BS EN 14424:2013

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Hose fittings with screwed ferrules

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National foreword

This British Standard is the UK implementation of EN 14424:2013. It supersedes BS EN 14424:2004 which is withdrawn.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 secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Compliance with a British Standard cannot confer immunity from legal obligations.

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Hose fittings with screwed ferrules

Raccords pour flexibles avec bague vissée

Schlaucharmaturen mit Schraubhülsen

This European Standard was approved by CEN on 8 May 2013.

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Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (EN 14424:2013) 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of an identical text or by endorsement, at the latest by December 2013, and conflicting national standards shall be withdrawn at the latest by December 2013.

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

This document supersedes EN 14424:2004.

In comparison to EN 14424:2004, the following changes have been made:

— In the Scope and in 4.3, the maximum working pressure and the working temperature ranges have been changed.

— In Clause 2, the normative references have been updated.

— Clause 3 "Terms and definitions" has been amended.

— In 4.2, a remark for the usage of plastic coatings was added.

— In 6.2, the list of materials for hose fittings and union nuts has been revised.

— A new subclause 6.3 "Surface treatment" was added.

— In 6.4, the requirements for materials of thread gaskets have been revised.

— In Clause 7, the requirements for marking have been revised.

— Clause 8 regarding type testing and quality control has been restructured and amended.

— The Bibliography has been reviewed.

— The standard has been revised editorially.

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1 Scope

This European Standard specifies the design, materials and dimensions of hose fittings with screwed ferrules for rubber and thermoplastics hoses for use with flammable and non-flammable liquids or gases, e.g. fuel dispensing hoses, liquid natural gas (LPG) hoses, tank truck hoses and hoses for liquid and gaseous chemicals. The nominal sizes covered are DN 13 to DN 40.

Up to DN 25, the maximum working pressure is 25 bar[1)], and for DN 32 and DN 40 the maximum working pressure is 16 bar.

The working temperature range is –20 °C to +65 °C, for LPG-usage it is –30 °C to +70 °C up to DN 25, and for LT-(low temperature) usage it is –50 °C to +70 °C.

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.

EN 10025-2, *Hot rolled products of structural steels — Part 2: Technical delivery conditions for non-alloy structural steels*

EN 10087, *Free-cutting steels — Technical delivery conditions for semi-finished products, hot-rolled bars and rods*

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

EN 10216-1, *Seamless steel tubes for pressure purposes — Technical delivery conditions — Part 1: Non-alloy steel tubes with specified room temperature properties*

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 12164, *Copper and copper alloys — Rod for free machining purposes*

EN 12168, *Copper and copper alloys — Hollow rod for free machining purposes*

EN 12420, *Copper and copper alloys — Forgings*

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

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)*

EN ISO 4042, *Fasteners — Electroplated coatings (ISO 4042)*

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

ISO 2859-1, *Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

1) 1 bar = 0,1 MPa.

3 Terms and definitions

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

3.1
DN (nominal size)
alphanumeric designation of size for components of a pipework system, which is used for reference purposes and which comprises 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 should 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 should be given, e.g. DN/OD or DN/ID.

[SOURCE: EN ISO 6708:1995, 2.1]

3.2
thread gasket
flat faced gasket for threads according to EN ISO 228-1

4 General requirements

4.1 General

Hose fittings shall withstand the mechanical, thermal and chemical loads and shall be impermeable and resistant to flammable and non-flammable fluids and vapours.

Hose fittings shall be designed such that they establish a frictional and positive-locking tight connection on the hose.

Hose fittings shall be designed such that when fitted to hoses the hose is destroyed first before being torn out from the fitting, if overstress occurs.

Hose side fitting components shall not cause any dangerous notch or shear stresses on the hose.

4.2 Resistance of the fitting materials to the fluid

When selecting the type of connection, consideration shall be given to the potential hazard caused by the medium and the operating conditions.

In individual cases, other concentrations and additions to the medium as well as increase of temperature can reduce the resistance of the metallic materials. In these cases details should be agreed between purchaser and manufacturer. If data are not available, individual tests are necessary.

The fitting components may be surface protected, e.g. nickel-plated, zinc-plated, chrome-plated or polymer coating.

Details should be agreed between purchaser and manufacturer.

If plastic coatings are provided it shall be ensured that the required electric conductivity of the hose assembly is maintained.

The pairing of fittings from different material groups shall be avoided, if the presence of electrolytes is expected (contact corrosion).

4.3 Maximum working pressures and temperatures

Up to nominal size DN 25, the maximum working pressure shall be 25 bar, and for nominal sizes DN 32 and DN 40 the maximum working pressure shall be 16 bar.

The range of the working temperature shall be –20 °C to + 65 °C, for LPG-usage it shall be –30 °C to +70 °C up to DN 25, and for LT-(Low temperature) usage it shall be –50 °C to +70 °C.

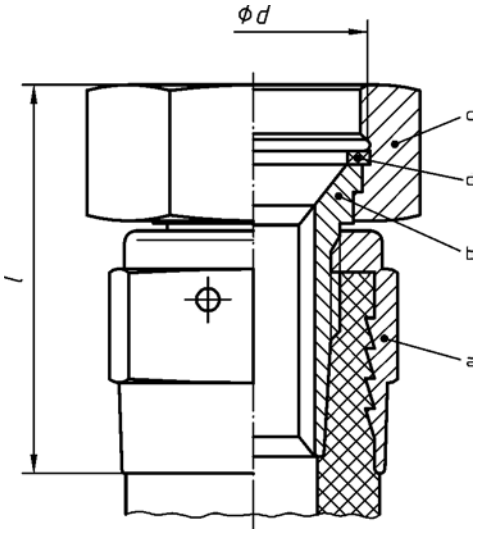
NOTE Permissible pressures and temperatures of hose assemblies are limited by the hoses and gaskets used.

5 Dimensions and designation

5.1 Dimensions

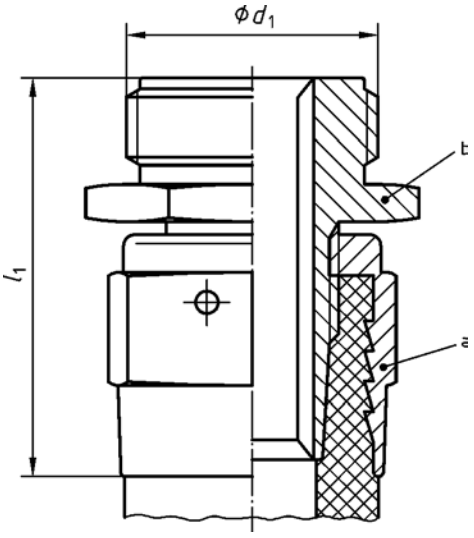
Figures 1 to 8 are examples only. The dimensions of hose fittings with screwed ferrules shall be in accordance with Tables 1 to 7.

NOTE Details not specified in the order are at the manufacturer's discretion.



Key
a ferrule
b female connecting part
c union nut
d thread gasket

Figure 1 — Ferrule fitting Type G (internal thread)

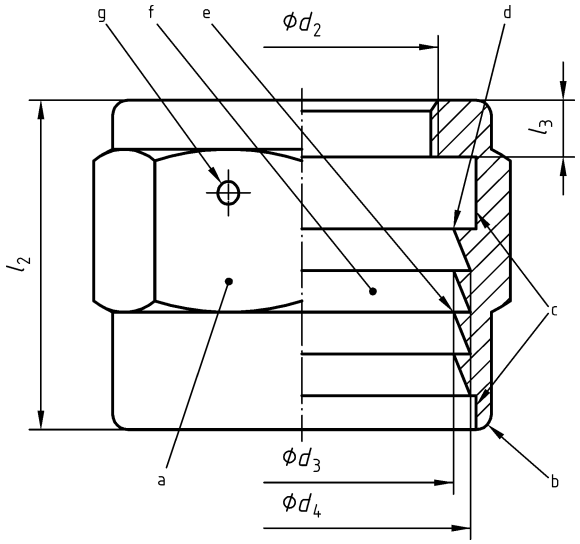


Key
a ferrule
b male connecting part

Figure 2 — Ferrule fitting Type GA (outside thread)

Table 1 — Dimensions for ferrule fittings Type G and GA

Nominal size DN	**Hose internal diameter**	d connecting thread	d_1 connecting thread	l min. mm	l_1 min. mm
13	13	G ½	G ½ A EN ISO 228-1	49	51
		G ¾	R ½ EN 10226-1/NPT		55
		G 1			
15	16	G ¾	G ¾ A EN ISO 228-1		53
		G 1	R ¾ EN 10226-1/NPT		54
		—	G 1 A EN ISO 228-1	—	54
19	19	G ¾	R ¾ EN 10226-1/NPT	50	54
		G 1	G 1 A EN ISO 228-1	52	55
21	21	G ¾	—	51	—
		G 1	—	52	—
25	25	G 1	G 1 A EN ISO 228-1	55	59
		G 1 ¼	R 1 EN 10226-1/NPT	58	65
32	32	G 1 ¼	G 1 ¼ A EN ISO 228-1	64	65
40	38	G 1 ½	G 1 ½ A EN ISO 228-1	67	71



Key

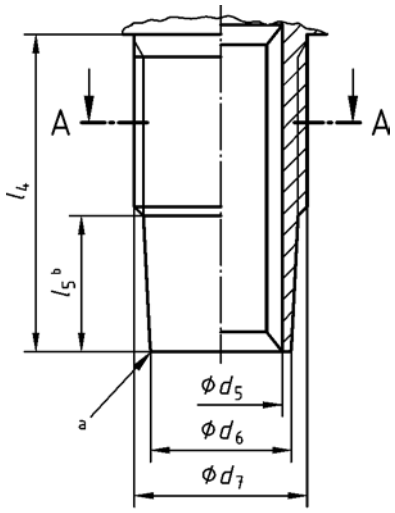
a s = width across flats, hexagonal or octagonal
b rounded
c dimension $\geq d_4$
d dimension $\geq d_3$
e profile corners chamfered
f inner profile at the discretion of the manufacturer
g inspection orifice location at the discretion of the manufacturer

Figure 3 — Ferrule

Table 2 — Dimensions for ferrule

Dimensions in millimetres

Nominal size DN	d_2	d_3 ± 0,5	d_4 ± 0,5	l_2 min.	l_3 min.	s min.
13	M 16 ×1	21	23,5	32	6	27
15	M 19 × 1,0	24	27	33		30
20 (19)	M 22 × 1,5	29	31,5			36
20 (21)	M 26 × 1,5	29,5	32	34		
25	M 28 × 1,5	35	38	37		41
32	M 36 × 1,5	40	44,5	43	7	50
40	M 42 × 1,5	48	52	44	7,5	60



A–A

Key

a rounded

b cone shall not be extended over the whole length

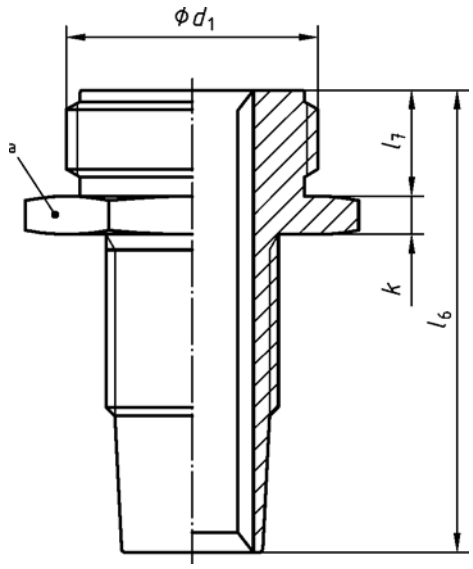
c cams for assembly provisionally

Figure 4 — Hose side part of ferrule fitting

Table 3 — Dimensions for hose side part of ferrule fitting

Dimensions in millimetres

Nominal size DN	d_5 ± 0,5	d_6 + 0,5 − 0	d_7	l_4 min.	l_5 max.
13	11	13	M 16 × 1	27	15
15	13,5	15,5	M 19 × 1	27	
20 (19)	16,5	18,5	M 22 × 1,5	30	
20 (21)	19	21	M 26 × 1,5	31,5	17
25	22	24,5	M 28 × 1,5	35,5	
32	29	31,5	M 36 × 1,5	38	
40	34	37,5	M 42 × 1,5	44	24



Key

[a] s_1 = width across flats, hexagonal or octagonal

Figure 5 — Male connecting part

Table 4 — Dimensions for male connecting part

Dimensions in millimetres

Nominal size DN	d_1 outside thread according to EN ISO 228-1	k min.	l_6 min.	l_7 min.	s_1 min.
13	G ½ A	5	45	12	22
	R ¾" EN 10226-1/NPT		48	15	
15	G ¾ A		46	13	27
	R ¾" EN 10226-1/NPT		48	15	
	G 1 A		47	14	36
20	G ¾ A	6	49	13	27
	R ¾" EN 10226-1/NPT		51	15	
	G 1 A		50	14	36
25	G 1 A		56		
	R 1" EN 10226-1/NPT		60	18	36
32	G 1¼ A		59	15	46
40	G 1½ A	6,5	69	18	50

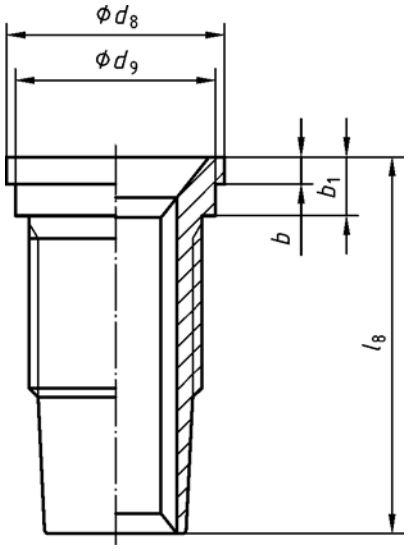


Figure 6 — Female connecting part

Table 5 — Dimensions for female connecting part

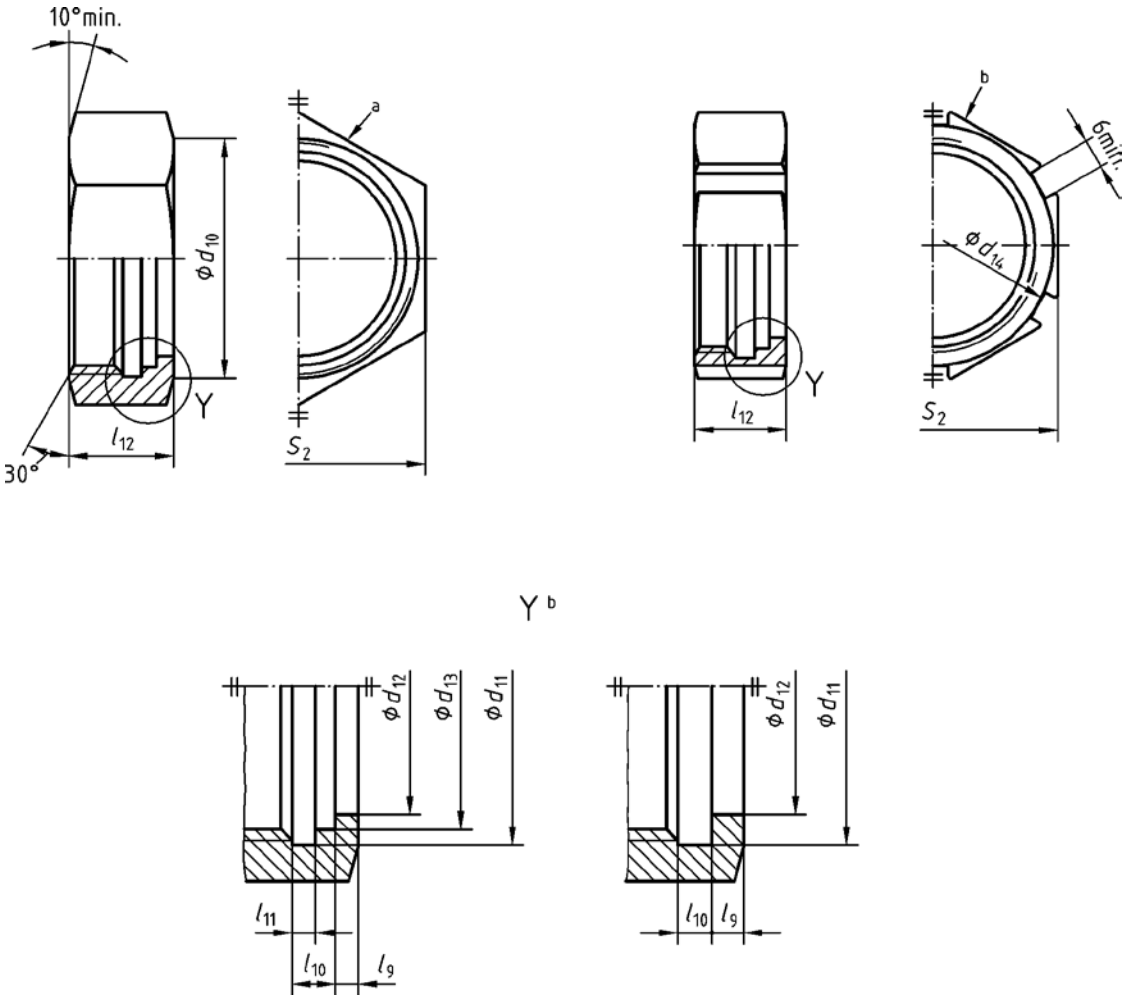
Dimensions in millimetres

Nominal size DN	**For union nut with inner thread according to EN ISO 228-1**	b^a ± 0,2	$b_1{}^a$ +1,5 −0,2	$d_8{}^a$ 0 −0,2	$d_9{}^a$ 0 −0,5	l_8 min.
13	G ½	3	6,5	18,5	15,5	34,5
	G ¾			24	22	
15	G ½			18,5	15,5	
	G ¾			24	22	
	G 1			30	28	
20 (19)	G ¾			24	22	35,5
	G 1			30	28	
20 (21)	G ¾			24	22	
	G 1			30	28	
25	G 1					42
	G 1 ¼		7	38,8	35,9	42,5
32	G 1 ¼					45
	G 1 ½	4,5	8,5	44,7	41,5	46,5
38	G 1 ½					52,5

[a] Dimensions shall be in accordance with EN 14420-5.

Dimensions in millimetres

Type A, for thread G ½ to G 1 ¼ **Type B, for thread G 1 ½**



Key

[a] hexagonal or octagonal

[b] four cornered, hexagonal or octagonal (at the discretion of the manufacturer)

Figure 7 — Union nuts, Type A and B

Table 6 — Dimensions for union nuts Type A and B

Dimensions in millimetres

Internal thread according to EN ISO 228-1	d_{10} [a] ≈	d_{11} [a]	Tolerance	d_{12} [a] + 0,2 0	d_{13} [a] + 0,2 0	d_{14} [a] ± 0,5	l_9 [a] ± 0,3	l_{10} [a] + 0,5 0	l_{11} [a] + 0,5 0	l_{12} [a] + 0 − 2	S_2 [a] min.
G ½	23,5	21,2	± 0,1	16,2	18,9	—	3	5,5	3,0	16	24
G ¾	28	26,7	± 0,2	22,1	24,5	—					30
G 1	34	33,5		28,1	30,7	—				18	36
G 1 ¼	44	42,5		36,1	39,3	—	3,5		3,5	19	46
G 1 ½	53	48,5	± 0,3	42,2	45,2	54	4	8	5	25	55

[a] Dimensions shall be in accordance with EN 14420-5.

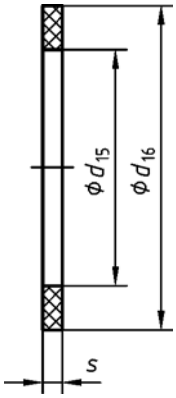


Figure 8 — Thread gasket

Table 7 — Dimensions for thread gasket

Dimensions in millimetres

Thread according to EN ISO 228-1	d_{15} ± 1	d_{16} [a]		s[a]	
			Tolerance		Tolerance
G ½	13	20	+ 0,2 − 0,5	1,5	+ 0,5 − 0,2
G ¾	19	26			
G 1	24	33		2,0	± 0,2
G 1¼	33	42			
G 1½	39	48			
[a] Dimensions shall be in accordance with EN 14420-5.					

5.2 Ordering designation system

Example for an ordering designation:

Denomination — Characteristics

Ferrule fitting — EN 14424 — G 20 — 1.4571

EN number

Type of ferrule fitting

— G internal thread
— GA outside thread

DN (nominal size)

Material according to 6.2

EXAMPLE Designation for a Type G ferrule fitting for use with DN 20 hoses, consisting of stainless steel (1.4571):

Ferrule fitting EN 14424 — G 20 — 1.4571

6 Materials

6.1 General

Unless otherwise specified in the order, the material used shall be at the discretion of the manufacturer.

6.2 Hose fittings and union nuts

Hose fittings and union nuts shall be made of the following materials:

a) unalloyed steels

11SMnPb30	material number 1.0718	according to EN 10087
S235JR	material number 1.0038	according to EN 10025-2
S355J0	material number 1.0553	according to EN 10025-2
S355J0+N	material number 1.0553+N	according to EN 10025-2
P235TR1	material number 1.0254	according to EN 10216-1

b) stainless steels

X5CrNi18-10	material number 1.4301	according to EN 10088-1
X5CrNiMo17-12-2	material number 1.4401	according to EN 10088-1
X2CrNiMo17-12-2	material number 1.4404	according to EN 10088-1
X6CrNiTi18-10	material number 1.4541	according to EN 10088-1
X6CrNiMoTi17-12-2	material number 1.4571	according to EN 10088-1

c) copper-zinc alloys

Parts forged from extruded materials:

CuZn39Pb3-H080	material number CW614N	according to EN 12420
CuZn40Pb2-H080	material number CW617N	according to EN 12420

Parts made by turning

CuZn39Pb3- R360 min.	material number CW614N	according to EN 12164
CuZn40Pb2- R360 min.	material number CW617N	according to EN 12164

Pipes

CuZn39Pb3 – H090 min.	material number CW614N	according to EN 12168
CuZn40Pb2 – H090 min.	material number CW617N	according to EN 12168

6.3 Surface treatment

Where possible, hose fittings and metallic components made of unalloyed steel shall be hot zinc dipped and chromated, with coatings A2C and/or A3C according to EN ISO 4042.

NOTE Other surface treatments (such as chromed brass) can be arranged.

6.4 Thread gaskets

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.

7 Marking

If appropriate surface area is available, hose tails and union nuts shall be clearly and durably marked with the following informations:

a) EN 14424;

b) manufacturer's name or trademark;

c) nominal size;

d) material number (at least with stainless steels).

8 Type testing and quality control

8.1 General

As defined by the quality control processes to be carried out at the plant the manufacturer shall verify on test samples from serial production that hose fittings safely withstand the operating stresses to be expected.

The requirements for testing the complete hose assembly is detailed in the product EN hose standard (e.g. EN 12115) within the framework of hose assembly testing.

A quality management system (QMS) is recommended, e.g. according to EN ISO 9001.

The concept of the quality management system has to be presented if requested by the purchaser. Details can be agreed upon between purchaser and supplier.

Upon request of the purchaser, the manufacturer or supplier confirms by the means of a test report 2.2 according to EN 10204 that the hose fittings comply with all requirements of this European Standard.

8.2 Type-test

Hose fittings shall be connected and shall withstand a minimum pressure at ambient temperature, which is 4 times as high as the working pressure, with water as test medium.

In all other cases, the triple of the maximum working pressure is valid.

Type-tests have to be carried out at least after 5 years or always in case of a technical change. This also includes changes in the manufacturing process.

Type-tests have to be carried out at least at one reference nominal diameter, e.g. NW 25, of each construction type.

8.3 Sampling

Couplings shall be submitted to random testing and checked for imperfections such as cracks or moulding defects in accordance with inspection level II, AQL 25, as specified in ISO 2859-1.

9 Mounting of hose fittings

Careful selection of the hose fitting shall be made to ensure that the inner diameter (ID), outer diameter (OD), and maximum working pressure (WP) of the hose are within the limits and tolerances of the couplings detailed in this document. The materials shall be tested for the products and medium being transferred.

NOTE Any mismatch could lead to a safety issue.

Bibliography

[1] EN 1762, *Rubber hoses and hose assemblies for liquefied petroleum gas, LPG (liquid or gaseous phase), and natural gas up to 25 bar (2,5 MPa) — Specification*

[2] EN 10204, *Metallic products — Types of inspection documents*

[3] EN ISO 9001, *Quality management systems — Requirements (ISO 9001)*

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