INTERNATIONAL STANDARD

ISO 1179-2

Second edition
2013-11-01

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)

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 2: Éléments mâles de séries légère (série L) et lourde (série S) avec joint en élastomère (type E)

Reference number
ISO 1179-2:2013(E)

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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.

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. www.iso.org/directives

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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

The committee responsible for this document is ISO/TC 131, *Fluid power systems*, Subcommittee SC 4, *Connectors and similar products and components*.

This second edition cancels and replaces the first edition (ISO 1179-2:2007), 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 can 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 subcommittee 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 are 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 subcommittee 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 are maintained because they specify ports and stud ends that are currently used in pneumatic systems worldwide.

Significant testing over more than 35 years of use has confirmed the performance requirements of connection ends made from carbon steel. The stud end connections specified in ISO 1179-2, ISO 1179-3 and ISO 1179-4 apply to connectors detailed in ISO 8434-1, ISO 8434-2 and ISO 8434-4.

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

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

CAUTION — The use of stud ends conforming to this part of ISO 1179 with ports conforming to the relevant parts of ISO 6149, ISO 9974 and ISO 11926 could lead to a hazardous situation.

1 Scope

This part of ISO 1179 specifies dimensions, performance requirements and test procedures for heavy-duty (S series) and light-duty (L series) stud ends with ISO 228-1 threads and the elastomeric sealing (type E) that is used with them.

Heavy-duty (S series) stud ends with type E sealing in accordance with this part of ISO 1179 can be used at working pressures up to 63 MPa (630 bar). Light-duty (L series) stud ends with type E sealing in accordance with this part of ISO 1179 can be used at working pressures up to 25 MPa (250 bar). 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. It is the responsibility of each manufacturer to perform testing according to the specification contained in this part of ISO 1179 in order to ensure 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 8434-1 and 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 documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 286-1, *Geometrical product specifications (GPS) — ISO code system for tolerances on linear sizes — Part 1: Basis of tolerances, deviations and fits*

ISO 286-2, *Geometrical product specifications (GPS) — ISO code system for tolerances on linear sizes — Part 2: Tables of standard tolerance classes and limit deviations for holes and shafts*

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

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)*

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 apply.

4 Dimensions

Heavy-duty (S series) and light-duty (L series) stud ends shall conform to the dimensions given in Figure 1 and Table 2. Hexagonal tolerances across flats shall be a maximum of h12 in accordance with ISO 286-1 and ISO 286-2.

5 Requirements

5.1 Working pressure

Heavy-duty (S series) and light-duty (L series) stud ends made of carbon steel shall be designed for use at the working pressures given in Table 3.

5.2 Performance

Heavy-duty (S series) and light-duty (L series) stud ends made of carbon steel shall meet or exceed the relevant burst and impulse pressures given in Table 3, when tested in accordance with Clause 7 and assembled using the torques listed in Table 5.

6 Elastomeric seals

Elastomeric seals for use with both heavy-duty (S series) and light-duty (L series) stud ends shall conform to the dimensions given in Figure 2 and Table 4. Figure 3 shows the correct assembly of the stud end and elastomeric seal.

7 Test methods

7.1 Burst pressure test (failure pressure test)

7.1.1 Principle

Three samples shall be tested to confirm that heavy-duty (S series) and light-duty (L series) stud ends meet or exceed a ratio of 4:1 between the burst and working pressures without failure.

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 carbon steel and be plated.

7.1.2.2 Test seals

Unless otherwise specified, test seals shall meet the requirements specified in ISO 19879. Test seals shall conform to the dimensions given in Table 4.

7.1.3 Procedures

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 5.

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 Procedures

7.2.3.1 Thread lubrication

Apply lubricant as specified in 7.1.3.1.

7.2.3.2 Stud end torque

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 test 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 1179-2;

c) thread size, followed;

d) the letter symbol for the relevant series.

EXAMPLE A heavy-duty (S series) stud end with a G 3/8 A thread in accordance with ISO 228-1 is designated as follows:

Stud end ISO 1179-2 - G 3/8 A-S

8.2 The elastomeric seal shall be designated in accordance with Table 1.

Table 1 — Designation of elastomeric seals for ISO 1179-2 stud ends

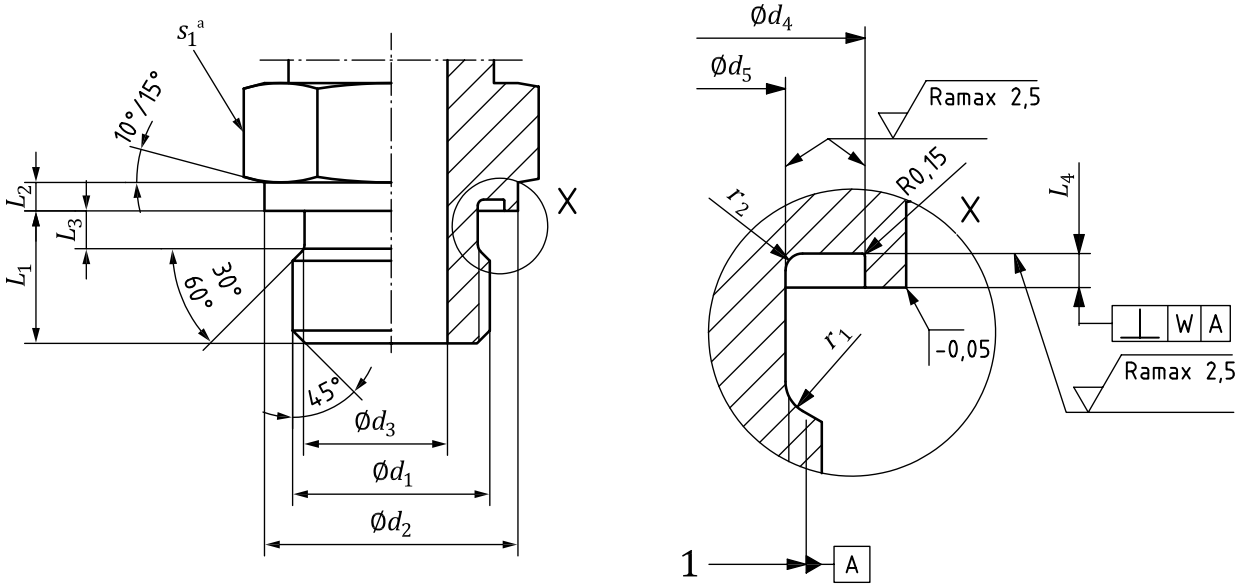
Thread	Designation
G 1/8 A	Elastomeric seal ISO 9974-2 – M10 × 1
G 1/4 A	Elastomeric seal ISO 9974-2 – M14 × 1,5
G 3/8 A	Elastomeric seal ISO 1179-2 – G 3/8 A
G 1/2 A	Elastomeric seal ISO 1179-2 – G 1/2 A
G 3/4 A	Elastomeric seal ISO 9974-2 – M26 × 1,5
G 1 A	Elastomeric seal ISO 9974-2 – M33 × 2
G 1 1/4 A	Elastomeric seal ISO 9974-2 – M42 × 2
G 1 1/2 A	Elastomeric seal ISO 9974-2 – M48 × 2
G 2 A	Elastomeric seal ISO 1179-2:— G 2 A

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.

> "Heavy-duty (S series) or light-duty (L series) stud ends conform to ISO 1179-2, *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)*."

Dimensions in millimetres/Surface roughness values in micrometres



Key

1 thread pitch diameter

a Dimension across the flats.

Figure 1 — Heavy-duty (S series) and light-duty (L series) stud end with elastomeric sealing (type E)

Table 2 — Dimensions for heavy-duty (S series) and light-duty (L series) stud end with elastomeric sealing (type E)

Dimensions in millimetres

Thread d_1[a]	d_2 $^{0}_{-0,2}$	**Inside diameter**[b] d_3				d_4 $^{+0,1}_{0}$	d_5 $^{0}_{-0,2}$	L_1 ±0,2	L_2 min.	L_3 $^{+0,3}_{0}$	L_4 $^{+0,1}_{0}$	r_1 ±0,2	r_2 ±0,1	s_1 hex	W
		L series	**tol.**	**S series**	**tol.**										
G 1/8 A	13,9	4	±0,1	—	—	12	8,3	8	1,5	2	0,7	1	0,5	14	0,1
G 1/4 A	18,9	6	±0,1	5	±0,1	16,6	11,2	12	2	3	1,2	1,2	0,5	19	0,1
G 3/8 A	21,9	9	±0,2	8	±0,2	19	14,7	12	2,5	3	1,2	1,2	0,6	22	0,1
G 1/2 A	26,9	14	±0,2	12	±0,2	24	18,4	14	3	4	1,2	1,2	0,6	27	0,1
G 3/4 A	31,9	18	±0,2	16	±0,2	29,3	23,8	16	3	4	1,2	1,2	0,6	32	0,2
G 1 A	39,9	23	±0,2	20	±0,2	36	29,6	18	3	5	1,6	1,6	0,8	41	0,2
G 1 1/4 A	49,9	30	±0,2	25	±0,2	46	38,6	20	3	5	1,6	1,6	0,8	50	0,2
G 1 1/2 A	54,9	36	±0,3	32	±0,3	51	44,5	22	3	5	1,6	1,6	0,8	55	0,2
G 2 A	74,9	—	±0,3	40	±0,3	66,9	56,4	24	3,5	5	3,4	1,6	0,8	75	0,2

a Size and dimensions in accordance with ISO 228-1.

b Inside diameters smaller than those given in this table can be applied in accordance with other specifications.

Table 3 — Pressures for ISO 1179-2 heavy-duty (S series) and light-duty (L series) stud ends with elastomeric sealing (type E)

Series	Thread size	Working pressure		Test pressures[a]			
				Burst		Impulse[b]	
		MPa	(bar)	MPa	(bar)	MPa	(bar)
L	G 1/8 A	25	(250)	100	(1 000)	33,2	(332)
	G 1/4 A	25	(250)	100	(1 000)	33,2	(332)
	G 3/8 A	25	(250)	100	(1 000)	33,2	(332)
	G 1/2 A	25	(250)	100	(1 000)	33,2	(332)
	G 3/4 A	16	(160)	64	(640)	21,3	(213)
	G 1 A	10	(100)	40	(400)	13,3	(133)
	G 1 1/4 A	10	(100)	40	(400)	13,3	(133)
	G 1 1/2 A	10	(100)	40	(400)	13,3	(133)
S	G 1/4 A	63	(630)	252	(2 520)	83,8	(838)
	G 3/8 A	63	(630)	252	(2 520)	83,8	(838)
	G 1/2 A	40	(400)	160	(1 600)	53,2	(532)
	G 3/4 A	40	(400)	160	(1 600)	53,2	(532)
	G 1 A	40	(400)	160	(1 600)	53,2	(532)
	G 1 1/4 A	25	(250)	100	(1 000)	33,2	(332)
	G 1 1/2 A	25	(250)	100	(1 000)	33,2	(332)
	G 2 A[c]	25	(250)	100	(1 000)	33,2	(332)

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

[b] Cyclic endurance test pressure.

[c] The size G 2 A stud end is used in hydraulic fluid power, mainly in accumulators.

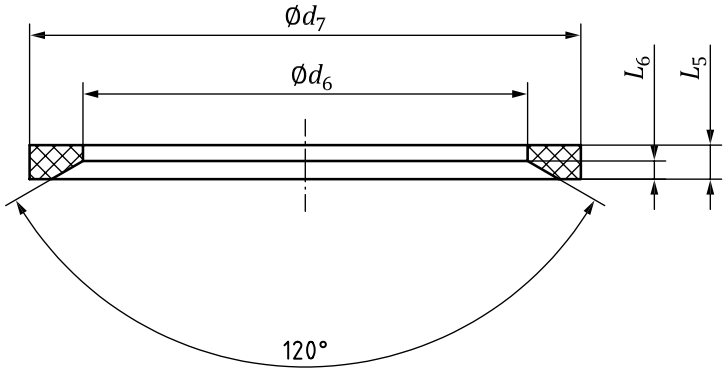


Figure 2 — Elastomeric seal for use with ISO 1179-2 heavy-duty (S series) and light-duty (L series) stud ends

Table 4 — Dimensions of elastomeric seals for use with ISO 1179-2 heavy-duty (S series) and light-duty (L series) stud ends

Dimensions in millimetres

Thread size	d_6		d_7		L_5	L_6 $^{+0,2}_{0}$
	nom.	tol.	nom.	tol.	±0,1	
G 1/8 A[a]	8,4	±0,2	11,9	±0,2	1,0	0,5
G 1/4 A[b]	11,6		16,5		1,5	0,8
G 3/8 A	14,7		18,9		1,5	0,8
G 1/2 A	18,5		23,9		1,5	0,8
G 3/4 A[c]	23,9		29,2		1,5	0,8
G 1 A[d]	29,7	±0,3	35,7	±0,3	2	1,0
G 1 1/4 A[e]	38,8		45,8		2	1,0
G 1 1/2 A[f]	44,7		50,7		2	1,0
G 2 A	56,5		66,5		4	2,0

a Dimensions given for reference only; see ISO 9974-2, elastomeric seal for size M10 × 1.

b Dimensions given for reference only; see ISO 9974-2, elastomeric seal for size M14 × 1,5.

c Dimensions given for reference only; see ISO 9974-2, elastomeric seal for size M26 × 1,5.

d Dimensions given for reference only; see ISO 9974-2, elastomeric seal for size M33 × 2.

e Dimensions given for reference only; see ISO 9974-2, elastomeric seal for size M42 × 2.

f Dimensions given for reference only; see ISO 9974-2, elastomeric seal for size M48 × 2.

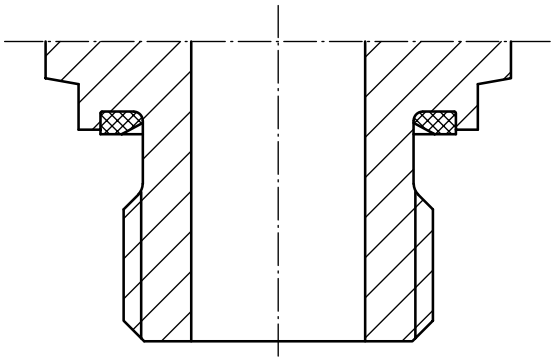


Figure 3 — Correct assembly of elastomeric seal on stud end

Table 5 — Stud qualification test torques

Series	Thread size	Torque N·m +10% –0%
L	G 1/8 A	20
	G 1/4 A	50
	G 3/8 A	80
	G 1/2 A	100
	G 3/4 A	200
	G 1 A	380
	G 1 1/4 A	500
	G 1 1/2 A	600
S	G 1/4 A	60
	G 3/8 A	90
	G 1/2 A	130
	G 3/4 A	200
	G 1 A	380
	G 1 1/4 A	500
	G 1 1/2 A	600
	G 2 A	650
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 1179-2 stud ends

Stud end specifications:				
Manufacturer:		Test facility:		
Stud end type:		Size:		
Minimum material tensile strength:			MPa	
Stud end working pressure (see Table 3):			MPa	
Stud end impulse test pressure (see Table 3):			MPa	
Stud end burst test pressure (see Table 3):			MPa	
Qualification test assembly torque (see Table 5):			Nm	
Burst test results: minimum number of samples tested = 3				
Sample No.	**Torque**	**Hardness**	**Pressure at failure**	**Type of failure**
1	Nm	HRB	MPa	
2	Nm	HRB	MPa	
3	Nm	HRB	MPa	
Cyclic endurance test results: minimum number of samples tested = 6				
Sample no.	**Torque**	**Hardness**	**Cycles at failure**	**Type of failure**
1	Nm	HRB		
2	Nm	HRB		
3	Nm	HRB		
4	Nm	HRB		
5	Nm	HRB		
6	Nm	HRB		
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 degree cone connectors*

[8] ISO 8434-2, *Metallic tube connections for fluid power and general use — Part 2: 37 degree 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*[1)]

[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 9974-3, *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)*

[12] ISO 11926-1, *Connections for general use and fluid power — Ports and stud ends with ISO 263 UN and UNF threads and O-ring sealing — Part 1: Ports with truncated housing for O-ring seal*

[13] ISO 11926-2, *Connections for general use and fluid power — Ports and stud ends with ISO 263 inch threads and O-ring sealing — Part 2: Heavy-duty (S series) stud ends*

[14] ISO 11926-3, *Connections for general use and fluid power — Ports and stud ends with ISO 263 inch threads and O-ring sealing — Part 3: Light-duty (L series) stud ends*

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

1) Withdrawn.

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