DEAS 1134: 2023

ICS nn.nnn.nn

DRAFT EAST AFRICAN STANDARD

Firefighting equipment — Components of underground and above ground hydrant systems — Specification

EAST AFRICAN COMMUNITY

First Edition 2023

Copyright notice

Contents

Page

Foreword vi

1 Scope 1

2 Normative references 1

3 Terms and definitions 1

4 Type components 1
4.1 Underground type components 1
4.2 Above-ground type components 2

5 Materials for components 2
5.1 General 2
5.2 Cast iron 3
5.3 Brass pipe 3
5.4 Rubber components 3
5.4.1 For seat washers 3
5.4.2 For sealling washers and joint rings 3
5.5 Copper alloys 3
5.6 Other alloys 3

6 Constructional requirements 3
6.1 Underground type components 3
6.1.1 Underground hydrant valves 3
6.1.2 Gate valve outlet bends (see Figure 2) 5
6.1.3 Underground hydrant valve outlet connections 6
6.1.4 Portable standpipes (see figure 6) 9
6.2 Above-ground type components 11
6.2.1 Above-ground hydrant valves 11
6.2.2 Separate hydrant valve outlet coupling 15
6.2.3 Hydrant valve outlet adapter 15
6.3 General components 15
6.3.1 Blank cap 15
6.3.2 Bolts and nuts 15
6.4 Finish 15
6.5 Burst resistance 16

7 Performance requirements 16
7.1 Capacity of valves 16
7.2 Resistance to hydraulic pressure 16

8 Marking 16

9 Sampling and compliance with the specification 16
9.1 Sampling 16
9.1.1 Sample for inspection 16
9.1.2 Sample for testing 17
9.2 Compliance with the specification 17

10 Inspection and methods of test 17
10.1 Inspection 17
10.2 Capacity test for valves 17
10.3 Pressure test for components 17
10.3.1 All components 17
10.3.2 Valves 18
10.4 Burst test for above-ground hydrant valves 18

10.4.1 Apparatus **18**
10.4.2 Procedure **18**
Bibliography **19**

Foreword

Development of the East African Standards has been necessitated by the need for harmonizing requirements governing quality of products and services in the East African Community. It is envisaged that through harmonized standardization, trade barriers that are encountered when goods and services are exchanged within the Community will be removed.

The Community has established an East African Standards Committee (EASC) mandated to develop and issue East African Standards (EAS). The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the public and private sector organizations in the community.

East African Standards are developed through Technical Committees that are representative of key stakeholders including government, academia, consumer groups, private sector and other interested parties. Draft East African Standards are circulated to stakeholders through the National Standards Bodies in the Partner States. The comments received are discussed and incorporated before finalization of standards, in accordance with the Principles and procedures for development of East African Standards.

East African Standards are subject to review, to keep pace with technological advances. Users of the East African Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

The committee responsible for this document is Technical Committee EASC/TC 039, *Mechanical engineering and metallurgy*.

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

Firefighting equipment — Components of underground and aboveground hydrant systems — Specification

1 Scope

This Draft East Africa Standard specifies requirements, sampling procedures, test methods of major components of underground and aboveground hydrant systems for firefighting.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

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

3.1
defective
a component that fails in one or more respects to comply with the relevant requirements of the specification

3.2
lot
not less than 15 and not more than 600 components of the same type, design, and material(s), from one manufacturer, submitted at any one time for inspection and testing

4 Type components

4.1 Underground type components

Underground type components shall be of one (or more) of the following types:

a) underground hydrant valves;

b) gate valve outlet bends;

c) underground hydrant valve outlet connections; and

d) portable standpipes.

NOTE An underground hydrant assembly requires one of each of the major components listed in (a), (b), and (d), when relevant.

4.2 Above-ground type components

Above-ground type components shall be of one (or more) of the following types, as specified by the purchaser:

a) above-ground hydrant valves;

b) above-ground hydrant valve outlet connections; and

c) hydrant valve outlet adapters.

NOTE An above ground hydrant assembly requires one of each of the above major components.

5 Materials for components

5.1 General

The material(s) of each component shall be as shown in Table 1.

Table 1 — Materials for components

Component	Material
Above-ground type	
Blank caps	Brass pressings, bronze, malleable iron, or aluminium alloy
Body	Gun metal or aluminium alloy
Handwheel	Bronze, cast iron, malleable iron, or aluminium alloy
Handwheel nut	Gun metal or aluminium alloy
Seat washer	Rubber (reinforced)
Spindle	Gun metal, stainless steel, or bronze
Spindle nut	Gun metal, brass bar, or manganese bronze
Tamperproof key type handle	Bronze, mild steel forging, steel fabrication, or aluminium alloy
Hydrant valve outlet connections	Bronze, cast iron or aluminium alloy
Hydrant valve outlet adapters	Bronze, gun metal, or aluminium alloy
underground type	
Blank caps	Cast iron or aluminium alloy
Body	Cast iron or aluminium alloy
Seat washer	Rubber (reinforced)
Spindle	Bronze or stainless steel
Spindle nut	Gun metal or manganese bronze
Hydrant valve outlet connections	Cast iron, gun metal, brass pressings, or aluminium alloy
Portable standpipes	Copper, brass, aluminium, mild steel, or aluminium alloy
Inlet and outlet connections	Cast iron, bronze, or aluminium alloy
Sealing rings	Rubber

5.2 Cast iron

Cast iron shall not have blowholes or other imperfections that may hinder proper performance.

5.3 Brass pipe

Brass tubing shall be of CuZn37 composition.

5.4 Rubber components

The material used for rubber components shall be of a quality at least equal to:

5.4.1 For seat washers

Chloroprene or butyl rubber reinforced with at least five plies of nylon or cotton that are distinctly separate from each other, each strand of reinforcing material being totally embedded in, and completely bonded to the rubber compound.

5.4.2 For sealling washers and joint rings

These shall be made from chloroprene or butyl rubber.

5.5 Copper alloys

Copper alloys shall be of the following types, as appropriate:

a) gun metal ;

b) extruded brass bar;

c) hot brass pressings; and

d) manganese bronze stampings.

5.6 Other alloys

Other alloys shall be of acceptable quality and suitable for the purposes for which they are intended.

6 Constructional requirements

6.1 Underground type components

6.1.1 Underground hydrant valves

An underground hydrant valve shall open in anti- clockwise direction, and shall be of one of the following types:

a) gate valve;

A gate valve of nominal size 80 mm with non-rising spindles.

b) screw-down valves;

A valve as generally shown in Figure. 1 and constructed as follows:

i. The gland or cover assembly, or both, shall have a flange that is bolted to a horizontal mating flange on the valve body and shall be so designed that, when the gland or cover assembly, or both, are removed, there is full access to all the interior parts of the valve, while the casing remains fixed in position;

ii. The inlet shall have a bore of 70 mm and shall be flanged as shown in Figure 1;

iii. The outlet shall have a bore of 70 mm and shall be flanged to mate with the flange of the underground outlet connection specified mate with the flange of the underground outlet connection specified in 5.1.3;

iv. The dimensions of the spindle and valve cap shall comply with those given for the spindle and cap of 65 mm; and

v. The seating face in the casing shall be machined and shall be of width at least 10 mm and raised to a height of at least 2 mm above the surrounding body material.

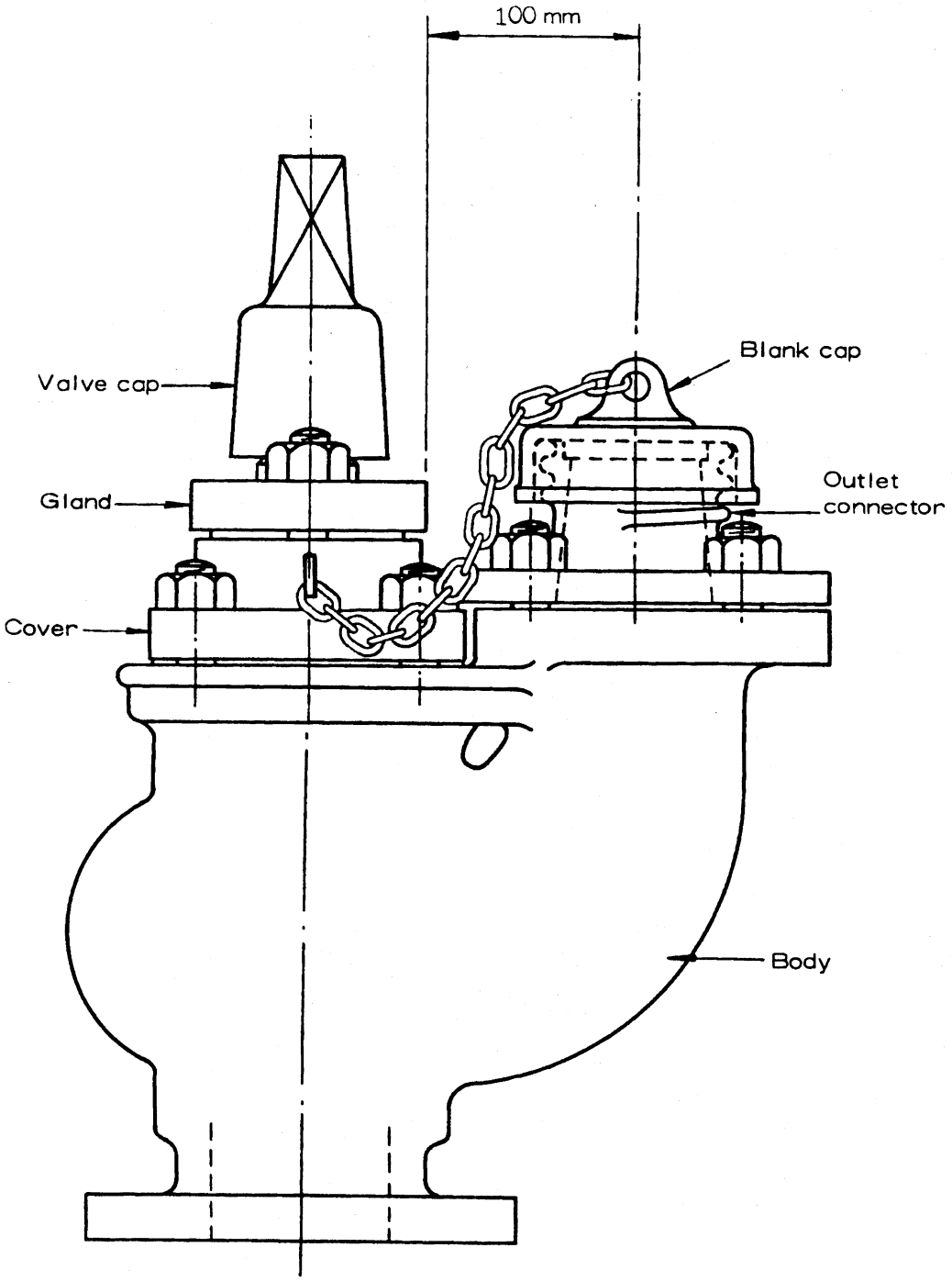


Figure 1 — Underground type II hydrant

6.1.2 Gate valve outlet bends (see Figure 2)

The inlet and outlet of an outlet bend shall be flanged to suit the flange of the gate valve [see 5.1.1(a)] and the flange of the outlet connection specified in 5.1.3 respectively.

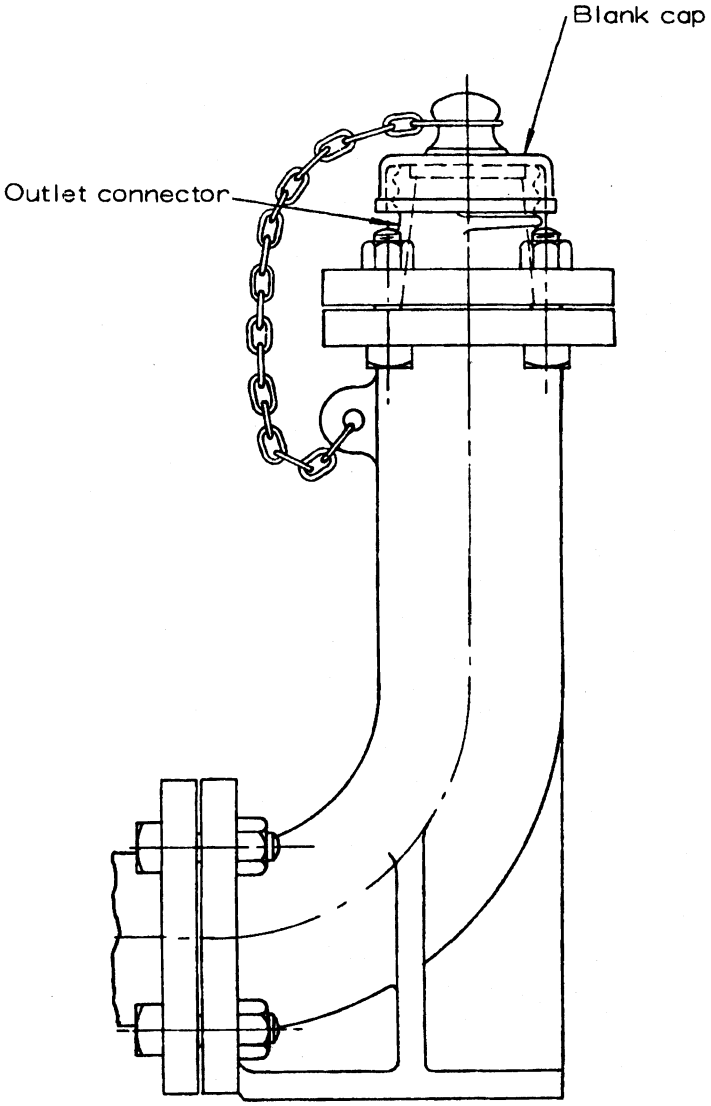
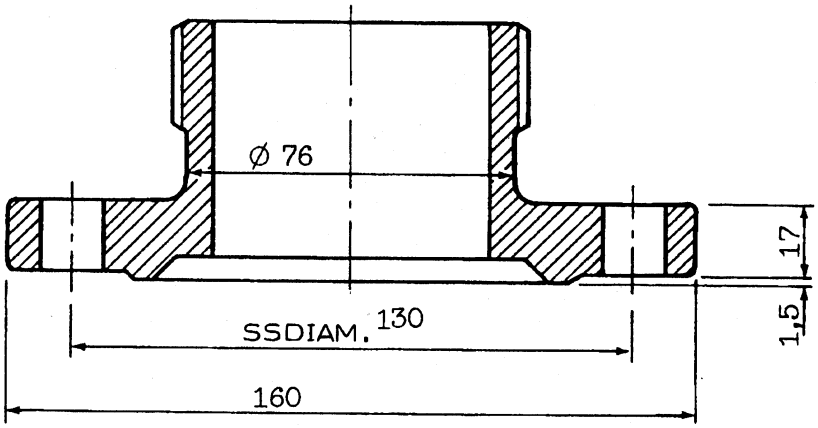


Figure 2 — Duck foot type I fire hydrant

6.1.3 Underground hydrant valve outlet connections

The inlet of an outlet connection shall be furnished with a fixed or loose flange and the outlet shall be of the Vee-thread, or round thread type as shown in the appropriate of Figures 3, 4 and 5.



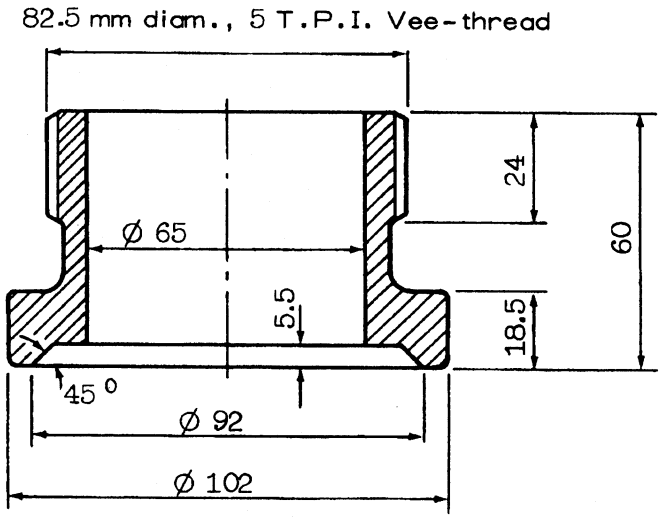


Figure 3 — Stand pipe adaptor (above) and stand pipe base below

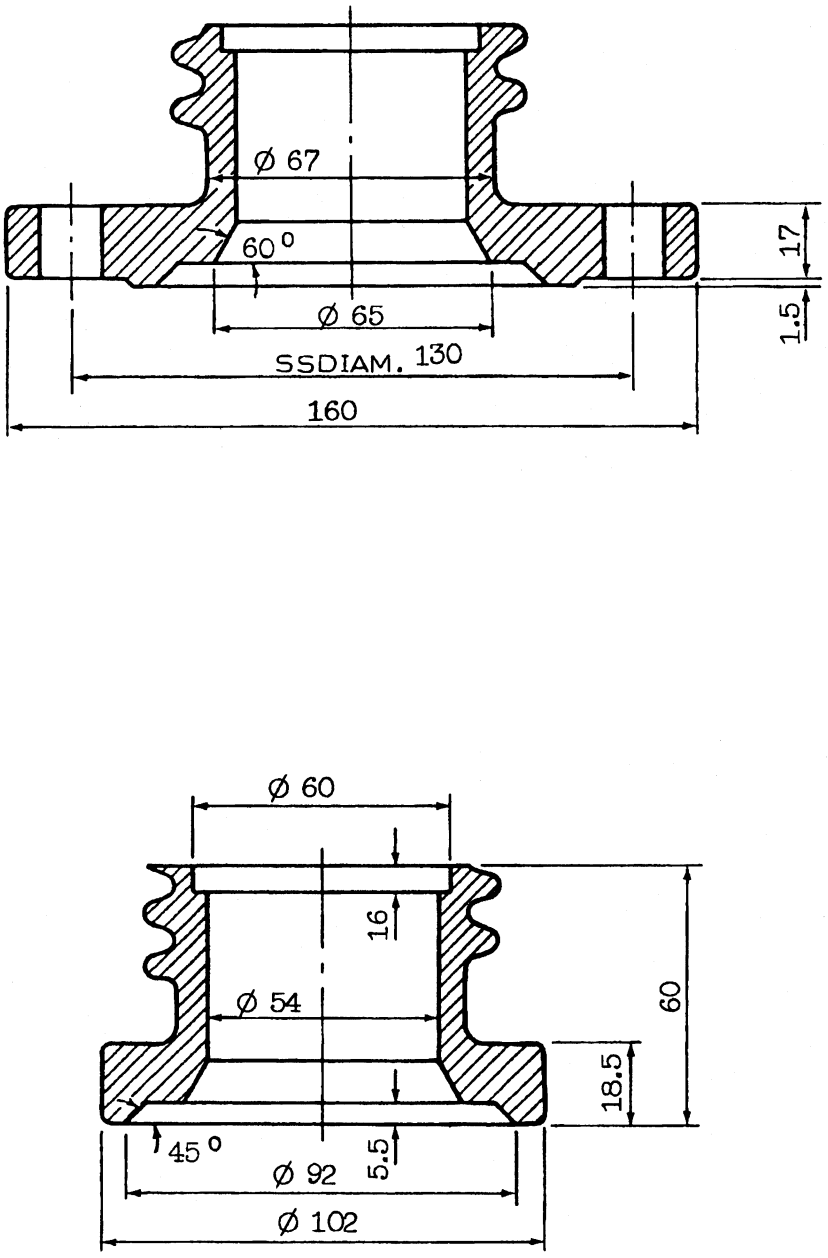


Figure 4 — Stand pipe adaptor (London round thread) — above and round thread outlet (below)

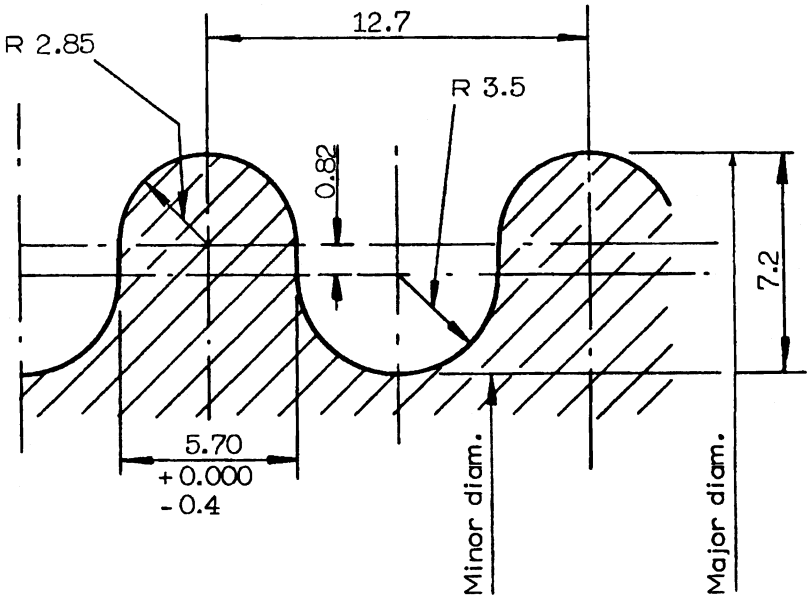


Figure 5 — Basic form of round threads

6.1.4 Portable standpipes (see figure 6)

6.1.4.1 General

A standpipe shall be of nominal bore at least 65 mm and thickness at least 2 mm and shall have inlet and outlet connections fixed to the pipe in an acceptable manner. The inlet connection shall be of screw type and of design such as to mate the appropriate outlet connection in 5.1.3. The outlet connection shall be as specified in 5.1.4.2 (b).

6.1.4.2 Screw-type

a) inlet connection

The thread on a screw type inlet shall be a 2-threads per inch round thread or a 5-threads per inch Whitworth thread, as specified by the purchaser and the dimensions of the thread shall comply with the appropriate values given in Tables 2 and 3. Figures 4, 5, 6 and 7 are illustrations.

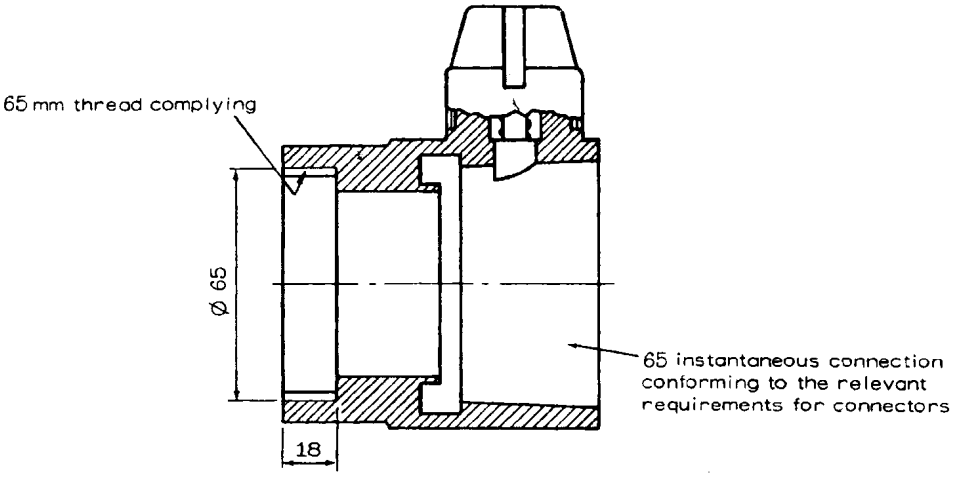


Figure 6 — Outlet connection/Coupling

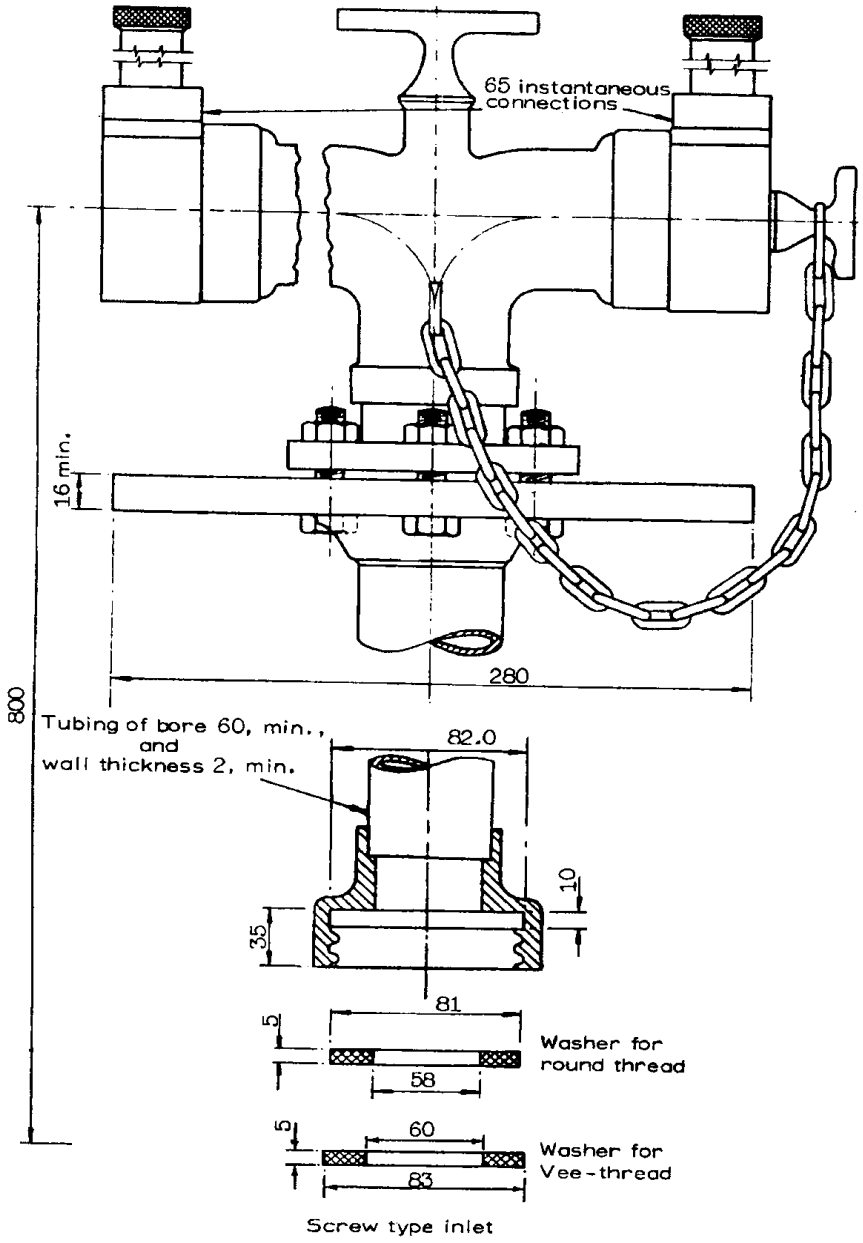


Figure 7 — Portable stand pipe

Table 2 — Dimensions (in mm) of round thread (basic form as in Figure 7)

1	2	3
Major diameter	Male thread	Female thread
	83.00 + 0.000 - 0.50	84.5 + 0.50 - 0.000
Minor diameter	68.00 max.	70.5 + 0.50 - 0.000

Table 3 — Dimensions (in mm) of vee-thread (basic form is whit worth 5-threads per inch

1	2	3
Major diameter	Male thread	Female thread
	83.00 + 0.000 - 0.50	83.50 + 0.50 - 0.000
Effective diameter	79.50 + 0.000 - 0.50	80.00 + 0.500 - 0.000
Minor diameter	77.00 + 0.000 - 0.50	77.00 + 0.50 - 0.000

b) outlet connection

The outlet connection shall consist of one or two 65-mm instantaneous connections (the relevant dimensions of which comply with those given in Figure 8) and shall be fitted to the standpipe by means of either a female thread of nominal size 65 mm.

6.2 Above-ground type components

6.2.1 Above-ground hydrant valves

The direction of opening for an above-ground hydrant valve shall be anti-clockwise and shall be as shown in Figure 10.

6.2.1.1 Valve body

The valve body shall have the following;

a) the inlet of the valve shall be of nominal size 80 mm and shall be flanged or threaded;

b) the outlet of the valve shall be of the upwards oblique, downwards oblique, right angle, or straight-through pattern (see Figure 9);

c) the outlet shall have a bore of at least 65 mm and shall be furnished with one of the following connections:

i. a 65-mm instantaneous connection integrally cast with the body; or

ii. a separate 65-mm instantaneous coupling or other connection, as relevant (see 5.2.2), screwed onto the body (as shown in Figure 8).

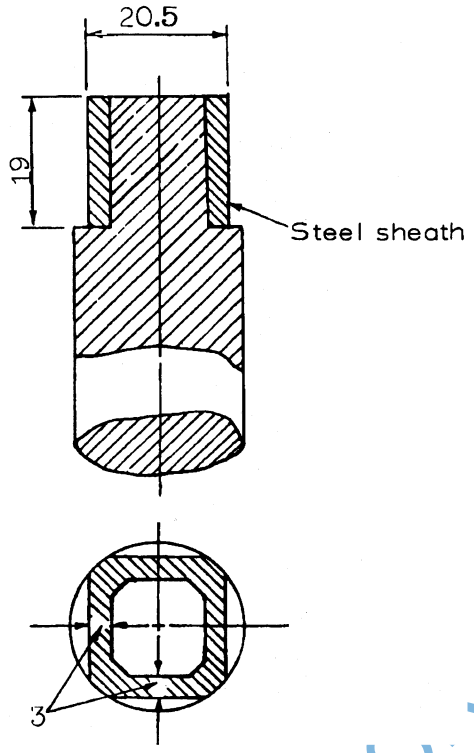


Figure 8 — Sheathed spindle

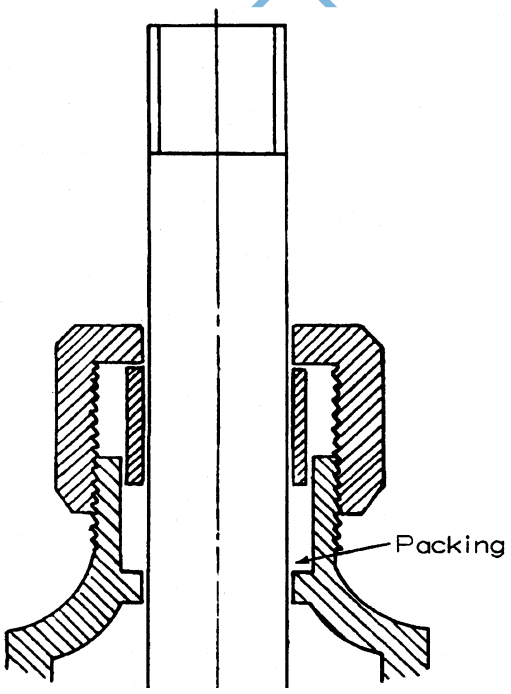


Figure 9 — Open-type spindle

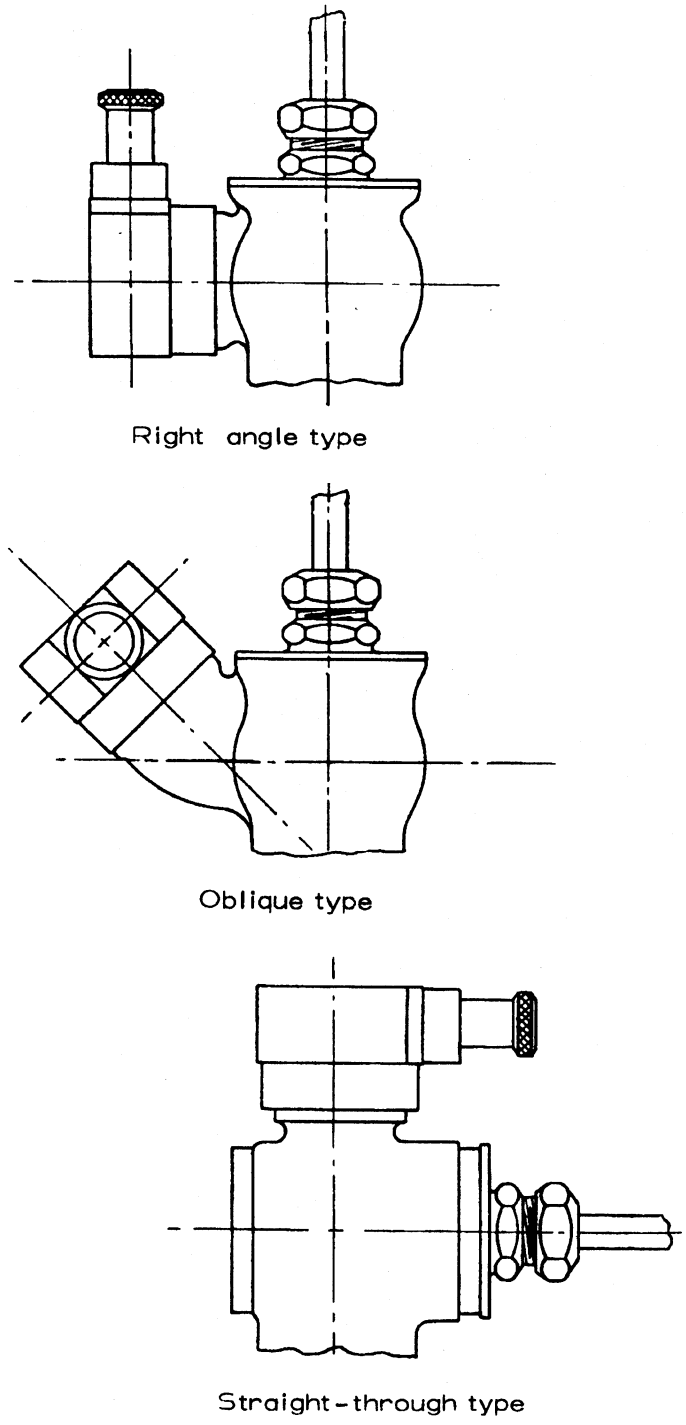


Figure 10 — Typical outlet connections for above ground hydrant valve

6.2.1.2 Valve spindle

For a fixed hand wheel, the top of the spindle shall be plain, and for a tamperproof key type handle, it shall be sheathed. Sheathed valve spindles shall be as shown in Figure 8 and of the open type (as shown in Figure 9) or the shielded type. The design of the spindle thread shall be as follows:

a) the root diameter shall be at least 19 mm; and

b) the form shall be either trapezoidal or acme.

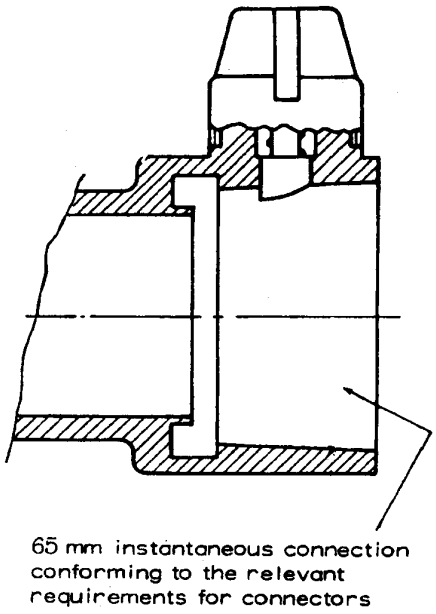


Figure 11 — Hydrant outlet adaptor

6.2.1.3 Valve clack

The clack shall be of a swivel type and shall be fixed to the spindle in an acceptable manner.

6.2.1.4 Valve gland

The gland shall be designed for use with packing rings or “O” rings.

6.2.1.5 Operating device

The operating device shall be of the fixed wheel type (with rim and spokes and of outside diameter 150 mm ± 10 mm) in Figure 12) and suitable to accept the appropriate spindle (see clause 5.2.1.2).

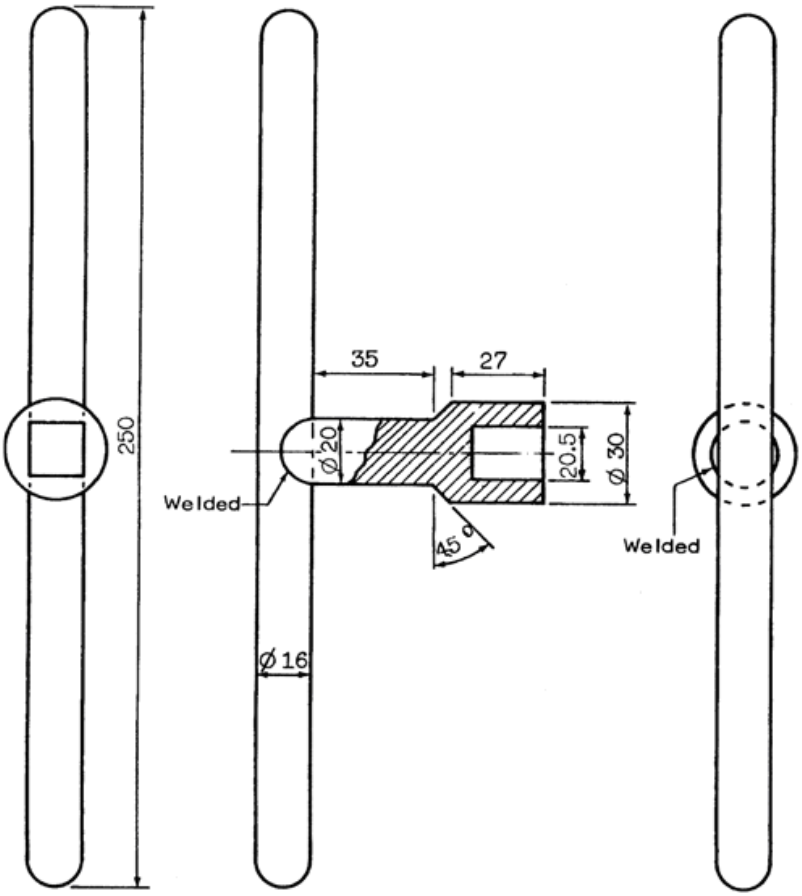


Figure 12 — Tamper proof type handle

6.2.2 Separate hydrant valve outlet coupling

A separate hydrant valve coupling shall have a female threaded inlet to suit the screwing of the hydrant valve outlet. The outlet of the coupling shall be of the 65 mm instantaneous type.

6.2.3 Hydrant valve outlet adapter

The adapter for a hydrant valve shall have an inlet of 65 mm instantaneous outlet connection.

6.3 General components

6.3.1 Blank cap

A blank cap (male or female, as relevant) shall, when so specified by the purchaser, be furnished for each outlet, and the cap shall be fixed to the component by means of a chain.

6.3.2 Bolts and nuts

Except for special bolts and nuts, the design of which shall be such that they will ensure sturdy, watertight, and neat joint(s), bolts and nuts.

6.4 Finish

All metal components shall be free from burrs, pits, sharp edges, blow holes, and plugged blow holes, and the

bores shall have a smooth finish. Feather edges (e.g. on round threads) shall have been removed. The external surface of an above-ground hydrant valve shall be acceptably smooth, clean, neat and free of scour marks and, when so required, polished.

6.5 Burst resistance

When an above-ground hydrant valve is tested in accordance with 9.4, it shall not burst or suffer such damage as would impair its normal operation.

7 Performance requirements

7.1 Capacity of valves

When tested in accordance with 9.2 at an inlet pressure of 150 kPa, a hydrant valve shall deliver at least 1200Lof water/min.

7.2 Resistance to hydraulic pressure

When a component is tested in accordance with 9.3 at a water pressure of 2 000 kPa:

a) the body of the component shall withstand the water pressure without leaking, distorting, or breaking;

b) in the case of a valve:

i. there shall be no sticking; jamming, or binding of the spindle; and

ii. the seat shall not leak or weep.

8 Marking

8.1 Each component shall be legibly marked by stamping or embossing with the manufacturer's name, trade name, or trade mark.

8.2 The direction of opening of an above-ground hydrant valve shall be marked (with words and arrows either indented 2 mm or raised 1 mm) on the surface of the hand wheel or handle (as relevant).

9 Sampling and compliance with the specification

NOTE This clause applies to the sampling for inspection and testing before acceptance or rejection of single lots (consignments) in cases where no information about the implementation of quality control or testing during manufacture is available to help in assessing the quality of the lot.

9.1 Sampling

The following sampling procedure shall be applied in determining whether a lot complies with the relevant requirements of the specification. The samples so taken shall be deemed to represent the lot.

9.1.1 Sample for inspection

From the lot take at random the number of components shown in Table 4 Column 2 relative to the appropriate lot size shown in Column 1.

9.1.2 Sample for testing

After inspection (see 9.1) of the sample drawn in accordance with 8.1.1, take from it at random the appropriate number of components shown in Column 4 of Table 4.

Table 4 — Sample sizes and acceptance number

1	2	3	4
Lot sizes, Components	Sample for inspection		Sample for testing, components
	Sample size, components	Acceptance number	
15-25	5	0	1
26-100	8	0	2
101-200	11	1	3
201-600	18	2	4

9.2 Compliance with the specification

The lot shall be deemed to comply with the relevant requirements of the specification if:

a) after inspection of the sample taken in accordance with 8.1.1, the number of defectives found does not exceed the appropriate acceptance number given in Column 3 of Table 4; and

b) after testing of the sample taken in accordance with 8.1.2, no defective is found.

10 Inspection and methods of test

10.1 Inspection

Inspect and measure the components taken in accordance with 8.1.1 for compliance with all the relevant requirements of Clauses 3, 4, 5, and 7, compliance with which is not assessed by the tests given in 9.2 and 9.3.

10.2 Capacity test for valves

Connect the inlet of the valve to a suitable water supply and, with the valve in the open position, increase the inlet water pressure to 150 kPa. Measure the rate of delivery and check for compliance with 6.1.

10.3 Pressure test for components

Connect the inlet of the component to a suitable water supply. With, in the case of valves, the gate or clack (as relevant) in the open position, fill the component with water ensuring that all air is expelled. Blank off the outlet, apply a hydraulic pressure of 2 000 kPa, maintain the pressure for 5 min and proceed as follows:

10.3.1 All components

Inspect the body for compliance with the requirements of 6.2(a).

10.3.2 Valves

10.3.2.1 Without reducing the pressure close and open the valve and check the spindle for compliance with the requirements of 6.2(b),(i).

10.3.2.2 Completely close the valve by hand and, without reducing the compliance with the requirements of 6.2(b)(ii).

10.4 Burst test for above-ground hydrant valves

10.4.1 Apparatus

a) A hydraulic pump, capable of producing a static pressure of 5 000 kPa.

b) A suitable pressure gauge.

c) An appropriately sized male component of a hose coupling that is blanked off on its tail.

10.4.2 Procedure

Properly assemble the male component to the outlet of the valve under test and connect the inlet to the pump. Fill the valve and increase the water pressure to 5 000 kPa, and maintain this pressure for 5 min. Inspect the valve for compliance with the requirements.

Bibliography

KS 2175: 2015, *Firefighting equipment — Components of underground and aboveground hydrant systems — Specification*