INTERNATIONAL STANDARD ISO 2848

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Modular co-ordination — Principles and rules

Coordination modulaire — Principes et règles

First edition — 1974-03-01

UDC 721.013 **Ref. No. ISO 2848-1974 (E)**

Descriptors : construction, modular structures, modular co-ordination, principles, dimensions.

Price based on 4 pages

FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up 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.

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.

International Standard ISO 2848 was drawn up by Technical Committee ISO/TC 59, *Building construction*, and circulated to the Member Bodies in July 1972.

It has been approved by the Member Bodies of the following countries :

Australia	India	South Africa, Rep. of
Austria	Ireland	Sweden
Canada	Israel	Switzerland
Denmark	Italy	Thailand
Egypt, Arab Rep. of	Japan	Turkey
Finland	Netherlands	United Kingdom
France	New Zealand	U.S.S.R.
Germany	Norway	
Hungary	Romania	

The Member Body of the following country expressed disapproval of the document on technical grounds :

Belgium

This International Standard is part of a series of ISO documents concerning modular co-ordination in building construction.

This series includes, among others, the following ISO documents; it is necessary to consult them in order to understand the present International Standard :

ISO 1006, *Modular co-ordination — Basic module.*

ISO 1040, *Modular co-ordination — Multimodules for horizontal co-ordinating dimensions.*

ISO 1789, *Modular co-ordination — Storey heights and room heights for residential buildings.*

ISO/R 1790, *Modular co-ordination — Reference lines of horizontal controlling co-ordinating dimensions.*

ISO 1791, *Modular co-ordination — Vocabulary.*

Modular co-ordination – Principles and rules

1 SCOPE

This International Standard specifies the aims of modular co-ordination and states the general principles and rules to be applied in determining the sizes of building components and equipment, and of assemblies and buildings themselves.

2 FIELD OF APPLICATION

Modular co-ordination applies to the design and construction of buildings of all types and to the production of building components of all kinds used for their construction.

3 DEFINITIONS

For the purpose of this International Standard, the definitions given in ISO 1791 apply.

4 AIMS OF MODULAR CO-ORDINATION

The principal object of modular co-ordination is to assist rationalization and industrialization within the building industry and associated industries, by standardization in such a way that components may be manufactured on an industrial scale, and/or erected efficiently on site, thereby improving the economics of building.

In addition, modular co-ordination is intended :

1) to facilitate co-operation between building designers, manufacturers, distributors and contractors;

2) to permit the use of building components of standard sizes to construct different types of building;

3) in design work, to simplify the preparation of building drawings and make possible the determination of the sizes and position of each building component in relation to other components and to the building as a whole;

4) to optimize the number of standard sizes of building components;

5) to permit the interchangeability of these components, whatever their material, form or method of manufacture;

6) to simplify site operations by rationalizing setting out, positioning and assembly of building components;

7) to ensure dimensional co-ordination between installations (equipments, storage units, other fitted furniture, etc.) and the rest of the building.

5 BASIS OF MODULAR CO-ORDINATION

Modular co-ordination is essentially based on :

1) the use of modules : the basic module and multimodules;

2) the use of a reference system to define co-ordinating spaces and zones for building elements and for the components which form them;

3) rules for locating building elements within the reference system;

4) rules for sizing building components in order to determine their work sizes;

5) rules for defining preferred sizes for building components and controlling dimensions for buildings.

6 MODULES

6.1 Basic module

The basic module is the fundamental unit of size in modular co-ordination[1)].

The co-ordinating sizes of building components, of the parts of buildings they form and of buildings themselves shall be multiples of the basic module.

6.2 Multimodules

Multimodules are selected multiples of the basic module; different multimodules will suit particular applications. However, since their values must not be chosen arbitrarily

1) See ISO 1006. The symbol of the basic module is M and its value 1 M = 100 mm.

if dimensional co-ordination is to be achieved, International Standards for their sizes are necessary[1)].

Using multimodules, it is possible to achieve a substantial reduction in the number of co-ordinating sizes.

A further reduction in the number of co-ordinating sizes may be achieved by means of general series of multimodular sizes based on selected multimodules. Such a reduction is particularly recommended for components having at least one dimension equal to one of the dimensions of the functional element of which they are a part.

7 CO-ORDINATION OF NON-MODULAR SIZES[2)]

The full use of modular co-ordination will not always be possible or economical, so that the use of non-modular sizes must be envisaged.

In particular, the thicknesses of many building components and assemblies may be non-modular. Such thicknesses are determined by economic and functional considerations. In some cases, such sizes could be co-ordinated by the use of simple fractions to the basic module (submodules)[3)].

The determination of size for multimodules and planning modules shall not be based on submodules.

8 REFERENCE SYSTEM

The reference system is a system of points, lines and planes to which the sizes and positions of building components or assemblies relate.

A reference system should be used during the design stage, and may also form the basis of the system of lines from which measurements on site are set out.

8.1 Modular space-grid

A modular space-grid is a three-dimensional system of planes within which a building and its components are located. The distance between the planes in such a system is equal to the basic module, or to a multimodule. (An example is shown in figure 1.)

NOTE — This multimodule may differ for each of the three directions of the modular space-grid.

8.2 Modular grids

Designs have to be expressed in two dimensions. To this end, horizontal and vertical projections of the modular space grid are used, which are known as modular grids.

Different modular grids may be superimposed on the same plan or elevation for different purposes.

The advantage of using grids is that they provide a continuous reference system in a project. The position of components and their co-ordinating dimensions can thus be recognized both by those preparing drawings and by those reading them.

8.2.1 *Basic module grid*

The fundamental modular grid is that in which the spacing of consecutive parallel lines is equal to the basic module. (See ISO 1006.)

8.2.2 *Multimodular grids*

In addition to the basic module grid, multimodular grids in which the spacing of the lines is a multimodule may be used. This multimodule may differ for each of the two directions of the grid.

Lines in a multimodular grid normally coincide with lines in the basic module grid.

In practice, however, it may be advantageous to displace modular grids used for different purposes in relation to each other.

8.2.3 *Interruptions and displacements of modular grids*

It may be necessary to interrupt a modular grid (for example, in order to accommodate dividing elements). The width of the zone of interruption of the modular grid may be modular or non-modular (neutral zone).

When several modular grids are used in designing the same plan, it may be advantageous to displace the grids with reference to each other in one or both directions. The displacement between the grids shall be chosen so as to produce a solution appropriate to the project as a whole. (An example is shown in figure 2.)

8.3 Controlling reference system

The reference system described above can be further elaborated. The planes in the modular space grid form a fundamental system of reference for the elements of construction, and therefore are termed "controlling planes". The zones for floors, walls, etc. lying between controlling planes are referred to as "controlling zones". On plans, sections and elevations, controlling planes are indicated by "controlling lines". The dimensions between controlling planes are known as "controlling dimensions".

Controlling planes divide the volume of a building into controlling zones and the usable spaces between them. Controlling zones are occupied (but not always entirely filled) by components. Usable spaces are bounded horizontally by floor and ceiling planes, and vertically by load-bearing wall and column zones.

1) See ISO 1040. In this International Standard, the use of brackets signifies a size of limited applicability which will only appear in specific national standards.

2) See ISO 1791, terms 2.1.12 and 2.1.15.

3) The values of these have yet to be determined.

Controlling planes also indicate where joints between elements of construction are most likely to occur. The dimensions of these elements, therefore, are directly related to controlling dimensions.

9 LOCATION AND DIMENSIONING

For the purposes of design, each building component and assembly is assumed to be located in a space within the reference system defined by reference planes or lines – its "co-ordinating space". This space includes the space required for joints and tolerances (deviations).

In modular planning, different methods of locating components may be used. The modular plane or line defining the location of a component may be boundary (see figure 3) or axial (see figure 4). Sometimes a component may be located asymmetrically in relation to a modular plane or line.

In practice, work-sizes[1] of components and assemblies are derived from co-ordinating sizes. Allowances must be made in particular for manufacturing, site setting-out and erection deviations.[1]

10 PREFERRED SIZES

In order to permit further reduction in the ranges of sizes resulting from the application of modular sizes to building components and assemblies and to controlling dimensions, general series of preferred multimodular sizes can be used.

Preferred sizes for various components and assemblies and for various controlling dimensions will be specified in future International Standards.

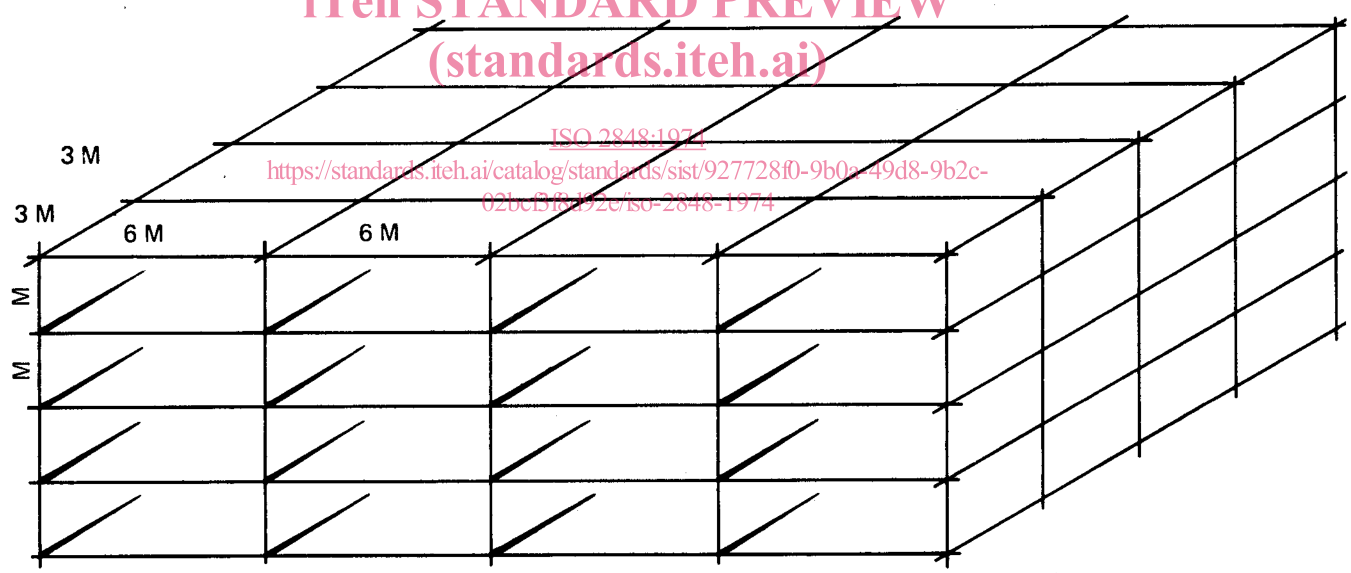

FIGURE 1 – **Example of a modular space-grid**

1) For definitions, see ISO 1803, *Tolerances for building – Vocabulary.*

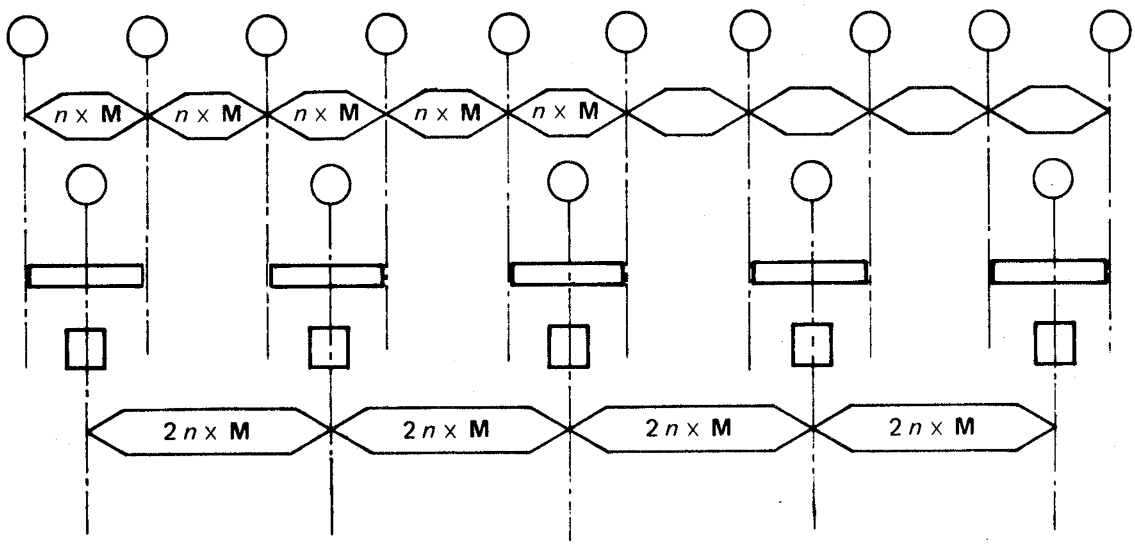

FIGURE 2 – **Example of modular grid displacement**

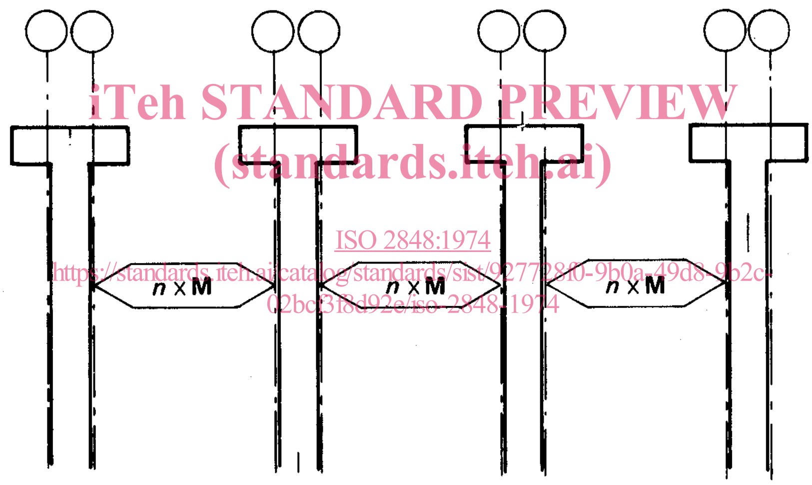

FIGURE 3 – **Example of modulation between boundary planes** (See also ISO/R 1790)

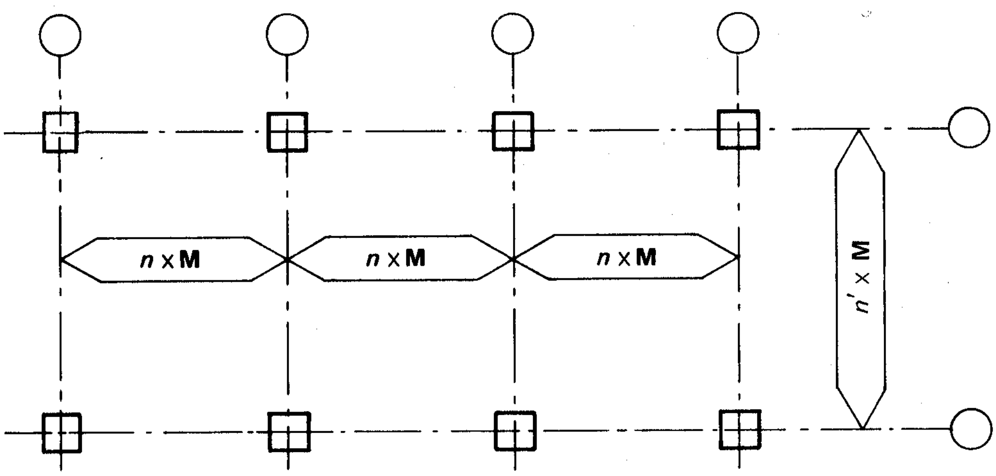

FIGURE 4 – **Example of interaxial modulation** (See also ISO/R 1790)