

Technical product documentation - Simplified  
representation of pipelines - Part 2: Isometric  
projection (ISO 6412-2:2017)

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 6412-2:2018 sisaldab Euroopa standardi EN ISO 6412-2:2018 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 6412-2:2018 consists of the English text of the European standard EN ISO 6412-2:2018.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 07.02.2018.	Date of Availability of the European standard is 07.02.2018.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile [standardiosakond@evs.ee](mailto:standardiosakond@evs.ee).

ICS 01.100.99, 23.040.01

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:  
Koduleht [www.evs.ee](http://www.evs.ee); telefon 605 5050; e-post [info@evs.ee](mailto:info@evs.ee)

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Homepage [www.evs.ee](http://www.evs.ee); phone +372 605 5050; e-mail [info@evs.ee](mailto:info@evs.ee)

English Version

Technical product documentation - Simplified  
representation of pipelines - Part 2: Isometric projection  
(ISO 6412-2:2017)

Documentation technique de produits - Représentation  
simplifiée des tuyaux et lignes de tuyauteries - Partie 2:  
Projection isométrique (ISO 6412-2:2017)

This European Standard was approved by CEN on 22 October 2017.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

## European foreword

This document (EN ISO 6412-2:2018) has been prepared by Technical Committee ISO/TC 10 “Process plant documentation”.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 2018, and conflicting national standards shall be withdrawn at the latest by August 2018.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 6412-2:1994.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

### Endorsement notice

The text of ISO 6412-2:2017 has been approved by CEN as EN ISO 6412-2:2018 without any modification.

# Contents

Page

<b>Foreword</b>	<b>iv</b>
<b>Introduction</b>	<b>v</b>
<b>1 Scope</b>	<b>1</b>
<b>2 Normative references</b>	<b>1</b>
<b>3 Terms and definitions</b>	<b>1</b>
<b>4 Coordinates</b>	<b>1</b>
<b>5 Line conventions</b>	<b>2</b>
<b>6 Deviations from the direction of coordinate axes</b>	<b>2</b>
6.1 General	2
6.2 Pipes in a vertical plane	2
6.3 Pipes in a horizontal plane	2
6.4 Pipes not parallel to any coordinate plane	3
6.5 Auxiliary projection planes	3
<b>7 Dimensioning and special rules</b>	<b>4</b>
7.1 General	4
7.2 Diameters and wall thickness	4
7.3 Longitudinal and angular dimensions	4
7.4 Pipes with bends	4
7.5 Radii and angles of bends	4
7.6 Levels	5
7.7 Direction of slope	5
7.8 Positions of ends of pipes	6
7.9 Redundant dimensioning	6
7.10 Dimensioning for pipe-bending machines	6
<b>8 Graphical symbols</b>	<b>6</b>
8.1 General	6
8.2 Examples of graphical symbols drawn with the isometric projection method	7
8.2.1 Valves	7
8.2.2 Transition pieces (cones)	7
8.2.3 Supports and hangers	8
8.2.4 Crossings	8
8.2.5 Permanent junctions	8
8.2.6 General connections	8
8.2.7 Flanges	9
<b>9 Examples</b>	<b>9</b>
<b>Bibliography</b>	<b>12</b>

## 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](http://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](http://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](http://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 6412-2:1989), which has been technically revised.

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

- the normative references were updated;
- the document underwent editorial revision.

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

## Introduction

For drawings for tender, manufacturing drawings and erection drawings in pipeline construction as well as in machine construction and the construction industry, isometric projection has been introduced to a great extent, since the drawing work can be cut down and the presentation made clearer.

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 ISO 6412-1.

# Technical product documentation — Simplified representation of pipelines —

## Part 2: Isometric projection

### 1 Scope

This document specifies supplementary rules, in addition to the general rules given in ISO 6412-1, applicable to isometric representation. Isometric representation is used where it is necessary to show the essential features clearly in three dimensions.

### 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 128-20, *Technical drawings — General principles of presentation*

ISO 129-1, *Technical drawings — Indication of dimensions and tolerances — Part 1: General principles*

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 6412-1, *Technical drawings — Simplified representation of pipelines — Part 1: General rules and orthogonal representation*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 6412-1 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 <https://www.iso.org/obp>

### 4 Coordinates

As far as it is necessary to use Cartesian coordinates, for instance for calculations or numerical control of machine tools, the coordinate axes shall comply with [Figure 1](#).

In all cases, the coordinates of individual pipes or pipe assemblies shall comply with those adopted for the complete installation and shall be indicated on the drawing or in an associated document.