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# International Standard 6594

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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

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## Cast iron drainage pipes and fittings — Spigot series

*Tuyaux et raccords salubres en fonte — Série à bouts unis*

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**Descriptors :** pipes (tubes), pipe fittings, cast iron products, drainage devices, specifications, dimensions, thickness, diameters, mass, marking, tests.

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been authorized 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 6594 was developed by Technical Committee ISO/TC 5, *Ferrous metal pipes and metallic fittings*, and was circulated to the member bodies in February 1982.

It has been approved by the member bodies of the following countries:

Austria	Germany, F.R.	Netherlands
China	India	Romania
Czechoslovakia	Israel	South Africa, Rep. of
Egypt, Arab Rep. of	Italy	Switzerland
France	Korea, Rep. of	USSR

The member bodies of the following countries is expressed disapproval of the document on technical grounds :

Australia  
Finland  
Poland  
United Kingdom

# Cast iron drainage pipes and fittings — Spigot series

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### 0 Introduction

This International Standard on drainage pipes and fittings, spigot series, comprises three sections :

- Section one : Technical specification
- Section two : Dimensions and masses
- Section three : Control testing and test methods

#### 0.1 Comments to section one — Technical specification

This specification applies to cast iron drainage pipes and fittings used for the discharge of waste water, sewage, rainwater and for ventilation.

The distinctive character of discharge pipelines is that products flow through them in a single direction under the force of gravity; they are thus laid on a slight slope in the direction of flow. As a result, they include descending, vertical, oblique or slightly sloping components, but exclude any horizontal or ascending components.

Nine of the nominal sizes used in various countries were selected; the figures and tables in section two give the relevant information.

NOTE — The nominal size, DN, is a number which permits classification of the pipes and fittings; it is only loosely related to the inside diameter.

The weight is calculated for each component taking the volumetric mass of cast iron to be 7,17 kg/dm<sup>3</sup>. This value is an average of the values fixed previously by the various countries which range between 7 and 7,25 kg/dm<sup>3</sup>.

#### 0.2 Comments to section two — Dimensions and masses

Only the most commonly used sizes of the various pipes and fittings were selected. This International Standard does not exclude the use of sizes which may be specified in national standards.

#### 0.3 Comments to section three — Control testing and test methods

This section is concerned with the tests and controls to be carried out to check compliance with the requirements stated in sections one and two.

## Section one : Technical specification

### 1 Scope and field of application

This International Standard specifies the characteristics of cast iron drainage pipes and fittings used for the installation of :

- discharge pipes for waste and sewage;
- rain water pipe systems;
- ventilation pipe systems.

If required, national standards and/or regulations may clarify and possibly restrict the field of application of those pipes and fittings described in this International Standard.

### 2 Reference

ISO 185, *Grey cast iron — Classification.*<sup>1)</sup>

### 3 Type of ends and their jointing

Cast iron drainage pipes and fittings are of the spigot type without sockets.

The pipes and fittings may be assembled using various types of joints whose characteristics and tolerances shall be specified in the national standards or, failing these, in manufacturers' catalogues.

To achieve satisfactory assembly it is essential that each end presents a free length corresponding at least to the values of table 1.

### 4 Quality of the cast iron

The quality of the type of cast iron used for drainage pipes and fittings must be at least 15, according to ISO 185, and have a phosphorous content of less than 0,9 %.

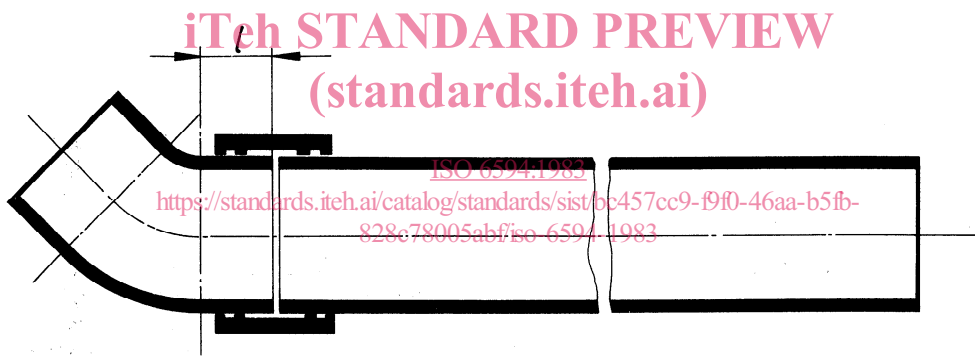


Table 1

Dimensions in millimetres

Nominal size DN	Minimum free length l
50	30
70*	35
75*	35
100	40
125	45
150	50
200	60
250	70
300	80

\* See footnote to clause 7.

1) At present at the stage of draft. (Revision of ISO/R 185-1961.)

**5 Quality of pipes and fittings**

Drainage pipes and fittings must be sound and free from surface and other defects which would impair performance or service life.

When fractured, the castings shall show a fine, grey, close and regular grain. Pipes and fittings with small imperfections, which are unavoidable due to the manufacturing processes and which are not harmful in any way to their usage, shall not be rejected.

Drainage pipes and fittings shall be capable of being cut with the tools normally used for installation.

**6 Marking**

Drainage pipes and fittings shall carry a durable manufacturer's mark.

The pipes shall carry this manufacturer's mark and the indication of the nominal diameter at least once per metre of length.

Where possible, the fittings shall have their nominal diameter and, if necessary, the angle of deviation, cast on.

The marking shall be effected outside the region of the joint of the spigot (see clause 3).

**7 Range of nominal sizes**

The range of nominal sizes is as follows<sup>1)</sup>:  
50 - 70 - 75 - 100 - 125 - 150 - 200 - 250 - 300

**8 External diameters and tolerances**

The external diameters of drainage pipes and fittings and the tolerances applicable are given in table 2.

**Table 2**  
Dimensions in millimetres

Nominal size DN	External diameter of the pipe body DE	Tolerance on the external diameter DE
50	58	+ 2 - 1
70*	78	+ 2 - 1
75*	83	+ 2 - 1
100	110	± 2
125	135	± 2
150	160	± 2
200	210	± 2,5
250	274	± 2,5
300	326	± 2,5

\* See footnote to clause 7.

1) The range of nominal sizes and their classification differ slightly from one country to another. The use of DN 70 or DN 75 is subject to existing national standards and regulations.

**9 Thicknesses and tolerances**

Table 3 gives the minimum and nominal thicknesses of drainage pipes and fittings, spigot series.

**Table 3**  
Dimensions and tolerances in millimetres

DN	Pipes		Fittings	
	e nom.	e min.	e nom.	e min.
50	3,5	3,0	4,2	3,5
70*	3,5	3,0	4,2	3,5
75*	3,5	3,0	4,2	3,5
100	3,5	3,0	4,2	3,5
125	4,0	3,5	4,7	3,7
150	4,0	3,5	5,3	4,0
200	5,0	4,0	6,0	4,5
250	5,5	4,5	7,0	5,5
300	6,0	5,0	8,0	6,5

\* See footnote to clause 7.

The nominal thicknesses given in table 3 are used for the calculation of the approximate masses of the corresponding castings in section two. Maximum thicknesses have not been specified. A reduction of the minimum thicknesses, and of the masses, shall only be allowed where the castings are not buried and have special coatings. In such a case, the technical characteristics of these coated pipes shall be specified in the national standards.

**10 Lengths and tolerances**

The normal manufacturing lengths of the pipes and fittings are given in the tables in section two.

**11 Tolerances on the angles**

The tolerance on the angles of the bends and branches is fixed at ± 1° 30' throughout.

**12 Masses and tolerances**

The masses of the pipes and fittings, indicated in the tables in section two are approximate values.

The negative tolerance with respect to the mass indicated in the table is fixed at :

- 15 % for pipes;
- 15 % for fittings.

Positive tolerances have not been specified, but components whose mass is greater than that indicated shall be accepted, provided that they satisfy all the other requirements of this International Standard.

### 13 Protection

Unless otherwise specified, drainage pipes and fittings shall be supplied coated internally and externally.

The coatings shall dry rapidly, shall not be sticky, shall adhere well, shall not chip and shall be sufficiently resistant to

temperature under normal conditions of use, transportation and storage of the products.

The external coating shall in addition be suitable for the application of finish coatings.

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## Section two : Dimensions and masses

### 14 Pipes

Symbol :



Tolerances on  $L$  :  $\pm 20$  mm

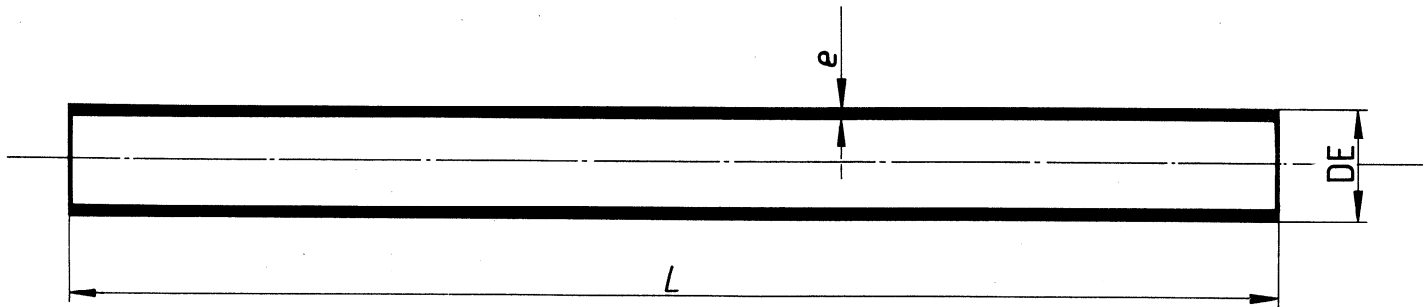


Table 4

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Nominal size DN	Mass (approximate) for a working length $L$ of 3 m kg
50	13,0
70*	17,7
75*	18,9
100	25,2
125	35,4
150	42,2
200	69,3
250	99,8
300	129,7

\* See footnote to clause 7.

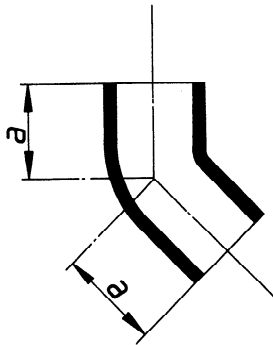
15 Fittings

15.1 45° bends

Symbol :



Tolerances on  $a$  :  $\pm 5$  mm

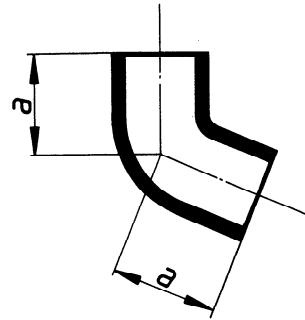


15.2 69° bends

Symbol :



Tolerances on  $a$  :  $\pm 5$  mm



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Table 5

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Nominal size DN	$a$ mm	Mass (approximate) kg
50	50	0,5
70*	60	0,9
75*	60	1
100	70	1,6
125	80	2,3
150	90	3,5
200	110	6,2
250	130	10,8
300	155	17,5

\* See footnote to clause 7.

Table 6

Nominal size DN	$a$ mm	Mass (approximate) kg
50	70	0,7
70*	75	1,1
75*	80	1,2
100	90	1,9
125	105	2,9
150	120	4,3
200	145	7,7

\* See footnote to clause 7.

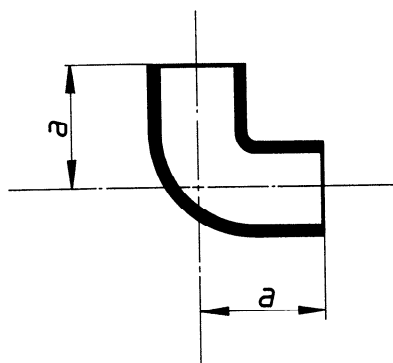


15.3 88° bends

Symbol :



Tolerances on  $a$  :  $\pm 5$  mm

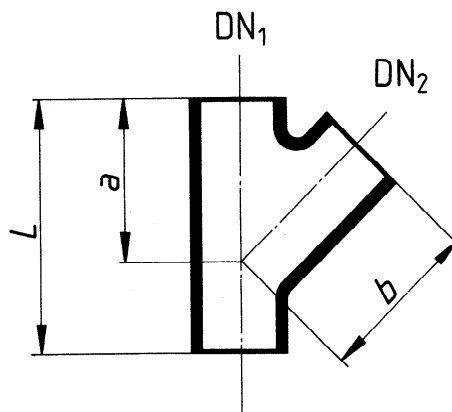


15.4 45° single branches

Symbol :



Tolerances on  $L, a, b$  :  $\pm 5$  mm



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Table 7

Nominal size DN	$a$ mm	Mass (approximate) kg
50	75	0,7
70*	90	1,2
75*	95	1,4
100	110	2,0
125	125	3,2
150	145	4,9
200	180	8,8

\* See footnote to clause 7.

Table 8

Nominal sizes		$L$	$a$	$b$	Mass (approximate) kg
DN <sub>1</sub>	DN <sub>2</sub>	mm	mm	mm	
50	50	160	115	115	1,2
70*	50	170	130	130	1,6
70*	70*	200	145	145	2,1
75*	50	180	135	135	1,7
75*	75*	215	155	155	2,4
100	50	185	150	150	2,3
100	70*	220	170	170	3,0
100	75*	220	170	170	3,0
100	100	260	190	190	3,8
125	100	270	210	210	5,0
125	125	305	230	230	6,1
150	100	280	225	225	6,5
150	125	315	245	245	7,7
150	150	355	265	265	9,2
200	150	375	300	300	13,3
200	200	455	340	340	17,2
250	200	470	380	380	24,8
250	250	560	430	430	31,8
300	250	580	465	465	42,1
300	300	660	505	505	50,1

\* See footnote to clause 7.