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EAST AFRICAN STANDARD

Cast iron rainwater goods — Specification

EAST AFRICAN COMMUNITY

Foreword

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

In order to meet the above objectives, the EAC Partner States have enacted an East African Standardization, Quality Assurance, Metrology and Test Act, 2006 (EAC SQMT Act, 2006) to make provisions for ensuring standardization, quality assurance, metrology and testing of products produced or originating in a third country and traded in the Community in order to facilitate industrial development and trade as well as helping to protect the health and safety of society and the environment in the Community.

East African Standards are formulated in accordance with the procedures established by the East African Standards Committee. The East African Standards Committee is established under the provisions of Article 4 of the EAC SQMT Act, 2006. The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the private sectors and consumer organizations. 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 procedures of the Community.

Article 15(1) of the EAC SQMT Act, 2006 provides that "Within six months of the declaration of an East African Standard, the Partner States shall adopt, without deviation from the approved text of the standard, the East African Standard as a national standard and withdraw any existing national standard with similar scope and purpose".

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.

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Introduction

In the preparation of this East African Standard, the following source was consulted extensively:

BS 460:2002, *Cast iron rainwater goods — Specification*

Assistance derived from this source and others inadvertently not mentioned is hereby acknowledged.

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Cast iron rainwater goods — Specification

1 Scope

This East African Standard specifies the requirements for cast iron rainwater systems for use on buildings. The sizes of the rainwater system extend from DN 50 to DN 150.

This standard specifies the requirements for the materials, dimensions, tolerances, mechanical properties, surface condition, primary coatings, jointing methods and marking for the following components of the rainwater system:

- rainwater pipes, fittings and components used for assembly or support;
- gutters, including half-round, ogee and beaded, fittings and components used for assembly or support.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this East African Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. For undated references, the latest edition of the publication referred to applies.

ISO 4628-2, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 2: Assessment of degree of blistering*

ISO 4628-3, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 3: Assessment of degree of rusting*

ISO 185, *Grey cast irons — Classification*

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

BS EN 10088-2, *Stainless steels — Part 2: Technical delivery conditions for sheet/plate and strip for general purposes*

BS EN 10088-3, *Stainless steels — Part 3: Technical delivery conditions for semi-finished products, bars, rods and sections for general purposes*

ISO 7253, *Paints and varnishes — Determination of resistance to neutral salt spray (fog)*

3 Terms and definitions

For the purposes of this East African Standard the following terms and definitions apply.

3.1

rainwater system

above ground system external to a building for the conveyance of rainwater from the building, excluding any pipework that has either entered the building or the ground

3.2

nominal size (DN)

alphanumeric designation of size for components of a pipework system, which is used for reference purposes

NOTE The nominal size 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

3.3

cast iron

alloy of iron and carbon, in which graphite can be present in different forms

3.4

pipe

casting of uniform bore, straight in axis, normally having plain ends but which can also be socketed

3.5

ear

projection on pipes or fittings which allows attachment of the rainwater system to the building

3.6

fitting

cast iron component, other than a pipe or gutter, which allows a deviation, a change in direction, diameter or profile

3.7

gutter

open channel casting of defined profile which is designed to evacuate rainwater from the roof area

NOTE 1 The profile of gutters may be socketed or socketless.

NOTE 2 Ogee is a particular shape of gutter profile (see Annex E).

3.8

joint

connection between the ends of pipes, gutters and/or fittings, by either clamping components or integrally cast sockets incorporating either mastic or elastomeric seals

3.9

effective length

overall length minus the socket depth

4 Technical requirements

4.1 Dimensions

4.1.1 Nominal size

The nominal size (DN) of pipes and fittings shall be one of the following:

DN 50; DN 65; DN 75; DN 100; DN 150.

4.1.2 Pipes and fittings

Pipes and pipe fittings shall conform to the dimensions given in Annex A.

All other dimensions shall be as specified by the manufacturer.

NOTE Typical examples of types of fitting are given in Annex B for pipes and Annex F for gutters.

4.1.3 Gutters and fittings

Gutters and gutter fittings shall conform to the dimensions and tolerances given in Annex C, Annex D and Annex E.

4.1.4 Manufacturer's declared length

The declared length and effective length of pipe and gutter shall be as specified by the manufacturer.

Lengths of all pipes and gutters shall have a tolerance of ± 20 mm when measured with equipment accurate to 1.0 mm.

The declared length and effective length of fittings shall be as specified by the manufacturer.

Lengths of fittings shall have a tolerance of ± 5 mm when measured with equipment accurate to 1.0 mm.

4.1.5 Angles of fittings

Angles of fittings shall be as specified by the manufacturer and shall have a tolerance of $\pm 2^\circ$.

4.1.6 Wall thickness

The wall thickness of pipes, fittings and gutters shall be as specified in Annex C, Annex D and Annex E when measured with equipment accurate to 0.1 mm.

4.1.7 Straightness

When measured in accordance with 5.1.3, pipes and gutters shall be straight with a maximum deviation of 1.5 mm per metre length for pipes and 2.5 mm per metre length for gutters.

NOTE Typical methods of measuring straightness are given in Annex F.

4.2 Mass

The nominal masses of finished products (pipes, gutters and fittings) shall be stated in manufacturers' catalogues. The actual mass shall be not less than 85 % of the nominal mass.

4.3 Materials

4.3.1 Metal for the manufacture of cast iron rainwater pipes, gutters and fittings shall conform to ISO 185 Grade EN-GJL-150 or ISO 185 Grade EN-JL1020.

4.3.2 Jointing components shall be manufactured in one of the following materials:

- a) cast iron conforming to 4.3.1;
- b) stainless steel conforming to BS EN 10088-1, BS EN 10088-2 or BS EN 10088-3. In order to ensure resistance to corrosion and stabilization against the effects of intergranular corrosion, only the following types shall be used:
 - 1) austenitic steels — all grades;
 - 2) ferritic and martensitic steels X3CrTi17 or X3CrNb17;
- c) any other material providing that it is suitably coated to withstand a salt spray test of at least 350 h in accordance with ISO 7253, the acceptable levels of blistering being dimension 3, class 3 in accordance with ISO 4628-2 and rusting being Ri not greater than 2 in accordance with ISO 4628-3.

4.4 As-cast surface conditions

4.4.1 Pipes, gutters and fittings shall be free from defects and surface imperfections that could lead to non-conformance with 4.1 or 4.2.

4.4.2 Internal surfaces shall be smooth and free from sharp protrusions so as to prevent blockage. External surfaces shall be uniform and free from protrusions that are detrimental to installation and handling.

4.5 Primary coatings

Unless otherwise agreed, pipes, gutters and fittings shall be supplied coated on the interior and on the exterior with a primary coating with a minimum thickness of 40 μm .

NOTE 1 Such primary coatings should not be readily flammable and should be free from toxic heavy metals. It is the responsibility of the installer to examine and repair any primary coating damage prior to further protective coatings being applied. The application of any further protective coatings is the responsibility of the installer/purchaser who needs to take account of local conditions, e.g. climate.

NOTE 2 Factory application of further coatings may be subject to special order arrangements.

4.6 Ears

Pipes and fittings can be supplied with or without ears. When ears are specified they shall be cast integrally to the socket or bolted on using non-corrosive fastenings (e.g. galvanized).

5 Test methods

5.1 Dimensions

5.1.1 External diameter (DE)

The external diameter of pipes and fittings shall be measured, to an accuracy of 0.2 mm, at a distance of at least 20 mm from the end faces of the casting concerned. Two measurements shall be taken at right angles at each cross-section and each measurement shall be within the dimensions given in Table A.1.

5.1.2 Internal diameter

The internal diameter shall be determined by taking the average of two measurements at 90° to each other across the diameter. The average shall be in accordance with Table A.1.

5.1.3 Straightness

Pipes shall be rolled on two gantries or rotated around its axis on rollers. The gantries or rollers shall be separated by not less than two-thirds of the pipe length. The point of maximum deviation from the straight axis shall be determined and the deviation measured at that point shall not exceed the limit given in 4.1.7.

Gutters shall be placed with their open side on a flat surface (see Figure G.1). Any gap along the length of the gutter, determined along either side of the gutter, shall not exceed the limits given in 4.1.7. The gutter shall then be rotated through 90° on a level surface (see Figure G.2) and the test shall be repeated for each edge of the gutter.

NOTE The socket should not be included in this test.

5.2 As-cast surface condition

The as-cast surface condition shall be inspected visually.

5.3 Primary coating thickness

Primary coating thickness shall be verified during manufacture.

6 Marking

Pipes, gutters and fittings shall be legibly marked with the following information:

- a) the number and date of this East African Standard¹⁾;
- b) the nominal size;
- c) if applicable, the angle of the fittings;
- d) a mark to identify the manufacturer, coded or not.

¹⁾ Marking CD/K/031:2009 on or in relation to a product represents a manufacturer's declaration of conformity, i.e. a claim by or on behalf of the manufacturer that the product meets the requirements of the standard. The accuracy of the claim is therefore solely the responsibility of the person making the claim. Such a declaration is not to be confused with third party certification of conformity, which may also be desirable.

Annex A
(normative)

Dimensions of pipes, sockets and ears

Dimensions of pipes, sockets and ears shall be as specified in Table A.1 and Figure A.1, (1 = ears and slot are optional).

Table A.1 — Dimensions of pipes, sockets and ears

Dimensions in millimeters

		Nominal size (DN)				
		50	65	75	100	150
Pipe						
Internal pipe diameter (min.)		45	55	68	95	145
External diameter (max.)	H	59	69	82	109	159
Wall thickness (min.)		3	3	3	3	3
Socket						
Internal diameter (min.) D	D	63	71	85		164
External diameter (max.)	C	74	84	98	124	176
Wall thickness (min.)		3	3	3	3	3
Spigot insertion depth (min.)	E	58	64	64	64	75
Ears						
Overall length (nom.)	A	130	150	162	191	255
Hole centres (± 4 mm)	B	100	111	130	158	215
Projecting ear (min.)	G	60	67	73	86	117
Standard ear (min.)	F	40	47	53	66	94
Bolt hole size (min.)		10	10	10	10	10

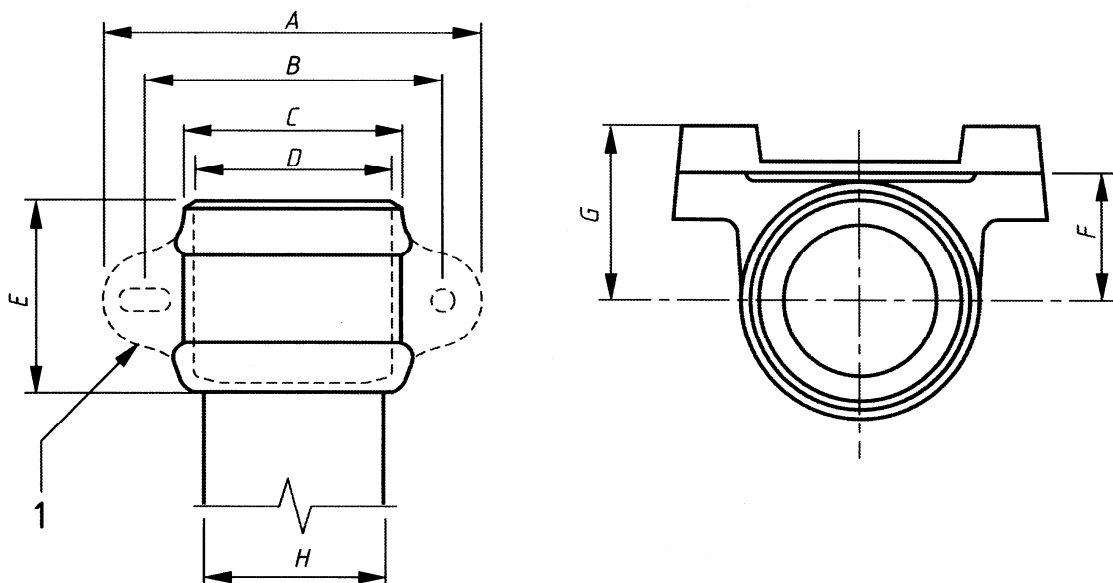


Figure A.1 — Dimensions

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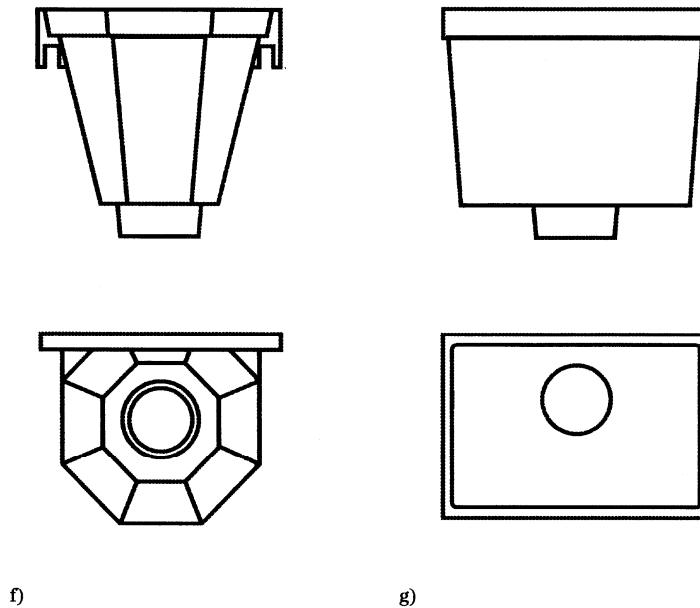
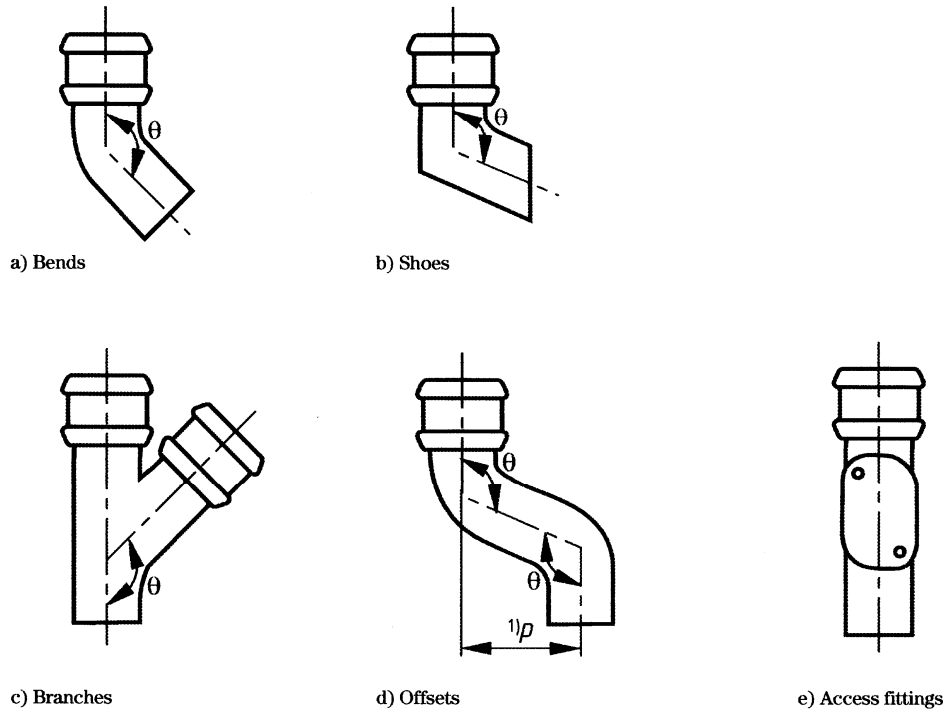
Annex B
(informative)

Typical examples of fittings for pipes

Typical examples of fittings for pipes are shown in Table B.1 and Figure B.1.

Table B.1 — Some typical examples of fittings for pipes

Nominal spigot sizes (DN)	a Bends			b Shoes	c Branches			d Offsets	e Access	f and g	
	θ			θ	θ			θ		Hoppers	
	92.5°	112.5°	135°	112.5°	92.5°	112.5°	135°	115°			
50	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
65	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
75	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
100	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
150	✓	✓	✓	✓	—	—	—	—	—	✓	✓



Hopper heads

Refer to manufacturer's catalogue for range of offsets

Figure B.1 — Illustrations of fittings for pipes

Annex C (normative)

Dimensions of half round gutter and fitting spigots

Dimensions of half round gutter and fitting spigots shall be as specified in Table C.1 and Figure C.1.

Table C.1 — Half round gutter and fitting spigot dimensions

Dimensions in millimetres

Nominal size	Internal width A	Radius B	Depth C	Thickness E
75	75 ± 3	38 ± 3	35 ± 3	≥ 3
100	100 ± 3	51 ± 3	45 ± 3	≥ 3
115	112 ± 4	58 ± 3	50 ± 3	≥ 3
125	125 ± 4	64 ± 3	56 ± 3	≥ 3
150	150 ± 4	76 ± 3	66 ± 3	≥ 3

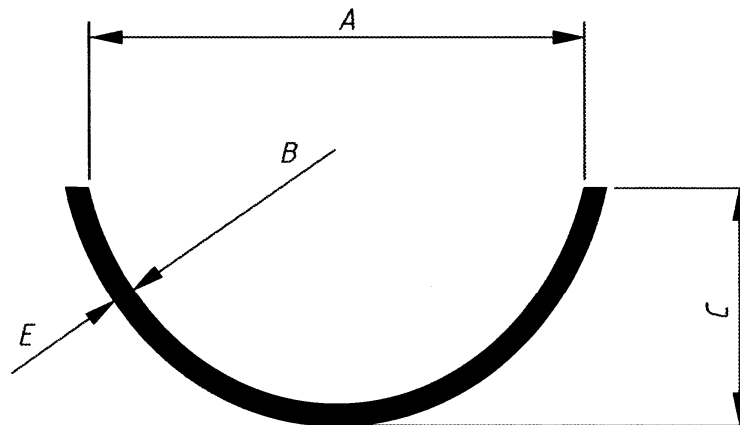


Figure C.1 — Half round gutter profile

Annex D
(informative)

Dimensions of half round beaded gutter and fitting spigots

Dimensions of half round beaded gutter and fitting spigots shall be as specified in Table D.1 and Figure 1.

Table D.1 — Half round beaded gutter and fitting spigot dimensions

Dimensions in millimeters

Nominal size	Internal width A	Radius B	Depth C	Bead width D	Thickness E
100	100 ± 3	50 ± 3	45 ± 3	8.5 ± 1.5	≥ 3
115	112 ± 4	57 ± 3	55 ± 3	8.5 ± 1.5	≥ 3
125	125 ± 4	64 ± 3	57 ± 3	8.5 ± 1.5	≥ 3

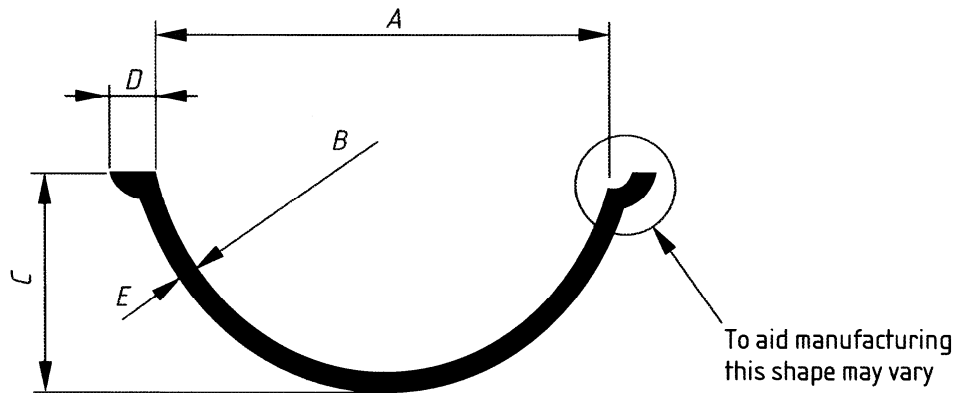


Figure D.1 — Half round beaded profile

Annex E
(normative)

Dimensions of Ogee gutters and fittings

Dimensions of Ogee gutters and fitting spigots shall be specified in Table E.1 and Figure E.1.

Table E.1 — Ogee gutter and fitting spigot dimensions

Dimensions in millimeters

Nominal size	Internal width A	Depth B	Thickness E
100	102 ± 3	54 ± 2	≥ 3
115	114 ± 3	60 ± 2	≥ 3
125	126 ± 3	67 ± 2	≥ 3

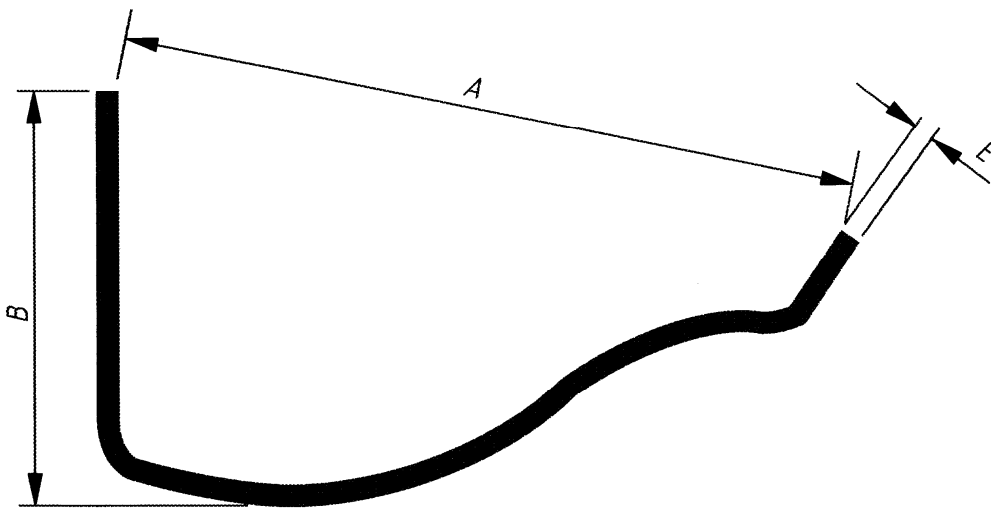


Figure E.1 — Typical Ogee profile

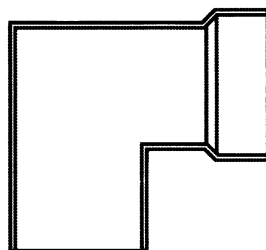
Annex F
(informative)

Typical types of fittings for gutters

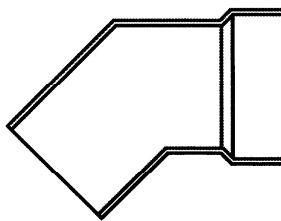
Typical types of fittings for gutters are shown in Table F.1 and Figure F.1.

Table F.1 — Some typical types of fittings for gutters

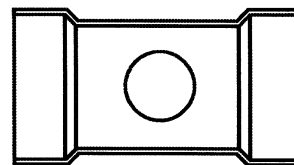
Range of sizes of gutters	100 A	115 B	125 E	150
Half round (see Figure C.1)	✓	✓	✓	✓
Half round beaded (see Figure D.1)	✓	✓	✓	—
Ogee (see Figure E.1)	✓	✓	✓	—



90° Angle

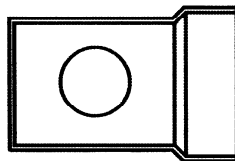


45° Angle

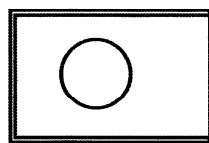


Nozzle

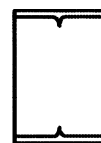
Can also be opposite hand



Socket



Spigot



Union clip



for Spigot



for Socket

Drop ends

Stop ends

Figure F.1 — Illustrations of fittings for gutters

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Annex G
(informative)

Straightness

Typical methods of measuring the straightness are illustrated in Figure G.1 and Figure G.2.

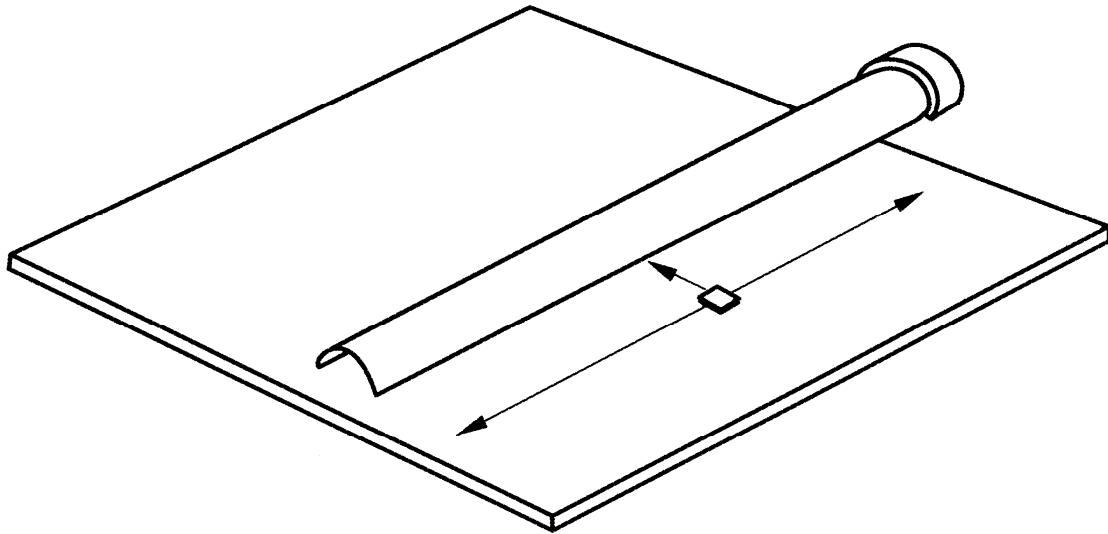


Figure G.1 — Open sided straightness

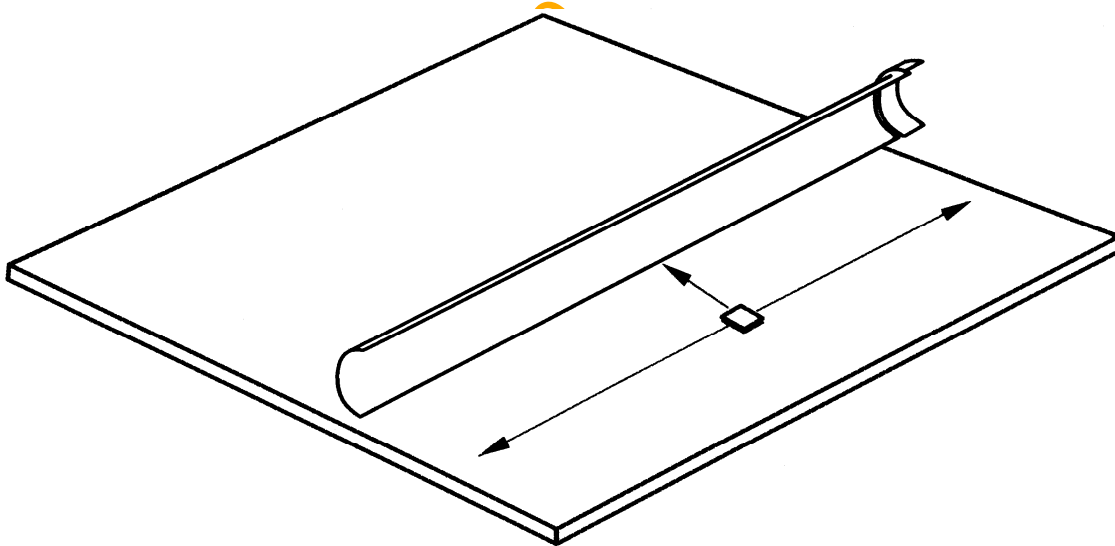


Figure G.2 — Closed sided straightness

Draft for com.

Bibliography

ISO 6708:1996, *Pipework components — Definition and selection of DN (nominal size)*

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