

Gravity drainage systems inside buildings —

Part 3: Roof drainage, layout and calculation

The European Standard EN 12056-3:2000 has the status of a
British Standard

ICS 91.060.20; 91.140.80

National foreword

This British Standard was published by BSI. It is the UK implementation of EN 12056-3:2000. It supersedes BS 6367:1983 which is withdrawn.

The UK participation in its preparation was entrusted by Technical Committee B/505, Wastewater engineering, to Subcommittee B/505/21, Roof drainage and sanitary pipework. Subcommittee B/505/21 was disbanded on 2 November 2000 and so Technical Committee B/505 assumes responsibility for this work.

A list of organizations represented on the technical committee can be obtained on request to its secretary.

In March 2007, Technical Committee B/505 introduced an amendment to BS EN 12056-3:2000 to delete National Annex NF. This annex is replaced by the test method given in BS 8490:2007, Annex B.

The remaining national annexes are an informative element of this standard and contain information provided to support easier implementation of EN 12056-3:2000 in the United Kingdom, within the framework envisaged by the scope of that standard. The remaining national annexes constitute a revision of those parts of BS 6367:1983 that were not otherwise superseded by BS EN 12056-3:2000. However, users are reminded that only the normative elements of the adopted European Standard set out the provisions to which it is necessary to conform in order to form part of a trade description when citing this British Standard by number or when compliance with it is claimed.

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

Additional information

It is recognized that Figure 2, Figure 3, Figure 4 and Figure 11, along with the logic diagrams contained in Annex D, are of poor quality. This has been reported to CEN in a proposal to correct them in the English language version of EN 12056-3:2000.

Until the standard is corrected, which BSI is not authorized to do, it is strongly recommended that these figures be used with care.

Textual errors

The textual errors set out below were discovered when the English language version of EN 12056-3:2000 was adopted as the national standard. They have been reported to CEN in a proposal to amend the text of the European Standard.

- Note 1 to Figure 8 should refer to Table 8, rather than Table 7.
- Note 3 to Figure 8 should refer to Table 8, rather than Table 7.

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

This British Standard, having been prepared under the direction of the Sector Committee for Building and Civil Engineering, was published under the authority of the Standards Committee and comes into effect on 15 September 2000

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ISBN 0 580 36486 0

Amendments issued since publication

Amd. No.	Date	Comments
17041	30 March 2007	Deletion of National Annex NF and revision of national foreword

English version

Gravity drainage systems inside buildings - Part 3: Roof drainage, layout and calculation

Réseaux d'évacuation gravitaire à l'intérieur des bâtiments -
Partie 3: Système d'évacuation des eaux pluviales,
conception et calculs

Schwerkraftentwässerungsanlagen innerhalb von
Gebäuden - Teil 3: Dachentwässerung, Planung und
Bemessung

This European Standard was approved by CEN on 27 October 1999.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.



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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 165 "Waste water engineering", the secretariat of which is held by DIN.

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 2000, and conflicting national standards shall be withdrawn at the latest by June 2001.

This part is the third in a series relating to the functional requirements of gravity drainage systems inside buildings. There will be five parts, as follows: Gravity drainage systems inside buildings

Part 1: General and performance requirements

Part 2: Sanitary pipework - Layout and calculation

Part 3: Roof drainage - Layout and calculation

Part 4: Waste water lifting plants - Layout and calculation

Part 5: Installation and testing, instructions for operation, maintenance and use

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 **Scope**

This European Standard applies to wastewater drainage systems, which operate under gravity. It is applicable for drainage systems inside dwellings and commercial, institutional and industrial buildings.

This third part of this European Standard describes a method of calculating the hydraulic adequacy of non-siphonic roof drainage systems and gives performance requirements for siphonic roof drainage systems. It also sets standards for the layout and installation of roof drainage insofar as they affect flow capacity.

This part of this European Standard applies to all roof drainage systems where the outlets are large enough not to limit the flow capacity of the gutter (i.e. free discharge conditions). It applies to all materials used for roof drainage systems.

Detailed information additional to that contained in this Standard may be obtained by referring to the technical documents listed in Annex B.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 12056-1:	Gravity drainage systems inside buildings Part 1: General and performance requirements
EN 12056-2:	Gravity drainage systems inside buildings Part 2: Sanitary pipework, layout and calculation
EN 12056-5	Gravity drainage systems inside buildings Part 5: Installation and testing, instructions for operation, maintenance and use

3 Definitions and symbols

3.1 Definitions

For the purposes of this European Standard, the following definitions apply:

- 3.1.1 **gutter angle**
deviation in gutter direction
- 3.1.2 **design water depth**
maximum depth of water under design rainfall conditions
- 3.1.3 **drainage length**
length of gutter from a stop end to an outlet or half the distance between adjacent outlets, in millimetres
- 3.1.4 **eaves gutter**
gutter where any spillover will discharge outside the building
- 3.1.5 **flat sole**
sole of the gutter, which is horizontal in cross-section for at least the width of the outlet
- 3.1.6 **freeboard**
total depth of gutter minus the designed water depth
- 3.1.7 **long gutter**
gutter whose drainage length is greater than 50 times its design water depth
- 3.1.8 **roof drainage of buildings**
all pipework and fittings outside and inside, fixed to or passing through the building structure, including drains below the building, to the point of connection to the buried drain adjacent to the building, used to remove precipitation from a roof (See Scope of EN 12056-1.)
- 3.1.9 **short gutter**
gutter whose drainage length is not greater than 50 times its design water depth
- 3.1.10 **siphonic drainage system**
drainage system in which the outlets and pipework enable the system to flow completely full under design conditions and make use of the total head available between the outlets and the discharge point
- 3.1.11 **spillover level**
level at which water will overflow the gutter

3.2 Symbols

For the purposes of this European Standard, the following symbols have been used:

Symbol	Description	Unit	Text reference
A	effective roof area	m^2	Table 3
A_E	full cross-sectional area of gutter	mm^2	5.1.2
A_W	cross-sectional area of the gutter below the freeboard	mm^2	5.2.3
A_O	plan area of a gutter outlet	mm^2	Figure 8
B_R	width of roof from gutter to ridge	m	Figure 1
C	runoff coefficient	dimensionless	4.1
d_i	internal diameter of pipe	mm	Table 8
D	effective diameter of a gutter outlet	mm	Figure 9
D_O	actual diameter of a gutter outlet	mm	Figure 9
f	filling degree of rainwater pipe which is equal to the proportion of cross-section of rainwater pipe filled with water	dimensionless	Table 8
F_d	depth factor	dimensionless	Figure 5
F_h	outlet head factor	dimensionless	Figure 10
F_L	capacity factor for long and sloping gutters	dimensionless	Table 6
F_s	shape factor	dimensionless	Figure 6
h	head at outlet	mm	Table 7
H_R	height of roof from gutter to ridge	m	Figure 1
h_d	water depth in drain	mm	annex C
i	pipe or gutter gradient	dimensionless	annex C
k_b	effective pipe roughness	mm	Table 8
k_O	outlet coefficient	dimensionless	Table 7
L	drainage length of gutter, i.e. length of gutter from a stop end to an outlet or half the distance between two adjacent outlets	mm	Table 6
L_R	length of roof to be drained	m	Figure 1
L_S	length of sump	mm	Figure 11
L_K	length of taper of a gutter outlet	mm	Figure 9
L_W	length of weir over which water can flow	mm	5.3.5 and Figure 12
Q	rate of flow of water	l/s	4.1
Q_d	drain capacity	l/s	annex C
Q_L	design capacity of "short" gutter, laid level	l/s	5.1.2
Q_N	nominal capacity of gutter	l/s	5.1.2
Q_O	total flow to an outlet (calculated on area drained multiplied by the rainfall intensity)	l/s	Table 7