BS EN 14420-7:2022
Incorporating corrigendum October 2023

BSI Standards Publication

Hose fittings with clamp units

Part 7: Cam locking couplings

bsi.

National foreword

This British Standard is the UK implementation of EN 14420-7:2022, incorporating corrigendum October 2023. It supersedes BS EN 14420-7:2013, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PRI/66, Rubber and plastics tubing, hoses and hose assemblies.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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31 October 2023	Implementation of CEN corrigendum October 2023: Table 8 corrected

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Hose fittings with clamp units - Part 7: Cam locking couplings

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Schlaucharmaturen mit Klemmfassungen - Teil 7: Hebelarmkupplungen

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Contents

European foreword

This document (EN 14420-7:2022) has been prepared by Technical Committee CEN/TC 218 “Rubber and plastics hoses and hose assemblies”, the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by February 2023, and conflicting national standards shall be withdrawn at the latest by February 2023.

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

This document supersedes EN 14420-7:2013.

In comparison to EN 14420-7:2013, the following changes have been made:

— In Clause 2, the Normative references have been updated;

— The Scope of the document has been changed.

The EN 14420 series, *Hose fittings with clamp units*, consists of the following parts:

— *Part 1: Requirements, types of fixing and connection, designation and testing*

— *Part 2: Hose side parts of hose tail*

— *Part 3: Clamp units, bolted or pinned*

— *Part 4: Flange connections*

— *Part 5: Threaded connections*

— *Part 6: TW tank truck couplings*

— *Part 7: Cam locking couplings*

— *Part 8: Symmetrical half coupling (Guillemin system)*

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Introduction

Cam locking couplings are manufactured worldwide according to the American “military specification” MIL-C-27487. This American standard fixes the coupling side in a limited way, but not the connection side. Other parts like levers, bolts, ring and gaskets are not standardized.

1 Scope

This document specifies the design, materials, dimensions and marking requirements for cam locking couplings that serve as the link between hoses and connections to transport liquids, solids and gases, except liquid gas and steam.

For all sizes of aluminium cast material couplings and for all couplings of size DN 100 the pressure range is from −0,8 bar to 10 bar in the working temperature range from −20 °C to +65 °C. All other couplings according to this document are capable of operating within the pressure range from 0,8 bar[1] to 16 bar in the working temperature range from −20 °C to +65 °C.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

EN 755-2, *Aluminium and aluminium alloys - Extruded rod/bar, tube and profiles - Part 2: Mechanical properties*

EN 1706, *Aluminium and aluminium alloys - Castings - Chemical composition and mechanical properties*

EN 1982, *Copper and copper alloys - Ingots and castings*

EN 10088-1, *Stainless steels - Part 1: List of stainless steels*

EN 10213, *Steel castings for pressure purposes*

EN 10226-1, *Pipe threads where pressure tight joints are made on the threads - Part 1: Taper external threads and parallel internal threads - Dimensions, tolerances and designation*

EN 12420, *Copper and copper alloys - Forgings*

EN 14420-1:2013, *Hose fittings with clamp units - Part 1: Requirements, types of fixing and connection, designation and testing*

EN 14420-2, *Hose fittings with clamp units - Part 2: Hose side parts of hose tail*

EN 14420-5, *Hose fittings with clamp units - Part 5: Threaded connections*

EN 22768-1, *General tolerances - Part 1: Tolerances for linear and angular dimensions without individual tolerance indications (ISO 2768-1)*

EN 22768-2[2], *General tolerances - Part 2: Geometrical tolerances for features without individual tolerance indications (ISO 2768-2)*

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

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1 1 bar = 0,1 MPa.

2 EN 22768-2 has been withdrawn and replaced by EN ISO 22081.

EN ISO 683-1, *Heat-treatable steels, alloy steels and free-cutting steels - Part 1: Non-alloy steels for quenching and tempering (ISO 683-1)*

EN ISO 8330, *Rubber and plastics hoses and hose assemblies - Vocabulary (ISO 8330)*

ISO 272, *Fasteners — Hexagon products — Widths across flats*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 8330 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
DN
nominal size
alphanumeric designation of size for components of a pipework system, which is used for reference purposes, comprised of the letters DN followed by a dimensionless whole number which is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections

Note 1 to entry: The number following the letters DN does not represent a measurable value and is not be used for calculation purposes except where specified in the relevant standard.

Note 2 to entry: In those standards which use the DN designation system, any relationship between DN and component dimensions is to be indicated, e.g. DN/OD or DN/ID.

[SOURCE: EN ISO 6708:1995, 2.1, modified]

3.2
PN
alphanumeric designation used for reference purposes related to a combination of mechanical and dimensional characteristics of a component of a hose fitting

Note 1 to entry: It comprises the letters PN followed by a dimensionless number.

Note 2 to entry: The number following the letters PN does not represent a measurable value and should not be used for calculation purposes except where specified in the relevant standard.

3.3
main gasket
interface gasket between the male and female part of a coupling

3.4
thread gasket
flat faced gasket for threads according to EN ISO 228-1

4 Requirements

4.1 Construction

The curves of the lever and the adapters as well as the dimensions of the main gaskets shall be harmonized such that twisting of the hose and vibrating during operation shall not lead to leakage. Cam arms shall be manually operable.

Cam arms shall be suitable to operate without using tools.

For gauges for cam-locking couplings according to this document see Annex A.

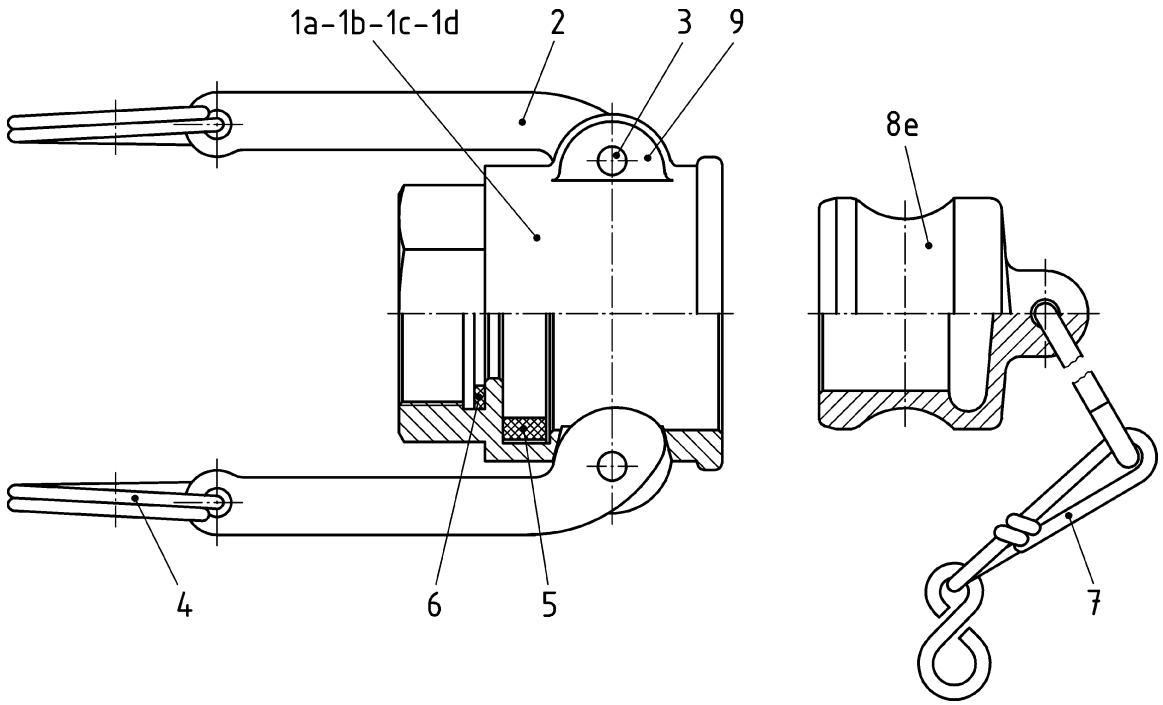
NOTE If the requirements of this document are met, compatibility between couplers and adapters from different manufacturers is ensured. Apart from gaskets, the interchangeability between spare parts from different manufacturers cannot be ensured.

4.2 Temperatures

Range of working temperatures of couplings equipped with nitrile butadiene rubber gasket (NBR-gasket): −20 °C to +65 °C.

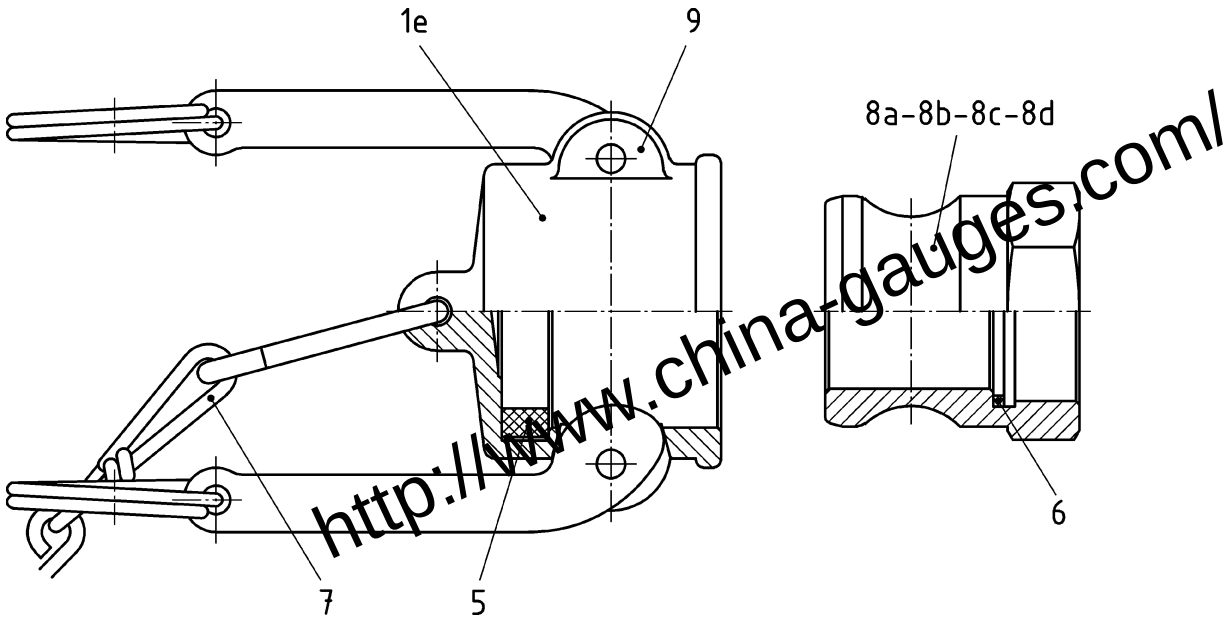
5 Survey

Figure 1 and Figure 2 show examples for cam-locking couplings. A parts list is given in Table 1.



NOTE Chain optional.

Figure 1 — Coupler type DF and adapter type DP (dust plug)



NOTE Chain optional.

Figure 2 — Coupler type DC and adapter type AF

Table 1 — Parts list

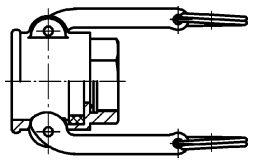
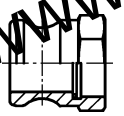
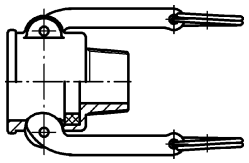
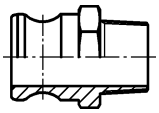
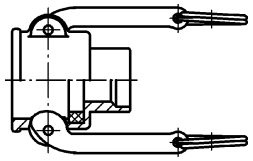
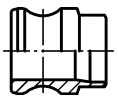
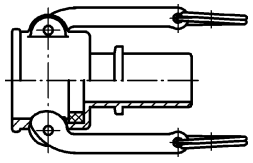
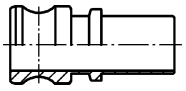
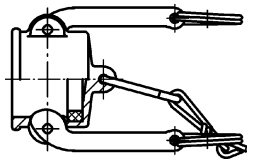
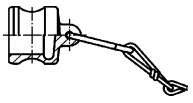
Item No.	Number of pieces	Nomination		
1 a	1	body	with internal thread	for coupler
1 b	1		with external thread	
1 c	1		with welding connection	
1 d	1		with hose nipple	
1 e	1		cap	
2	2	cam arms		
3	2	pin		
4	2	ring		
5	1	main gasket		
6	1	thread gasket for internal thread (see EN 14420-5)		
7	1	At the discretion of the manufacturer [a]		
8 a	1	Adapter	with internal thread	
8 b	1		with external thread	
8 c	1		with welding neck	
8 d	1		with hose tail	
8 e	1		plug	
9	4	ears		

[a] The chain is not part of a complete coupling.

6 Types of connection

The different types of connection of cam lock couplings are specified in Table 2.

Table 2 — Types of connection

Coupler			Adapter					
Figure	Type	For detail see	Figure	Type	For detail see	Kind of connection	DN	Thread
	DF	8.2.1		AF	8.8.1	internal thread according to EN ISO 228-1 flat-faced with thread gasket according to EN 14420-5	20 25 32 40 50 65 80 100	G 3/4 G 1 G 1 1/4 G 1 1/2 G 2 G 2 1/2 G 3 G 4
	BF [a]	8.2.2		FF [a]	8.8.2	external thread according to EN 10226-1	20 25 32 40 50 65 80 100	R 3/4 R 1 R 1 1/4 R 1 1/2 R 2 R 2 1/2 R 3 R 4
	DW	8.2.3		AW	8.8.3	welding connection	20 25 32 40 50 65 80 100	—
	CC	8.2.4		EC	8.8.4	hose tail	20 25 32 40 50 65 80 100	—
	DC	8.2.5		DP	8.8.5	dust cap, dust plug	20 25 32 40 50 65 80 100	—

[a] Prepared for flat face connections.

7 Designation

Example for an ordering designation of a complete coupler with nominal size DN 20 with internal thread (DF) made of copper-zinc alloy (CW614N):

Coupler EN 14420-7 – 20 – DF – CW614N

Example for an ordering designation of a complete adapter with nominal size DN 20 with internal thread (AF) made of copper-zinc alloy (CW614N):

Adapter EN 14420-7 – 20 – AF – CW614N

Example for an ordering designation of the main gasket (item No. 5) with nominal size DN 20 made of nitrile butadiene rubber (NBR):

Main gasket EN 14420-7 – 5 – 20 – NBR

8 Dimensions

8.1 General

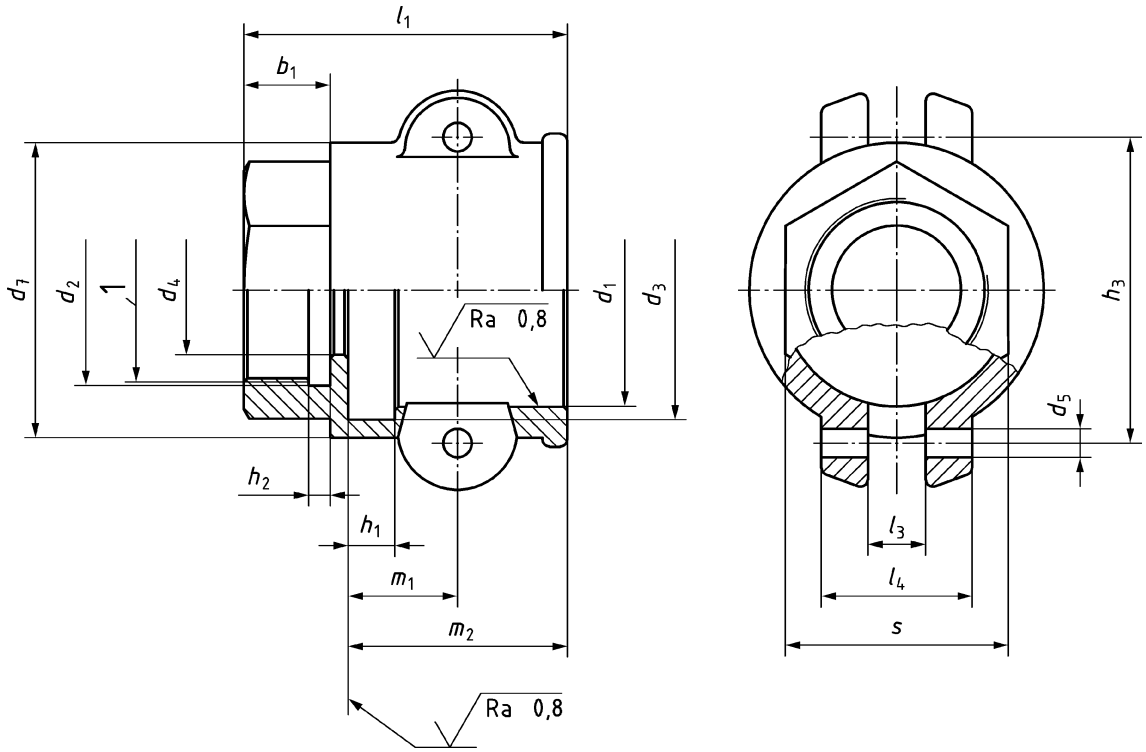
Dimensions and their values are given in Figure 3 to Figure 16 and Table 3 to Table 17.

Dimensions in millimetres.

General tolerances shall be according to EN 22768-1 and EN 22768-2[2].

8.2 Coupler types

8.2.1 Coupler type DF (item No. 1 a)



Key

1 d_6 — thread according to Table 2

Figure 3 — Coupler type DF

Table 3 — Coupler type DF

Dimensions in millimetres

DN	d_1 ±0,1	d_2 min.	d_3 ±0,2	d_4	d_5 H8	d_7 $^{+0,2}_{0}$	h_1 ±0,2	h_2 $^{0}_{-0,2}$	h_3 max.	l_1 min.	l_3 min.	l_4 min.	m_1 $^{+1}_{-0}$	m_2 max.	b_1 min.	s [a]
20	32,4	26,5	36	18	4	41	6,5	3	42,5	45	8	21	15,2	30,5	12	32
25	37,3	33,5	40,8	24	5,4	47	7,3	4	50	53	9,5	25	19	36	14	41
32	46	42,5	51	32	6,3	57			58,5	59	12	33	21,8	41,5		50
40	54	48,5	57	38		64			66	65				43	18	60
50	63,8	60,5	68	48		75			75,5	73			26,3	50	20	70
65	76,5	76,5	80,7	60		90		4,5	88,5	77,5			25,6	51	22	85
80	92,2	88,5	95,8	76	8	106			107,5	81	16	37	27,5	53	24	100
100	120,3	114,5	125,2	100		137			135,5	85,5				56	25	130

[a] This width across flats according to ISO 272 shall be used.

8.2.2 Coupler type BF (item No. 1 b)

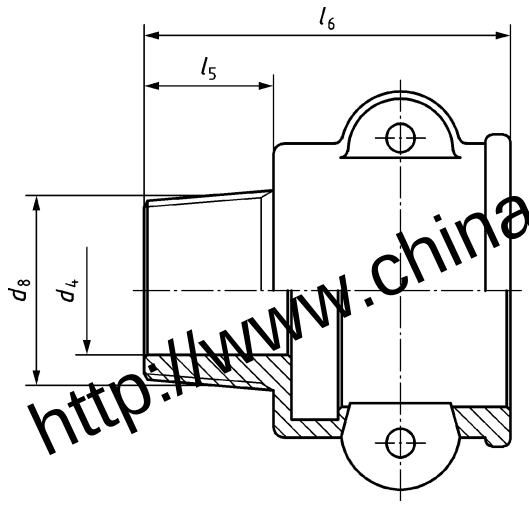


Figure 4 — Coupler type BF

Table 4 — Coupler type BF

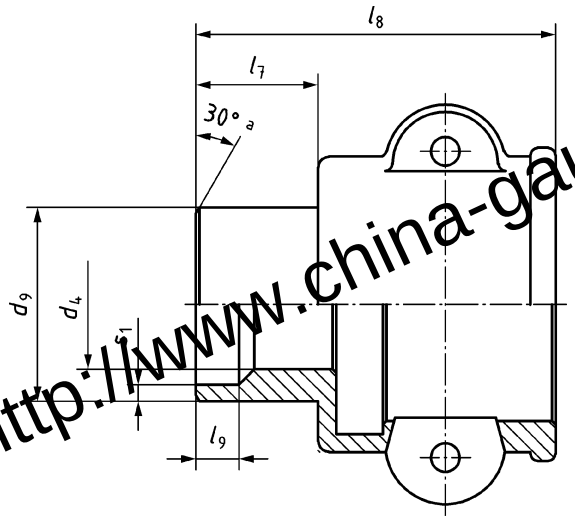
Dimensions in millimetres

Nominal size DN	d_8 thread according to EN 10226-1	l_5 [a] min.	l_6 min.
20	R 3/4	16	51
25	R 1	21	60
32	R 1 1/4	24	69
40	R 1 1/2		71
50	R 2	28	81
65	R 2 1/2	33	88
80	R 3	36	93
100	R 4	42	102

[a] It may be agreed upon shorter external thread lengths for flat faced connections. In this case, the dimensions l_5 min. and l_6 min. are shortened appropriately.

NOTE For other dimensions and specifications see 8.2.1.

8.2.3 Coupler type DW (item No. 1 c)



Key

a weld chamfer at the discretion of the manufacturer

Figure 5 — Coupler type DW

Table 5 — Coupler type DW

Dimensions in millimetres

Nominal size DN	d_9 min.	l_7 min.	l_8 min.	l_9 min.	s_1 min.
20	26,9	17	50	6	2,3
25	33,7	19	56	6,5	2,6
32	42,4	22	67		
40	48,3		69		
50	60,3	24	77	7,5	2,9
65	76,1	26	81,5		
80	88,9		83	8	3,2
100	114,3		86,5	9	3,6

NOTE For other dimensions and specifications see 8.2.1.

8.2.4 Coupler type CC (item No. 1 d)

Hose side part of hose tail: dimensions shall be according to EN 14420-2.

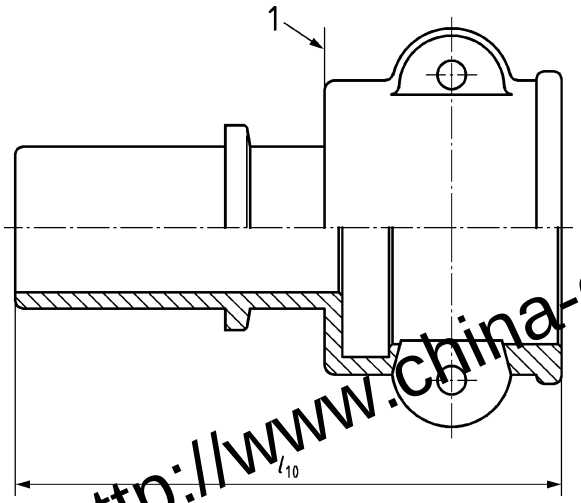


Figure 6 — Coupler type CC

Table 6 — Coupler type CC

Dimensions in millimetres

Nominal size DN	l_{10} min.
20	76
25	82
32	88
40	90
50	103
65	119,5
80	125
100	169,5

NOTE For other dimensions and specifications see 8.2.1.

8.2.5 Dust cap, Coupler type DC (item No. 1 e)

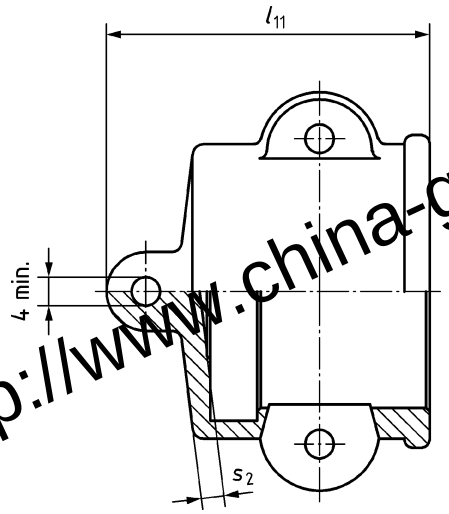


Figure 7 — Dust cap, Coupler type DC

Table 7 — Dust cap, Coupler type DC

Dimension in millimetres

Nominal size DN	l_{11} min.	s_2 min.
20	45	2,4
25	51	
32	57	3,2
40	59	
50	65	
65	68,5	4,0
80	70	
100	74,5	5,6

NOTE For other dimensions and specifications see 8.2.1.

8.3 Cam arm (item No. 2)

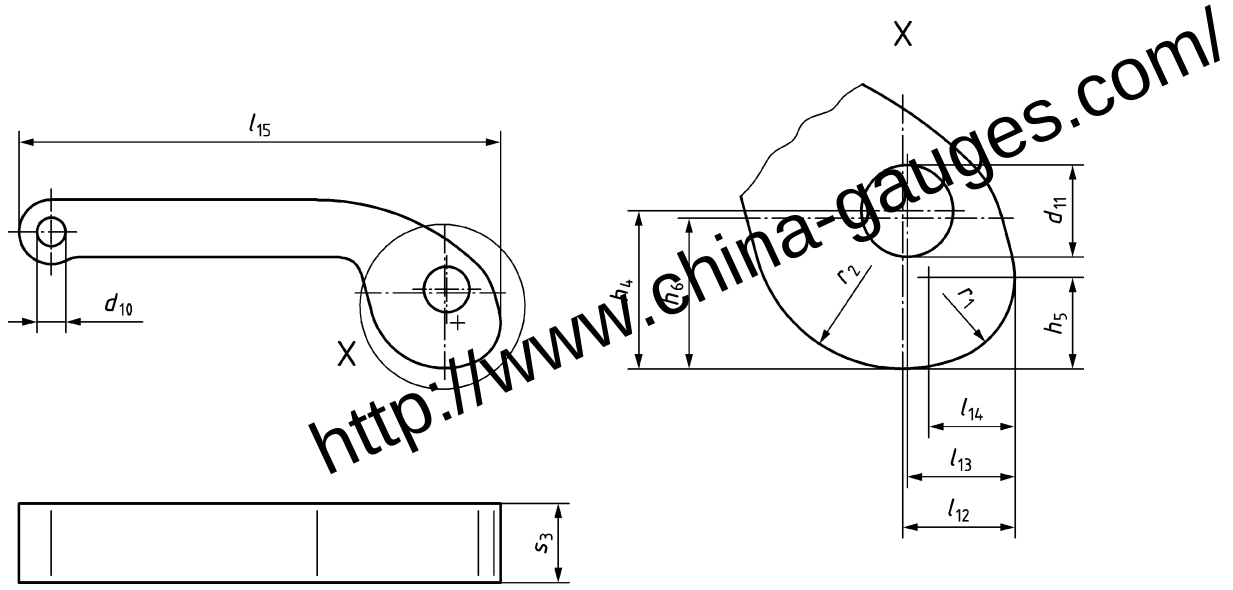


Figure 8 — Cam arm

Table 8 — Torques

Nominal size DN	**Maximum torque** max. Nm	**Compression** min. mm
20	6,8	0,762
25	7,9	0,762
32	11,3	0,635
40	11,3	0,635
50	11,3	0,635
65	11,3	0,635
80	13,0	0,635
100	14,7	0,635

The required gasket compression and the torques shall be achieved by the cam arm dimensions as shown in Figure 8.

Table 9 — Cam arm

Dimensions in millimetres

Nominal size DN	Well left d_{10} ±0,1	Well right d_{11} $^{+0,03}_{0}$	Reference point curve left l_{12} ±0,1	Cylinder axis l_{13} ±0,1	Reference point curve right l_{14} ±0,1	Overall length l_{15} ±0,3	Radius right r_1 ±0,1	Radius left r_2 ±0,1	Axle height h_4 ±0,1	Reference level right h_5 ±0,1	Reference level left h_6 ±0,1	Thickness s_3 ±0,1
20	4,0	4,12	5,5	5,5	5,0	40	5,0	8,0	8,0	5,2	8,0	7,5
25		5,52	6,5	6,7	6,5	48	6,5	9,8	9,8	6,5	9,8	9,5
32		6,42	7,8	7,5	6,0	67	6,0	10,5	11,0	6,4	10,5	11,0
40												
50												
65												
80	6,0	8,12	8,5	8,0		78		12,0	12,5	6,5	12,0	14
100												
NOTE Other dimensions at manufacturer's discretion.												

It shall be possible to couple male and female coupling parts. Furthermore, it shall be secured that a self-acting opening of the levers in case of shaking and vibrating operation by an eccentricity in the radii r_2 (see Figure 8 — Cam arm) is prevented.

8.4 Pin (item No. 3)

During assembly, pins shall be headed on both sides. The pin shall be secure in both ears.

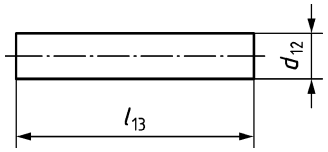


Figure 9 — Pin

Table 10 — Pin

Dimensions in millimetres

Nominal size DN	d_{12} H11	l_{13} min.
20	4	20
25	5,4	26
32	6,3	33
40		
50		
65		
80	8	35
100		

8.5 Ring (item No. 4)

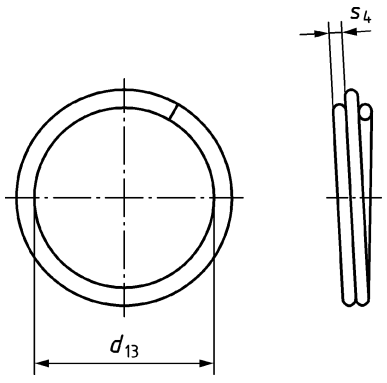


Figure 10 — Ring

Table 11 — Ring

Nominal size DN	d_{13}	s_4	**Number of turns** min.
20	25	1,8	2
25			
32	33	2,4	
40			
50			
65			
80	39	2,6	3
100			

8.6 Main gasket (item No. 5)

Other shapes shall fulfil the same demands like the main gasket shown in Figure 11.

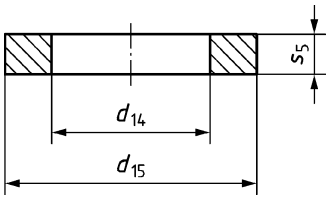


Figure 11 — Main gasket

Table 12 — Main gasket

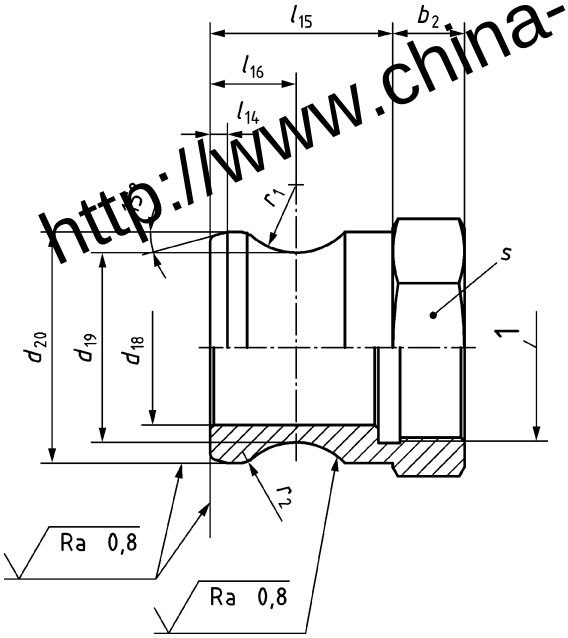
Nominal size DN	d_{14}	d_{15}	s_5
20	22	35	5,5
25	27	40	6,4
32	35	50	
40	41	56	
50	51	67	
65	60	80	
80	76	95	
100	102	124	

8.7 Thread gasket (item No. 6)

See EN 14420-5.

8.8 Adapter types

8.8.1 Adapter type AF (item No. 8 a)



Key

1 thread shall be according to EN 14420-5

NOTE Number of flats at manufacturer's discretion.

Figure 12 — Adapter type AF

Table 13 — Adapter type AF

Dimensions in millimetres

Nominal size DN	d_{18} max.	d_{19} $^{0}_{-0,15}$	d_{20} ±0,1	l_{14}	l_{15} min.	l_{16} $^{0}_{-0,15}$	r_1 $^{+0,15}_{0}$	r_2 $^{0}_{-0,5}$	b_2 min.	s [a] min.
20	21,5	26,3	32,1	2,4	25,4	11,96	9,45	1,6	10	32
25	24,2	29,1	36,7	3,2	33,3	14,35	11,05	2,4	16	41
32	28,2	35,3	45,5		39,6	17,53		3,2	17,5	50
40	36,5	42,9	53,4		41,2				21,5	60
50	46	52,5	63		47,5	21,54			23,5	70
65	56,6	64,6	75,8	4,8	49,2				26	85
80	73,3	81,8	91,5		50,8	22,73	12,62		28	100
100	98,2	109,4	119,5	5,6	52,3					130

[a] See Table 3.

8.8.2 Adapter type FF **(item No. 8 b)**

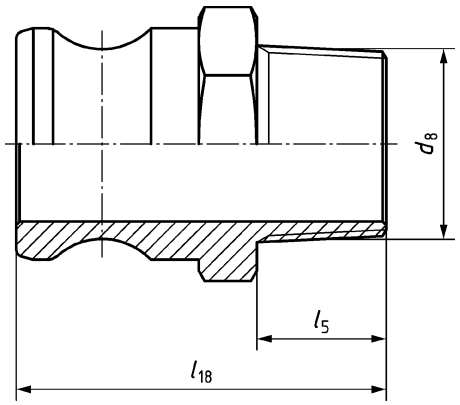


Figure 13 — Adapter type FF

Table 14 — Adapter type FF

Dimensions in millimetres

Nominal size DN	l_{18} min.
20	51,5
25	62,5
32	77
40	78,5
50	88,5
65	99,5
80	104
100	117,5

NOTE 1 For d_8, l_5 see 8.2.2.

NOTE 2 For other dimensions and specifications see 8.8.1.

8.8.3 Adapter type AW (item No. 8 c)

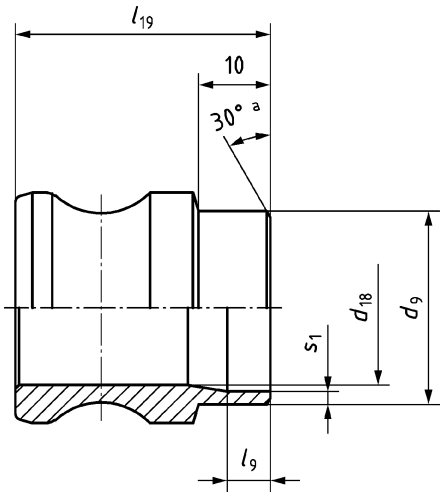


Figure 14 — Adapter type AW

Weld chamfer according to the discretion of the manufacturer.

Table 15 — Adapter type AW

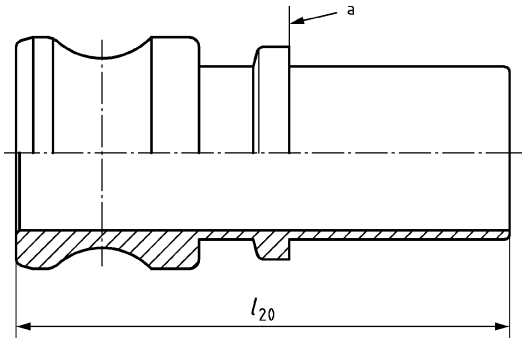
Dimensions in millimetres

Nominal size DN	l_{19} min.
20	35,5
25	43,5
32	50
40	51,5
50	57,5
65	59,5
80	60
100	62,5

NOTE 1 For d_9, d_{18}, l_9, s_1 see 8.2.3.

NOTE 2 For other dimensions and specifications see 8.8.1.

8.8.4 Adapter type EC (item No. 8 d)



Key

a hose side part of hose tail: dimensions shall be according to EN 14420-2

Figure 15 — Adapter type EC

Table 16 — Adapter type EC

Nominal size DN	l_{20} min.
20	68,5
25	76,5
32	83
40	84,5
50	97,5
65	113,5
80	119
100	161,5

NOTE For other dimensions and specifications see 8.8.1.

8.8.5 Dust plug, Adapter type DP (item No. 8 e)

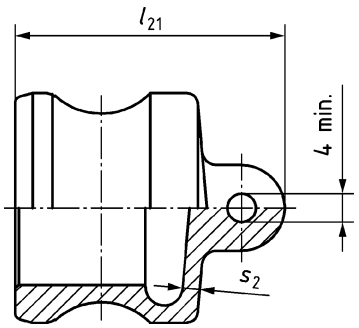


Figure 16 — Dust plug, Adapter type DP

Table 17 — Dust plug, Adapter type DP

Nominal size DN	l_{21} min.
20	37
25	45
32	52
40	53
50	59
65	62
80	64
100	66

NOTE 1 For s_2 see 8.2.5.

NOTE 2 For other dimensions and specifications see 8.8.1.

9 Materials

9.1 General

Parts shall be manufactured from the materials specified in 9.2.

Whatever the kind of manufacturing procedure is, the minimum mechanical characteristics shall be equivalent to the mechanical characteristics of investment casting (in case of stainless steel) using the materials specified in this document.

9.2 Coupler and adapter body

Materials for couplers and adapter bodies shall be selected from those listed below:

a) Copper-zinc alloy

forgings from extruded products:

CuZn39Pb3 material number CW614N in material condition H080 according to EN 12420
CuZn40Pb2 material number CW617N in material condition H080 according to EN 12420

cast:

CuZn39Pb1Al-C material number CC754S according to EN 1982

b) Copper tin alloy

CuSn5Zn5Pb5 material number CC491K according to EN 1982
CuSn5Zn5Pb5-C-GS material number CC491K according to EN 1982

c) Aluminium alloys

Al Si1MgMn material number EN AW-6082 according to EN 755-2
EN AC-Al Si12(Cu) material number EN AC-47000 according to EN 1706

d) Stainless steel

X2CrNiMo17–12–2 material number 1.4404 according to EN 10088-1
X5CrNiMo17–12–2 material number 1.4401 according to EN 10088-1
X6CrNiMoTi17–12–2 material number 1.4571 according to EN 10088-1
GX5CrNiMoNb19–11–2 material number 1.4581 according to EN 10213
GX5CrNiMo19–11–2 material number 1.4408 according to EN 10213
X2CrNiMoN25–7–4 material number 1.4410 according to EN 10088-1

9.3 Cam arm (item No. 2)

Materials for cam arms shall be selected from those listed below:

X2CrNiMo17–12–2 material number 1.4404 according to EN 10088-1

X5CrNiMo17–12–2 material number 1.4401 according to EN 10088-1

X2CrNiMoN25–7–4 material number 1.4410 according to EN 10088-1

9.4 Pin (item No. 3)

Pins shall be made of the following material:

X5CrNiMo17–12–2 material number 1.4401 according to EN 10088-1

9.5 Ring (item No. 4)

Rings shall be made of the following material:

X10CrNi18–8 material number 1.4310 according to EN 10088-1

9.6 Main gasket (item No. 5)

Materials shall be selected to be resistant to the fluid/product/liquid being conveyed.

The materials shall be preferably selected from the following:

a) nitrile butadiene rubber (NBR);

b) fluoro rubber (FPM);

c) chlorosulphonated polyethylene (CSM); or

d) polytetrafluoroethylene (PTFE) encapsulated.

Main gaskets shall be made from non-asbestos materials.

9.7 Thread gasket (item No. 6)

Materials shall be selected to be resistant to the fluid/product/liquid being conveyed.

The materials shall be preferably selected from the following:

a) polyurethane (PUR);

b) polytetrafluoroethylene (PTFE);

c) nitrile butadiene rubber (NBR);

d) fluoro rubber (FPM);

e) ethylene propylene diene monomer (EPDM).

Thread gaskets shall be made from non-asbestos materials.

10 Marking

If appropriate surface area is available, bodies and male parts of the cam locking couplings shall be clearly and durably marked on the outside with the following information:

a) EN 14420-7;

b) manufacturer's sign (e.g. name, emblem or trademark);

c) type and nominal size;

d) PN (at least for aluminium cast material);

e) material number (at least for stainless steels).

11 Type testing and quality control

Type testing and quality control shall be done according to EN 14420-1:2013, Clause 7.

Annex A
(normative)

Gauges for cam-locking couplings

A.1 Dimensions and designation

Figure A.1 shows the dimensions of a gauge A1 for cam-locking couplings. Only the values given in Table A.1 shall be used here.

Tolerances shall be according to EN 22768-1 and EN 22768-2[2].

Details not specified in this document may be chosen as appropriate.

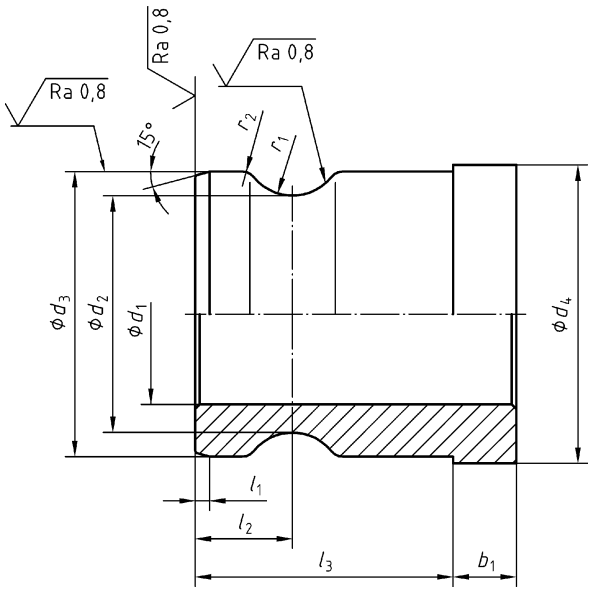


Figure A.1 — Gauge A1

Designation of a gauge A1 for a cam coupling with nominal size DN 50:

Gauge EN 14420-7 — A1 — 50

Table A.1 — Dimensions

Dimensions in millimetres

Nominal size DN	d_1 ±0,2	d_2 ±0,01	d_3 ±0,01	d_4 ±0,2	l_1 ±0,2	l_2 −0,01	l_3 ±0,2	r_1 ±0,1	r_2 +0,1	b_1 ±0,2
20	—	26,29	32,11	41	2,4	11,96	45	9,45	1,6	12
25	—	29,06	36,73	41	3,2	14,35	45	9,45	2,4	12
32		35,26	45,52	50	3,2	17,53	51	11,05	3,2	12
40	—	42,93	53,47	60	3,2	17,53	55	11,05	3,2	13
50	—	52,45	63,09	66	3,2	21,54	57	11,05	3,2	14
65	—	64,64	75,82	77	4,8	21,54	57	11,05	3,2	14
80	55	81,33	91,54	102	4,8	22,73	64	12,62	3,2	14
100	55	109,4	119,58	128	5,6	22,73	64	12,62	3,2	14

A.2 Material

Gauge body: Material number 1.0601 — Symbol C60, or equivalent in mechanical resistance according to EN ISO 683-1.

Heat treated and surface protected.

Bolt: At the discretion of the manufacturer.

Bibliography

[1] EN 10204, *Metallic products - Types of inspection documents*

[2] EN ISO 4957, *Tool steels (ISO 4957)*

[3] EN ISO 6708:1995, *Pipework components - Definition and selection of DN (nominal size) (ISO 6708:1995)*

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