

Code of practice for

Design of joints and jointing in building construction

Committees responsible for this British Standard

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- British Adhesives and Sealants Association
- Department of the Environment (Building Research Establishment)
- Department of the Environment (Property Services Agency)
- Royal Institute of British Architects

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Foreword

This revision of BS 6093 has been prepared under the direction of Technical Committee B/212, Tolerances, drawing practice, modular coordination, joints, project information. BS 6093 gives guidance on the design of joints and jointing in order to improve performance in building practice and to reduce the incidence of technical failure. Sound building construction depends on proper joints being formed between building components.

As a code of practice, this British Standard takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

The general structure of BS 6093:1981, which is withdrawn, is retained in this updated version but the emphasis on jointing between precast concrete walling components has been reduced. Greater emphasis is now given to lightweight rain screens. The manner in which the basic principles of jointing are described remains unchanged.

In recent years, many developments in design, construction and materials have supplanted traditional practices. Many proprietary products now encompass the total element, for example curtain walling, compared with separate walling components such as masonry, windows and sealants. The design of jointing for these components is now an integral part of the design of the whole, and performance is dependent on test work and established standards. The basic mechanisms by which these joints perform are however the same as those described in this standard, such as profile and geometry.

Materials for components such as glass and metal are capable of precision manufacture and the range of dimensional tolerances is not as coarse as that needed for traditional materials, for example masonry and concrete.

The consequences of jointing failures are often such as to render buildings unserviceable and to necessitate extremely costly remedial repair works.

With the ever increasing importance now being attached to the performance of joints and to the need to specify clearly each type of joint and the standard of workmanship that should be achieved on site, a logical design process is of fundamental importance. This code therefore describes the design processes and mechanisms of a broad range of basic jointing methods in the belief that if the designers are guided along these lines they are better equipped to solve problems for their specific designs. Great emphasis is placed upon the need to design for each particular situation in which a joint has to function. The principal factors that the designer has to consider are listed in 4.5 and 4.6, which are based on ISO 3447. Guidance on the use of sealants for joints is given in BS 6213.

Considerably greater knowledge is needed about the performance of materials, building components and jointing solutions, and it is strongly recommended that designers test the joint designs if they have doubts about the design concepts, particularly where the consequences of failures would be costly. Testing, or at the least the interpretation of test results, needs to take particular account of the effects of accuracy and movements, which it may not be practical to simulate completely under test conditions.

In addition to this code, the following standards are relevant to joints and jointing: BS 5606, BS 6213, BS 6750, BS 6954 and BS 8000.

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 40, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This British Standard gives recommendations for the design of joints and the use of jointing products in building construction. Following an analysis of joint functions and of the performance of the parts to be joined, joints are classified in this standard on the basis of the movements and inaccuracies they have to accommodate. Mechanisms by which joints operate are identified and recommendations are made on the use of sealants and gaskets. Some emphasis is placed on weather resistance of joints in the external envelope of buildings.

The code does not present guidance in the form of a catalogue of proven joint designs, because the extent to which a design is appropriate to a particular use depends on circumstances specific to the building, e.g. its exposure, desired performance, durability and costs. The code therefore draws attention to matters that need consideration, in order that solutions may be developed that are appropriate.

The code does not cover:

- a) rigidly connected joints (except type 1 joints, see 4.6.4.1);
- b) joints within components normally made in a factory, such as those around opening lights in windows;
- c) the load-bearing functions of structural joints;
- d) glazing (see BS 6262);
- e) joints in service pipes and ducts and their connections to appliances;
- f) methods of test for joints or for jointing products.

NOTE All figures in this standard showing detailed joint designs illustrate principles in a recognizable context and are not production drawings of proven and universally applicable joints.

2 References

2.1 Normative references

This British Standard 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 page 40. Subsequent amendments to, or revisions of, any of these publications apply to BS 6093 only when incorporated in it by updating or revision.

2.2 Informative references

This British Standard 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 page 40, but reference should be made to the latest editions.

3 Definitions

For the purposes of this British Standard, the definitions given in BS 6100-1.3.6:1991, BS 6100-1.5.1:1984 and BS 6100-1.5.2:1987 apply, together with the following.

3.1 Joint design

3.1.1 induced deviation

dimensional deviation caused by work done

NOTE The operations of setting out, manufacture, assembly and erection give rise to this type of deviation.

3.1.2 inherent deviation

dimensional deviation caused by an inherent material property

NOTE Changes in temperature, humidity, stress etc. give rise to this type of deviation.

3.1.3 interchangeability

ability of a component to be used and jointed satisfactorily with a variety of other components

3.1.4 joint (1)¹⁾

construction formed by the adjacent parts of two or more products, components or assemblies when these are put together, fixed or united with or without the use of a jointing product

3.1.5 joint (2)¹⁾

position in the construction works where the joint (1) is situated

3.1.6 joint clearance²⁾

distance between the joint faces of adjacent building components, i.e. the joint gap widths considered in order to achieve fit

3.1.7 joint gap²⁾

space between adjacent components, with or without a jointing product

¹⁾ Definition repeated from BS 6100-1.3.6.

²⁾ Definition differs from that given in BS 6100.

3.1.8 joint geometry

disposition of all the parts that contribute to the functions of a joint

3.1.9 joint profile³⁾

form of that part of the cross section of a joint derived from each of its components

3.1.10 joint reference plane⁴⁾

theoretical reference plane from which the relative position of the joint profiles of adjacent building components and/or associated jointing products may be determined

3.1.11 movement accommodation factor (MAF) of a sealant

maximum movement which a sealant is capable of tolerating throughout its working life, expressed as a percentage of the minimum joint width

3.2 Materials for jointing

3.2.1 seal⁴⁾

physical barrier that is notionally impenetrable and is in contact with the components forming the joint

NOTE The term does not presuppose the use of any particular material or mechanism, but implies effectiveness in sealing against whatever agent is relevant, such as water, air, fire or sound.

3.2.2 sealant^{4) 5)}

material which, applied in an unformed state to a joint, seals it by adhering to appropriate surfaces within the joint

3.2.3 elastic sealant⁵⁾

sealant which after application exhibits predominantly elastic behaviour, i.e. remaining stresses induced in the sealant as a result of joint movement are almost proportional to the strain

3.2.4 plastic sealant⁵⁾

sealant which after application retains predominantly plastic properties, i.e. the remaining stresses induced in the sealant as a result of joint movement are rapidly relieved

3.2.5 elastoplastic sealant⁴⁾

sealant which after application has predominantly elastic properties but exhibits some plastic properties when stressed for other than short periods

3.2.6 plastoelastic sealant⁴⁾

sealant which after application has predominantly plastic properties with some elastic recovery when stressed for short periods

3.2.7 back-up material^{4) 5)}

material inserted in a joint that limits the depth of sealant applied and defines the back profile of the sealant

NOTE See also 3.2.12.

3.2.8 bond breaker⁴⁾

film or thin strip material applied to the back of a joint to prevent sealant adhesion

3.2.9 sealing strip⁴⁾

preformed material that constitutes a seal when compressed between appropriate joint surfaces, and that may have adhesive properties

3.2.10 gasket⁴⁾

flexible, generally elastic, preformed material that constitutes a seal when compressed

3.2.11 baffle⁴⁾

strip of flexible material inserted into a multi-stage joint to prevent the passage of rain

3.2.12 joint filler⁴⁾

compressible non-adhesive material used to fill movement joints during their construction

NOTE It may act as a back-up material. See also 3.2.7.

4 Design of joints

4.1 General

Since joints are breaks in the physical continuity of construction, they are potential breaks in the continuity of performance. It is therefore important that an entire assembly, including the joints, should achieve the desired performance.

³⁾ Definition repeated from BS 6100-1.5.2.

⁴⁾ Definition differs from that given in BS 6100.

⁵⁾ Definition identical to that given in BS EN 26927.

4.2 The need for joints

Decisions should first be made with regard to the need for and the types of joints to be used.

From physical attributes inherent in materials and methods of work the need for site joints arises at or on account of:

- a) junctions of different elements or components and junctions comprising different materials;
- b) change of conditions necessitating separation by a barrier;
- c) limitations imposed by methods of working, for example the formation of day-work joints in in situ concrete construction;
- d) limitations of size and/or weight of components imposed by their manufacture, handling, storage, transport and assembly;
- e) limitations imposed in service by inherent properties of materials.

4.3 Location and frequency of joints

Once the need for joints is established, their location and frequency are determined from design decisions and are influenced by:

- a) general planning decisions about storey height, relationships between solids and voids (for example walls and windows), room sizes, floor spans, etc.;
- b) values chosen from the range of coordinating sizes;
- c) the location of joints to take account of areas of high stress of components and elements in service;
- d) the avoidance of complex joint intersections;
- e) the facilitating of fit, for example:
 - 1) by increasing the number of joints;
 - 2) by avoiding components having to be fitted within preformed openings;
 - 3) by preforming internal and external corners;
- f) the minimizing of the extent of jointing for reasons of, for example, hygiene, cost or performance;
- g) the obtaining of a particular appearance of scale, proportion, pattern, symmetry or other attributes such as false joints.

4.4 Procedure for the design of a joint

(see also Annex B)

The procedure for the design of a joint should be as follows.

- a) Examine the types and positions of all the joints in the building.
- b) Examine each joint at a large scale: full size or half full size.

- c) Establish the joint reference plane for each joint and relate it to a building reference plane.
- d) Check the joint functions (see 4.5), and whether provision should be made for dimensional deviations (see 4.6).
- e) Modify the design of the joint to meet all the requirements at the positions where it occurs.

4.5 Joint functions

NOTE The recommendations in this clause are similar to those given in ISO 3447.

4.5.1 Environmental factors

When the general needs for joints have been considered, environmental factors should be quantified.

The data for joints are the same as those needed for the components. Some values emerge from user requirements. Other values derive from the natural environment.

Designers should also consider the immediate environment that could exist during construction. This may be more severe than the service conditions referred to previously.

Joints may need to obstruct the passage of any or all of the following:

- a) insects and vermin;
- b) plants, leaves, roots, seeds and pollen;
- c) dust and inorganic particles;
- d) heat, light, sound, radiation;
- e) air, gases and odours;
- f) water, snow, ice and water vapour.

Joints may need to avoid the generation of sound and odours.

4.5.2 Capacity to withstand stress

Joints may need to withstand stress (either during or after assembly) in one or more directions due to compression, tension, bending, shear, torsion, vibrations or any other type of stress that may induce fatigue, impact, abrasion, shrinkage, creep, and expansion or contraction due to temperature variations.

4.5.3 Safety (see also 8.5)

The functions of joints in the context of safety are:

- a) to obstruct the passage of fire, smoke, gases, radiation and radioactive materials;
- b) to resist sudden positive or negative pressures due to explosion or atmospheric factors;
- c) to avoid the generation of toxic gases and fumes in case of fire;
- d) to avoid harbouring or proliferation of dangerous micro-organisms.

4.5.4 Fixing of components

The functions of joints in the context of the fixing of components are to support joined components in one or more directions, to resist differential deformation of joined components, and to permit operation of movable components.

4.5.5 Appearance

Joints should have an acceptable appearance.

The effects of weathering of the appearance (colour) of the jointing material itself should be borne in mind during its selection.

Joints should also avoid:

- a) promotion of mould and plant growth;
- b) discoloration due to UV radiation and biological, physical or chemical action;
- c) all or part of the internal structure showing;
- d) dust collection.

4.5.6 Durability

If a joint is likely to be less durable than the components joined, then the consequences and ease of repair should be considered. In considering durability and the minimum life of a joint, designers should aim to reduce its exposure, minimize damage to the fabric and, should the joint fail, provide access for repair or replacement, and establish the expected frequency of replacement (see also 8.6).

Joints may be required to resist abrasive action and damage or unauthorized dismantling. They may also be required to resist the action of animals and insects, plants and micro-organisms, water and water vapour and aqueous solutions or suspensions, polluted air, light and radiation, freezing of water, extremes of temperatures, airborne or structure borne vibrations, shock waves and high intensity sound, and acids, alkalis, oils, fats and solvents.

4.5.7 Maintenance (see also 8.6)

The design of joints should allow for inspection, partial or complete dismantling and reassembly, and the replacement of decayed jointing products, during maintenance.

4.5.8 Ambient conditions

Joints should be able to perform the required functions over a specified range of temperature, atmospheric humidity, air or liquid pressure differential joint clearance variation, and driving rain volume.

4.5.9 Functions that apply to a specific position

A joint in a specific position may have particular requirements that need to be identified and specified accordingly.

4.6 Variation in the sizes of joints

4.6.1 General

The accommodation of movement after assembly (inherent deviations) and the variability in size and position of jointed parts (induced deviations) have to be finally resolved at joints.

Data about inherent and induced deviations in components and spaces are needed to determine the effects of these deviations on joint dimensions and to aid selection of appropriate joint mechanism and materials.

The data needed are as follows:

- a) the predicted variability in the size and position of elements and spaces normally achievable in construction given in BS 5606:1990 (or, when not given therein, the normally achievable deviations estimated by the building designer);
- b) the predicted changes in sizes of components and spaces in services due to thermal, moisture, creep and load deformation;
- c) the number of joints in the assembly involved/required to accommodate the deviations predicted in a) and b).

NOTE Guidance on calculations to predict target size, clearances and fit are given in BS 5606 and BS 6954-3.

When building components are located in relation to a continuous reference system such as a modular grid so that the structure is subjected to overall dimensional control, deviations of size, shape and position have to be absorbed within the jointing system.

The consideration of tolerances for the manufacture of components and for the construction of buildings is therefore inseparable from the design of joints to provide the required dimensional flexibility (see ISO 2445:1972). This does not mean that all joints should necessarily have this capability, but it is necessary for deviations to be accommodated at some point; this may be achieved at the joints between individual components, or by the provision of special joints at intervals.

4.6.2 Inherent deviations

4.6.2.1 Reversible inherent deviations

Reversible inherent deviations are due to cyclic environmental factors such as thermal and moisture variations and vibration. These factors can induce the movement described in 7.2.2.

The greatest range of temperature is usually experienced on the external face of buildings and especially on south facing elevations, but resulting dimensional changes may tend to be balanced by opposite movements due to changes in moisture content. Internally, both thermal and moisture movements may be less significant depending on the environment within the building.

Whereas the annual air temperature range in the United Kingdom is about 35 K (– 5 °C to 30 °C), the actual temperature range to which materials are subjected due to radiant heat is greater and depends on the orientation of, and the incidence of radiation on, the surface, as well as on the colour and degree of protection (insulation or shading). Surface temperatures can in extreme circumstances be as high as 80 °C and as low as – 20 °C.

Thermal movement per unit length may be influenced by:

- a) temperature range;
- b) degree of exposure;
- c) response of materials to thermal change;
- d) colour of surfaces;
- e) restraint of movement.

NOTE Information concerning the calculation of thermal movement per unit length is given in BRE Digests 227, 228 and 229 [1].

The capability of joints to accommodate movement determines the maximum interval between them, taking account of the way in which fixings may permit or distribute movement.

While it may be sufficient for a designer to make allowance for movement for in-service conditions on the basis of thermal movement only (see Annex A for list of coefficients), the validity of this assumption should always be confirmed. Examples of exceptions are sandstone and timber (across grain), where movement due to moisture may exceed that due to thermal change (see Annex A). Movement due to moisture along the grain of timber is not significant.

Some materials respond to changes in moisture content following changes in weather conditions, and appropriate allowance has to be made taking into account the environment at the time of construction. Examples of such materials are concrete blockwork and timber.

Care should be taken about the moisture content of absorbent materials in storage and during the course of construction, in order to minimize subsequent movement.

In such environments as are found in swimming pools and certain industrial processes where high humidity occurs, the behaviour of moisture-sensitive materials should be given special consideration.

4.6.2.2 Irreversible inherent deviations

Irreversible inherent deviations are due to non-cyclic factors. They occur over predictable short or long term periods depending on the nature of the material.

In addition to reversible movement, concrete is subject to irreversible drying shrinkage and thermal contraction.

Plastic shrinkage may occur during the first few hours after placing through the loss of water from the plastic concrete by evaporation or, sometimes, by absorption into adjacent materials. Plastic shrinkage is common in hot weather and in drying winds and can result in cracking. It can largely be avoided by slowing down the drying of the concrete.

Early thermal contraction can be significant in concrete over about 0.5 m thickness. It is due to the natural cooling that takes place when the heat of hydration passes its peak. The temperature rise can typically be about 20 K, 2 days after placing. The designer should be aware of the effect of early thermal contraction and, where appropriate, should provide joints or planes of weakness to confine cracking to predetermined positions.

Drying shrinkage is a long term process and may continue over many months. Any movement is influenced by the size of section, the concrete mix, the amount of reinforcement and the environment. Allowance should be made for the effects of drying shrinkage when detailing concrete blockwork.

Calcium silicate bricks need to be protected against excessive moisture up to and during construction. Provision should be made for the free circulation of air within the stack so that the bricks may dry out before they are built in.

Fired clay units exhibit reversible movements due to changes in moisture content. These are usually small but there is a permanent moisture expansion, the rate of which decreases with time and is dependent upon the type of clay and firing process.

For various masonry materials, information on moisture movement and thermal properties is given in BS 5628-3 together with guidance on the determination of spacing and design width of movement joints.

The effect of creep may need to be taken into account in joint sizes. Continuous loading of concrete structural frames will cause beams and slabs to continue to deflect beyond their initial elastic deflection and columns and concrete walls to shorten over a long period of time. After the first year, movements due to creep are very small but recognition should be given and allowance made in the joints between the frame and components fitted to it.

4.6.3 Induced deviations

An individual component normally deviates both from its intended size and from its intended position in the building. Both kinds of deviation occur three-dimensionally. When two components are placed with a joint clearance between them, these deviations affect the size and shape of the joint three-dimensionally. Designers have to design for the generality of such deviations, but a particular assembly when constructed contains deviations with particular values. If systematic account is taken of deviations, the majority of joints can be expected to lie within the desired joint clearance limits.

If the size of a joint is likely to exceed the specified limits, consideration should first be given to the possibility of adjusting the position of the components in the assembly so as to distribute excess deviation among the joints in the assembly and optimize the joint clearances. Particular types of deviation in joint size may still need special action, for example, the tapering of joint clearances, bow and twist of components and inaccuracy in component alignment.

When it is not practical to rectify joints that have sizes outside the specified limits, an alternative joint design should be adopted.

4.6.4 Provision for dimensional deviations

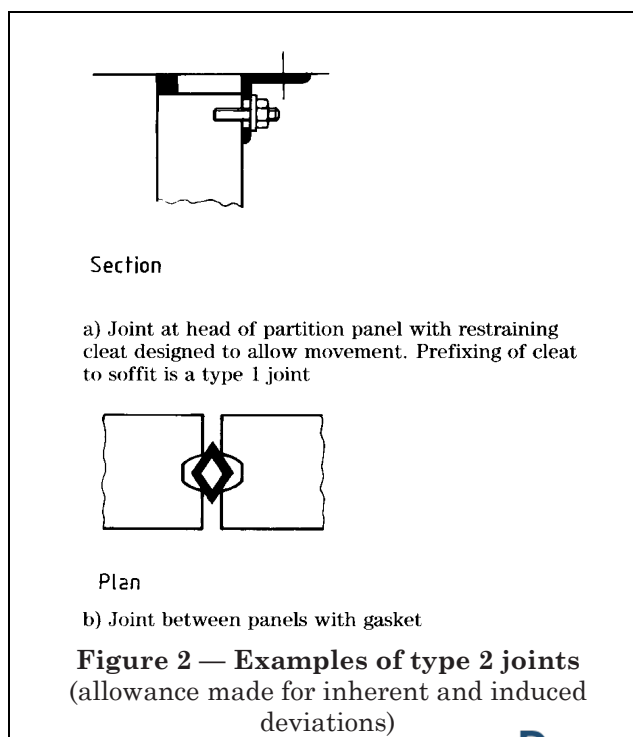
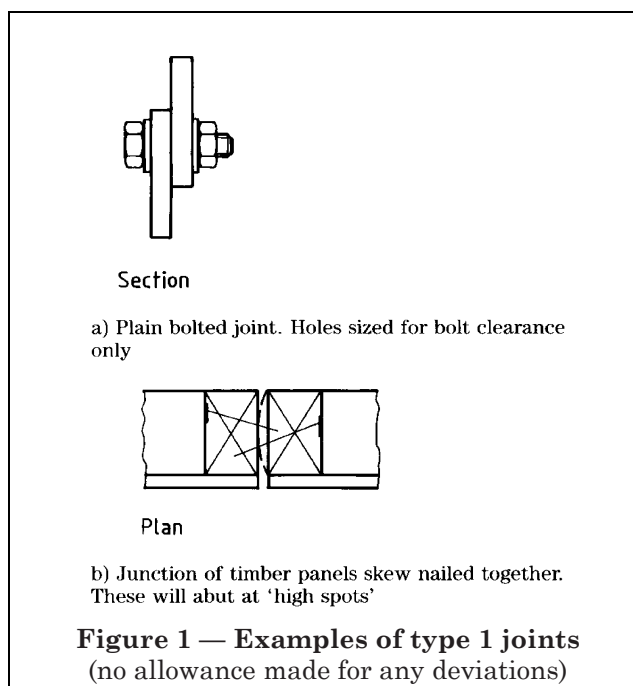
4.6.4.1 General

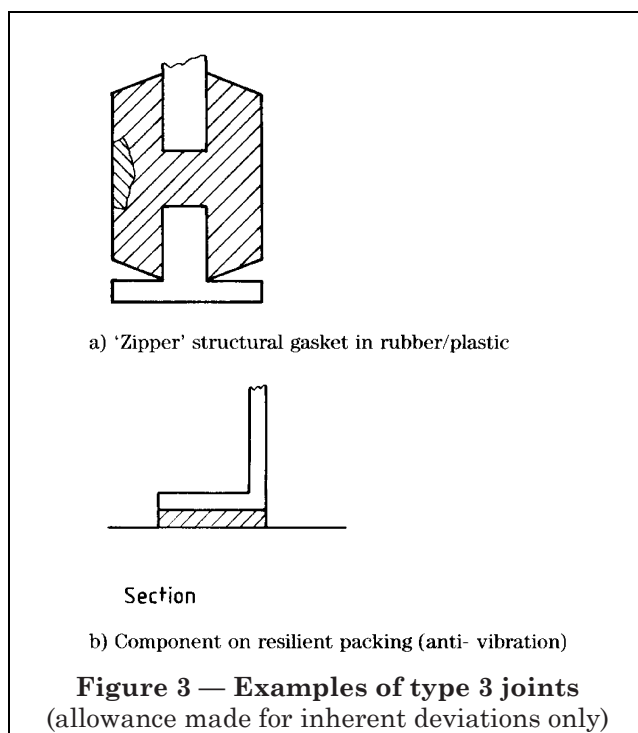
The initial generation of solutions may be based upon four assumptions that can be made about the distribution of induced and inherent deviations (see clause 3). These are as follows.

- a) *Type 1 joint.* No allowance made for any deviations.
- b) *Type 2 joint.* Allowance made for inherent and induced deviations.
- c) *Type 3 joint.* Allowance made for inherent deviations only.
- d) *Type 4 joint.* Allowance made for induced deviations only.

Examples of joints for which each assumption is usually made are given in Figure 1 to Figure 4. Having made a provisional assumption about the design of the joint, the designer should then consider:

- 1) the significance and values of dimensional deviations to be accommodated;
- 2) the consequences of this assumption for joints elsewhere in that assembly.





4.6.4.2 Interaction of the four joint types

An assembly usually contains more than one of the four joint types. The designer should assess the distribution of induced and inherent deviations throughout the assembly in order to choose the appropriate combination of joint types.

Figure 5 illustrates the interrelationship and effects of an assembly of two panels of walling erected in an existing opening.

Fixings may modify the distribution of inherent deviations in the assembly and this needs separate consideration, for example, central fixings cause inherent deviations to be shared between the end joints: fixings at one end concentrate all inherent deviations at the other end.

4.7 Dimensioning joints on drawings

It is not unusual for joint clearances to be shown on drawings as finite dimensions. This is a matter of convenience which enables component sizes and joint clearances to be added up to give a correct overall size. However, joint clearances shown in this way can lead to the expectation that they are of fixed size when, in reality, they are of variable size and have to be so in order to fulfil their function of accommodating dimensional deviations.

Joint clearances should be considered to be “critical dimensions” and treated as required by clause 20 of BS 1192-1:1984, thus they should be shown on drawings as a target size with permitted deviations. This is illustrated in Figure B.1 as “ 8 ± 2 mm”. If this is felt to be unduly laborious the permitted deviations can be shown in the drawing notes.

Indicating joint clearances in this way makes readily available the criteria for checking compliance on site and confirming that the joint can be expected to be able to accommodate future dimensional deviations in the way intended by the designer.

5 Materials for jointing

5.1 General

A classification of sealants, sealing strips, gaskets and baffles is given in Table 1. Table 2 gives a list and properties of various joint fillers.

Guidance on the selection, applications and use of sealants is given in BS 6213. More information is available on sealants than on gaskets which are normally purpose-made (for which only general guidance can be given). In all cases, the details of the properties and performance of seals should be obtained from the manufacturers.

There are at least two critical features of seal performance that have to be considered, firstly the interfaces between the seal and the components to be joined and secondly the nature of the sealing material itself.

5.2 Sealants

5.2.1 General

Sealants are classified as elastic, elastoplastic, plastoelastic or plastic according to their response to movement (Table 1).

5.2.2 Movement accommodation factor (MAF)

The MAF indicates the full range of movement between maximum compression and maximum extension that the sealant can accommodate. It is expressed as a percentage of the minimum design joint gap width in this code.

NOTE 1 MAF is sometimes expressed as a percentage about the mean joint gap width: this mode of expression is deprecated.

Low, medium and high movement accommodation factors correspond approximately to values of 5 %, 15 % and 25 %.

NOTE 2 The MAF of some sealants reaches 50 %.

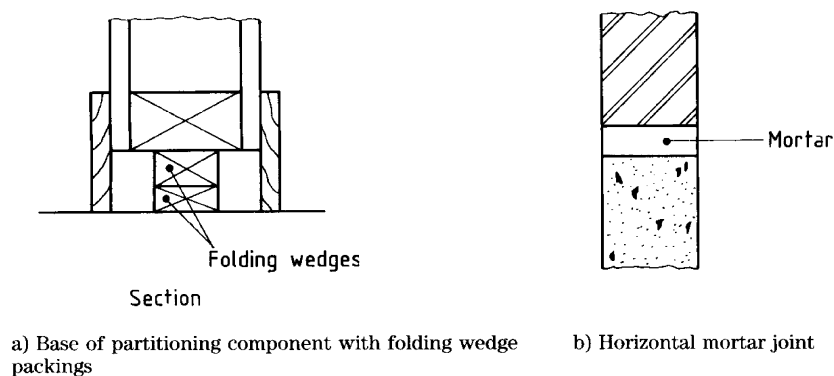
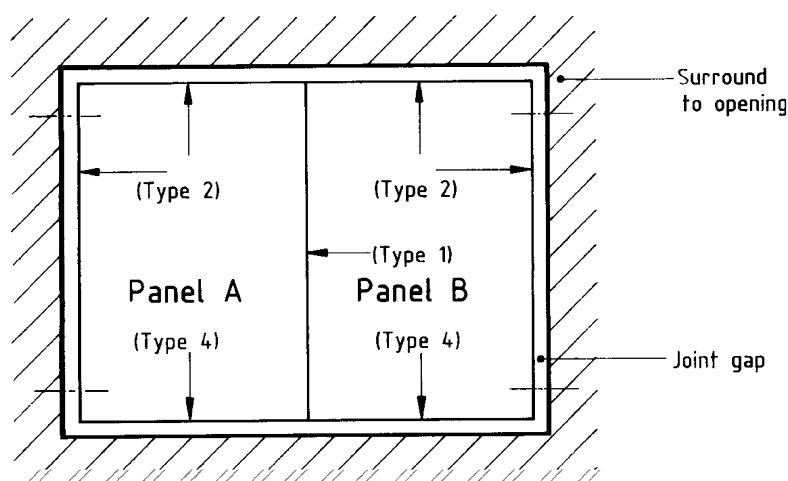


Figure 4 — Examples of type 4 joints
(allowance made for induced deviation only)



NOTE 1 *Joint at base: assumed type 4.* Panels are supported at the base. Induced deviations are taken into account to ensure verticality of jamb joints and to distribute the total vertical clearance between head and base joints. Inherent deviations are assumed not to occur. (A supporting joint without adjustability would be type 1.)

NOTE 2 *Joint at head: assumed type 2.* Allowance for induced deviation is shared with the joint at the base. Allowance is made for inherent deviation due to change in panel size (thermal and moisture movement) and change in size of the opening (thermal movement, deflection and creep).

NOTE 3 *Joint at jambs: assumed type 2.* Inherent and induced deviations are shared by these joints but not with the centre joint (type 1).

NOTE 4 *Joint at centre: assumed type 1.* This joint is butted and fixed on assembly and is subject to neither inherent nor induced deviations.

Figure 5 — Elevation showing assembly of panels and joint types in an opening

Table 1 — Classification of sealants, sealing strips, gaskets and baffles

Seal type	Chemical types	Physical type	Movement accommodation (See 5.2.2)	Life expectancy (years) see note
Hot poured sealants	Bitumen Bitumen/rubber Pitch/polymer	Plastic Plastoelastic Elastoplastic	Low Medium Medium	Up to 10 Up to 10 Up to 10
Cold poured, chemically-curing sealants	Polysulfide Polyurethane Epoxy	Elastoplastic Elastic Elastoplastic	Medium-high Medium-high Low-Medium	Up to 20 Up to 20 Up to 20
Gun-applied, non-curing sealants	Oil Butyl Acrylic	Plastic Plastic Plastoelastic	Low Low Low-medium	Up to 10 Up to 10 (not exposed) Up to 15
Gun-applied, one-part, chemically-curing sealants	Polysulfide Polyurethane Silicone	Elastoplastic Elastic Elastic	Medium-high Medium-high Medium-high	Up to 25 Up to 20 Up to 25
Gun-applied, two-part, chemically-curing sealants	Polysulfide Polyurethane Silicone	Elastoplastic Elastic Elastic	Medium-high Medium-high Low-high	Up to 25 Up to 20 Up to 25
Hot-applied, non-sag sealants	Bitumen Bitumen/rubber	Plastic Plastoelastic	Low Medium	Up to 10 Up to 10
Sealing strip (mastic)	Oil Butyl Bitumen/rubber Polyisobutylene/butyl	Plastic Plastic Elastoplastic Elastoplastic	} Low	Up to 15 Up to 15 Up to 15 Up to 15
Sealing strip (cellular)	PVC Polyethylene Polyurethane Butyl Neoprene EVA	Range in properties from plastic to elastic		Up to 20
Gaskets	Neoprene Natural rubber EPDM Butyl rubber Polyurethane Silicone EVA Cork	Elastic	Low to high	Up to 20
Baffles	Neoprene PVC Polyethylene Aluminium Stainless steel Zinc Copper	Profiles loosely fitted with adjoining components	Low to high	Up to 40

NOTE The actual service life of a sealant is dependent not only on composition but also on environmental conditions and quality of application.