INTERNATIONAL STANDARD

ISO 7976-2

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Tolerances for building — Methods of measurement of buildings and building products —

Part 2 : Position of measuring points

Tolérances pour le bâtiment — Méthodes de mesure des bâtiments et des produits pour le bâtiment —
Partie 2 : Positions des points de mesure

Reference number
ISO 7976-2 : 1989 (E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 7976-2 was prepared by Technical Committee ISO/TC 59, *Building construction.*

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

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Tolerances for building — Methods of measurement of buildings and building products —

Part 2 : Position of measuring points

1 Scope and field of application

This part of ISO 7976 gives guidance on the position of measuring points to be used in the measurements of buildings and building products. The positions given apply for check and compliance measurement, and when collecting accuracy data.

It is divided into two sections. Section one deals with the position of measuring points for those measurements which can be carried out both in factories and on building sites, and section two with the position of measuring points for the measurements which can be carried out on building sites only.

Building products consisting of glass wool and similar soft materials are not the subject of this International Standard.

To facilitate cross-referencing, the same numbering is used in both parts of this International Standard.

2 References

ISO 4463, *Measurement methods for building — Setting out and measurement — Permissible measuring deviations.*

ISO 7976-1, *Tolerances for building — Methods of measurement of buildings and building products — Part 1 : Methods and instruments.*

3 General

Suitable positions for measuring points are given for both compliance measurement and the collection of accuracy data; measurements should be carried out from, towards, or between these points.

The points at which measurements are taken should be those specified in the inspection schedule or similar document. If not, they shall be taken at 100 mm from corners or edges (see figure 1) : the examples below illustrate some general cases. If this is not possible, the position of the measuring points should be noted in the field book.

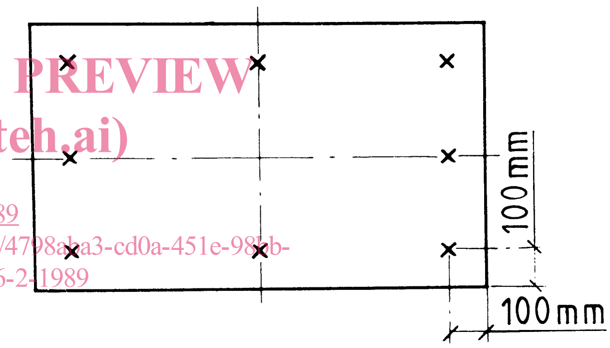


Figure 1

The number of measuring points shown in the clauses below is considered to be the minimum number required; additional measurements may therefore be taken to reflect any additional dimensional accuracy requirements.

The items to be measured should be supported as they will be supported in use. When this is impractical, the support conditions should be as agreed in the inspection schedule or similar document.

Whenever possible it is recommended that components be measured in the state in which they are ready for delivery.

Unless specifically required, the measurements should not be made whilst the manufactured component is still in the manufacturing jig or mould.

On sites, construction deviations (dealt with in section two) can be determined in relation to the co-ordinate system of the site, in relation to a reference system in plan or height in the assembly, in relation to the vertical line or in relation to other components.

Section one : Position of measuring points for those measurements which can be carried out both in factories and on building sites

NOTE — Most of the examples concerning components can also be applied to parts executed on site.

4 Sizes of components

4.1 Length and width

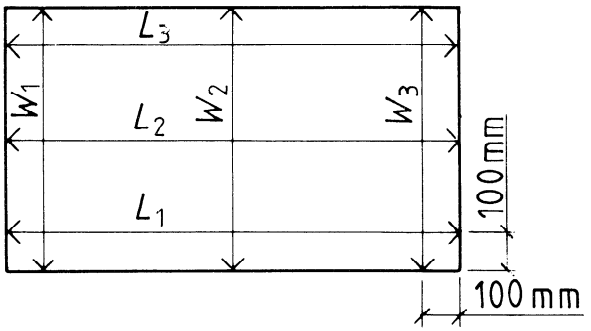


Figure 2

On each face of the manufactured component, three length measurements (L_1 to L_3) and three width measurements (W_1 to W_3) shall be taken as shown in figure 2. If the specified width does not exceed 1,20 m, measurement L_2 may be omitted. If the specified length does not exceed 1,20 m, measurement W_2 may be omitted.

4.1.1 Effective span

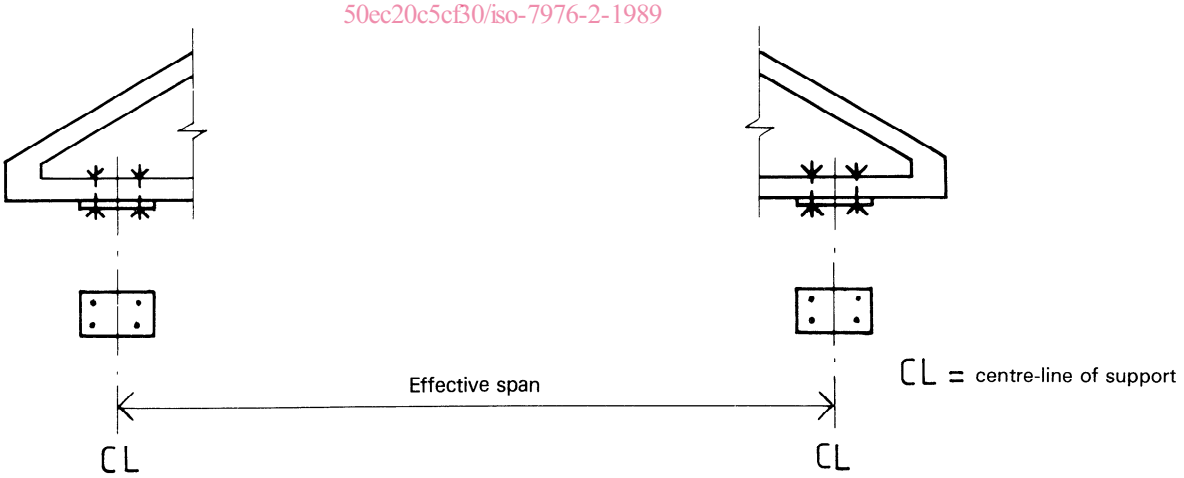


Figure 3

One measurement shall be made of the effective span on each manufactured component. For components which have base plate fixings, the two measuring points shall be as shown in figure 3.

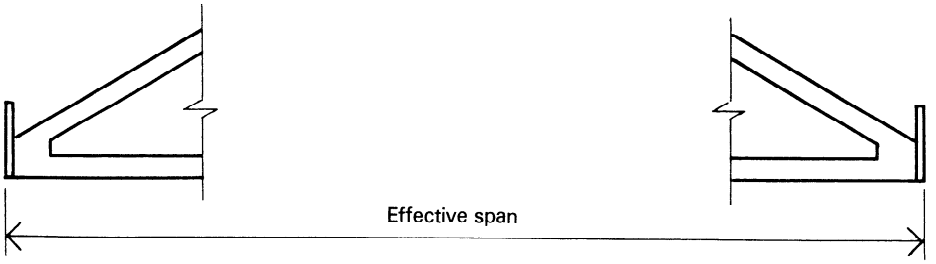


Figure 4

For components which have end or wall plate fixings, the two measuring points shall be as shown in figure 4.

For components which are manufactured in sections, the measurement shall be made only after the sections have been firmly bolted together.

4.2 Thickness or depth

Eight thickness or depth measurements shall be made on each manufactured component.

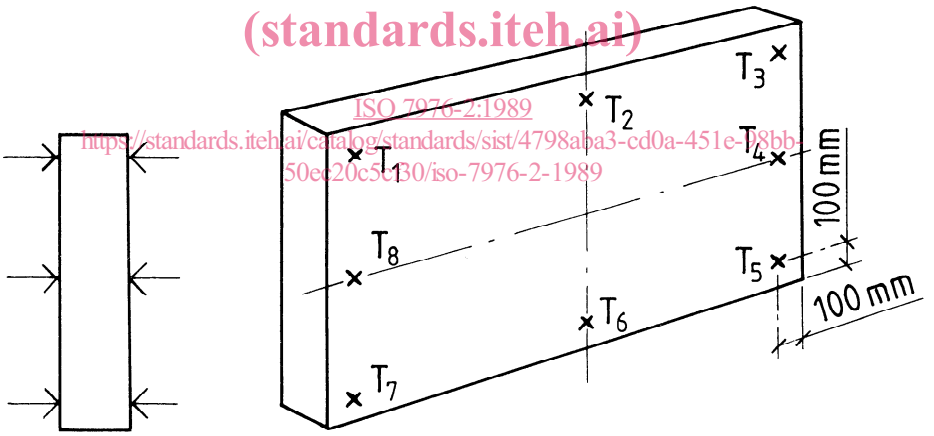


Figure 5

For components having a rectangular cross-section, the measuring points shall be as shown in figure 5.

Where the specified width does not exceed 1,20 m, measurements at points T_4 and T_8 may be omitted. Where the specified length does not exceed 1,20 m, measurements at points T_2 and T_6 may be omitted.

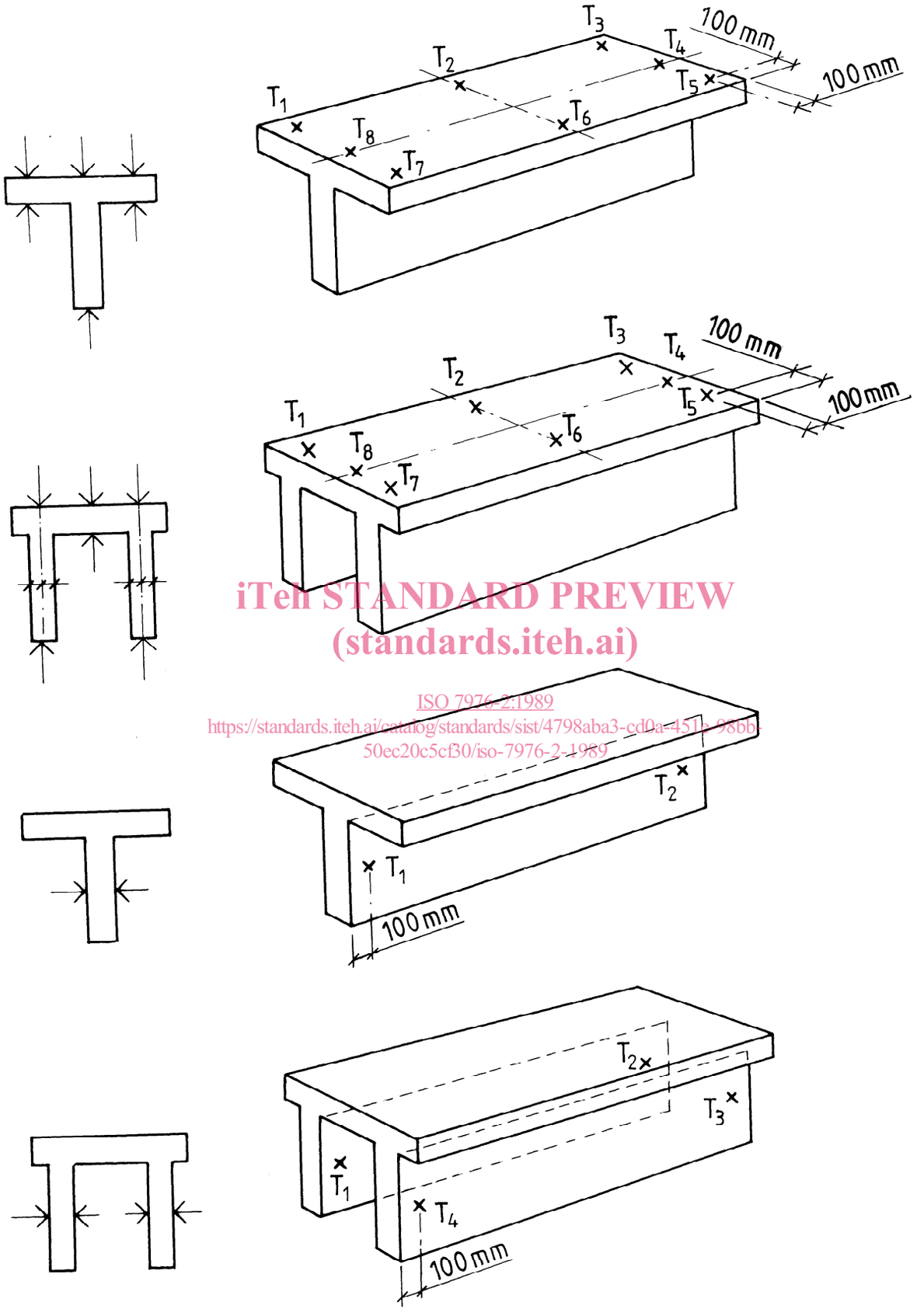


Figure 6

The position of measuring points for thickness measurement of components which have a non-rectangular cross-section such as beams provided with ribs shall be as shown in figure 6.

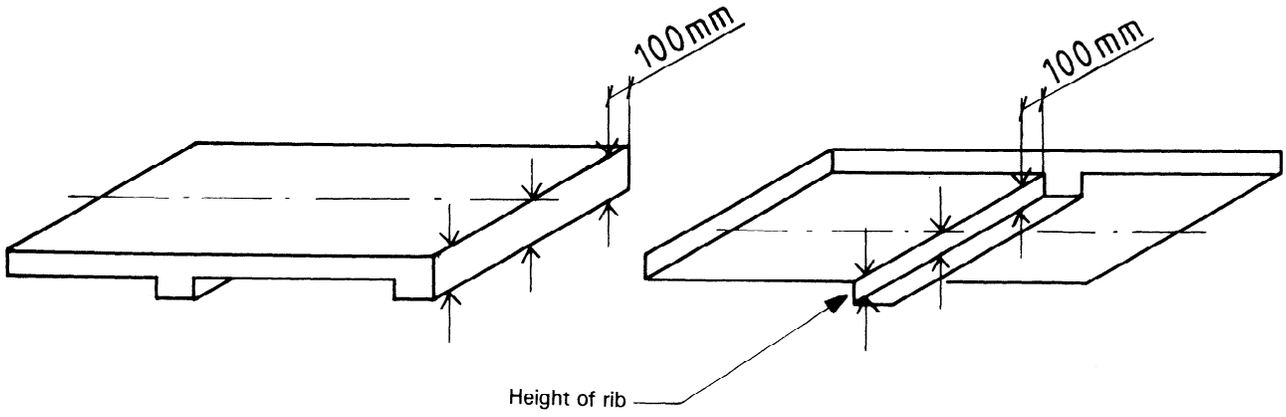


Figure 7

The position of measuring points for thickness measurements for *in situ* concrete beams shall be as shown in figure 7.

4.2.1 Thickness of brick or block walls or *in situ* concrete walls

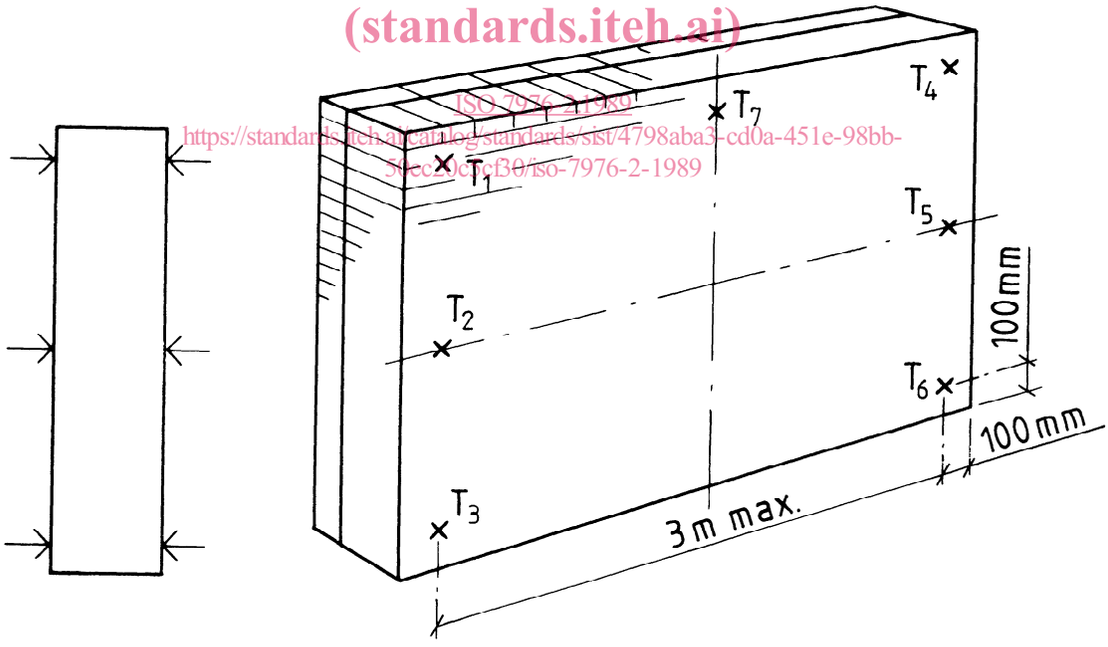


Figure 8

The position of measuring points for thickness measurement of walls shorter than 3 m is shown in figure 8.

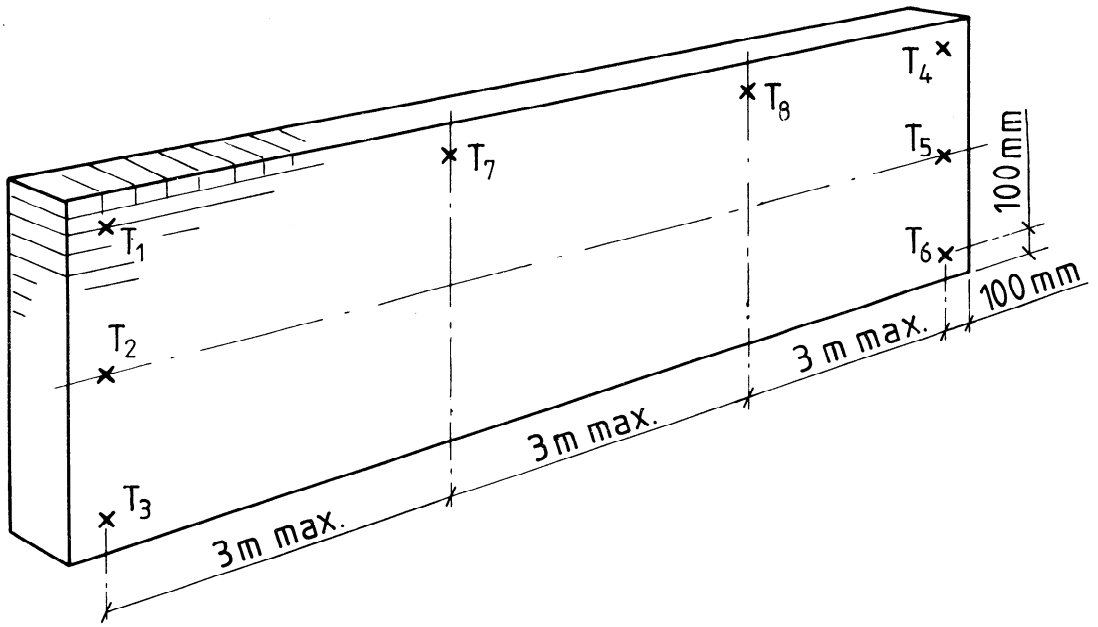


Figure 9

Figure 9 shows the position of measuring points for thickness measurement of walls longer than 3 m. The intermediate measuring points at the top should be equally spaced (at not more than 3 m intervals) between the measuring points of the ends of the wall.

4.2.2 Dimensional measurement of components with non-rectangular cross-section

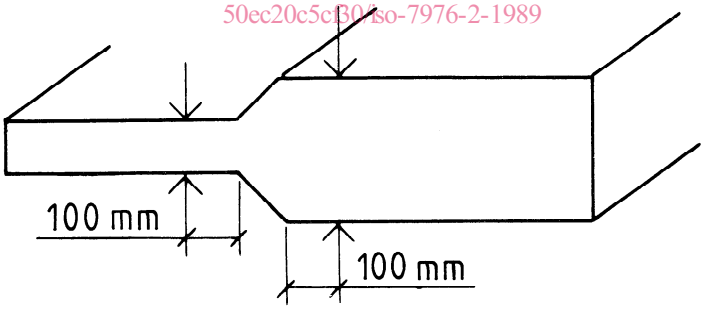


Figure 10

When manufactured components or *in situ* constructions have a designed cross-section which varies over a defined dimension, two additional measurements shall be made as shown in figure 10.

5 Squareness of components

5.1 Angular deviation

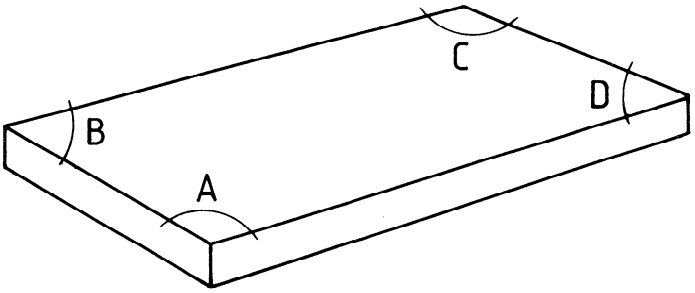
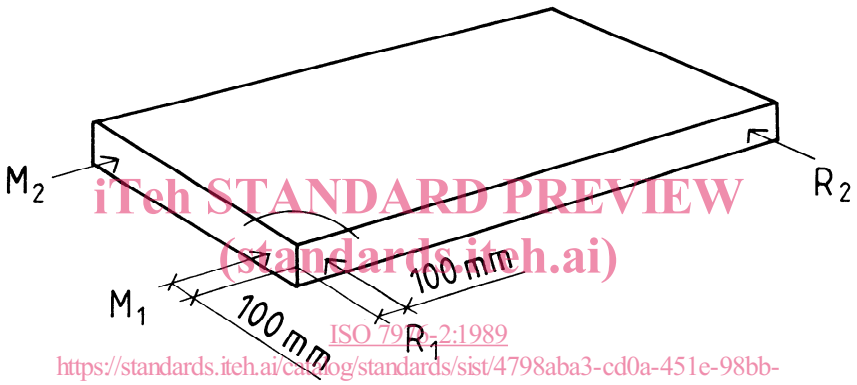


Figure 11

Angular deviation is in most cases determined at all four corners of the component as indicated in figure 11.



R = reference point
M = measuring point

Figure 12

To measure the angle deviation, two reference points R_1, R_2 constituting a reference line and two measuring points M_1, M_2 are necessary. (See figure 12.)

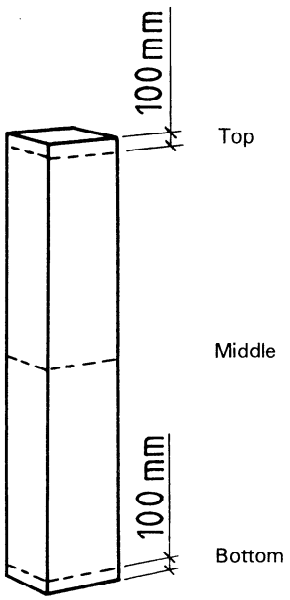


Figure 13

Storey height columns should be measured at the top, middle and bottom as indicated in figure 13.