

IS 15021 (Part 1) : 2001  
ISO 5456-1 : 1996

भारतीय मानक  
तकनीकी ड्राइंग — प्रक्षेपण पद्धतियाँ  
भाग 1 रूपरेखा

*Indian Standard*

TECHNICAL DRAWINGS — PROJECTION METHODS  
PART 1 SYNOPSIS

ICS 01.100.10

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**BUREAU OF INDIAN STANDARDS**  
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NATIONAL FOREWORD

This Indian Standard (Part 1) which is identical with ISO 5456-1 : 1996 'Technical drawings — Projection methods — Part 1: Synopsis' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of Drawings Sectional Committee and approval of the Basic and Production Engineering Division Council.

This standard (Part 1) gives a survey of the various types of projection methods as well as their geometric relationships. Other parts of this series are given as follows:

- IS 15021 (Part 2) : 2001      Technical drawings — Projection methods: Part 2 Orthographic representations
- IS 15021 (Part 3) : 2001      Technical drawings — Projection methods: Part 3 Axonometric representations
- IS 15021 (Part 4) : 2001      Technical drawings — Projection methods: Part 4 Central projection

The text of ISO Standard has been approved as suitable for publication as Indian Standard without deviations. In the adopted standard certain terminology and conventions are not identical to those used in Indian Standards. Attention is particularly drawn to the following:

- a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.
- b) Comma (,) has been used as a decimal marker, while in Indian Standards, the current practice is to use a full point (.) as the decimal marker.

In this adopted standard, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards which are to be substituted in their place are listed below along with their degree of equivalence for the editions indicated :

<i>International Standard</i>	<i>Corresponding Indian Standard</i>	<i>Degree of Equivalence</i>
ISO 5456-2 : 1996	IS 15021 (Part 2) : 2001 Technical drawings — Projection methods: Part 2 Orthographic representations	Identical
ISO 5456-3 : 1996	IS 15021 (Part 3) : 2001 Technical drawings — Projection methods: Part 3 Axonometric representations	do
ISO 5456-4 : 1996	IS 15021 (Part 4) : 2001 Technical drawings — Projection methods: Part 4 Central projection	do
IS 10209-1 : 1992	IS 8930 (Part 1) : 1995 Technical product documentation — Vocabulary: Part 1 Terms relating to technical drawings: General and types of drawings ( <i>first revision</i> )	do
ISO 10209-2 : 1993	IS 8930 (Part 2) : 2001 Technical product documentation — Vocabulary: Part 2 Terms relating to projection methods	do

The concerned Sectional Committee has reviewed the provision of ISO 1503 : 1977 referred in this adopted standard and has decided that it is acceptable for use in conjunction with this standard.

This adopted standard also gives Bibliography in Annex A which is informative. The corresponding Indian Standard against the ISO Standard is given below along with its degree of equivalence for the edition indicated:

<i>International Standard</i>	<i>Corresponding Indian Standard</i>	<i>Degree of Equivalence</i>
ISO 128 : 1982	IS 10714 : 1983 General principles of presentation on technical drawings	Identical

*Indian Standard*  
**TECHNICAL DRAWINGS — PROJECTION METHODS**  
**PART 1 SYNOPSIS**

## **1 Scope**

This part of ISO 5456 gives a survey of the various types of projection methods as well as their geometric relationships.

Parts 2 to 4 specify details for the selection and application of the various projection methods.

## **2 Normative references**

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 5456. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 5456 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 1503:1977, *Geometrical orientation and directions of movements*.

ISO 5456-2:1996, *Technical drawings — Projection methods — Part 2: Orthographic representations*.

ISO 5456-3:1996, *Technical drawings — Projection methods — Part 3: Axonometric representations*.

ISO 5456-4:1996 *Technical drawings — Projection methods — Part 4: Central projection*.

ISO 10209-1:1992, *Technical product documentation — Vocabulary — Part 1: Terms relating to technical drawings: general and types of drawings*.

ISO 10209-2:1993, *Technical product documentation — Vocabulary — Part 2: Terms relating to projection methods*.

## **3 Definitions**

For the purposes of this part of ISO 5456, the definitions given in ISO 10209-1 and ISO 10209-2 and the following definitions apply.

**3.1 pictorial representation:** Parallel or central projection on a single projection plane giving a three-dimensional image of an object.

**3.2 true view:** View of the features of an object that lie on a plane parallel to the projection plane; geometrically similar to the corresponding features of the object.

**3.3 exploded view:** Drawing of an assembly in pictorial representation in which all the components are drawn to the same scale and correctly orientated relative to each other, but are separated from each other in their correct sequence along common axes.

NOTE 1 This term should not be confused with representations where a covering layer is removed in order to show inner portions like those presented in section (cut-away view).

**3.4 principal view:** View of an object showing the important features, which may be chosen from the point of view of design, assembly, sales, service or maintenance.

## **4 Survey of projection methods**

Projection methods are defined by:

- the type of projectors, which may be either parallel or convergent;

- the position of the projection plane in relation to the projectors, either orthogonal or oblique;
- the position of the object (its main features), which may be either parallel/orthogonal or oblique to the projection plane.

A survey of the various possibilities and their relationships is given in table 1.

## 5 Geometrical orientation

Geometrical orientation in space is given by coordinate axes and coordinate planes in accordance with the arrangement given by the right-hand rule (see ISO 1503).

### 5.1 Coordinate axes

Coordinate axes are imaginary lines in space which intersect at right angles to each other at the origin.

There are three coordinate axes: X, Y and Z (see figure 1), to be designated by capital letters.

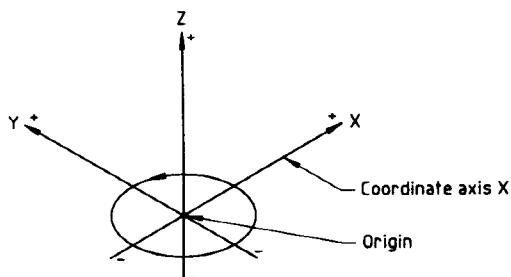


Figure 1

### 5.2 Coordinate planes

Three imaginary planes in space which intersect each other at right angles. Each of the three coordinate planes is defined by two coordinate axes and includes the origin. They are designated by capital letters XY, YZ and XZ (see figure 2).

NOTE 2 Coordinate planes and projection planes are not always the same, therefore, if necessary, appropriate indication (designation) should be shown on the drawing.

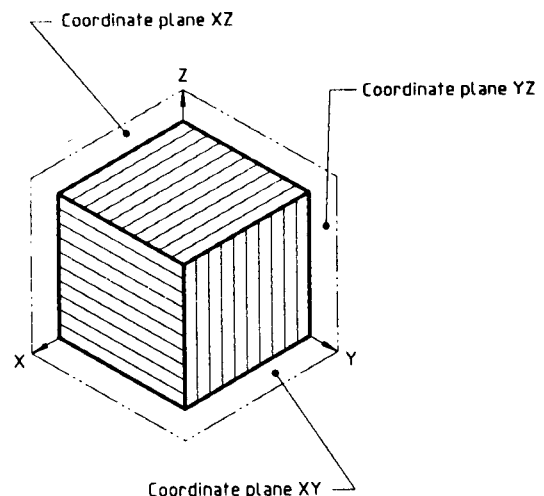


Figure 2

## 6 Invariables

Depending on the projection method chosen, certain features of the object are represented in true view as follows:

### 6.1 The central projection invariable is:

- the size of angles in planes which are parallel to the projection plane; therefore the projection plane figures lying in planes parallel to the projection plane are similar.

### 6.2 Oblique projection invariables are:

- the parallelism of lines, unless they are parallel to the projection lines;
- the divisional ratio of lines;
- the size of angles, length of lines and all plane figures in planes parallel to the projection plane.

### 6.3 Orthogonal projection invariables are:

- the parallelism of lines, unless they are parallel to the projection lines;
- the divisional ratio of lines;
- the size of angles, length of lines and all plane figures in planes parallel to the projection plane;
- right angles, if one side of the right angle in the object is parallel to the projection plane.

**Table 1 — Projection systems**

Projection centre	Position of projection plane to projectors	Main features of the object in relation to projection plane	Number of projection planes	Type of view	Type of projection
Infinite (parallel projectors)	Orthogonal	Parallel/orthogonal	One or more	Two-dimensional	Orthogonal (ISO 5456-2)
		Oblique	One	Three-dimensional	Axonometric (ISO 5456-3)
	Oblique	Parallel/orthogonal	One	Three-dimensional	
		Oblique	One	Three-dimensional	
Finite (convergent projectors)	Oblique	Oblique	One	Three-dimensional	Central (ISO 5456-4)

**Annex A**  
(informative)

**Bibliography**

- [1] ISO 128:1982, *Technical drawings — General principles of presentation*.

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Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc : No. BP 24 (0140).

### Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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