



SLOVENSKI STANDARD SIST EN ISO 4413:2011

01-januar-2011

Nadomešča:

SIST EN 982:1998+A1:2008

Fluidna tehnika - Hidravlika - Splošna pravila in varnostne zahteve za fluidne sisteme in njihove komponente (ISO 4413:2010)

Hydraulic fluid power - General rules and safety requirements for systems and their components (ISO 4413:2010)

Fluidtechnik - Allgemeine Regeln und sicherheitstechnische Anforderungen an Hydraulikanlagen und deren Bauteile (ISO 4413:2010)

Transmissions hydrauliques - Règles générales et exigences de sécurité relatives aux systèmes et leurs composants (ISO 4413:2010)

Ta slovenski standard je istoveten z: EN ISO 4413:2010

ICS:

23.100.01 Hidravlični sistemi na splošno Fluid power systems in general

SIST EN ISO 4413:2011

en,fr,de

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 4413:2011

<https://standards.iteh.ai/catalog/standards/sist/c4445fce-bb05-4aac-8fde-f69e91a3b341/sist-en-iso-4413-2011>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 4413

November 2010

ICS 23.100.01

Supersedes EN 982:1996+A1:2008

English Version

Hydraulic fluid power - General rules and safety requirements for systems and their components (ISO 4413:2010)

Transmissions hydrauliques - Règles générales et exigences de sécurité relatives aux systèmes et leurs composants (ISO 4413:2010)

Fluidtechnik - Allgemeine Regeln und sicherheitstechnische Anforderungen an Hydraulikanlagen und deren Bauteile (ISO 4413:2010)

This European Standard was approved by CEN on 6 November 2010.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

[SIST EN ISO 4413:2011](https://standards.iteh.ai/catalog/standards/sist/c4445fce-bb05-4aac-8fde-f69e91a3b341/sist-en-iso-4413-2011)

<https://standards.iteh.ai/catalog/standards/sist/c4445fce-bb05-4aac-8fde-f69e91a3b341/sist-en-iso-4413-2011>



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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents	Page
Foreword.....	3
Annex ZA	4

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 4413:2011](https://standards.iteh.ai/catalog/standards/sist/c4445fce-bb05-4aac-8fde-f69e91a3b341/sist-en-iso-4413-2011)
<https://standards.iteh.ai/catalog/standards/sist/c4445fce-bb05-4aac-8fde-f69e91a3b341/sist-en-iso-4413-2011>

Foreword

This document (EN ISO 4413:2010) has been prepared by Technical Committee ISO/TC 131 “Fluid power systems” in collaboration with Technical Committee CEN/TC 114 “Safety of machinery” the secretariat of which is held by DIN.

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 May 2011, and conflicting national standards shall be withdrawn at the latest by November 2011.

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

This document supersedes EN 982:1996+A1:2008.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive.

For relationship with EU Directive, see informative Annex ZA, which is an integral part of this document.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

[SIST EN ISO 4413:2011](https://standards.iteh.ai/catalog/standards/sist/c4445fce-bb05-4aac-8fde-f69e91a3b211/sist-en-iso-4413-2011)

[https://standards.iteh.ai/catalog/standards/sist/c4445fce-bb05-4aac-8fde-](https://standards.iteh.ai/catalog/standards/sist/c4445fce-bb05-4aac-8fde-f69e91a3b211/sist-en-iso-4413-2011)

[f69e91a3b211/sist-en-iso-4413-2011](https://standards.iteh.ai/catalog/standards/sist/c4445fce-bb05-4aac-8fde-f69e91a3b211/sist-en-iso-4413-2011)

Endorsement notice

The text of ISO 4413:2010 has been approved by CEN as a EN ISO 4413:2010 without any modification.

Annex ZA (informative)

Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the New Approach Directive 2006/42/EC on machinery.

Once this standard is cited in the Official Journal of the European Union under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative clauses of this standard confers, within the limits of the scope of this standard, a presumption of conformity with the relevant Essential Requirements, except Essential Requirements 1.5.8 and 1.7.4.2 u), of that Directive and associated EFTA regulations.

WARNING — Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 4413:2011

<https://standards.iteh.ai/catalog/standards/sist/c4445fce-bb05-4aac-8fde-f69e91a3b341/sist-en-iso-4413-2011>

INTERNATIONAL STANDARD

**ISO
4413**

Third edition
2010-11-15

Hydraulic fluid power — General rules and safety requirements for systems and their components

*Transmissions hydrauliques — Règles générales et exigences de
sécurité relatives aux systèmes et leurs composants*

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 4413:2011](https://standards.iteh.ai/catalog/standards/sist/c4445fce-bb05-4aac-8fde-f69e91a3b341/sist-en-iso-4413-2011)

[https://standards.iteh.ai/catalog/standards/sist/c4445fce-bb05-4aac-8fde-
f69e91a3b341/sist-en-iso-4413-2011](https://standards.iteh.ai/catalog/standards/sist/c4445fce-bb05-4aac-8fde-f69e91a3b341/sist-en-iso-4413-2011)



Reference number
ISO 4413:2010(E)

© ISO 2010

ISO 4413:2010(E)

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN ISO 4413:2011](https://standards.iteh.ai/catalog/standards/sist/c4445fce-bb05-4aac-8fde-f69e91a3b341/sist-en-iso-4413-2011)

<https://standards.iteh.ai/catalog/standards/sist/c4445fce-bb05-4aac-8fde-f69e91a3b341/sist-en-iso-4413-2011>

**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2010

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
Introduction.....	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 List of significant hazards	3
5 General rules and safety requirements.....	3
5.1 General	3
5.2 Basic requirements for the design and specification of hydraulic systems.....	3
5.3 Additional requirements	5
5.4 Specific requirements for components and controls	7
6 Verification of safety requirements and acceptance testing	26
7 Information for use	26
7.1 General requirements	26
7.2 Final information for systems on stationary industrial machinery.....	26
7.3 Maintenance and operating data	27
7.4 Marking and identification.....	28
8 Identification statement (reference to this International Standard)	30
Annex A (informative) List of significant hazards	31
Annex B (informative) Form for collecting hydraulic system and component data to ensure conformance with ISO 4413	33
Bibliography.....	45

ISO 4413:2010(E)**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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 4413 was prepared by Technical Committee ISO/TC 131, *Fluid power systems*, Subcommittee SC 9, *Installations and systems*.

This third edition cancels and replaces the second edition (ISO 4413:1998), which has been technically revised, specifically with regards to the following:

- a) integration of ISO 4413:1998 and EN 982:1996;
- b) integration of safety requirements to comply with the European Machinery Directive 2006/42/EC;
- c) updating of safety requirements, taking into account International Standards on machine safety.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 4413:2011

<https://standards.iteh.ai/catalog/standards/sist/c4415fce-bb05-4aac-8fde-f69e91a3b341/sist-en-iso-4413-2011>

Introduction

This International Standard is a type B standard as defined in ISO 12100. The provisions of this International Standard can be supplemented or modified by a type C standard. For machines that are covered by the scope of a type C standard and that have been designed and built in accordance with the provisions of that standard, the provisions of that type C standard take precedence over the provisions of this type B standard.

In hydraulic fluid power systems, power is transmitted and controlled through a liquid under pressure within an enclosed circuit.

In the past, ISO 4413 was intended to provide assistance in the understanding between the supplier and the purchaser. This edition of ISO 4413 now includes, in addition, general requirements for the engineering of a hydraulic system and safety requirements that support the essential health and safety requirements of the European Machinery Directive.

Equivalent requirements for pneumatic systems are defined in ISO 4414.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN ISO 4413:2011](https://standards.iteh.ai/catalog/standards/sist/c4445fce-bb05-4aac-8fde-f69e91a3b341/sist-en-iso-4413-2011)

<https://standards.iteh.ai/catalog/standards/sist/c4445fce-bb05-4aac-8fde-f69e91a3b341/sist-en-iso-4413-2011>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 4413:2011](#)

<https://standards.iteh.ai/catalog/standards/sist/c4445fce-bb05-4aac-8fde-f69e91a3b341/sist-en-iso-4413-2011>

Hydraulic fluid power — General rules and safety requirements for systems and their components

1 Scope

This International Standard specifies general rules and safety requirements for hydraulic fluid power systems and components used on machinery as defined by ISO 12100:2010, 3.1. It deals with all significant hazards associated with hydraulic fluid power systems and specifies the principles to apply in order to avoid those hazards when the systems are put to their intended use.

NOTE 1 See Clause 4 and Annex A.

The significant hazard noise is incompletely dealt with in this International Standard.

NOTE 2 Noise emission depends especially on the installation of hydraulic components or systems into machinery.

This International Standard applies to the design, construction and modification of systems and their components, also taking into account the following aspects:

- (standards.iteh.ai)
- [SIST EN ISO 4413:2011
https://standards.iteh.ai/catalog/standards/sist/c4445fce-bb05-4aac-8fde-f69e91a3b341/sist-en-iso-4413-2011](https://standards.iteh.ai/catalog/standards/sist/c4445fce-bb05-4aac-8fde-f69e91a3b341/sist-en-iso-4413-2011)
- a) assembly;
 - b) installation;
 - c) adjustment;
 - d) uninterrupted system operation;
 - e) ease and economy of maintenance and cleaning;
 - f) reliable operation in all intended uses;
 - g) energy efficiency; and
 - h) environment.

2 Normative references

The following referenced documents are indispensable for the application 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 1219-1, *Fluid power systems and components — Graphic symbols and circuit diagrams — Part 1: Graphic symbols for conventional use and data-processing applications*

ISO 1219-2, *Fluid power systems and components — Graphic symbols and circuit diagrams — Part 2: Circuit diagrams*

ISO 4021, *Hydraulic fluid power — Particulate contamination analysis — Extraction of fluid samples from lines of an operating system*

ISO 4413:2010(E)

ISO 4406, *Hydraulic fluid power — Fluids — Method for coding the level of contamination by solid particles*

ISO 5598, *Fluid power systems and components — Vocabulary*

ISO 6149-1, *Connections for hydraulic fluid power and general use — Ports and stud ends with ISO 261 metric threads and O-ring sealing — Part 1: Ports with truncated housing for O-ring seal*

ISO 6149-2, *Connections for hydraulic fluid power and general use — Ports and stud ends with ISO 261 metric threads and O-ring sealing — Part 2: Dimensions, design, test methods and requirements for heavy-duty (S series) stud ends*

ISO 6149-3, *Connections for hydraulic fluid power and general use — Ports and stud ends with ISO 261 metric threads and O-ring sealing — Part 3: Dimensions, design, test methods and requirements for light-duty (L series) stud ends*

ISO 6162-1, *Hydraulic fluid power — Flange connectors with split or one-piece flange clamps and metric or inch screws — Part 1: Flange connectors for use at pressures of 3,5 MPa (35 bar) to 35 MPa (350 bar), DN 13 to DN 127*

ISO 6162-2, *Hydraulic fluid power — Flange connectors with split or one-piece flange clamps and metric or inch screws — Part 2: Flange connectors for use at pressures of 35 MPa (350 bar) to 40 MPa (400 bar), DN 13 to DN 51*

ISO 6164, *Hydraulic fluid power — Four-screw, one-piece square-flange connections for use at pressures of 25 MPa and 40 MPa (250 bar and 400 bar)*

ISO 10763, *Hydraulic fluid power — Plain-end, seamless and welded precision steel tubes — Dimensions and nominal working pressures*

ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction*

ISO 13850, *Safety of machinery — Emergency stop — Principles for design*

ISO 13851, *Safety of machinery — Two-hand control devices — Functional aspects and design principles*

ISO 16874, *Hydraulic fluid power — Identification of manifold assemblies and their components*

ISO 17165-1, *Hydraulic fluid power — Hose assemblies — Part 1: Dimensions and requirements*

ISO 23309, *Hydraulic fluid power systems — Assembled systems — Methods of cleaning lines by flushing*

IEC 60947-5-5, *Low-voltage switchgear and controlgear — Part 5-5: Control circuit devices and switching elements — Electrical emergency stop device with mechanical latching function*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5598 and ISO 12100 and the following apply.

3.1 function plate

surface that contains information describing either the performance of a manually operated device (e.g. ON/OFF, forward/reverse, left/right, up/down) or the status of a function performed by the system (e.g. clamp, lift, advance)

4 List of significant hazards

Table A.1 lists the significant hazards associated with the use of hydraulic fluid power in a machine.

5 General rules and safety requirements

5.1 General

5.1.1 When designing hydraulic systems for machinery, all intended operations and use of systems shall be considered. Risk assessment, e.g. in accordance with ISO 14121-1, shall be carried out to determine the foreseeable risks associated with systems when they are used as intended. Reasonably foreseeable misuse shall not cause hazards. The risks identified shall be eliminated by design and, where this is not practicable, safeguards (first preference) or warnings (second preference) against such risks shall be incorporated, in accordance with the hierarchy established in ISO 12100.

NOTE This International Standard provides requirements for components of fluid power systems; some of these requirements are dependent on the hazards associated with the machine in which the system is installed. Therefore, the final specification and construction of the hydraulic system could need to be based on risk assessment and agreement between purchaser and supplier.

5.1.2 The control systems shall be designed in accordance with the risk assessment. This requirement is met when ISO 13849-1 is used.

5.1.3 The prevention of damage to the machine, system and the environment shall be considered.

5.2 Basic requirements for the design and specification of hydraulic systems

5.2.1 Selection of components and piping

5.2.1.1 All components and piping in the system shall be selected or specified to provide for safety in use, and they shall operate within their rated limits when the system is put to its intended use. Components and piping shall be selected or specified so as to ensure that they can operate reliably under all intended uses of the system. Particular attention shall be paid to the reliability of components and piping that can cause a hazard in the event of their failure or malfunction.

5.2.1.2 Components and piping shall be selected, applied and installed in accordance with the supplier's instructions and recommendations, unless testing or field experience validates other components, applications or installations. Operator manuals for mobile machinery may exclude operation in certain situations.

5.2.1.3 It is recommended that, wherever practicable, components and piping made in conformance with recognized International Standards be used.

5.2.2 Unintended pressures

5.2.2.1 All related parts of the system shall be designed or otherwise protected against foreseeable pressures exceeding the maximum working pressure of a system or the rated pressure of any part of the system if the excessive pressure can cause a hazard.

Any system or part of a system that can be disconnected and sealed so that trapped fluid can be subject to a pressure increase or decrease (e.g. due to the change in a load or the fluid temperature) shall include means for limiting the pressure if the change can cause a hazard.

5.2.2.2 The preferred means of protection against excessive pressure is one or more pressure-relief valves located to limit the pressure in all related parts of the system. Other means, such as pressure-compensator pump controls, may be used to limit main system operating pressure, provided these means ensure safety under all operating conditions.