



## DRAFT INTERNATIONAL STANDARD ISO/DIS 6149-4.2

ISO/TC 131/SC 4

Secretariat: **ANSI**

Voting begins on  
**2002-12-05**

Voting terminates on  
**2003-05-05**

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

# Connections for fluid power and general use — Ports and stud ends with ISO 261 threads and O-ring sealing —

## Part 4:

Dimensions, design, test methods and requirements for external and internal hex port plugs

*Raccordements pour transmissions hydrauliques et pneumatiques et applications générales — Orifices et éléments mâles à filetage ISO 261 et joint torique —*

*Partie 4: Dimensions, conception, méthodes d'essai et prescriptions des bouchons d'orifices à six pans internes et six pans externes*

<https://standards.iteh.ai/catalog/standards/sist/6eacfe56-ef89-4b1d-be2a-c8162e8f0cd6/iso-dis-6149-4-2>

ICS 23.100.40

To expedite distribution, this document is circulated as received from the committee secretariat. ISO Central Secretariat work of editing and text composition will be undertaken at publication stage.

Pour accélérer la distribution, le présent document est distribué tel qu'il est parvenu du secrétariat du comité. Le travail de rédaction et de composition de texte sera effectué au Secrétariat central de l'ISO au stade de publication.

THIS DOCUMENT IS A DRAFT CIRCULATED FOR COMMENT AND APPROVAL. IT IS THEREFORE SUBJECT TO CHANGE AND MAY NOT BE REFERRED TO AS AN INTERNATIONAL STANDARD UNTIL PUBLISHED AS SUCH.

IN ADDITION TO THEIR EVALUATION AS BEING ACCEPTABLE FOR INDUSTRIAL, TECHNOLOGICAL, COMMERCIAL AND USER PURPOSES, DRAFT INTERNATIONAL STANDARDS MAY ON OCCASION HAVE TO BE CONSIDERED IN THE LIGHT OF THEIR POTENTIAL TO BECOME STANDARDS TO WHICH REFERENCE MAY BE MADE IN NATIONAL REGULATIONS.

### Copyright notice

This ISO document is a working draft or committee draft and is copyright-protected by ISO. While the reproduction of working drafts or committee drafts in any form for use by participants in the ISO standards development process is permitted without prior permission from ISO, neither this document nor any extract from it may be reproduced, stored or transmitted in any form for any other purpose without prior written permission from ISO.

Requests for permission to reproduce this document for the purpose of selling it should be addressed as shown below or to ISO's member body in the country of the requester:

*Copyright Manager  
ISO Central Secretariat  
1 rue de Varembé  
1211 Geneva 20 Switzerland  
tel. + 41 22 749 0111  
fax + 41 22 734 1079*

*internet: iso@iso.ch*

Reproduction for sales purposes may be subject to royalty payments or a licensing agreement.

Violators may be prosecuted.

## iTeh STANDARD PREVIEW (standards.iteh.ai)

[ISO/DIS 6149-4.2](https://standards.iteh.ai/catalog/standards/sist/6eacfe56-ef89-4b1d-be2a-c8162e8f0cd6/iso-dis-6149-4-2)

<https://standards.iteh.ai/catalog/standards/sist/6eacfe56-ef89-4b1d-be2a-c8162e8f0cd6/iso-dis-6149-4-2>

## Contents

Page

Foreword .....	iv
Introduction.....	v
1 Scope .....	1
2 Normative references.....	1
3 Terms and definitions .....	2
4 Dimensions .....	2
4.1 Plug dimensions.....	2
4.2 Hex tolerances .....	2
4.3 Screw threads .....	2
5 Requirements.....	2
5.1 Working pressures and working temperatures.....	2
5.2 Performance.....	3
6 O-rings.....	3
7 Test methods .....	3
8 Designation of port plugs.....	3
9 Identification .....	4
10 Manufacture .....	4
10.1 Construction .....	4
10.2 Workmanship.....	4
10.3 Finish .....	4
11 Procurement information .....	4
12 Marking.....	4
13 Identification statement (Reference to this part of ISO 6149).....	4
Bibliography.....	11

## 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.

International Standard ISO 6149-4 was prepared by Technical Committee ISO/TC 131, *Fluid power systems*, Subcommittee SC 4, *Connectors and similar products and components*.

ISO 6149 consists of the following parts, under the general title: *Connections for fluid power and general use — Ports and stud ends with ISO 261 metric threads and O-ring sealing*

- Part 1: *Ports with O-ring seal in truncated housing*
- Part 2: *Dimensions, design, test methods and requirements for heavy-duty (S series) stud ends*
- Part 3: *Dimensions, design, test methods and requirements for light-duty (L series) stud ends*
- Part 4: *Dimensions, design, test methods and requirements for external hex and internal hex port plugs*

## Introduction

In fluid power systems, power is transmitted and controlled through a fluid (liquid or gas) under pressure within an enclosed circuit. In general applications, a fluid may be conveyed under pressure.

Components are connected through their threaded ports by stud ends on fluid conductor connectors to tubes and pipes or to hose fittings and hoses. Fluid ports are closed by inserting a plug in the port.

## iTeh STANDARD PREVIEW (standards.iteh.ai)

[ISO/DIS 6149-4.2](https://standards.iteh.ai/catalog/standards/sist/6eacfe56-ef89-4b1d-be2a-c8162e8f0cd6/iso-dis-6149-4-2)

<https://standards.iteh.ai/catalog/standards/sist/6eacfe56-ef89-4b1d-be2a-c8162e8f0cd6/iso-dis-6149-4-2>

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[ISO/DIS 6149-4.2](#)

<https://standards.iteh.ai/catalog/standards/sist/6eacfe56-ef89-4b1d-be2a-c8162e8f0cd6/iso-dis-6149-4-2>

# Connections for fluid power and general use — Ports and stud ends with ISO 261 threads and O-ring sealing —

## Part 4:

## Dimensions, design, test methods and requirements for external and internal hex port plugs

### 1 Scope

This part of ISO 6149 specifies dimensions and performance requirements for metric external hex and internal hex port plugs for use with ISO 6149-1 ports.

Port plugs in accordance with this part of ISO 6149 may be used at working pressures up to 63 MPa (630 bar<sup>1</sup>). The permissible working pressure depends upon the plug end size, materials, design, working conditions, application, etc.

Conformance to the dimensional information in this part of ISO 6149 does not guarantee rated performance. Each manufacturer should perform testing according to the specification contained in this part of ISO 6149 to assure that components comply with the performance ratings.

### 2 Normative references

ISO/DIS 6149-4.2

<https://standards.iteh.ai/catalog/standards/sist/6eacfe56-ef89-4b1d-be2a-c0162e810c00/iso-dis-6149-4.2>

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 48, *Rubber, vulcanized or thermoplastic — Determination of hardness (hardness between 10 IRHD and 100 IHRD)*.

ISO 261, *ISO general-purpose metric screw threads — General plan*

ISO 1629, *Rubber and lattices — Nomenclature*

ISO 3601-3, *Fluid systems — Sealing devices — O-rings — Part 3: Quality acceptance criteria*

ISO 4042, *Fasteners — Electroplated coatings*

ISO 4759-1, *Tolerances for fasteners — Part 1: Bolts, screws and nuts with thread diameters between 1,6 (inclusive) and 150 mm (inclusive) and product grades A, B, and C*

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

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

<sup>1</sup>) 1 bar = 0,1 MPa = 10<sup>5</sup> Pa; 1 MPa = 1 N/mm<sup>2</sup>.

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

ISO 7789, *Hydraulic fluid power — Two-, three- and four-port screw-in cartridge valves — Cavities*

ISO 8434-5, *Metallic tube connections for fluid power and general use — Part 5: Test methods for threaded hydraulic fluid power connections*

ISO 9227, *Corrosion tests in artificial atmospheres — Salt spray tests*

ISO 10683, *Fasteners — Non-electrolytically applied zinc flake coatings*

### 3 Terms and definitions

For the purpose of this part of ISO 6149, the terms and definitions given in ISO 5598 and the following apply.

#### 3.1 plug

Stud end with no through hole for fluid passage, used to contain hydraulic fluid.

### 4 Dimensions

#### 4.1 Plug dimensions

External hex and internal hex plugs shall conform to the dimensions shown in figures 1 and 2 and given in tables 1 and 2 respectively.

iTeh STANDARD PREVIEW  
(standards.iteh.ai)

[ISO/DIS 6149-4.2](#)

<https://standards.iteh.ai/catalog/standards/sist/6eacfe56-ef89-4b1d-be2a-c8162e8f0cd6/iso-dis-6149-4-2>

#### 4.2 Hex tolerances

External hex tolerances across flats shall be in accordance with ISO 4759-1, product grade B. Minimum across corner dimensions are 1,092 times the nominal width across flats. The minimum side flat is 0,43 times the nominal width across flats.

Internal hex tolerances shall be to ISO 4759-1, product grade A.

#### 4.3 Screw threads

The screw threads on the plug shall be metric screw threads conforming to ISO 261, class 6g.

### 5 Requirements

#### 5.1 Working pressures and working temperatures

External hex and internal hex plugs conforming to this part of ISO 6149 shall be suitable for use at the working pressures given in table 3 when used at temperatures between  $-40\text{ }^{\circ}\text{C}$  and  $+120\text{ }^{\circ}\text{C}$ . For use at pressures and/or temperatures outside of this range, the manufacturer shall be consulted.

NOTE Connectors conforming to this part of ISO 6149 may contain elastomeric seals. Unless otherwise specified, connectors are made and delivered with elastomeric seals for use within the specified working temperature range with petroleum base hydraulic fluids. The use of these connectors and elastomeric seals with other hydraulic fluids may result in a reduced working temperature range or may render the connectors unsuitable for the application. Manufacturers may supply, upon request, connectors with elastomeric seals for use with hydraulic fluids other than petroleum base hydraulic fluids which will meet the specified working temperature range of the connectors.



## 5.2 Performance

External hex and internal hex plugs conforming to this part of ISO 6149 shall meet the burst and impulse pressures given in table 3, and shall be capable of withstanding a vacuum of 6,5 kPa (0,065 bar) absolute pressure when tested in accordance with clause 7.

## 6 O-rings

Unless otherwise specified, for use at the pressure and temperature requirements in 5.1 and table 3 and for testing, the O-rings shall

- be made of NBR (nitrile) with a hardness of  $(90 \pm 5)$  IRHD, measured in accordance with ISO 48,
- conform to the dimensions shown in figure 3 and given in table 4, and
- meet or exceed the O-ring quality acceptance criteria for grade N of ISO 3601-3.

Tolerances on O-ring dimensions shall be in accordance with ISO 6149-2.

## 7 Test methods

Port plug tests shall be conducted in accordance with ISO 8434-5 for burst, cyclic endurance (impulse) and vacuum. The qualification test torques given in table 5 shall be used in testing. Test results shall be reported on the test data form in ISO 8434-5.

## 8 Designation of port plugs ISO/DIS 6149-4.2

<https://standards.iteh.ai/catalog/standards/sist/6eacfe56-ef89-4b1d-be2a->

Port plugs shall be designated by an alphanumeric code to facilitate ordering. They shall be designated by the word Plug, then a space, followed by ISO 6149-4, then a hyphen, followed by the shape code EH for external hex or IH for internal hex, followed a hyphen, followed by the plug size, followed by the O-ring code O for plugs delivered with an O-ring. If desired, the code can be supplemented by a hyphen followed by the O-ring material code in accordance with ISO 1629, followed by a hyphen, followed by the plating code in accordance with ISO 4042 or ISO 10683.

EXAMPLE 1 Plug with an external hex for an ISO 6149-1 port size M12 x 1,5 shall be designated as follows:

Plug ISO 6149-4-EH-M12.

EXAMPLE 2 Plug with an external hex for an ISO 6149-1 port size M12 x 1,5, ordered assembled with an O-ring that conforms to the requirements of clause 6 shall be designated as follows:

Plug ISO 6149-4-EH-M12-O.

EXAMPLE 3 Plug with an external hex for an ISO 6149-1 port size M12 x 1,5, ordered assembled with an O-ring that conforms to the requirements of clause 6 but made of FPM instead of NBR shall be designated as follows:

Plug ISO 6149-4-EH-M12-FPM

EXAMPLE 4 Plug with an external hex for an ISO 6149-1 port size M12 x 1,5, ordered assembled with an O-ring that conforms to the requirements of clause 6 but made of FPM instead of NBR and zinc plated in accordance with ISO 4042 shall be designated as follows:

Plug ISO 6149-4-EH-M12-FPM-A3C