SLOVENSKI STANDARD
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Tehnične risbe - Poenostavljeno prikazovanje cevovodov - 1. del: Splošna pravila in ortogonalno prikazovanje (ISO/FDIS 6412-1:2017)

Technical drawings - Simplified representation of pipelines - Part 1: General rules and orthogonal representation (ISO/FDIS 6412-1:2017)

Dessins techniques - Représentation simplifiée des tuyaux et lignes de tuyauteries - Partie 1: Règles générales et représentation orthogonale (ISO/FDIS 6412-1:2017)

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Technical drawings — Simplified representation of pipelines —

Part 1: General rules and orthogonal representation

Dessins techniques — Représentation simplifiée des tuyaux et lignes de tuyauteries —

Partie 1: Règles générales et représentation orthogonale

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 10, *Technical drawings*, Subcommittee SC 10, *Process plant documentation*.

This second edition cancels and replaces the first edition (ISO 6412-1:1989), which has been technically revised.

The main changes compared to the previous edition are as follows:

— the normative references were updated;

— the document went under editorial revision.

A list of all parts in the ISO 6412 series can be found on the ISO website.

Introduction

Depending on the information it is intended to convey and the form of representation required, a distinction is made between graphical representation by means of orthogonal and that by means of isometric representation.

This document deals with general rules used for both representations (orthogonal and isometric). Rules applicable only to isometric representation are given in ISO 6412-2.

For the purposes of this document, all dimensions and tolerances on the drawings have been stencilled in upright lettering. It should be understood that these indications could just as well be written in free-hand or inclined (italic) lettering without altering the meaning of the indications.

For the presentation of lettering (proportions and dimensions), see 4.4.

Technical drawings — Simplified representation of pipelines —

Part 1:
General rules and orthogonal representation

1 Scope

This document specifies rules and conventions for the execution of simplified drawings for the representation of all kinds of pipes and pipelines made of all sorts of materials (rigid and flexible).

It is used whenever it is necessary to represent pipes or pipelines in a simplified manner.

For the purposes of this document, the figures illustrate the text only and should not be considered as design examples.

NOTE This document can also be used for the representation of similar installations, such as ventilation or air-conditioning systems; in such cases, the term “duct”, etc. is substituted for the term “pipe”.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 128 (all parts), *Technical drawings — General principles of presentation*

ISO 129-1, *Technical product documentation (TPD) — Presentation of dimensions and tolerances — Part 1: General principles*

ISO 1219-1, *Fluid power systems and components — Graphical symbols and circuit diagrams — Part 1: Graphical symbols for conventional use and data-processing applications*

ISO 3098-2, *Technical drawings — Lettering — Part 2: Latin alphabet, numerals and marks*

ISO 3545-1, *Steel tubes and fittings — Symbols for use in specifications — Part 1: Tubes and tubular accessories with circular cross-section*

ISO 5261, *Technical drawings — Simplified representation of bars and profile sections*

ISO 5455, *Technical drawings — Scales*

ISO 6428*Technical drawings — Requirements for microcopying*

ISO 7573, *Technical product documentation — Parts lists*

ISO 81714, *General principles for the creation of graphical symbols — Part 2: Graphical symbols for use in technical product documentation*

ISO 14617-3, *Graphical symbols for diagrams — Part 3: Connections and related devices*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
orthogonal representation
projection method in which the projectors are at right angles to the projection plane

3.2
isometric representation
projection method in which each of the three coordinate axes is inclined at the same angle to the projection plane

3.3
flow line
representation of the flow path of the inlet or outlet streams or of material, energy or energy carriers

4 General principles

4.1 Overview

In this clause, all general principles are specified which are common to the methods of projection and to the pictorial representations, as recommended in this document.

4.2 Representation of pipes

The flow line representing a pipe (irrespective of its diameter), shall be a single continuous thick line (type A, see Table 1), coinciding with the central line of the pipe.

Bends may be simplified by extending the straight length of the flow line to the vertex (see Figure 1). However, bends may be shown for the sake of clarity in the form illustrated in Figure 2. In this case, if projections of bends would otherwise have been elliptical, these projections may be simplified by drawing circular arcs (see Figure 3).

4.3 Scale

If the drawing is to scale, this shall be indicated in accordance with ISO 5455.

4.4 Lines

4.4.1 Line thickness

In general, only one thickness of line shall be used. However, in cases where more than one line thickness needs to be used, the line thicknesses shall be chosen from ISO 128-20; the relative proportions of line thicknesses **a**:**b**:**c** shall be $2 : \sqrt{2} : 1$. Different line thicknesses shall then be used as follows (see also 4.4.2):

— line thickness **a**: main flow lines;

— line thickness **b**: secondary flow lines, lettering;

— line thickness **c**: leader lines, dimension lines, etc.

4.4.2 Types of line

The types and thicknesses of line shown in Table 1 shall be used.

