SLOVENSKI STANDARD
SIST ISO 5459:1995

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Tehniļ ne risbe - Geometrijsko toleriranje - Reference in sistemi referenc za geometrijske tolerance

Technical drawings -- Geometrical tolerancing -- Datums and datum-systems for geometrical tolerances

Dessins techniques -- Tolérancement géométrique -- Références spécifiées et systèmes de références spécifiées pour tolérances géométriques

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ICS:

01.100.20	Konstrukcijske risbe	Mechanical engineering drawings

SIST ISO 5459:1995 **en**

International Standard 5459

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Technical drawings — Geometrical tolerancing — Datums and datum-systems for geometrical tolerances

Dessins techniques — Tolérancement géométrique — Références spécifiées et systèmes de références spécifiées pour tolérances géométriques

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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 5459 was developed by Technical Committee ISO/TC 10, *Technical drawings*, and was circulated to the member bodies in February 1978.

It has been approved by the member bodies of the following countries :

Australia	India	Spain
Austria	Italy	Sweden
Belgium	Japan	Switzerland
Bulgaria	Mexico	Turkey
Canada	Netherlands	United Kingdom
Chile	New Zealand	USA
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Denmark	Poland	Yugoslavia
Finland	Romania	
Germany, F. R.	South Africa, Rep. of	

The member body of the following country expressed disapproval of the document on technical grounds :

France

Printed in Switzerland

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0 Introduction

For uniformity all figures in this International Standard are in first angle projection.

It should be understood that the third angle projection could equally well have been used without prejudice to the principles established.

For the definitive presentation (proportions and dimensions) of symbols for geometrical tolerancing, see ISO 7083.

1 Scope and field of application

This International Standard describes datum and datum-systems for geometrical tolerancing, their definitions, practical embodiments and their indications on technical drawings in the field of mechanical engineering.

2 References

ISO 128, *Technical drawings — General principles of presentation.* [1]

ISO 129, *Engineering drawings — Dimensioning.* [2]

ISO 1101, *Technical drawings — Geometrical tolerancing — Tolerances of form, orientation, location and run-out — Generalities, definitions, symbols, indications on drawings.* [3]

ISO 2692, *Technical drawings — Geometrical tolerancing — Maximum material principle.* [4]

ISO 7083, *Techical drawings — Symbols for geometical tolerancing — Proportions and dimensions.* [5]

3 Definitions

3.1 datum : A theoretically exact geometric reference (such as axes, planes, straight lines, etc.) to which toleranced features are related. Datums may be based on one or more datum features of a part.

3.2 datum-system : A group of two or more separate datums used as a combined reference for a toleranced feature.

3.3 datum feature : A real feature of a part (such as an edge, a surface, or a hole, etc.), which is used to establish the location of a datum.

NOTE — As datum features are subject to manufacturing errors and variations, it may be necessary where appropriate to specify tolerances of form to them.

3.4 datum target : A point, line or limited area on the workpiece to be used for contact with the manufacturing and inspection equipment, to define the required datums in order to satisfy the functional requirements.

3.5 simulated datum feature : A real surface of adequately precise form (such as a surface plate, a bearing, or a mandrel, etc.) contacting the datum feature(s) and used to establish the datum(s).

NOTE — Simulated datum features are used as the practical embodiment of the datums during manufacture and inspection.

1) At present at the stage of draft. (Revision of ISO/R 128-1959.)

2) At present at the stage of draft. (Revision of ISO/R 129-1959.)

3) At present at the stage of draft. (Revision of ISO/R 1101/1-1969.)

4) At present at the stage of draft. (Revision of ISO/R 1101/2-1974.)

5) At present at the stage of draft.

4 Establishing datums

Features indicated as datums have inherent inaccuracies resulting from the production process. These may take the form of convex, concave or conical deviations. The following methods are examples for establishing datums.

4.1 Datum being a straight line or a plane

The datum feature shall be arranged in such a way that the maximum distance between it and the simulated datum feature has the least possible value. Should the datum feature not be stable with the contacting surface, suitable supports should be placed between them at a practical distance apart. For lines, use two supports (see figure 1) and for flat surfaces, use three supports.

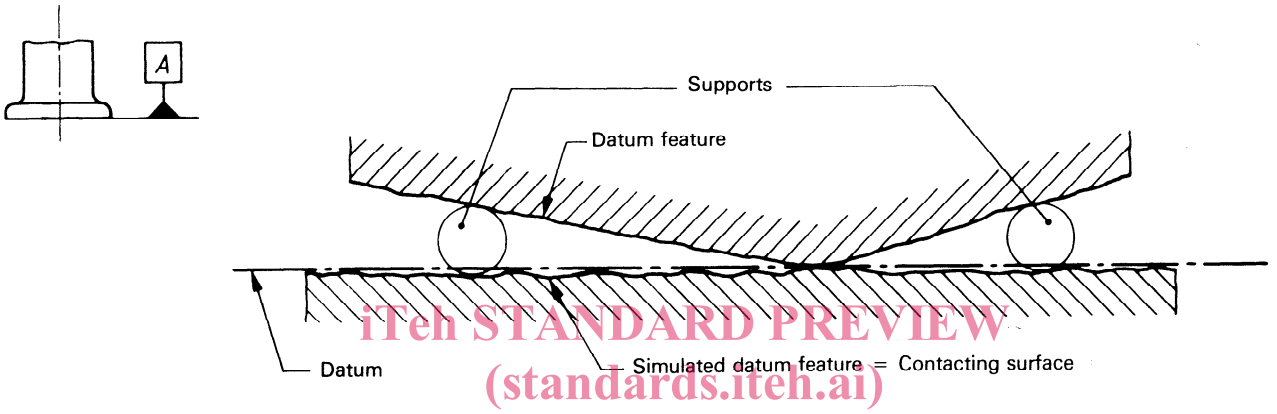


Figure 1

4.2 Datum being the axis of a cylinder

The datum is the axis of the largest inscribed cylinder of a hole or the smallest circumscribed cylinder of a shaft, so located that any possible movement of the cylinder in any direction is equalised (see figure 2).

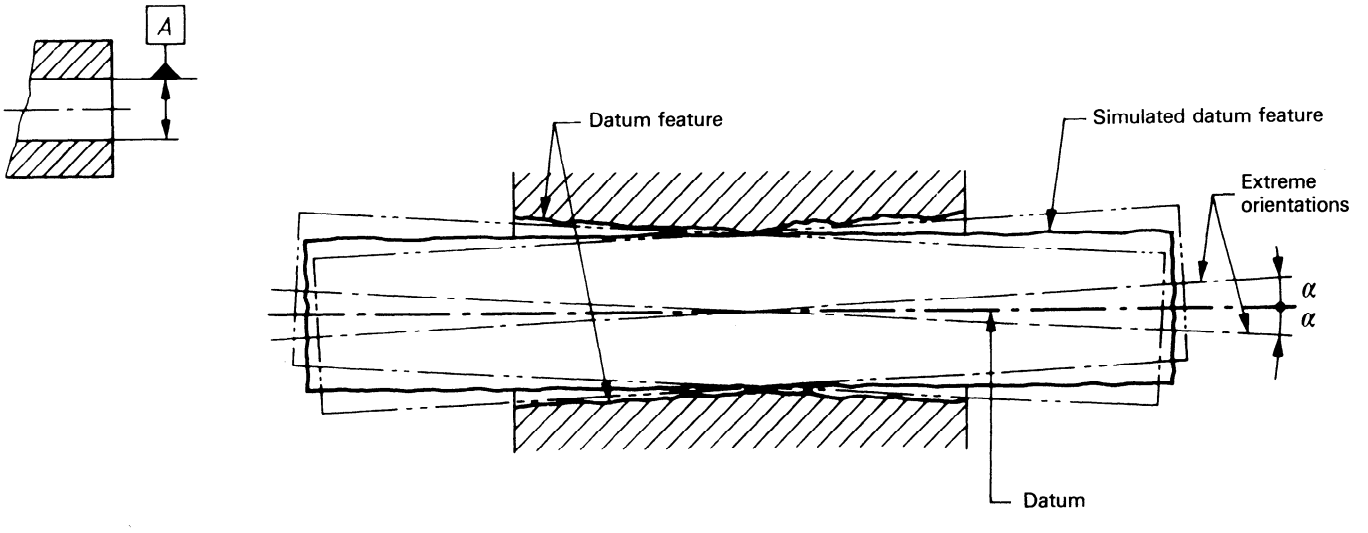


Figure 2

4.3 Datum being the common axis or common median plane

In the example shown in figure 3, the datum is the common axis formed by the two smallest circumscribed coaxial cylinders.

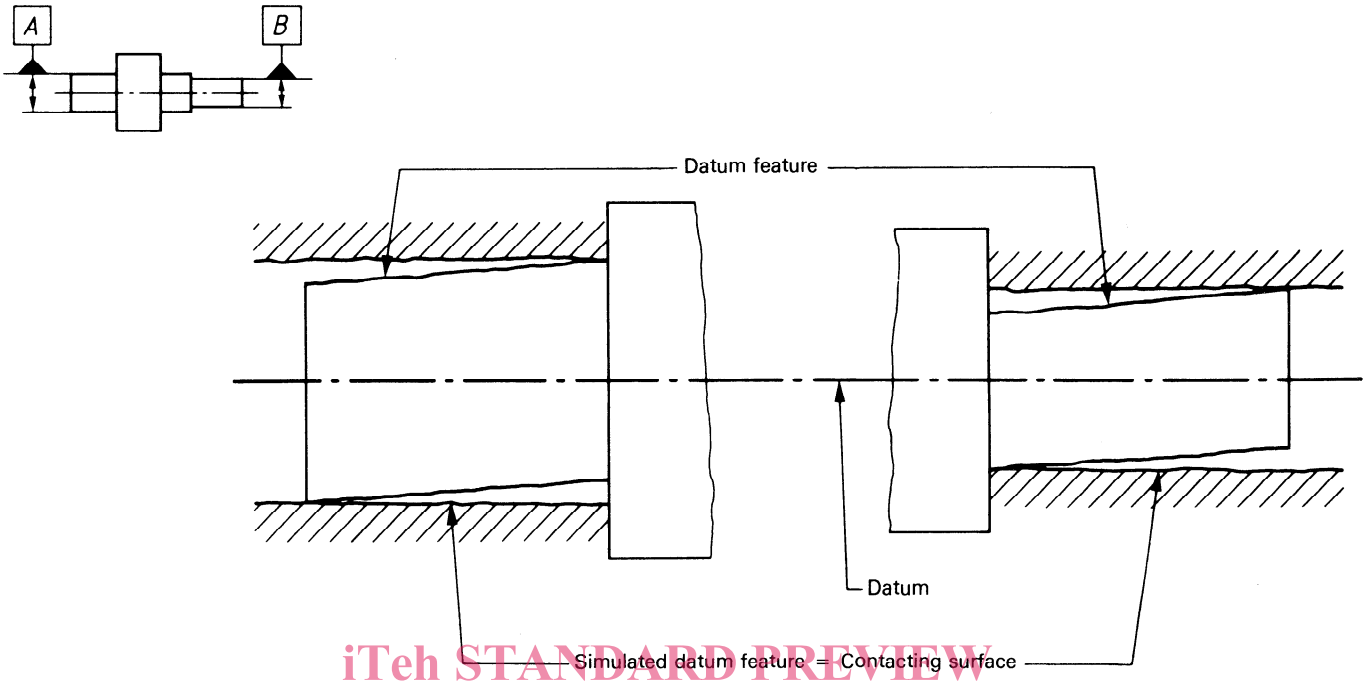


Figure 3

4.4 Datums being the axis of a cylinder and perpendicular to a plane

The datum "A" is the plane represented by the contacting flat surface.

The datum "B" is the axis of the largest inscribed cylinder, perpendicular to the datum "A".

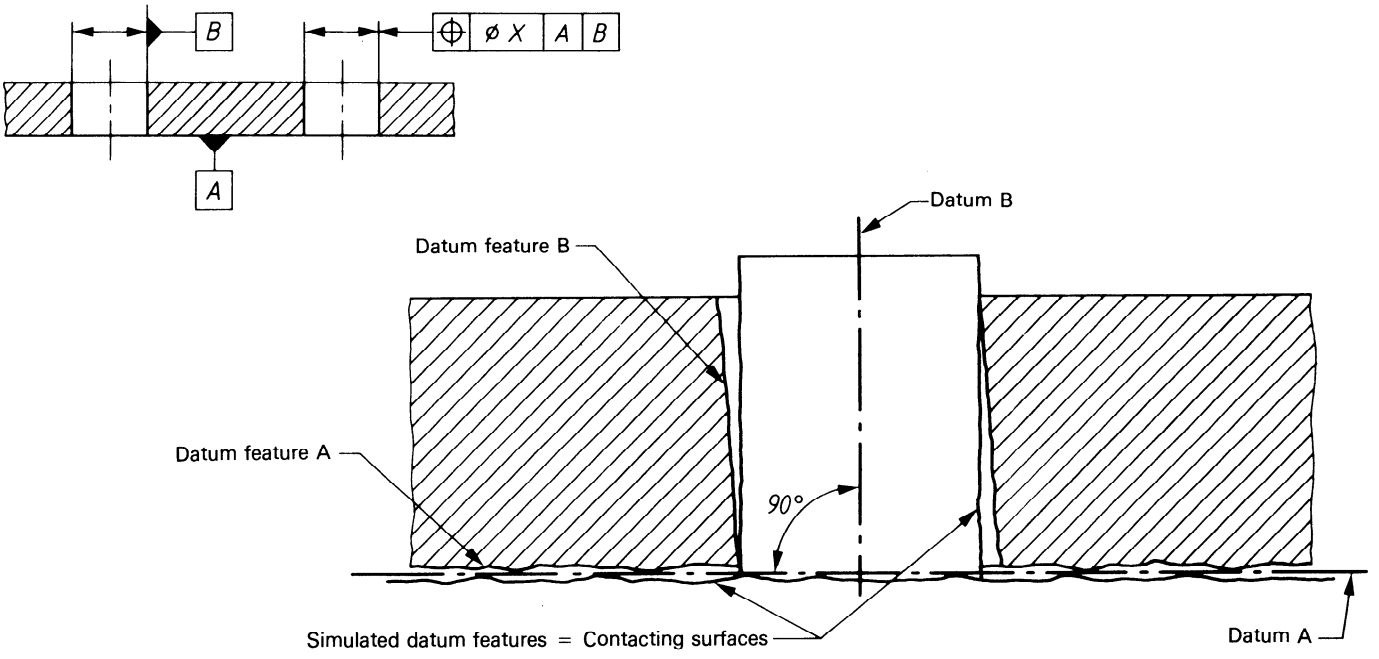


Figure 4

NOTE — In the above example the datum "A" is considered to be primary and the datum "B", secondary (see 6.2.3).

5 Application of datums

Datums and datum-systems are used as the base for establishing the geometric relationship of related features. The quality of relevant datum features and simulated datum features must be adequate for functional requirements.

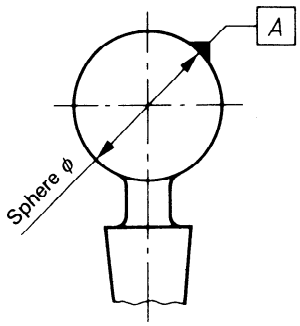
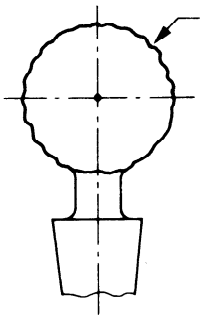
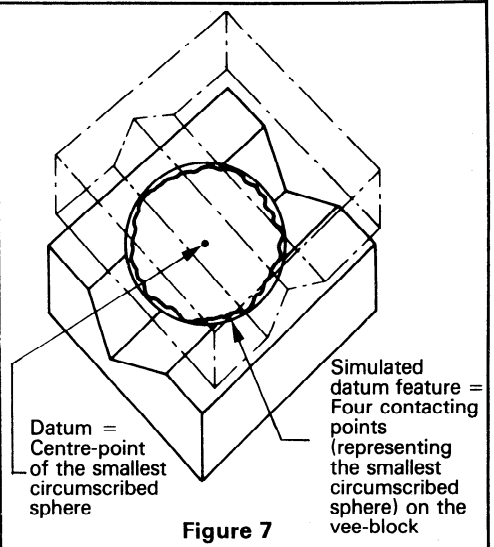
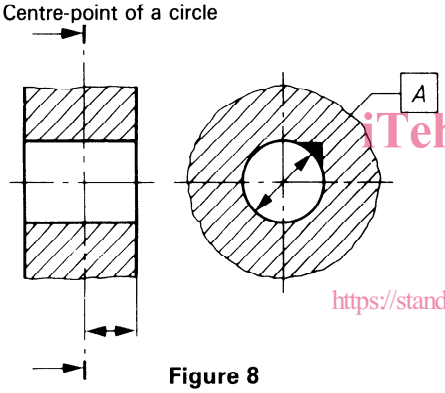
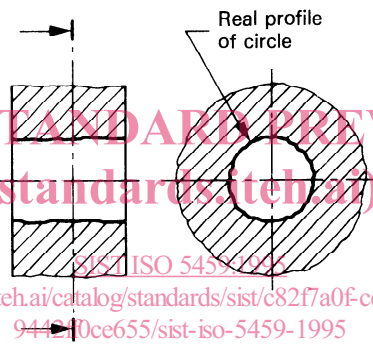
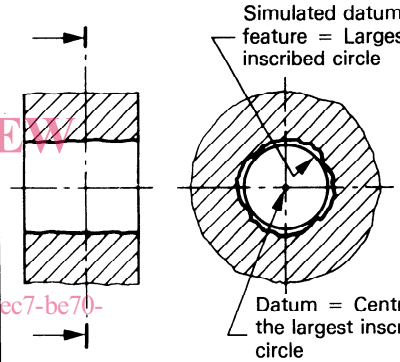
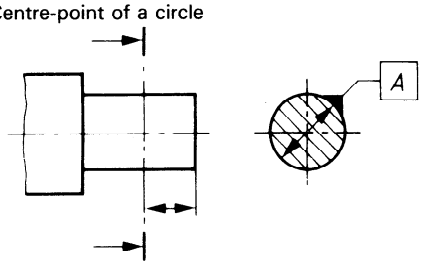
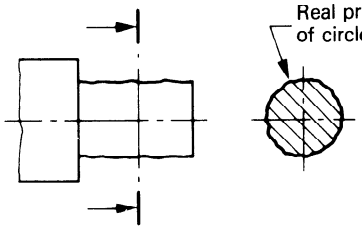
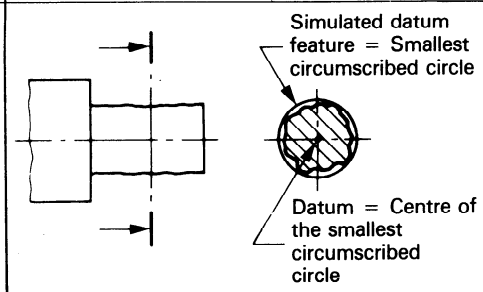
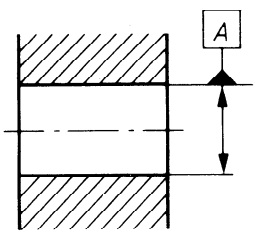
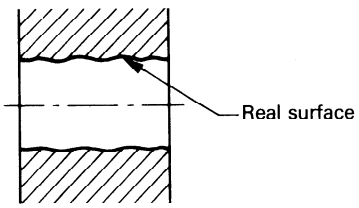
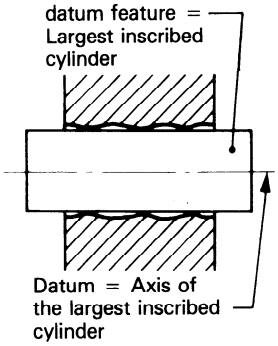
The following table shows :

— the indication of datums on technical drawings;

— the datum features;

— how datums are established by means of simulated datum features.

Table — Examples

Datums	Datum features	Establishment of datums
Datum - centre-point Centre-point of a sphere  **Figure 5**	 **Figure 6**	 **Figure 7**
Centre-point of a circle  **Figure 8**	 **Figure 9**	 **Figure 10**
Centre-point of a circle  **Figure 11**	 **Figure 12**	 **Figure 13**
Datum-line Axis of a hole  **Figure 14**	 **Figure 15**	 **Figure 16**