



SLOVENSKI STANDARD

SIST EN 12056-2:2001

01-december-2001

Težnostni kanalizacijski sistemi v stavbah - 2. del: Sanitarni sistem, načrtovanje in izračun

Gravity drainage systems inside buildings - Part 2: Sanitary pipework, layout and calculation

Schwerkraftentwässerungsanlagen innerhalb von Gebäuden - Teil 2: Schmutzwasseranlagen, Planung und Berechnung

Réseaux d'évacuation gravitaire à l'intérieur des bâtiments - Partie 2: Systemes pour les eaux usées, conception et calculs

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 12056-2

June 2000

ICS 91.140.80

English version

Gravity drainage systems inside buildings - Part 2: Sanitary pipework, layout and calculation

Réseaux d'évacuation gravitaire à l'intérieur des bâtiments -
Partie 2: Systèmes pour les eaux usées, conception et
calculs

Schwerkraftentwässerungsanlagen innerhalb von
Gebäuden - Teil 2: Schmutzwasseranlagen, Planung und
Berechnung

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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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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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 is the second part in a series of the following five parts:

- 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 of drainage systems, 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.

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1 Scope

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

Differences in plumbing within Europe have led to a variety of systems being developed. Some of the major systems in use are described but this standard has not attempted to detail the intricacies of each system. Detailed information additional to that contained in this Standard may be obtained by referring to the technical documents listed in Annex A.

This second part of the standard sets out principles which shall be followed for both layout and calculation. It makes limited provision for drainage systems conveying trade effluent and also makes limited provision for fluids removed by pumps.

All drawings in the standard are given as examples and are not intended to exclude any other system configuration.

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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 publication referred to applies.

- EN 12056-1: Gravity drainage systems inside buildings
Part 1: General and performance requirements
- EN 12056-3: Gravity drainage systems inside buildings
Part 3: Roof drainage, layout and calculation
- EN 12056-4: Gravity drainage systems inside buildings
Part 4: Waste water lifting plants, layout and calculation
- EN 12056-5: Gravity drainage systems inside buildings
Part 5: Installation and testing,
instructions for operation, maintenance and use
- EN 752 Drain and Sewer Systems outside Buildings
- prEN 12380 Ventilating Pipework - Air Admittance Valve Systems (AVS)

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3 Definitions

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

3.1 General

3.1.1 Waste water

Water which is contaminated by use and all water discharging into the drainage system; e.g. domestic and trade effluent, condensate water and also rainwater when discharged in a waste water drainage system.

3.1.2 Domestic waste water

Water which is contaminated by use and normally discharged from WC, shower, bath, bidet, wash basin, sink, floor gully.

3.1.3 Trade effluent

Water after industrial use and processes contaminated / polluted water including cooling water.

3.1.4 Grey water

Waste water not containing faecal matter or urine.

3.1.5 Black water

Waste water containing faecal matter or urine.

3.1.6 Rainwater

Water resulting from natural precipitation that has not been deliberately contaminated.

3.1.7 Flood level

The maximum level to which waste water can rise within a drainage system.

3.1.8 Drainage system

A system composed of drainage equipment, and other components collecting waste water and discharging by means of gravity. Effluent lifting plant may be part of a gravity drainage system.

3.1.9 Combined system

A drainage system for both rain and waste water in a single pipe.

3.1.10 Separate system

A drainage system for draining rain and waste water separately by dedicated pipework.

3.2 Pipes and fittings

3.2.1 Sanitary pipework

Arrangement of discharge pipework, with or without ventilating pipes, connected to a drainage system.

Note: For the purposes of this standard "pipework" include pipes and fittings.

3.2.2 Nominal Diameter (DN)

Numerical designation of size which is a convenient round number approximately equal to the diameter in mm.

3.2.3 Internal diameter (d)

Mean internal diameter of the pipe barrel at any cross section.

3.2.4 External diameter (d_a)

Mean external diameter of the pipe barrel at any cross section.

3.2.5 Minimum internal diameter (d_{min})

Smallest internal diameter allowed with maximum tolerance.

3.2.6 Branch discharge pipe

Pipe connecting sanitary appliances to a discharge stack or drain.

3.2.7 Square entry

Equal branch junction that is more than 45°, or has a centre line radius less than the internal pipe diameter.

3.2.8 Swept entry

Equal branch junction that is at 45° or less, or has a centre line radius not less than the internal pipe diameter.

3.2.9 Connection bend

First fitting in direction of flow after trap outlet.

3.2.10 Discharge stack

Main (generally vertical) pipe, conveying discharges from sanitary appliances.

3.2.11 Stack offset

Non vertical part of a discharge stack.

3.2.12 Drain

Near horizontal pipe suspended within a building or buried in the ground to which stacks or ground floor appliances are connected.

3.2.13 Filling degree

Proportion of water depth (h) to the inside diameter (d).

3.3 Ventilating pipework

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3.3.1 Ventilating pipe

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Pipe provided to limit the pressure fluctuations within the discharge pipe system.

3.3.2 Branch ventilating pipe

Ventilating pipe connected to a branch discharge pipe.

3.3.3 Stack vent

Extension of a vertical discharge pipe above the highest branch discharge pipe connection that terminates in an end, open to the atmosphere.

3.3.4 Ventilating stack

Main vertical ventilating pipe, connected to a discharge stack, to limit pressure fluctuations within the discharge stack.

3.3.5 Air admittance valve

Valve that allows air to enter the system but not to escape in order to limit pressure fluctuations within the sanitary pipework.

3.4 Appliances**3.4.1 Domestic sanitary appliances**

Fixed appliances supplied with water and used cleaning or washing. For example: baths, showers, wash basins, bidets, WCs, urinals, sinks, dishwashers, washing machines.

3.4.2 Non-domestic sanitary appliances

Special sanitary appliances used in commercial kitchens, laundries, laboratories, hospitals, hotels, swimming-pools etc.

3.4.3 Floor gully

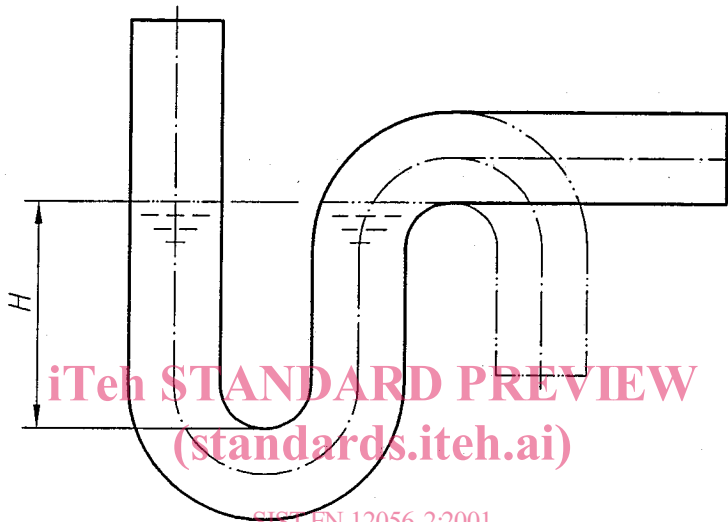
Discharge fitting intended to receive water from floors either through apertures in a grating or from pipes connected to the body of the gully. A gully may include a trap.

3.4.4 Trap

Device that prevents the passage of foul air by means of water seal.

3.4.5 Depth of water seal (H)

The depth of water which would have to be removed from a fully charged trap before gases and odours at atmospheric pressure could pass through the trap shown as H in Figure 1.



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Figure 1: Water depth in trap

3.5 Calculation

3.5.1 Discharge Unit (DU)

The average discharge rate of a sanitary appliance expressed in litres per second (l/s).

3.5.2 Frequency factor (K)

Variable to take into account the frequency of use of sanitary appliances (dimensionless).

3.5.3 Waste water flow rate (Q_{ww})

Total design flow rate from sanitary appliances in a drainage system or in a part of a drainage system in litres per second (l/s).

3.5.4 Continuous flow rate (Q_c)

Flow rate of all continuous flows e.g. cooling water etc. in litres per second (l/s).

3.5.5 Pumped water flow rate (Q_p)

Discharge rate of waste water pumps in litres per second (l/s).

3.5.6 Total flow rate (Q_{tot})

The total flow rate is the sum of the waste water flow rate (Q_{ww}) and continuous flow rate (Q_c) and pumped water flow rate (Q_p), in litres per second (l/s).

3.5.7 Hydraulic capacity (Q_{max})

Maximum flow rate of water permitted in a branch, stack or drain in litres per second (l/s).

3.5.8 Air flow rate (Q_a)

Minimum flow rate of air through a ventilating pipe or air admittance valve, measured at 250 Pascal (Pa) pressure drop, in litres per second (l/s).

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