapes and sealant capping*** [see Figure 24a)]

a) Clean the rebate and bead. Clean the perimeter of the glass unit.

b) Apply primers to the rebate, bead and glass as necessary.

c) Apply tape or section (which should be at least 3 mm thick) to the rebate, without creating indentations, so that the tape or section lies approximately 6 mm below the sight line.

d) Insert setting blocks.

e) Insert and centralize the unit on the setting blocks, pushing it back onto the bedding, so that it is compressed to the specified thickness.

f) Fill the void around the edge of the unit with non-setting compound or sealant, finishing flush with the face of the unit.

g) Apply tape or section to the face of the bead or to the insulating glass units 6 mm below the sight line. Ensure that it is of sufficient thickness so that when it is compressed it fills the space between the bead and glass.

h) Seal external beads to the frame where appropriate (see **3.2**).

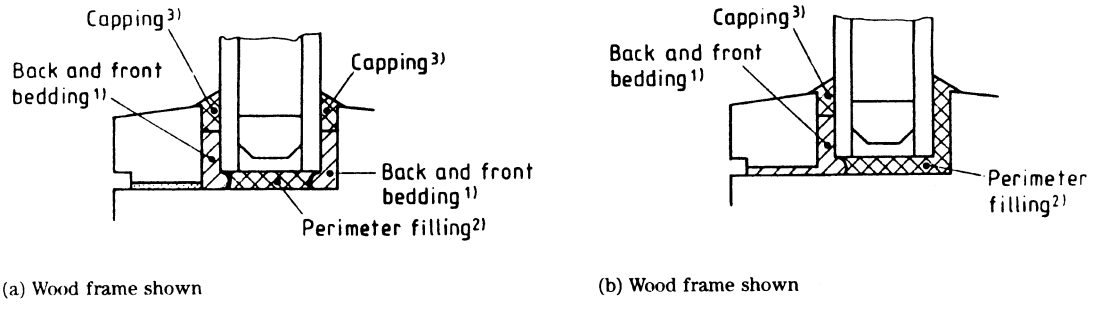
i) Fix the beads in position compressing the bedding, using sufficient fixings to ensure that the beads cannot move or distort. Where pins are used, place them not more than 50 mm from each corner and at not more than 150 mm spacings. Place screws not more than 75 mm from each corner and at not more than 200 mm spacings.

j) When the beads have been fixed, apply sealant cappings, filling the spaces between the unit and bead, and unit and rebate, above the tape or section.

k) Finish to a smooth chamfer to shed water. Tool the glazing lines to a smooth even surface.

COMMENTARY. *Where there is little risk of condensation or other water from inside, such as in continuously air conditioned buildings, the internal capping can be omitted, but in such instances the load bearing tape should be applied in line with the top edge of the rebate and should be tooled or trimmed on completion to give a smooth even sight line. The bottom glazing lines must be chamfered to shed water.*

As a further alternative to the above, an internal bedding of non-setting compound, and sealant capping on the external side only, may be used [see Figure 24b)].



(a) Wood frame shown

(b) Wood frame shown

1) Load bearing mastic tapes, closed cell self-adhesive sections or closed cell self-adhesive tapes.
2) Gun-grade sealant or non-setting compound.
3) One- or two-part silicone, polysulphide, polyurethane or acrylic sealant.

Figure 24 — Flush-edged insulating glass units using load bearing tapes and sealant capping

3.4.2.3 ***Using heel bead seal*** (see Figure 25)

a) Clean the rebate and bead.

b) Apply primer to the glazing surfaces of the bead and rebate as required, and allow to dry.

c) Clean the perimeter of the glass unit and prime as necessary.

d) Apply a narrow load bearing tape or section to the rebate, set in line with the top edge of the rebate, so that the other edge of the tape will be at least 3 mm from the outer edge of the unit.

e) Apply a triangular fillet of sealant around the perimeter of the rebate below the edge of the back bedding to form the sealant heel bead.

COMMENTARY. *In general this will be a 45° triangular fillet extending up to the rebate to the underside of the back bedding and a similar distance across the glazing platform.*

f) Insert setting blocks.

g) Insert the unit, centralizing it on the blocks. Push the unit back into the sealant, compressing the back bedding.

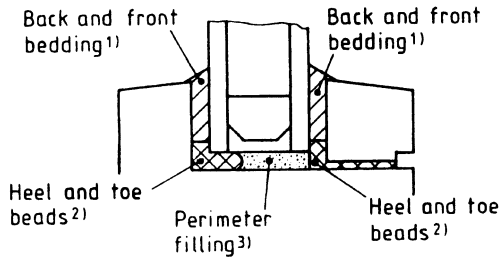
h) Fill the perimeter void around the unit with sealant or, in the case of very thick units, tamp in a closed cell polyethylene foam, compressing the heel bead of sealant back against the rebate upstand to fill completely the space beneath the back bedding.

i) Apply further sealant around the perimeter of the glass between the glass and glazing platform in the form of a triangular fillet.

j) Apply the front bedding to the glazing face of the bead, fixing it in line with the sight line and ensuring that it is set at least 3 mm above the edge of the unit. Bed the bead in position compressing the fillet of sealant between the bead and glass to fill the space between the bead and glass beneath the front bedding.

k) Fix the beads, ensuring that the front bedding is under compression to form a weather seal, using sufficient fixings to ensure that the bead cannot move or distort.

l) Trim the front and back bedding if necessary to give a smooth even sight line.



Wood frame shown

[1)] Load bearing or pre-shimmed tapes or self-adhesive cellular sections.
[2)] One-part curing sealant.
[3)] One-part curing sealant or polyethylene foam.

Figure 25 — Flush-edged insulating glass using heel head seal

3.5 Glazing techniques for stepped insulating glass units (see Figure 26)

a) Clean steel rebates. These normally do not need to be primed but, if they have been, check that the primer has hardened fully. Clean wood rebates and prime or seal with one or more coats, according to the frame conditions, and in accordance with the manufacturer's sitework instructions. Allow adequate drying time between application of coats, and between application of the final coat and glazing.

b) Apply sufficient putty of the appropriate type to the rebate to provide a back bed thickness of 1.5 mm after the unit has been pressed into the rebate.

c) Place setting blocks in position. Ensure that these are of sufficient thickness to provide a clearance at the head and sill between the larger glass and the glazing platform, and between the inset glass and the top of the rebate.

d) Clean the perimeter of the unit with a dry cloth. Insert the unit, ensuring that the inset glass is to the inside.

e) Centralize the unit in the frame, and check that the inset glass does not foul handles, brackets and similar fittings.

f) Insert location blocks as necessary.

g) Secure the unit by means of sprigs, clips or cleats as appropriate.

h) Apply further putty to form the fronting, finishing at an angle to the frame to shed water.

i) If internal beads are provided, rake out surplus back putty [see Figure 26a)], and fix the beads, bedding them to the inset glass with non-setting compound and sealing them to the frame with a thin smear of gun-grade sealant.

j) If it is not practical to fit internal beads, the space between the inset glass and the top of the rebate should be filled with the same type of putty or compound as used for the glazing, finishing to a chamfer at the sill to shed water [see Figure 26b) and Figure 26c)].

3.6 Glazing techniques for plastics glazing sheet

Follow the procedures given in **3.3.2.2**, **3.3.2.3**, **3.3.2.4**, **3.3.2.5** and **3.3.2.6** to inclusive (which exclude putty glazing), **3.3.4** and **3.3.5**, but with the following detail modifications.

a) Omit setting blocks unless required to centralize the pane. (See **3.1**.) Where possible, avoid the use of location blocks.

b) Where techniques involve the use of non-curing sealant compounds type 3, or curing sealant type 5 capping to front or back beddings, increase the width of the capping (and therefore width of the bedding under) as given in Table 2. Ensure that the minimum depth of the capping is 6 mm.

Table 2 — Sealant widths

Maximum sheet edge dimension mm	Sealant width mm
600	3
1 000	5
2 000	6
3 000	8

c) Check with the compound or sealant manufacturer's sitework instructions, the compatibility of sealant, compound, primer and cleaners in contact with plastics sheet material (see **2.2.2**).

d) Remove excess compound and sealant materials soon after application. Do not scratch with sharp tools.

e) Install with protective masking in place but bending back just sufficient masking at the edges to allow fixing.

3.7 Glazing techniques for laminated glass

3.7.1 Laminated safety glass to BS 6206:1981.

Follow the procedures described in **3.3.2.2**, **3.3.2.3**, **3.3.2.4**, **3.3.2.5** and **3.3.2.6**, **3.3.3.3**, **3.4.1.4**, **3.4.2.1**, **3.4.2.2** and **3.4.2.3**, subject to the following changes.

a) Where solid bedding is required, ensure that the medium is compatible with the interlayer (see **2.2.1**).

b) Ensure that drained systems are capable of carrying away moisture quickly from the edge of the laminated glass.

COMMENTARY. *Prolonged contact with water will cause swelling of the interlayer and a milky opaqueness will develop, ultimately leading to delamination of the glass.*

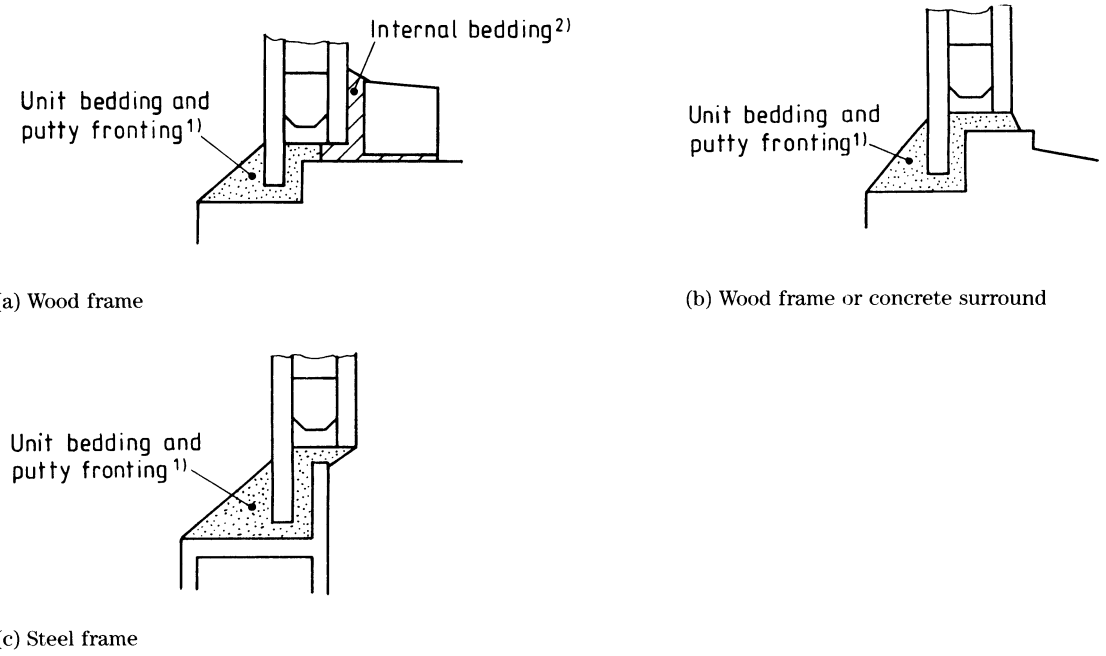
3.7.2 Laminated security glass to BS 5544:1978

Follow the procedures given in **3.7.1** for the glazing of laminated safety glass. For laminated security glazing to meet security criteria in service, however, use a system of glazing incorporating an adhesive medium to secure the glazing in the frame. Typically, use polysulphide or silicone sealants and procedures described in **3.3.2.6**, **3.4.1.3**, **3.4.1.4**, **3.4.2.2** and **3.4.2.3**.

3.7.3 Laminated bullet resistant glass for interior use to BS 5051-1:1988.

Follow the procedures described in **3.7.2** for the glazing of laminated security glass for fixing laminated bullet resistant glass.

COMMENTARY. *It should be noted that the framing for this glass will be substantial since it also has to be capable of performing to the same level of resistance. Together, the weight of the assemblies may be considerable and it follows that the grounds to which they are fixed should be capable of adequately supporting them.*



(a) Wood frame

(b) Wood frame or concrete surround

(c) Steel frame

1) Linseed oil putty for softwood frames to be painted; metal casement putty for hardwood frames to be painted, or for non-absorbent hardwood, or softwood frames treated with certain primers or preservatives which reduce absorption.
2) Non-setting compound.

NOTE The edge tape should not be damaged or displaced during handling or placing in position. The edge tape should not be cut back to exposed the edge seal.

Figure 26 — Stepped insulating glass units

blank

Section 4. Cleaning and protection

4.1 Cleaning

Carefully remove excess putties, compounds and/or sealants from glazing sheets and surrounds. Do not scratch the finished faces with tools or abrasive materials. If solvents are used for cleaning plastics sheets, first check the compatibility with the manufacturer's sitework instructions. Finally wash sheets with warm soapy water, rinse thoroughly and wipe dry with a clean soft cloth.

4.2 Protective masking

Leave in place for as long as practicable.

COMMENTARY. *Masking is normally provided to plastics sheet materials. Take note that exposure to heat and sunlight may harden the adhesive making stripping a problem. If possible, check with the manufacturer; otherwise the masking can be stripped early, reversed and taped to the surround, rather than the plastics sheet.*

4.3 Protection of putty

Seal putty with paint after it has firmed but not before 7 days after glazing and within the maximum time advised by the putty manufacturer. Cover the putty edge against the glass by painting at least 1 mm to 2 mm onto the glass.

Leave all opening lights in the closed position until the putty has set sufficiently to prevent displacement of glass.

4.4 Spillages of other materials

Remove accidental spillage from the surface of the glazing sheets whilst it is still wet or alternatively protect the glazing sheeting if spillages are likely to occur in subsequent work.

COMMENTARY. *The removal of spillages of wet materials (paint, mortar, etc.) after they have dried will be more difficult and likely to cause damage. In addition solvents will attack plastics, and alkali in cement will attack glass. Special care should be taken with the removal of spillages from plastics glazing sheet materials to avoid permanently damaging the surface. Advice should be sought from the manufacturer. Care should be taken about rainwater run off from concrete to glass over a prolonged period without cleaning the glass as the glass surface can be permanently etched.*

4.5 Indication of installed glazing

Spot ball whitening onto glazed panels to indicate that glazing has been installed. On no account use lime since it may damage the surface. Avoid using painted or adhesive markings since their removal may cause damage to the surface. Do not partly cover tinted glazing with applied markings since in sunlight there is a risk of thermal breakage through shading.

Index

List of references (see **1.2**)

Normative references

BSI standards publications

BRITISH STANDARDS INSTITUTION, London

BS 2571:1990, *Specification for general-purpose flexible PVC compounds for moulding and extrusion*.

BS 5051, *Bullet-resistant glazing*.

BS 5051-1:1988, *Specification for glazing for interior use*.

BS 5544:1978, *Specification for anti-bandit glazing (glazing resistant to manual attack)*.

BS 6100, *Glossary of building and civil engineering terms*.

BS 6100-1, *General and miscellaneous*.

BS 6100-1.3, *Parts of construction works*.

BS 6100-1.3.5:1988, *Doors, windows and openings*.

BS 6100-1.4, *Materials*.

BS 6100-1.4.1:1990, *Glazing*.

BS 6206:1981, *Specification for impact performance requirements for flat safety glass and safety plastics for use in buildings*.

Informative references

BSI standards publications

BRITISH STANDARDS INSTITUTION, London

BS 6262:1982, *Code of practice for glazing for buildings*.

BS 8000, *Workmanship on building sites*.

BS 8000-1:1989, *Code of practice for excavation and filling*.

BS 8000-2, *Code of practice for concrete work*.

BS 8000-2.1:1990, *Mixing and transporting concrete*.

BS 8000-2.2:1990, *Sitework with in situ and precast concrete*.

BS 8000-3:1989, *Code of practice for masonry*.

BS 8000-4:1989, *Code of practice for waterproofing*.

BS 8000-5:1990, *Code of practice for carpentry, joinery and general fixings*.

BS 8000-6:1990, *Code of practice for slating and tiling of roofs and claddings*.

BS 8000-8:1989, *Code of practice for plasterboard partitions and dry linings*.

BS 8000-9:1989, *Code of practice for cement/sand floor screeds and concrete floor toppings*.

BS 8000-10:1989, *Code of practice for plastering and rendering*.

BS 8000-11, *Code of practice for wall and floor tiling*.

BS 8000-11.1:1989, *Ceramic tiles, terrazzo tiles and mosaics*.

BS 8000-11.2:1990, *Natural stone tiles*.

BS 8000-12:1989, *Code of practice for decorative wallcoverings and painting*.

BS 8000-13:1989, *Code of practice for above ground drainage and sanitary appliances*.

BS 8000-14:1989, *Code of practice for below ground drainage*.

BS 8000-15:1990, *Code of practice for hot and cold water services (domestic scale)*.

Other references

[1] GLASS AND GLAZING FEDERATION. *Glass handling, storage, transport, Code of Practice*[1)].

[1)] Obtainable from the Glass and Glazing Federation, 44-48 Borough High Street, London SE1 1XB.

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