

DRAFT INTERNATIONAL STANDARD ISO/DIS 1179-3

ISO/TC 131/SC 4

Secretariat: ANSI

Voting begins on 2001-10-25

Voting terminates on 2002-03-25

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • MEXICITIAN OPPAHU3ALUN IN CTAHDAPTU3ALUN • ORGANISATION INTERNATIONALE DE NORMALISATION

# Connections for general use and fluid power — Ports and stud ends with ISO 228-1 threads with elastomeric or metal-to-metal sealing—

## **Part 3:**

Light-duty (L series) stud ends with sealing by O-ring with retaining ring (types G and H)

(Revision in parts of ISO 1179:1981)

Raccordements pour applications générales et transmissions hydrauliques et pneumatiques — Orifices et éléments mâles à filetage ISO 228-1 et joint en élastomère ou étanchéité métal sur métal —

Partie 3: Éléments mâles série légère (sèrie L) avec étanchéité par joint torique et bague de retenue (types G et H)

ISO/DIS 1179-3 https://standards.iteh.ai/catalog/standards/sist/e7d2ccef-86a5-4ba2-b2cfa0d128712eaf/iso-dis-1179-3

ICS 23.100.40

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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.

International Standard ISO 1179 was prepared by a joint working group between Technical Committee ISO/TC 5, Ferrous metal pipes and metallic fittings, and Technical Committee ISO/TC 131, Fluid power systems.

ISO 1179 consists of the following parts, under the general title Connections for general use and fluid power - Ports and stud ends with ISO 228-1 threads with elastomeric or metal-to-metal sealing.

- Part 1: Threaded ports

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- Part 2: Heavy-duty (S series) and light-duty (L series) stud ends with elastomeric sealing (type E) standards.iten.ai)
- Part 3: Light-duty (L series) stud ends with sealing by O-ring with retaining ring (types G and H)

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- Part 4: Stud ends for general use only with metal-to-metal sealing (type B) a5-4ba2-b2cf-

a0d128712eaf/iso-dis-1179-3 The four parts of ISO 1179 constitute a revision of and replace ISO 1179:1981. This revision defines performance requirements, dimensions and designs for port and stud end connections for heavy-duty (S series) in parts 2 and 4 and light-duty (L series) in parts 2 and 3. Significant testing through more than 30 years of use has confirmed the performance requirements of connection ends made from carbon steel. The stud end connections specified in ISO 1179 parts 2, 3 and 4 apply to fittings detailed in ISO 8434 parts 1, 2 and 4.

Annex A of this standard is normative.

### Introduction

In fluid power systems, power is transmitted and controlled through a fluid (liquid or gas) under pressure within a circuit. In general applications, a fluid may be conveyed under pressure. Components are connected through their threaded ports by stud ends on fluid conductor fittings to tubes and pipes or to hose fittings and hoses.

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## Connections for general use and fluid power — Ports and stud ends with ISO 228-1 threads with elastomeric or metal-to-metal sealing — Part 3: Light-duty (L series) stud ends with sealing by O-ring with retaining ring (types G and H)

#### 1 Scope

This part of ISO 1179 specifies dimensions, performance requirements and test procedures for non-adjustable and adjustable light-duty (L series) stud ends with ISO 228-1 threads with sealing by O-ring with retaining ring (types G and H, respectively).

Light-duty (L series) stud ends in accordance with this part of ISO 1179 may be used at working pressures up to 31,5 MPa (315 bar) for non-adjustable stud ends (type G) and up to 20 MPa (200 bar) for adjustable stud ends (type H). The permissible working pressure depends upon size, materials, design, working conditions, application, etc.

For threaded ports and stud ends for use in new designs in hydraulic fluid power applications, only ISO 6149 shall be used. Threaded ports and stud ends in accordance with ISO 1179, ISO 9974 and ISO 11926 shall not be used for new design in hydraulic fluid power applications.

For threaded ports and stud ends for use in new designs in pneumatic fluid power applications, only ISO 16030 shall be used... Threaded ports and stud ends in accordance with this edition of ISO 1179 may not be interchangeable with those in accordance with ISO 1179:1981 and shall not be interchanged with threaded ports and stud ends in accordance with ISO 16030.

Conformance to the dimensional information in this standard does not guarantee rated performance. Each manufacturer shall perform testing according to the specification contained in this standard to assure that components made to this standard comply with the performance ratings.

#### 2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 1179. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 1179 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 48, Rubber, vulcanized or thermoplastic – Determination of hardness (hardness between 10 and 100 IRHD)

ISO 228-1, Pipe threads where pressure-tight joints are not made on the threads – Part 1: Dimensions, tolerances and designation

ISO 228-2, Pipe threads where pressure-tight joints are not made on the threads – Part 2: Verification by means of limit gauges

ISO 1179-1:--<sup>1)</sup>, Connections for general use and fluid power – Ports and stud ends with ISO 228-1 threads with elastomeric or metal-to-metal sealing – Part 1: Threaded ports

ISO 1179-2:--<sup>1)</sup>, Connections for general use and fluid power – Ports and stud ends with ISO 228-1 threads with elastomeric or metal-to-metal sealing – Part 2: Heavy-duty (S series) and light-duty (L series) stud ends with elastomeric sealing (type E)

ISO 1179-4:--<sup>1)</sup>, Connections for general use and fluid power – Ports and stud ends with ISO 228-1 threads with elastomeric or metal-to-metal sealing – Part 4: Stud ends for general use only with metal-to-metal sealing (type B)

ISO 3448, Industrial liquid lubricants – ISO viscosity classification

ISO 3601-3, Fluid systems – Sealing devices – O-rings – Part 3: Quality acceptance criteria (under revision)

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 6508, Metallic materials – Hardness test – Rockwell test (scales A- B- C- D- E- F- G- H- K)

ISO 6803, Rubber or plastics hoses and hose assemblies – Hydraulic-pressure impulse test without flexing

ISO 8434-5, Metallic tube connections for fluid power and general use – Part 5: Test methods for threaded hydraulic fluid power connections (under revision)

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3 Terms and definitions

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For the purposes of this part of ISO 1179-3, the terms and definitions given in ISO 5598 and the following apply:

#### 3.1

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#### adjustable stud end connector

stud end connector that allows for fitting orientation through final tightening of the locknut to complete the connection. This type of stud end is typically used on shaped fittings (e.g. tees, crosses and elbows).

#### 3.2

#### non-adjustable stud end connector

stud end connector that does not require specific orientation before final tightening of the connection because it is only used on straight fittings.

#### 4 Stud end size specification

The stud ends shall be specified by ISO 1179-3 and the thread size, separated by a colon, for example, ISO 1179-3:G 3/8 A, which specifies an ISO 1179-3 stud end with a G 3/8 thread per ISO 228-1. The O-ring shall be specified by the thread size of the stud end with which it is used followed by the word "O-ring," for example, ISO 1179-3:G 1/8 O-ring. The retaining ring shall also be specified by the thread size of the stud end with which it is used followed by the stud end with which it is used followed by the words "retaining ring," for example, ISO 1179-3:G 1/4 retaining ring.

<sup>1)</sup> To be published.

#### **5** Requirements

#### 5.1 Dimensions

Light-duty (L series) type G and type H stud ends, locknuts and washers shall conform to the dimensions given in figures 1 and 2 and table 1. Hex tolerances across flats shall be according to ISO 4759-1, product grade C.

#### 5.2 Working pressure

Light-duty (L series) stud ends (types G and H) made of low carbon steel shall be designed for use at the working pressures given in table 2.

#### 5.3 Performance

Light-duty (L series) stud ends made of low carbon steel shall meet or exceed the burst and impulse pressures given in table 2, when tested according to clause 7.

#### 5.4 Adjustable stud end back-up washer flatness and fit

The back-up washer shall be clinched to the stud end with a tight slip fit to an interference fit. The slip fit shall be tight enough so that the washer cannot be shaken loose to cause it to drop from its uppermost position by its own weight. The locknut torque needed to move the washer at the maximum washer interference fit shall not exceed the torques given in table 3.

Any back-up washer surface that is out of flatness shall be uniform (i.e., not wavy) and concave with respect to the stud end of type H stud ends only and shall conform to the allowance given in table 3.

#### 6 Sealing

#### <u>ISO/DIS 1179-3</u>

#### https://standards.iteh.ai/catalog/standards/sist/e7d2ccef-86a5-4ba2-b2cf-

O-rings and retaining rings for use with light-duty (Leseries) stud ends shall conform to the dimensions given in figures 2 and 3 and tables 4 and 5. Figures 4 and 5 show the correct assembly of the stud end with O-ring and retaining ring.

#### 7 Test methods

NOTE 1 Parts used for cyclic endurance or burst test shall not be tested further, used or returned to stock.

NOTE 2 This test procedure conforms to that described in ISO 8434-5.

#### 7.1 Burst pressure test

#### 7.1.1 Principle

Three samples shall be tested to confirm that light-duty (L series) stud ends meet or exceed a ratio of 4:1 between the burst and working pressures.

#### 7.1.2 Materials

#### 7.1.2.1 Test block and stud ends

Test blocks shall be unplated and hardened to 50-55 HRC per ISO 6508. Stud ends shall be made from low carbon steel and plated.

#### 7.1.2.2 Test seals

Unless otherwise specified, seals shall be made from nitrile (NBR) rubber with a hardness of  $90 \pm 5$  IRHD when measured per ISO 48. Seals shall conform to the dimensions given in tables 4 and 5, and O-rings shall meet or exceed the quality requirement grade N in ISO 3601-3.

#### 7.1.3 Procedure

#### 7.1.3.1 Thread lubrication

For testing only, threads and contact surfaces shall be lubricated with hydraulic oil with a viscosity of VG 32 per ISO 3448 prior to the application of torque.

#### 7.1.3.2 Stud end torque

Stud ends shall be tested after application of the torques given in table 7. Adjustable stud end locknut torques shall be applied after the stud end has been backed out one full turn from finger tight position, to correctly test the worst possible actual assembly conditions.

#### 7.1.3.3 Pressure rise rate

During the burst test, the rate of pressure rise rate shall not exceed 138 MPa (1 380 bar) per minute.

#### 7.1.4 Test report

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Test results and conditions shall be reported on the test data form in annex A. (standards.iteh.ai)

#### 7.2 Cyclic endurance (impulse) test

# ISO/DIS 1179-3 7.2.1 Principle https://standards.iteh.ai/catalog/standards/sist/e7d2ccef-86a5-4ba2-b2cf

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Six samples, when tested at their respective impulse pressures, shall pass a cyclic endurance test of 1 000 000 cycles.

#### 7.2.2 Materials

Use the same materials as per 7.1.2.

#### 7.2.3 Procedure

#### 7.2.3.1 Thread lubrication

Apply lubricant per 7.1.3.1.

#### 7.2.3.2 Stud end torques

Apply torque per 7.1.3.2.

#### 7.2.3.3 Cycle and pressure rise rate

Cycle rate shall be uniform at 0,5 to 1,3 Hz and shall conform to the wave pattern shown in ISO 6803, except the pressure rise rate shall be adjusted accordingly.

#### 7.2.4 Test report

Test results and conditions shall be reported on the test data form in annex A.

#### 8 Identification statement (reference to this part of ISO 1179)

Use the following statement in test reports, catalogues and sales literature when electing to comply with this part of ISO 1179:

"Light-duty (L series) stud end conforms to ISO 1179-3, Connections for general use and fluid power – Ports and stud ends with ISO 228-1 threads with elastomeric or metal-to-metal sealing – Part 3: Light-duty (L series) stud end with sealing by O-ring with retaining ring (types G and H)."

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