INTERNATIONAL STANDARD

ISO 1179-3

First edition
2007-08-15

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)

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 (série L) avec étanchéité par joint torique et bague de retenue (types G et H)

Reference number
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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 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 1179-3 was prepared by Technical Committee ISO/TC 131, *Fluid power systems*, Subcommittee SC 4, *Connectors and similar products and components*.

This first edition of ISO 1179-3, together with ISO 1179-1, ISO 1179-2 and ISO 1179-4, cancels and replaces ISO 1179:1981 which has been technically revised.

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*

— *Part 2: Heavy-duty (S series) and light-duty (L series) stud ends with elastomeric sealing (type E)*

— *Part 3: Light-duty (L series) stud ends with sealing by O-ring with retaining ring (types G and H)*

— *Part 4: Stud ends for general use only with metal-to-metal sealing (type B)*

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 fluid conductor connectors to tubes and pipes or to hose fittings and hoses.

For threaded ports and stud ends specified in new designs in hydraulic fluid power applications, ISO/TC 131/SC 4 recommends that the ISO 6149 series be used because these International Standards specify ports and stud ends with metric threads and O-ring sealing and because the sub-committee would like to help users by recommending one preferred system. ISO/TC 131/SC 4 further recommends that threaded ports and stud ends in accordance with the ISO 1179 series, ISO 9974 series and ISO 11926 series not be used for new designs in hydraulic fluid power applications; these International Standards will be maintained because they specify ports and stud ends that are currently used in hydraulic systems worldwide.

For threaded ports and stud ends specified in new designs in pneumatic fluid power applications, ISO/TC 131/SC 4 recommends that ISO 16030 be used, except where products are to interface with ISO 7-1 threads, because the sub-committee would like to help users by recommending one preferred system. ISO/TC 131/SC 4 further recommends that threaded ports and stud ends in accordance with the ISO 1179 series not be used for new designs in pneumatic fluid power applications; these International Standards will be maintained because they specify ports and stud ends that are currently used in pneumatic systems worldwide.

Significant testing over 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 connectors detailed in ISO 8434 parts 1, 2 and 4.

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.

Conformance to the dimensional information in this part of ISO 1179 does not guarantee rated performance. Each manufacturer shall perform testing according to the specification contained in this part of ISO 1179 to assure that components made to this part of ISO 1179 comply with the performance ratings.

NOTE 1 This part of ISO 1179 applies to connectors detailed in ISO 8434-2.

NOTE 2 The introduction of this part of ISO 1179 gives recommendations for ports and stud ends to be used for new designs in hydraulic and pneumatic fluid power applications.

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

ISO 3601-3:2005, *Fluid power systems — O-rings — Part 3: Quality acceptance criteria*

ISO 4759-1:2000, *Tolerances for fasteners — Part 1: Bolts, screws, studs and nuts — Product grades A, B and C*

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

ISO 19879, *Metallic tube connections for fluid power and general use — Test methods for hydraulic fluid power connections*

3 Terms and definitions

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

3.1
adjustable stud end connector
stud end connector that allows for connector orientation through final tightening of the locknut to complete the connection

NOTE This type of stud end is typically used on shaped connectors (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 connectors

4 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. Hexagonal tolerances across flats shall be in accordance with ISO 4759-1:2000, product grade C.

5 Requirements

5.1 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.

5.2 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 in accordance with Clause 7 and assembled using the torques listed in Table 6.

5.3 Flatness and fit of adjustable stud end back-up washers

The 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 under its own weight. The locknut torque needed to move the washer at the maximum washer interference fit shall not exceed the torques listed in Table 3.

Any 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

O-rings and retaining rings for use with light-duty (L series) stud ends shall conform to the dimensions given in Figures 3 and 4 and Tables 4 and 5. Figures 5 and 6 show the correct assembly of the stud end with O-ring and retaining ring.

7 Test methods

7.1 Burst pressure test (failure 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 in accordance with the requirements specified in ISO 19879. Stud ends shall be made from low carbon steel and be plated.

7.1.2.2 Test seals

Unless otherwise specified, test seals shall meet the requirements specified in ISO 19879. 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 3601-3:2005.

7.1.3 Procedure

7.1.3.1 Thread lubrication

For testing only, threads and contact surfaces shall be lubricated in accordance with the requirements of ISO 19879.

7.1.3.2 Stud end torque

Stud ends shall be tested after application of the torques given in Table 6. 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

The rate of pressure rise shall be in accordance with the requirements of ISO 19879.

7.2 Cyclic endurance (impulse) test

7.2.1 Principle

Six samples, when tested at their respective impulse pressures, shall pass a cyclic endurance test of 1 000 000 cycles without leakage or component failure.

7.2.2 Materials

Use the same materials as specified in 7.1.2.

7.2.3 Procedure

7.2.3.1 Thread lubrication

Apply lubricant as specified in 7.1.3.1.

7.2.3.2 Stud end torques

Apply torque as specified in 7.1.3.2.

7.2.3.3 Cycle and pressure rise rate

The cycle rate shall be in accordance with the requirements of ISO 19879, except the rate of pressure rise shall be adjusted accordingly.

7.3 Test report

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

7.4 Re-use of components

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

8 Designation of stud ends

8.1 Stud ends shall be designated by:

a) "Stud end";

b) reference to this part of ISO 1179, i.e. ISO 1179-3;

c) thread size;

d) a letter "G" to designate type G sealing or letter "H" to designate type H sealing.

EXAMPLE A stud end with a G 3/8 A thread in accordance with ISO 228-1 with type G sealing is designated as follows:

Stud end ISO 1179-3 - G 3/8 A - G

8.2 The O-ring shall be designated by the word "O-ring," followed by "ISO 1179-3", followed by the thread size of the stud end with which it is used. Retaining ring shall be designated by the phrase "Retaining ring", followed by ISO 11793", followed by the thread size of the stud end with which it is used.

EXAMPLE 1 An O-ring for use with a size G 1/8 A stud end in accordance with ISO 1179-3 is designated as follows:

O-ring ISO 1179-3 - G 1/8

EXAMPLE 2 A retaining ring for use with a size G 1/4 A stud end in accordance with ISO 1179-3 is designated as follows:

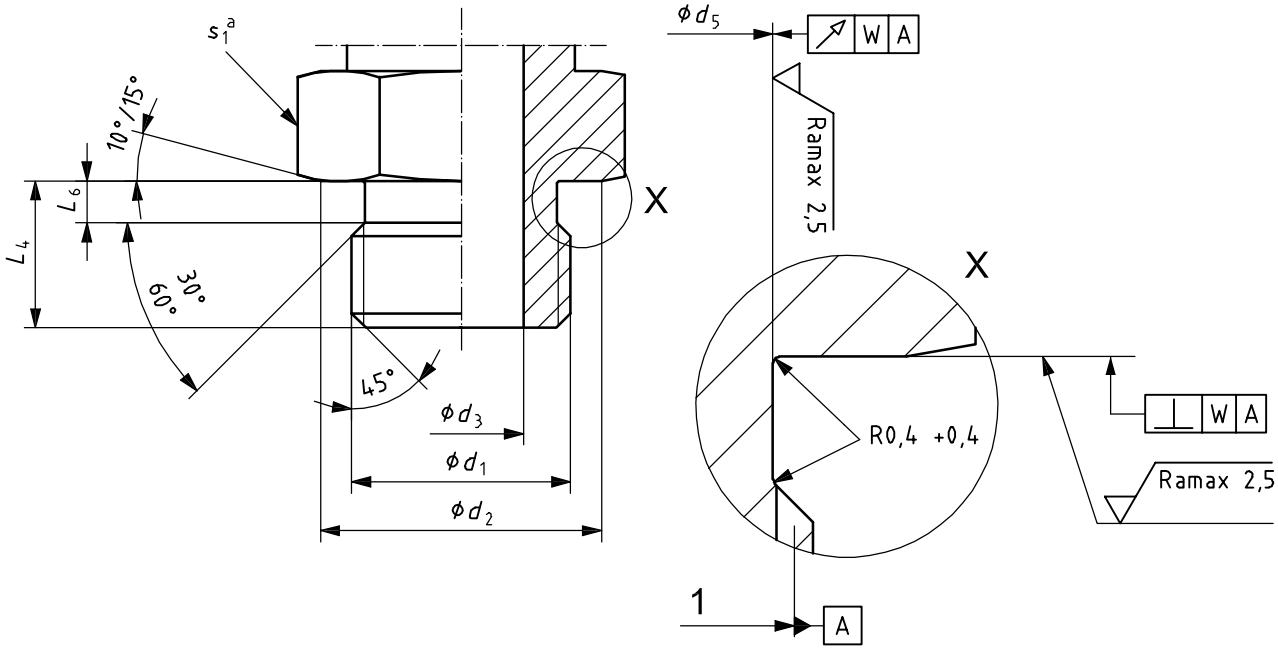
Retaining ring ISO 1179-3 - G 1/4

9 Identification statement (reference to this part of ISO 1179)

It is strongly recommended to manufacturers who have chosen to conform to this part of ISO 1179 that the following statement be used in test reports, catalogues and sales literature.

"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)*".

Dimensions in millimetres,
surface roughness values in micrometres



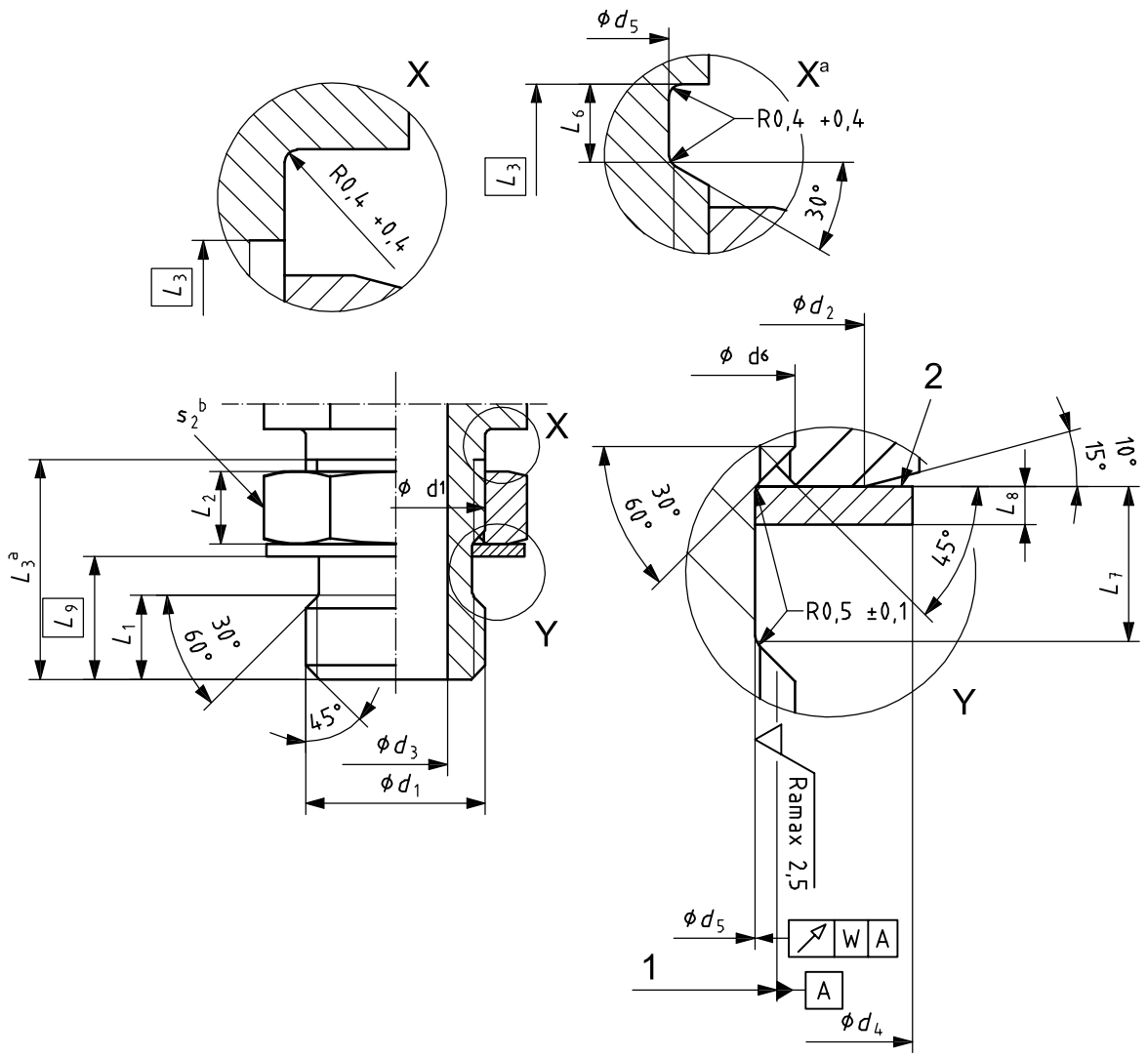
Key

1 thread pitch diameter

a Dimension across the flats.

Figure 1 — ISO 1179-3 light-duty (L series) non-adjustable stud end — Type G

Dimensions in millimetres,
surface roughness values in micrometres



Key

1 thread pitch diameter

2 back-up washer (see 5.3)

a Optional construction.

b Dimension across the flats.

Figure 2 — ISO 1179-3 light-duty (L series) adjustable stud end — Type H

Table 1 — Dimensions of ISO 1179-3 light-duty (L series) stud ends — Types G and H

Dimensions in millimetres

Thread size d_1	d_2 $^{0}_{-0,4}$	Maximum drill size d_3 nom.	tol.	d_4 ± 0,4	d_5 $^{0}_{-0,1}$	d_6 $^{+0,4}_{0}$	L_1 ± 0,2	L_2 ± 0,2	L_3 ref.	L_4 ± 0,2	L_6 $^{0}_{-0,3}$	L_7 ± 0,1	L_8 ± 0,08	L_9 ref.	s_1 hex	s_2 hex	W
G 1/8 A	13,8	4,4	± 0,1	16,7	8,27	9,8	6	5,6	16	7,6	1,8	3,4	0,9	8,5	14	14	0,1
G 1/4 A	18,8	7,5	± 0,2	20,2	11,11	13,3	8	7,1	20	11,2	3,2	4,1	0,9	11,2	19	19	0,1
G 3/8 A	21,8	9,9	± 0,2	24	14,47	16,8	8	7,1	20	11,2	3,2	4,1	1,0	11,1	22	22	0,1
G 1/2 A	29,8	12,3	± 0,2	29,1	18,20	21,1	10	8,6	26,1	14,5	3,2	6,1	1,2	14,9	30	27	0,1
G 3/4 A	35,8	15,5	± 0,2	36,4	23,71	26,5	10	8,6	26,1	14,5	3,2	6,1	1,2	14,9	36	36	0,2
G 1 A	45,8	21,5	± 0,2	45,6	29,88	33,3	12	11,9	30	18,6	3,8	6,5	1,2	17,3	46	41	0,2
G 1 1/4 A	49,8	27,5	± 0,2	53,5	38,42	42	12	11,9	30	18,6	3,8	6,5	1,2	17,3	50	50	0,2
G 1 1/2 A	54,8	33,0	± 0,3	60	44,36	47,9	12	11,9	30	18,6	3,8	6,5	1,2	17,3	55	55	0,2

Table 2 — Pressures for ISO 1179-3 light-duty (L series) stud ends — Types G and H [a]

Thread size	Non-adjustable —Type G						Adjustable — Type H					
	Working pressure		Test pressure				Working pressure		Test pressure			
			Burst		Impulse [b]				Burst		Impulse [b]	
	MPa	(bar)	MPa	(bar)	MPa	(bar)	MPa	(bar)	MPa	(bar)	MPa	(bar)
G 1/8 A	31,5	(315)	126	(1 260)	41,9	(419)	20	(200)	80	(800)	26,6	(266)
G 1/4 A	31,5	(315)	126	(1 260)	41,9	(419)	20	(200)	80	(800)	26,6	(266)
G 3/8 A	31,5	(315)	126	(1 260)	41,9	(419)	20	(200)	80	(800)	26,6	(266)
G 1/2 A	25	(250)	100	(1 000)	33,2	(332)	20	(200)	80	(800)	26,6	(266)
G 3/4 A	25	(250)	100	(1 000)	33,2	(332)	20	(200)	80	(800)	26,6	(266)
G 1 A	25	(250)	100	(1 000)	33,2	(332)	20	(200)	80	(800)	26,6	(266)
G 1 1/4 A	16	(160)	64	(640)	21,3	(213)	16	(160)	64	(640)	21,3	(213)
G 1 1/2 A	16	(160)	64	(640)	21,3	(213)	16	(160)	64	(640)	21,3	(213)

[a] These pressures were established using connectors made of low carbon steel and tested in accordance with Clause 7.

[b] Cyclic endurance test pressure.

Table 3 — Nut torque required to move washer and adjustable stud end washer flatness for ISO 1179-3 light-duty (L series) stud ends — Type H only

Thread size	Nut torque required to move washer $^{+10\,\%}_{0\,\%}$ Nm	Maximum washer flatness allowance mm
G 1/8 A	3	0,25
G 1/4 A	5	0,25
G 3/8 A	7	0,25
G 1/2 A	12	0,25
G 3/4 A	15	0,40
G 1 A	20	0,40
G 1 1/4 A	25	0,50
G 1 1/2 A	30	0,50

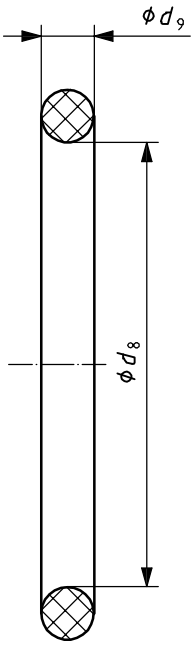


Figure 3 — O-ring for ISO 1179-3 light-duty (L series) stud ends

Table 4 — Dimensions for O-rings for ISO 1179-3 light-duty (L series) stud ends — Types G and H

Dimensions in millimetres

Thread size	Inside diameter d_8		Cross-section diameter d_9	
	nom.	tol.	nom.	tol.
G 1/8 A	7,97	± 0,2	1,88	± 0,08
G 1/4 A	10,77	± 0,2	2,62	± 0,08
G 3/8 A	13,94	± 0,2	2,62	± 0,08
G 1/2 A	17,86	± 0,22	2,62	± 0,08
G 3/4 A	23,47	± 0,24	2,62	± 0,08
G 1 A	29,74	± 0,29	3,53	± 0,09
G 1 1/4 A	37,69	± 0,37	3,53	± 0,09
G 1 1/2 A	44,04	± 0,44	3,53	± 0,09

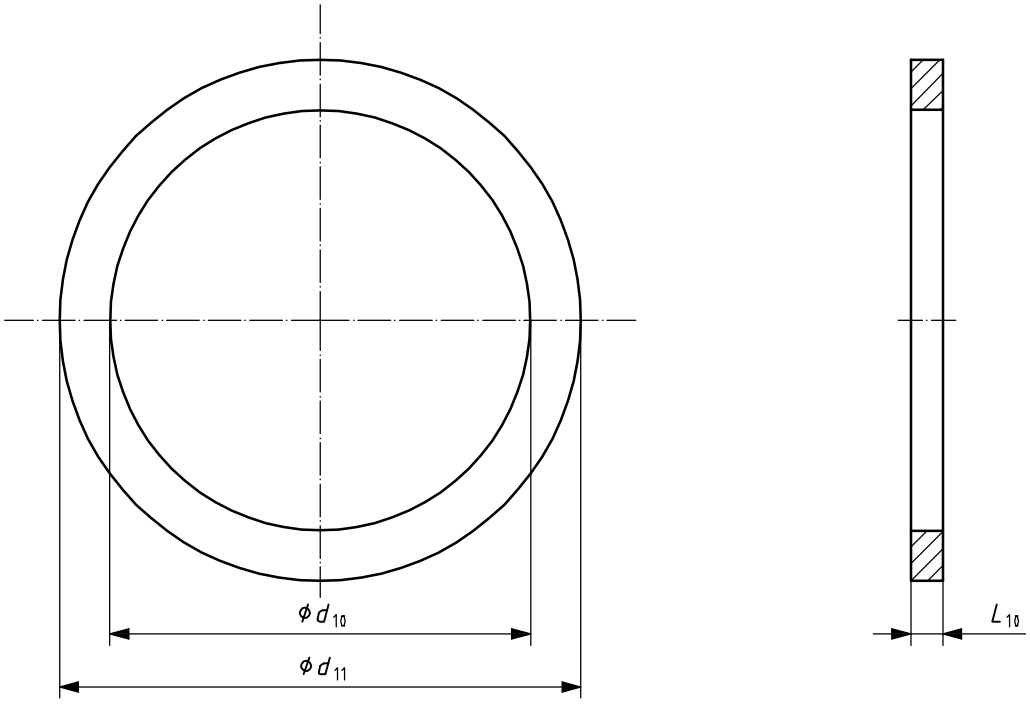
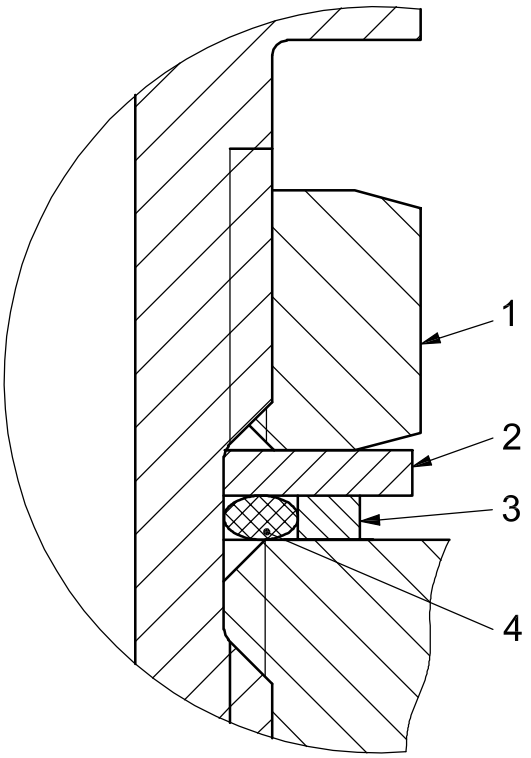


Figure 4 — Retaining ring for ISO 1179-3 light-duty (L series) stud ends — Types G and H

Table 5 — Dimensions for retaining rings for ISO 1179-3 light-duty (L series) stud ends — Types G and H

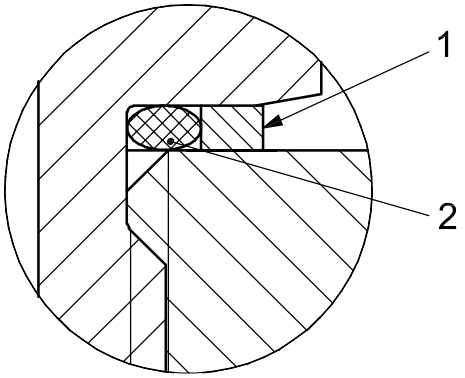
Dimensions in millimetres

Thread size	d_{10} $^{+0,1}_{0}$	d_{11} $\pm 0,1$	L_{10} $^{0}_{-0,1}$
G 1/8 A	12,20	15,0	1,40
G 1/4 A	16,15	19,50	1,90
G 3/8 A	19,50	23,50	1,90
G 1/2 A	23,30	28,50	1,90
G 3/4 A	28,60	34,50	1,90
G 1 A	36,60	43,50	2,60
G 1 1/4 A	44,90	52,50	2,60
G 1 1/2 A	50,90	60,00	2,60



Key
1 locknut
2 back-up washer
3 retaining ring
4 O-ring

Figure 5 — Assembly of adjustable connector



Key
1 retaining ring
2 O-ring

Figure 6 — Assembly of non-adjustable connector

Table 6 — Stud end qualification test torques for ISO 1179-3 light-duty (L series) stud ends — Types G and H

Thread size	Torque Nm + 10 % − 0 %
G 1/8 A	25
G 1/4 A	50
G 3/8 A	80
G 1/2 A	105
G 3/4 A	220
G 1 A	370
G 1 1/4 A	500
G 1 1/2 A	600
NOTE These torque values are for testing only. Assembly tightening torque depends on many factors, including lubrication, coating and surface finish. The manufacturer should be consulted.	

Annex A
(normative)

Test data form for ISO 1179-1 port and ISO 1179-3 stud ends

Stud end specifications:				
Manufacturer		Test facility		
Stud end type		Size		
Minimum material tensile strength			MPa	
Stud end working pressure (see Table 2):			MPa	
Stud end impulse test pressure (see Table 2):			MPa	
Stud end burst test pressure (see Table 2):			MPa	
Qualification test assembly torque (see Table 6):			Nm	

Burst test results: minimum number of samples tested = 3

Sample No.	Pressure at failure	Torque	Hardness	Type of failure
1	MPa	Nm	HRB	
2	MPa	Nm	HRB	
3	MPa	Nm	HRB	

Cyclic endurance test results: minimum number of samples tested = 6

Sample No.	Hardness	Torque	Cycles at failure	Type of failure
1	HRB	Nm		
2	HRB	Nm		
3	HRB	Nm		
4	HRB	Nm		
5	HRB	Nm		
6	HRB	Nm		

Conclusions: Pass/fail, with reason for failure

Dimensions (list any exceptions):	
Name (printed/typed) and signature of person certifying report:	Date:

Bibliography

[1] ISO 7-1, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Dimensions, tolerances and designation*

[2] ISO 1101, *Geometrical Product Specifications (GPS) — Geometrical tolerancing — Tolerances of form, orientation, location and run-out*

[3] ISO 1302, *Geometrical Product Specifications (GPS) — Indication of surface texture in technical product documentation*

[4] 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*

[5] 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*

[6] 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*

[7] ISO 8434-1, *Metallic tube connections for fluid power and general use — Part 1: 24° cone connectors*

[8] ISO 8434-2, *Metallic tube connections for fluid power and general use — Part 2: 37° flared connectors*

[9] ISO 8434-4, *Metallic tube connections for fluid power and general use — Part 4: 24° cone connectors with O-ring weld-on nipples*

[10] ISO 9974-1, *Connections for general use and fluid power — Ports and stud ends with ISO 261 threads with elastomeric or metal-to-metal sealing — Part 1: Threaded ports*

[11] ISO 9974-2, *Connections for general use and fluid power — Ports and stud ends with ISO 261 threads with elastomeric or metal-to-metal sealing — Part 2: Stud ends with elastomeric sealing (type E)*

[12] ISO 9974-3, *Connections for general use and fluid power — Ports and stud ends with ISO 261 threads with elastomeric or metal-to-metal sealing — Part 3: Stud ends with metal-to-metal sealing (type B)*

[13] ISO 11926-1, *Connections for general use and fluid power — Ports and stud ends with ISO 725 threads and O-ring sealing — Part 1: Ports with O-ring seal in truncated housing*

[14] ISO 11926-2, *Connections for general use and fluid power — Port and stud ends with ISO 725 threads and O-ring sealing — Part 2: Heavy-duty (S series) stud ends*

[15] ISO 11926-3, *Connections for general use and fluid power — Port and stud ends with ISO 725 threads and O-ring sealing — Part 3: Light-duty (L series) stud ends*

[16] ISO 16030, *Pneumatic fluid power — Connections — Ports and stud ends*

ICS 23.100.40

Price based on 13 pages