



Technical drawings – Projection methods – Part 3: Axonometric representations

The International Standard ISO 5456-3:1996 has the status of a Swedish Standard. This document contains the official English version of ISO 5456-3:1996 with a Swedish translation

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Ritregler - Projektionsmetoder - Del 3: Axonometrisk projection

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Foreword

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International Standard ISO 5456-3 was prepared by Technical Committee ISO/TC 10, *Technical drawings, product definition and related documentation*, Subcommittee SC 1, *Basic conventions*.

ISO 5456 consists of the following parts, under the general title *Technical drawings — Projection methods*

- Part 1: *Synopsis*
- Part 2: *Orthographic representations*
- Part 3: *Axonometric representations*
- Part 4: *Central projection*

Annex A of this part of ISO 5456 is for information only,

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International Organization for Standardization
Case postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

Förord

ISO (Internationella Standardiseringsorganisationen) är en världsomspännande sammanslutning av nationella standardiseringsorgan (ISO-medlemmar). Internationella standarder utarbetas vanligen i ISOs tekniska kommittéer. Varje medlem, som är intresserad av det arbete som pågår i någon teknisk kommitté, har rätt att delta. Internationella organisationer, såväl på regeringsnivå som privata, samarbetande med ISO, deltar också i arbetet. ISO har nära samarbete med Internationella Elektrotekniska Kommissionen (IEC) i alla frågor som berör elektroteknisk standardisering.

Förslag till internationella standarder som godkänns av de tekniska kommittéerna sänds till medlemsländerna för röstning. För publicering som internationell standard krävs att minst 75% av de medlemmar som röstat på förslaget har godkänt detta.

Den internationella standarden ISO 5456-3 har utarbetats av den tekniska kommittén ISO/TC 10, *Technical drawings, product definition and related documentation*, underkommittén SC 1, *Basic conventions*.

ISO 5456 består av följande delar under den gemensamma titeln *Ritregler – Projektionsmetoder*:

- *Del 1: Översikt*
- *Del 2: Ortografisk projection*
- *Del 3: Axonometrisk projection*
- *Del 4: Centralprojektion*

Bilaga A till denna del av ISO 5456 är medtagen endast som information.

Introduction

Axonometric representations are simple pictorial representations obtained by projecting the object to be represented from an infinitely distant point (projection centre) on a single projection plane (normally the drawing surface). This kind of parallel projection gives an adequate approximation for distant views.

The resulting representation depends on the shape of the object and on the relative positions of the projection centre, the projection plane and the object itself.

Among the infinite possibilities of axonometric representation, only a few types are recommended for technical drawings in all fields of technical activities (mechanical, electrical, construction, etc.).

Axonometric representations are not as commonly used in technical drawings as are orthographic representations.

Orientering

Axonometrisk projektion är enkla bilder som erhålls genom att det objekt som skall återges projiceras från en oändligt avlägsen punkt (ögonpunkt) på ett enda projektionsplan (normalt ritfältet). Denna slags parallellprojektion ger en tillräcklig approximation för avlägsna vyer.

Den resulterande bilden är beroende av objektets form och ögonpunktens relativa positioner, projektionsplanet och objektet i sig självt.

Av de oändliga möjligheterna till axonometrisk projektion rekommenderas endast ett fåtal typer för tekniska ritningar inom alla tekniska verksamhetsfält (mekanisk-teknisk, elektroteknisk, byggnadsteknisk, etc.)

Axonometrisk projektion används inte lika ofta i tekniska ritningar som ortografisk projektion.

Technical drawings — Projection methods —

Part 3: Axonometric representations

1 Scope

This part of ISO 5456 specifies basic rules for the application of the recommended axonometric representations for all types of technical drawings.

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 128:1982, *Technical drawings — General principles of presentation*.

ISO 129:1985, *Technical drawings — Dimensioning — General principles, definitions, methods of execution and special indications*.

ISO 3098-1:1974, *Technical drawings — Lettering — Part 1: Currently used characters*.

ISO 5456-1:1996, *Technical drawings — Projection methods — Part 1: Synopsis*.

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 5456-1, ISO 10209-1 and ISO 10209-2 apply.

4 General

The general principles of presentation given in ISO 128 shall be followed.

4.1 Position of the coordinate system

The position of the coordinate axes shall be chosen, by convention, so that one of the coordinate axes (the Z-axis) is vertical.

4.2 Position of the object

The object to be represented is located with its principal faces, axes and edges parallel to the coordinate planes. The object shall be orientated to show the principal view and the other views that would preferably be chosen when representing the same object in orthogonal projections.

Ritningsregler - Projektionsmetoder - Del 3: Axonometrisk projektion

1 Omfattning

Denna del av ISO 5456 anger grundläggande regler för hur man använder rekommenderade axonometriska projektioner för alla typer av tekniska ritningar.

2 Bindande referenser

I standarden hänvisas till följande standarder, innehållande krav som även utgör krav i denna del av ISO 5456. Vid tiden för fastställelsen gällde de utgåvor som anges. Standarder revideras ibland och parter som gör upp avtal baserade på denna del av ISO 5456 uppmanas att undersöka möjligheten att tillämpa de senaste utgåvorna av nedan angivna standarder. IEC- och ISO-medlemmar tillhandahåller förteckningar över gällande internationella standarder.

ISO 128:1982, *Technical drawings – General principles of presentation*

ISO 129:1985, *Technical drawings – Dimensioning – General principles, definitions, methods of execution and special representation*

ISO 3098-1:1974, *Technical drawings - Lettering – Part 1: Currently used characters*

ISO 5456-1:1996, *Technical drawings – Projection methods – Part 1: Synopsis*

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 Definitioner

Vid tillämpning av denna del av ISO 5456 gäller de definitioner som anges i ISO 5456-1, ISO 10209-1 och ISO 10209-2.

4 Allmänt

De allmänna principerna för återgivning som anges i ISO 128 skall följas.

4.1 Koordinatsystemets läge

Läget för koordinataxlarna skall, som regel, väljas så att en av koordinataxlarna (Z-axeln) är vertikal.

4.2 Objektets läge

Det objekt som skall återges placeras med sina huvudytor, huvudaxlar och kanter parallella med koordinatplanen. Objektet skall vara så orienterat att det visar den huvudvy och de andra vyer som man helst skulle välja vid återgivning av samma objekt i rät projektion.

4.3 Axes of symmetry

Axes and traces of planes of symmetry of the object shall not be drawn unless necessary.

4.4 Hidden contours and edges

Hidden contours and edges should preferably be omitted.

4.5 Hatching

Hatching to indicate a cut or section shall be drawn preferably at an angle of 45° with respect to axes and contours of the cut or section (see figure 1).

Hatching to indicate planes parallel to the coordinate planes shall be drawn parallel to the projected coordinate axis, as shown in figure 2.

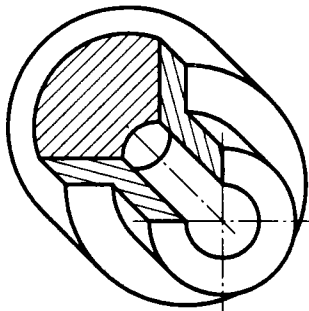


Figure 1

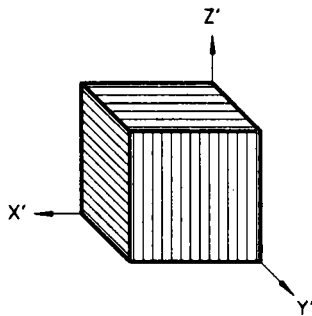


Figure 2

4.6 Dimensioning

Dimensioning of axonometric representations is normally avoided. If, for special reasons, dimensioning is considered necessary, the same rules given for orthogonal projections (ISO 129 and ISO 3098-1) shall be used (see figures 6 and 12).

5 Recommended axonometries

Recommended axonometries for technical drawings are:

- isometric axonometry (see 5.1);
- dimetric axonometry (see 5.2);
- oblique axonometry (see 5.3).

Coordinate axes X, Y, Z are to be indicated by upper case letters. If other items (e.g. dimensions) have to be indicated in a table or drawing, lower-case letters x, y, z shall be used for better differentiation (for examples see ISO 6412-2).

5.1 Isometric axonometry

The isometric axonometry is the orthogonal axonometry in which the projection plane forms three equal angles with the three coordinate axes X, Y and Z).

Three unit length segments u_x , u_y and u_z on the three coordinate axes X, Y and Z, are respectively projected orthogonally on the projection plane in three equal segments $u_{x'}$, $u_{y'}$ and $u_{z'}$ on the projected X', Y' and Z' axes whose lengths are:

$$u_{x'} = u_{y'} = u_{z'} = (2/3)^{1/2} = 0,816$$

The projection X', Y' and Z' of the three coordinate axes X, Y and Z on the projection plane (drawing surface) is shown in figure 3.

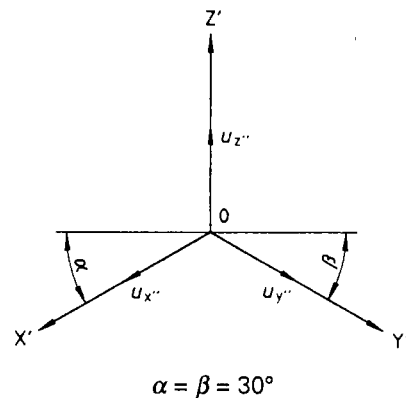


Figure 3

In drawing practice, the projected unit length segments on the X', Y' and Z' axes are taken as $u_{x''} = u_{y''} = u_{z''} = 1$, which corresponds to a graphic representation of the object enlarged by a factor $(3/2)^{1/2} = 1,225$.

1) This gives a representation identical to that obtained by orthogonal projection of the principal view of a right hexahedron with all its faces equally inclined to the projection plane.