



**SLOVENSKI STANDARD**  
**SIST ISO 8512-1:1999**

**01-marec-1999**

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Surface plates -- Part 1: Cast iron

Marbres de traçage et de contrôle -- Partie 1: Marbres en fonte

**Ta slovenski standard je istoveten z: ISO 8512-1:1990**

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**ICS:**

17.040.30      Merila      Measuring instruments

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# INTERNATIONAL STANDARD

**ISO**  
**8512-1**

First edition  
1990-12-01

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**Surface plates —**

**Part 1:**  
Cast iron

**iTeh STANDARD PREVIEW**

*Marbres de traçage et de contrôle —*

*Partie 1: Marbres en fonte*

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Reference number  
ISO 8512-1:1990(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 voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 8512-1 was prepared by Technical Committee ISO/TC 3, *Limits and fits*.

ISO 8512 consists of the following parts, under the general title *Surface plates*:

- Part 1: *Cast iron*
- Part 2: *Granite*

Annexes A, B, C and D of this part of ISO 8512 are for information only.

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## Introduction

Surface plates, for many practical purposes, serve the user as a plane or datum surface.

Surface plates are made usually of cast iron or granite; other materials may be used provided that they comply with the requirements for quality and accuracy specified in this International Standard.

For convenience of presentation ISO 8512 comprises two parts, each complete in itself, dealing with cast iron and granite surface plates respectively.

The choice between cast iron and granite surface plates depends on the conditions of use; some general information about care and use, testing, and moderation in loading of plates is given in annex A, annex B and annex C, respectively.

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## Surface plates —

### Part 1: Cast iron

#### 1 Scope

This part of ISO 8512 specifies requirements for rectangular or square cast iron surface plates ranging from 160 mm × 100 mm to 2 500 mm × 1 600 mm, as preferred sizes, in four grades of accuracy 0, 1, 2 and 3.

This part of ISO 8512 applies to new cast iron surface plates, cast iron surface plates in use, and those reconditioned according to their grade.

#### 2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this part of ISO 8512. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this part of ISO 8512 are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 185:1988, *Grey cast iron — Classification*.

#### 3 Definition

For the purposes of this part of ISO 8512, the following definition applies.

**deviation from flatness of the working surface:** The minimum distance separating two parallel planes

between which the working surface can just be contained.

#### 4 Nomenclature

For the purposes of this part of ISO 8512, the nomenclature shown in figure 1 applies.

#### 5 Material

Good quality, close-grained, plain cast iron or alloy cast iron at least equal to grade 250 of ISO 185 shall be used; the material shall be sound and free from blow holes and porous patches. Minor defects in working surfaces of grades 2 and 3 only may be repaired by plugging with material of composition similar to that of the plate.

#### 6 Stress relief

After being cast and rough machined, all plates of grades 0 and 1 and of size up to and including 400 mm × 250 mm shall be given a suitable treatment to relieve internal stresses before being finished. It is strongly recommended that larger plates of all grades be stress-relieved by similar means; however, where facilities for this purpose are not available, such plates may be stabilized by natural ageing by agreement with the purchaser.

The manufacturer shall, on request, supply the purchaser with a statement of the stress-relieving process which the plate has received.

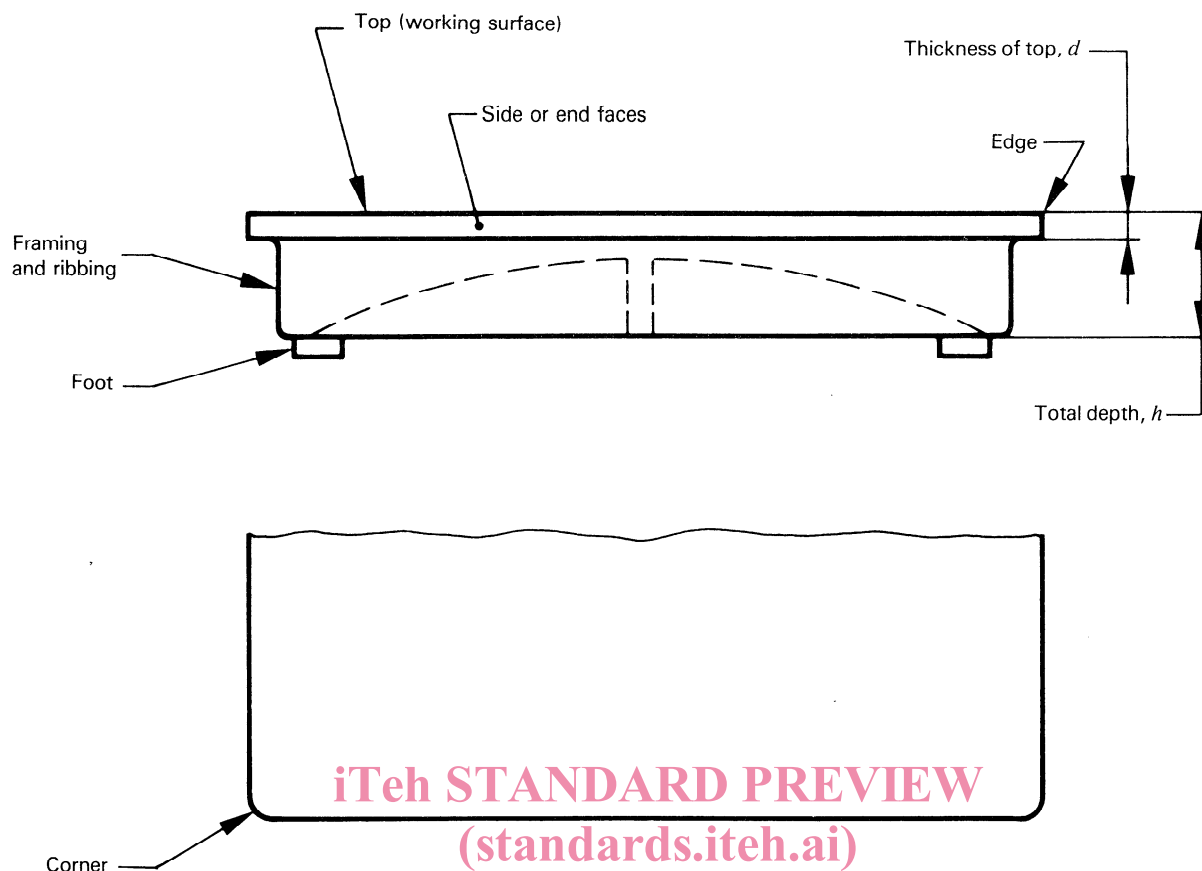


Figure 1 ~~SIST~~ Nomenclature

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## 7 Preferred sizes

The preferred sizes for cast iron plates are given in table 1. If plates of other sizes are required, the requirements of this part of ISO 8512 shall nevertheless apply.

The lengths of faces of plates shall be within  $\pm 5\%$  of the nominal size.

### NOTES

1 There may be a transition period, however, until existing stocks of castings are exhausted and before patterns for the sizes specified in this part of ISO 8512 replace those currently in use. During this period national standards may be unable to make the  $\pm 5\%$  tolerance mandatory.

2 It will be seen that the nominal lengths of faces, with one exception, are taken from the R5 series of preferred numbers; one plate, size 2000 mm  $\times$  1000 mm, is included because it is an established and widely used size, although 2000 is not an R5 preferred number.

## 8 Rigidity

Cast iron surface plates shall be made with adequate ribbing and the total depth [i.e. the combined thickness of the top (working surface) and the depth of the framing] shall be such that when a concentrated load is applied about the centre of the plate, the loaded area shall not deflect below the remaining area of the plate by more than  $1\ \mu\text{m}/200\ \text{N}$ . The limiting value for deflection applies to surface plates of size 400 mm  $\times$  250 mm and larger.

NOTE 3 A test method is given in annex B.

## 9 Finish of the working surface

The top (working surface) of grades 0 and 1 plates shall be finished by scraping or other process which results in a surface similar to that obtained by scraping. Grades 2 and 3 plates may be finished by the same processes or by machining.

The bearing area shall be not less than 20 % for grade 0, 15 % for grade 1 and 10 % for grades 2 and 3. High spots shall be uniformly distributed and the percentage of bearing area should not be so high as to cause wringing.



NOTE 4 A method of assessing the bearing area is given in annex B.

## 10 General features

### 10.1 Supporting feet of surface plates

All surface plates shall be supported on three feet. Plates larger than size 1 000 mm × 630 mm shall have safety feet. Feet shall be positioned within the boundary of the working surface to minimize deflection.

NOTE 5 The setting of adjustable feet may affect the deviation from flatness of the working surface; specific instructions for adjusting the feet are given in footnote 3 to table 1.

The feet shall be smoothly machined, but machining of the supporting feet into a plane parallel to the working surface is optional.

### 10.2 Projection of top

The top of each plate of size 400 mm × 250 mm and larger shall extend at least 25 mm beyond the framing on all sides; the underside of this projecting surface shall be reasonably flat for accommodating clamps.

It is not mandatory for plates smaller than size 400 mm × 250 mm to extend beyond the framing, but if they do, the top shall extend at least 20 mm and shall be reasonably flat on the underside.

### 10.3 Edges

The side and end faces of the plate shall be machined; if the purchaser requires the side and end faces to be finished straight, mutually parallel and square, the tolerances shall be specified in the purchasing order.

All edges and corners shall be rounded with a radius of at least 2 mm. Alternatively, the edges and corners may be chamfered at an angle of approximately 45° using the value given above.

### 10.4 Handling

The plates shall be provided with means for convenient handling.

### 10.5 Clamping methods (i.e. tapped holes or slots)

The use of tapped holes in the plate for clamping purposes can cause distortion of the working surface if high clamping pressures are applied. The

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Table 1 — Tolerances on deviation from flatness overall

Dimensions in millimetres; tolerances in micrometres

Size of plate	Diagonal length (approx.)	Border zone	Tolerance on deviation from flatness overall <sup>1) 2)</sup> for plates of grade			
			0	1	2	3
<b>Rectangular</b>						
160 × 100	188	2	3	6	12	25
250 × 160	296	3	3,5	7	14	27
400 × 250	471	5	4	8	16	32
630 × 400	745	8	5	10	20	39
1 000 × 630	1 180	13	6	12	24	49
1 600 × 1 000 <sup>3)</sup>	1 880	20	8	16	33	66
2 000 × 1 000 <sup>3)</sup>	2 236	20	9,5	19	38	75
2 500 × 1 600 <sup>3)</sup>	2 960	20	11,5	23	46	92
<b>Square</b>						
250 × 250	354	5	3,5	7	15	30
400 × 400	566	8	4,5	9	17	34
630 × 630	891	13	5	10	21	42
1 000 × 1 000 <sup>3)</sup>	1 414	20	7	14	28	56

1) The bases of the tolerances specified are given in annex D.

2) Tolerances on deviation from flatness overall are expressed to the nearest

0,5 µm for plates of grade 0,

1 µm for plates of grades 1, 2 and 3.

3) These plates are supplied with more than three feet. Typically, after the plate has been carefully levelled by the three primary levelling screws, then the remaining supports may be adjusted either so that they are just in contact without disturbing the setting of the level or to give a minimum deviation from flatness. The tolerance applies after the supports have been adjusted and set in the manner agreed between the purchaser and manufacturer. These plates should be checked regularly to ensure that the setting has not been disturbed.