# इंटरनेट मानक

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IS 6408-1 (1990): Recommendations for Modular Co-ordination in Building Industry : Tolerances, Part 1: Glossary of Terms [CED 51: Planning, Housing and pre-fabricated construction]

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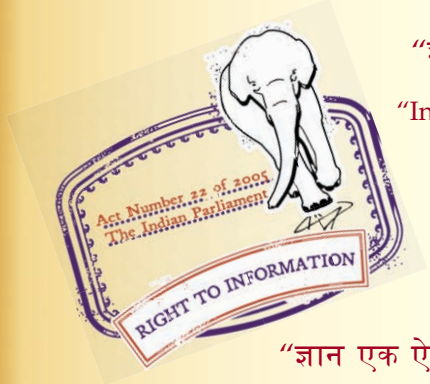



"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

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IS 6408 ( Part 1 ) : 1990
( Reaffirmed 2005 )

भारतीय मानक

# भवन निर्माण उद्योग में माड्यूली समन्वय हेतु सिफारिशें

## भाग 1 पारिभाषिक शब्दावली

## ( पहला पुनरीक्षण )

*Indian Standard*

# RECOMMENDATIONS FOR MODULAR CO-ORDINATION IN BUILDING INDUSTRY : TOLERANCES

## PART 1 GLOSSARY OF TERMS

## *( First Revision )*

UDC 621·753·1 : 721·013 [ 389·63 ]



BUREAU OF INDIAN STANDARDS
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*December* 1990

Price Group 3

## FOREWORD

This Indian Standard ( Part 1 ) ( First Revision ) was adopted by the Bureau of Indian Standards on 25 April 1990 after the draft finalized by the Planning Bye-Laws and Dimensional Co-ordination Sectional Committee had been approved by the Civil Engineering Division Council.

One of the aims of modular co-ordination is to provide compatibility and inter-changeability of components. In earlier days a practical system of tolerance was derived as clearance fit, prescribing minus tolerance on each component without any allowance to the space in which it is to be placed. The extensive use of prefabricated elements and components in building construction have provoked the concept of tolerances in recent years. The concept of tolerance is indeed a tool to be used for dimensional control of the component which can fit without any problem for size, squareness, bow, plumbness, posit on and appearance. In order to ensure clarity and unambiguous expression in tolerance principles, it is necessary to adopt the internationally agreed glossary of terms. This standard, therefore, has been prepared giving the definitions of these terms which are specially used in relation to principles and applications of tolerances.

This standard was originally published as IS 6408 : 1971 'Recommendations for modular co-ordination: Application of tolerances in building industry'. In the usage of this standard, a need was felt to cover the terminology in a comprehensive manner in addition to effecting the other technical changes deemed necessary on the basis of the experience gained over the years. As a result the standard is being bifurcated into two parts as follows:

Part 1 Glossary of terms, and

Part 2 Principles and applications.

This, the first part provides a glossary of terms applicable to principles and applications of tolerances for modular co-ordination in building industry. The definitions of general terms relating to modular co-ordination are covered in IS 4993 : 1983 'Glossary of terms relating to modular co-ordination ( *second revision* )'.

In the preparation of this standard due weightage has been given to international co-ordination among the standards and practices prevailing in different countries in addition to relating it to the pratices in the field in this country. This has been met by deriving assistance from the following documents:

a) Industrialised building and modular design. Henrik Nissen. Cement and Concrete Association, London 1972

b) The principles of modular co-ordination in building ( *revised* ) CIB W24. The International Modular Group 1982.

c) Modular co-ordination of low cost housing. United Nations Publication. 1972.

d) Dimensional co-ordination for building. DC 12. HMSO Publication 1972.

e) PCI Committee report on tolerances for precast and prestressed concrete. PCI Journal. Vol 30, No. 1, Jan/Feb 1985

f) DS/R 1050-1982 Application of dimensional tolerances in building. Dansk Standardiseringsraad.

g) ISO 4464-1980 Tolerances for building — Relationship between the different types of deviations and tolerances used for specification. International Organization for Standardization.

*Indian Standard*

# RECOMMENDATIONS FOR MODULAR CO-ORDINATION IN BUILDING INDUSTRY : TOLERANCES

## PART 1 GLOSSARY OF TERMS

*( First Revision )*

## 1 SCOPE

**1.1** This standard ( Part 1 ) defines the terms used in the principles and applications of tolerances used in the study, planning, design and construction of buildings carried out in accordance with the principles of modular co-ordination.

## 2 TERMINOLOGY ( *See Also* FIG. 1 )

### 2.1 Actual Dimensions

The measured dimensions of the elements or components after casting or fabrication. This dimension may differ from the working dimensions due to construction and material induced variation. This is also known as actual measurement.

### 2.2 Alignment Face

The face of precast element which is to be set in alignment with the face of adjacent elements or features.

### 2.3 Average Joint Width

The difference between the work size and modular size.

### 2.4 Basic Dimension

The dimension shown on the contract drawing or called for the specifications. The basic dimension shall apply to size, location and relative location. This shall also be called the normal or 'nominal' dimension.

### 2.5 Basic Line

An imaginary line with reference to which the actual location of component at site is determined.

### 2.6 Component Reference Plane

The alignment of component reference point, line or plane with the joint reference plane.

### 2.7 Deviation of Form

The difference between actual form and the corresponding basic form.

### 2.8 Feature Tolerance

The location or dimensional tolerance of feature, such as a corbel or a blockout with respect to the overall member dimensions.

### 2.9 Grid Reference Lines

These represent the co-ordinating planes between modular components.

### 2.10 Joint

Space between the adjacent component, irrespective use of jointing material, for filling up space.

### 2.11 Joint Reference Plane

The position of the joint represented co-ordinating reference plane.

### 2.12 Jointing Component Size

The dimension which ensures shape, size and position of the linkage components such that all joint widths from maximum to minimum are acceptable when the jointing components are in position.

### 2.13 Joint Width

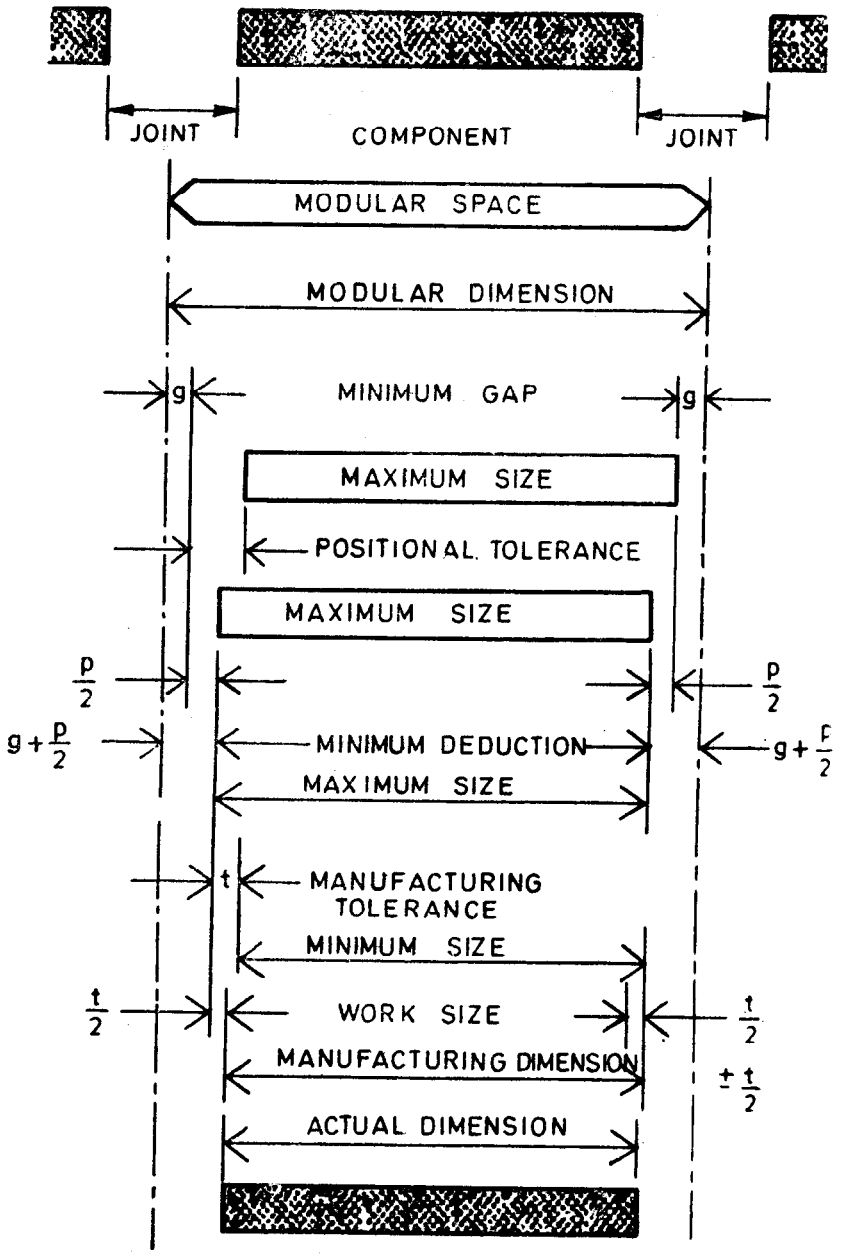
The maximum and minimum limits of joint dimension in width.

### 2.14 Linear Deviation

The difference between an actual line measurement and the corresponding basic size.

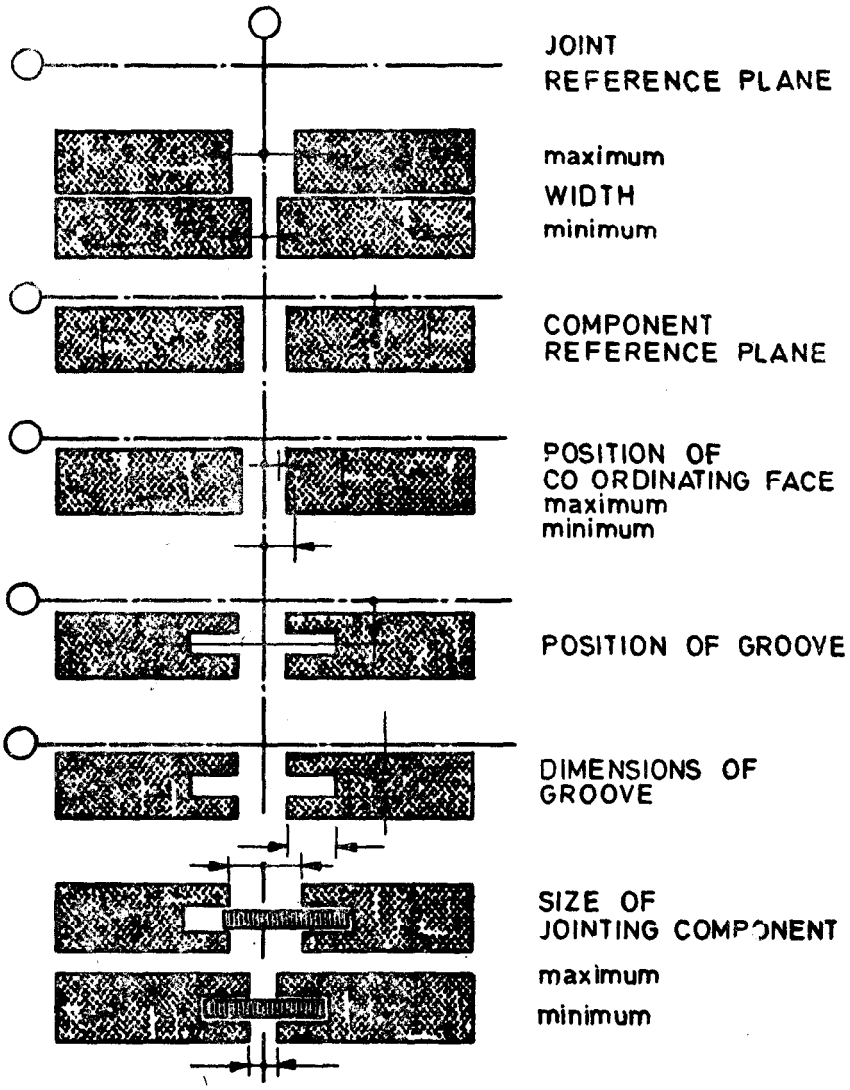
### 2.15 Maximum Joint Width

The largest size specified to take account of the minimum component size.



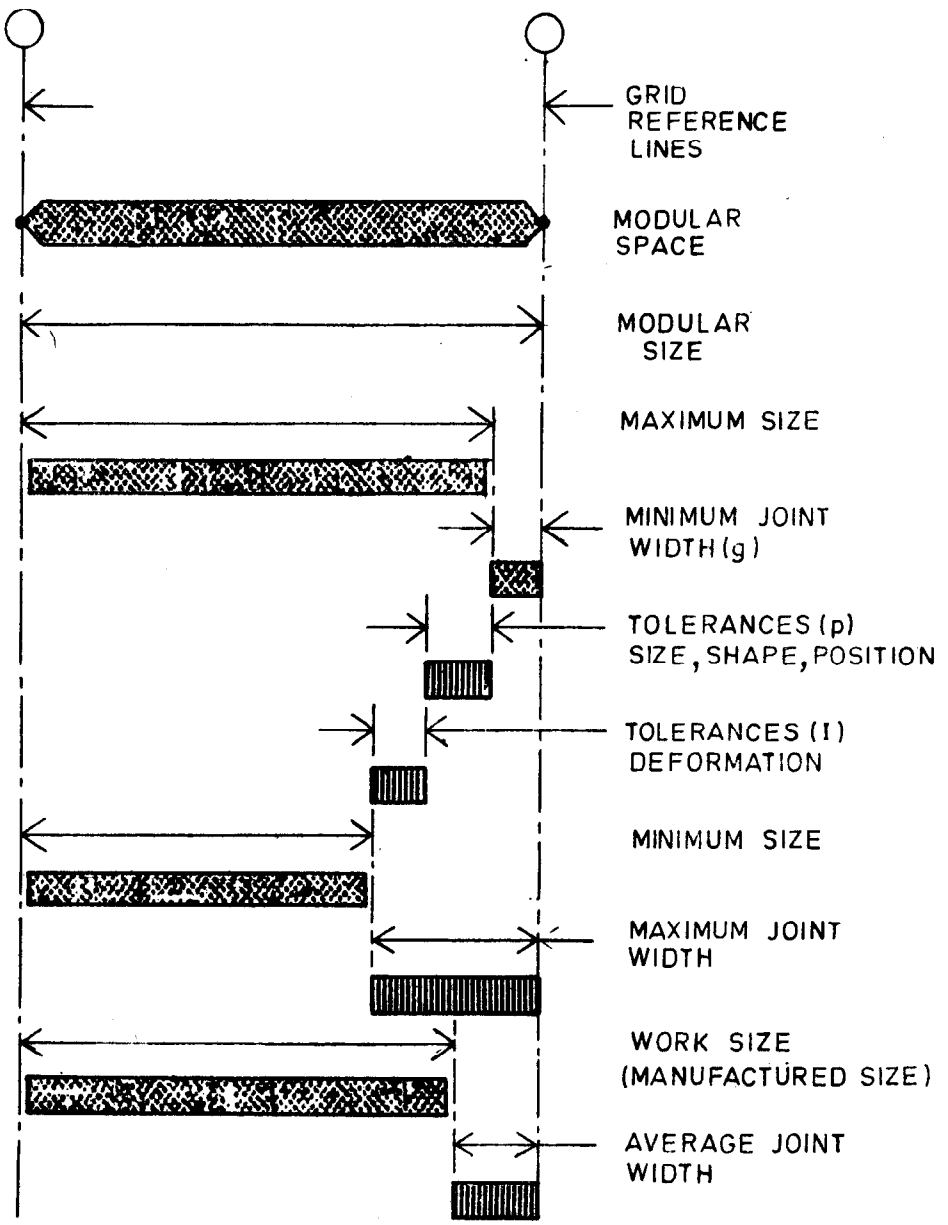

1A Terms Relating to Size and Dimension

FIG. 1 TERMS RELATING TO TOLERANCES IN MODULAR CO-ORDINATION — *Contd*




1B Terms Relating to Joint

FIG. 1 TERMS RELATING TO TOLERANCES IN MODULAR CO-ORDINATION — *Contd*




1C Terms Relating to Telerances with Respect to Sizes and Dimensions

FIG. 1 TERMS RELATING TO TOLERANCES IN MODULAR CO-ORDINATION

**2.16 Minimum Joint Width**

The minimum size specified to take account of the maximum size of component.

**2.17 Minimum Gap**

The minimum distance between the co-ordinating face of a component and a modular plane, it is equal to half the minimum joint thickness.

**2.18 Modular Size**

The basic size of the component which is the same size as the modular space.

**2.19 Modular Space**

The basic space allocated to a component and sized in accordance with the rules of modular co-ordination.

**2.20 Part Tolerance**

Tolerance applicable to part dimension of an element or component.

**2.21 Position of Co-ordinating Face**

The space for the co-ordinating face of a component to lie between the maximum and minimum gap.

**2.22 Position of Groove**

The position of the groove in the co-ordinating face of a component.

**2.23 Positional Variation**

The distance between the basic line, point or plane and a reference line, point or plane on the component.

**2.24 Primary Control Surface**

A surface on a precast element, the dimensional location of which is specifically set and controlled in the erection process. Clearance is generally allowed to vary so that the primary control surface can be set within tolerance.

**2.25 Secondary Control Surface**

A surface on a precast element, the dimensional location of which is dependent on the location tolerance of the member primary control surfaces in addition to the member feature tolerances.

*Example*

The elevation of a second storey corbel on a multistoreyed column whose first storey corbel is selected as the primary elevational control surface.

**2.26 Shape of Groove**

The shape and size of groove in the co-ordinating face of a component.

**2.27 Sum Tolerance ( Total Tolerance )**

Tolerance applicable to the sum ( total ) dimension of elements or components.

**2.28 Tolerance**

The definition shall include the following:

a) The permitted variation from a basic dimension or quantity as in the length or width of a member.

b) The range of variation permitted in maintaining a basic dimension as in an alignment tolerance.

c) A permitted variation from location or alignment.

d) The difference between the permissible limits of size or between the permissible limits of position.

**2.29 Tolerance 'T'**

Tolerance for deformation, thermal movement, etc. and these are combined algebraically.

**2.30 Tolerance 'P'**

Tolerance allocated for size, shape and position and these are combined statistically.

**2.31 Manufacturing Tolerance**

An allowance for the lack of accuracy permitted for the production of a component.

**2.32 Variation**

The difference between the actual and the basic dimension. Variation may be either negative ( lesser ) or positive ( greater ).

**2.33 Working Dimension**

The planned dimension of the member obtained from both its basic dimension and joint or clearance dimensions. It is to this planned dimension that the product tolerance is applied.

*Example*

If a nominal 2 400 mm wide component is designed to have nominal 20 mm joint width on either side, the working dimension for component would be 2 380 mm.

**2.34 Work Size**

The definition shall include:

a) A size which is specified for the manufactured component. This shall also be called a manufacturing size.

b) The size given with its permissible deviations, specified for manufacturing a component the actual size of which would be within these deviations under reference condition.

### 2.35 Construction Tolerance

The width of the space on the site, related to reference points or lines, within the limits of which a point, a line or a surface of a component shall be situated.

NOTE — Manufacturing tolerance, setting-out tolerance and erection tolerance together shall comprise the construction tolerance. Construction tolerances are determined by the requirements of the construction for satisfactory performance.

### 2.36 Manufacturing Tolerance

The width of the space related to the reference form, within the limits of which a point, a line or a surface of a component shall be situated after manufacture.

NOTE — Dimensional tolerance, orientation tolerance and form tolerance together shall comprise the manufacturing tolerance. The latter is not related to any reference object on the site.

### 2.37 Setting Out Tolerance

The width of the space on the site within the limits of which a setting-out point or line shall be situated.

NOTE — The positional and orientation tolerance for setting out together shall compose the setting-out tolerance.

### 2.38 Erection Tolerance

The width of the space on the site, related to the actual form of a component and the actual position for reference points or lines, within the limits of which a point, a line or a surface of a component shall be situated.

NOTE — For each component there shall be a reference position determined by reference points or lines set-out on the site and by the actual form of the component. This position also gives the reference position for each point, line or surface of the component. From these positions, the erection tolerance determines the width of the space within the limits of which a given point, line or surface of the component shall be situated. The positional and orientation tolerances for erection together shall compose the erection tolerance

### 2.39 Dimensional Tolerances

The tolerance width governing the size of a dimension in a given direction of the component concerned; that is length, width, thickness, height, depth or diameter.

### 2.40 Orientation Tolerance ( Angularity Manufacture )

The tolerance width governing the relative orientation of straight lines or planes of a component.

### 2.41 Form Tolerance

The tolerance width governing the form of a line or a surface ( such as of a component ) relative to a reference form.

### 2.42 Positional Tolerance

The tolerance width governing the position of a point, a line, a plane or a surface relative to a reference position.

### 2.43 Orientation Tolerance ( Erection Setting-out )

The tolerance width after setting-out or erection, governing the orientation of a straight line or plane surface relative to a reference orientation.

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**Amendments Issued Since Publication**

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