SLOVENSKI STANDARD
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Namakalna tehnika – Hidranti za namakanje

Irrigation techniques - Irrigation hydrants

Bewässerungsverfahren - Hydranten für Bewässerungswasser

Techniques d'irrigation - Bornes d'irrigation

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Management Centre: rue de Stassart, 36 B-1050 Brussels

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Foreword

This document (EN 14267:2004) has been prepared by Technical Committee CEN/TC 334 “Irrigation techniques”, the secretariat of which is held by AENOR.

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of an identical text or by endorsement, at the latest by January 2005, and conflicting national standards shall be withdrawn at the latest by January 2005.

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

1 Scope

This document applies to irrigation hydrants intended to supply equipment for use in water distribution irrigation networks. The range of *PN* is that defined in EN 1074-1, i.e.: *PN* 10, *PN* 16, *PN* 25 and limited to *PN* 25.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 19, *Industrial valves – Marking of metallic valves.*

EN 1074-1:2000, *Valves for water supply – Fitness for purpose requirements and appropriate verification tests – Part 1: General requirements.*

EN 1092-1, *Flanges and their joints – Circular flanges for pipes, valves, fittings and accessories, PN designated – Part 1: Steel flanges.*

EN 1092-2, *Flanges and their joints – Circular flanges for pipes, valves, fittings and accessories, PN designated – Part 2: Cast iron flanges.*

EN 1267, *Valves – Test of flow resistance using water as test fluid.*

EN 1503-3, *Valves –Materials for bodies, bonnets and covers – Part 3: Cast irons specified in European Standards.*

EN 1561, *Founding – Grey cast irons.*

EN 1563, *Founding – Spheroidal graphite cast iron.*

EN 12266-1:2003, *Industrial valves - Testing of valves - Part 1: Pressure tests, test procedures and acceptance criteria - Mandatory requirements*

EN ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads – Part 1: Dimensions, tolerances and designation (ISO 228-1:2000).*

EN ISO 4628-1:2003, *Paints and varnishes – Evaluation of degradation of coatings – Designation of quantity and size of defects, and of intensity of uniform changes in appearance – Part 1: General introduction and designation system (ISO 4628-1:2003)*.

ISO 4064-1, *Measurement of water flow in closed conduits – Meters for cold potable water – Part 1: Specifications.*

ISO 4064-3, *Measurement of water flow in closed conduits – Meters for cold potable water – Part 3: Test methods and equipment.*

ISO 4200:1991, *Plain end steel tubes, welded and seamless – General tables of dimensions and masses per unit length.*

ISO 9227, *Corrosion tests in artificial atmospheres – Salt spray tests.*

ISO 9635:1990, *Irrigation equipment – Hydraulically operated irrigation valves.*

3 Terms and definitions

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

3.1
irrigation hydrant
valve apparatus intended to ensure the delivery of irrigation water supplied to a user network from a pressurised distribution network which is generally subterranean buried

The irrigation hydrant consists of the body of the hydrant and one or more distribution outlets fitted to it.

It is characterised by the diameter of the body and by the diameters of the outlets (see Figure 1).

It features at least a "shut-off" function and a "metering" function. It may also integrate the "flow-rate limitation" and "pressure regulation" functions.

NOTE Throughout the rest of this document, "irrigation hydrant" is also referred to as the hydrant.

3.2
pressurised water distribution network for irrigation
collective network which is generally positioned underground which supplies irrigation water to several user networks

3.3
user network
distribution network belonging to the user which supplies land irrigation systems

3.4
nominal diameter (*DN*)
alpha-numerical designation of dimension for the components of a piping network used for reference purposes. It comprises the letters *DN* followed by a whole number without units, which is indirectly related to the actual dimensions, in millimetres, of the bore or the external diameter of the end connections

NOTE The number which follows the letters *DN* does not represent a measurable value and should not be used for calculation purposes, except where specified in the relevant standard.

[EN ISO 6708:1995]

3.5
nominal pressure (*PN*)
alpha-numerical term used for reference purposes and relating to a combination of mechanical and dimensional characteristics of a pipeline network component. It comprises the letters PN followed by a whole number without unit

NOTE 1 The number following the letters *PN* does not represent a measurable value and it should not be used for calculation purposes except where specified in the relevant standard.

NOTE 2 The term *PN* is not significant unless it is associated with the number of the relevant component standard.

NOTE 3 The permissible pressure of a component of a pipeline network depends on the *PN* value, the material and the design of the component, its permissible temperature, etc., and is given in the tables of pressure/temperature relationships specified in the relevant standards.

NOTE 4 It is planned that all components with the same *PN* and *DN* designations have the same connection dimensions for compatible flange types.

[EN 1333:1996]

3.6
hydraulic test pressure (P_t) or test pressure
pressure, chosen in the service pressure variation range, to which the equipment is subjected for test purposes

[EN 764:1994]

3.7
regulated downstream pressure (*PAR*)
pressure measured at the level of the connection to the user network once the permanent flow-rate is attained in the hydrant

3.8
setpoint downstream pressure (*PAC*)
desired reference pressure at the output from the hydrant at the level of the connection to the user network

3.9
allowable operating pressure (*PFA*)
maximum hydrostatic pressure that a component is capable of withstanding continuously in service

[EN 805:2000]

3.10
allowable maximum operating pressure (*PMA*)
maximum pressure occurring from time to time, including surge, that a component is capable of withstanding in service

[EN 805:2000]

3.11
allowable site test (*PEA*)

maximum hydrostatic pressure that a newly installed component is capable of withstanding for a relatively short duration, in order to ensure the integrity and tightness of the pipeline

[EN 805:2000]

3.12
pressure regulator
self acting device (operating without external energy input) enabling the output water pressure to be reduced at an approximately constant value between certain limits within the regulation range, in spite of variations in pressure and/or discharge at the inlet

3.13
pressure regulator calibration pressure (*PTR*)
adjustment pressure of the pressure regulator of the hydrant

It is normally superior to the downstream set point pressure (*PAC*) in order to take into account head losses caused by parts of the hydrant situated downstream of the regulator, such as: nozzle, flow-rate limiter, etc.

3.14
flow-rate limiter
self acting valve apparatus operating without external energy input intended to ensure that the flow-rate does not exceed a certain threshold under any circumstances

3.15
permanent flow-rate (*QN*)
highest flow-rate within the rated operating conditions, at which the components of the irrigation hydrants are required to operate in a satisfactory manner within the maximum permissible error

The following designations are used:

— QNB, the permanent flow-rate of the body of the hydrant;

— QNP, the permanent flow-rate of the outlet;

— QNR, the permanent flow-rate of the pressure regulator;

— QNL, the permanent flow-rate of the flow-rate limiter;

— QNC, the permanent flow-rate of the meter.

3.16
minimum operating flow-rate (*QRmin.* and *QRmin.*)
the lowest flow-rate at which the water meter and the pressure regulator are required to operate within the maximum permissible error

The following designations are used:

— $QRmin.$: the minimum operating flow-rate for the meter;

— $QRmin.$: the minimum operating flow-rate for the pressure regulator.

3.17
maximum accidental flow-rate (*QMA*)
maximum flow-rate which may be delivered by the outlet for a period of time limited to a few minutes only, without deterioration of all or part of the equipment

3.18
overload flow-rate (*QSC*)
highest flow-rate, at which a water meter is required to operate, for a short period of time, within its maximum permissible error, whist maintaining its metrological performance when it is subsequently operated within its rated operating conditions

3.19
nominal hydrant closing time (*tcNB*)
closing time defined by the manufacturer for hydrants other than those operated using a wheel

3.20
head loss (Δh)
loss of energy for a given flow-rate due to the presence of the hydrant in the pipeline

3.21
permanent head loss (ΔhN)
loss of energy due to the presence of the hydrant at its permanent flow-rate

3.22
maximum operating torque (*MOT*)
higher limit fixed for the torque which, when applied at the entrance point of the mechanical energy, will operate the valve and ensure compliance with the required leakage rate

[EN 1074-1:2000]

4 Classification

4.1 By function

Distinction is made between four types of irrigation hydrants, which integrate the following functions:

— type 1: shut-off and metering;

— type 2: shut-off, metering and flow-rate limitation;

— type 3: shut-off, metering and pressure regulation;

— type 4: shut-off, metering, flow-rate limitation and pressure regulation.

Other ancillary functions (remote reading, prepayment, etc.) may be included unto any of types 1 to 4 provided they do not affect the performance of the meters as defined in this document.

4.2 By dimension

Table 1 — Classification of hydrants according to connection dimensions

Nominal diameter (DNB) [b]	Nominal diameter of the outlet (DNP) [b]					
	50	65	80	100	150	200
65	X [a]	X [a]				
80	X [a]	X [a]	X [a]			
100	X [a]	X [a]	X [a]	X [a]		
150	X [a]	X [a]	X [a]	X [a]	X [a]	
200	X [a]	X [a]	X [a]	X [a]	X [a]	X [a]

[a] Possible solutions.

[b] See Figure 1.

4.3 By *PN*

PN 10, *PN* 16 and *PN* 25.

4.4 By flow-rate limiter class

Class 1 flow-rate limiter: can operate up to a maximum differential pressure of 5 bar;

Class 2 flow-rate limiter: can operate up to a maximum differential pressure of 10 bar.

5 Quality of irrigation waters

5.1 General

Irrigation water may permanently or occasionally contain mineral or organic materials in variable proportions.

Three qualities of water have been defined for testing purposes.

5.2 Water quality 1a

Water quality 1a contains a total load of solid particles composed of three loads whose classes have an increasing granulometry.

Table 2 — Classes of granulometry

Material	Solid particles
Total content of solid particles of classes 1 + 2 + 3	(2,0 ± 0,2) g/l with over 95 % of silica SiO_2
Class 1 content	Granulometry between 20 µm and 60 µm fraction by mass (25 ± 5) % of the total content of solid particles
Class 2 content	Granulometry between 60 µm and 320 µm fraction by mass (50 ± 10) % of the total content of solid particles
Class 3 content	Granulometry between 320 µm and 1 600 µm fraction by mass (25 ± 5) % of the total content of solid particles

5.3 Water quality 1b

To obtain water quality 1b, from water quality 1a, it shall be added a total load of particles of 100 mg/l of synthetic fibres whose characteristics are the following:

Synthetic fibre:

- approximately volume mass: < 1 000 kg/m^3;
- resistance to traction: > 400 MPa;
- module of elasticity: > 12 GPa;
- wetting (immersion time): < 90 s;
- thickness of fibre: approximately 40 µm to 50 µm;
- width: 0,6 mm to 0,7 mm;
- length: 15 mm to 20 mm.

5.4 Water quality 1c

Clean water

5.5 Water quality 2

Water quality 2 is water, which corresponds to the transportation of large particles through the hydrant.

- Particles:

  form: spherical balls;

  number of balls: 48;

  density: 24 balls between 0,9 and 1,1; 24 balls greater than 2;

size of balls with respect to meter: equal to 10 % of nominal diameter of hydrant outlet to be tested with ± 2 %.

6 Requirements

6.1 Dimensional hydrant specifications

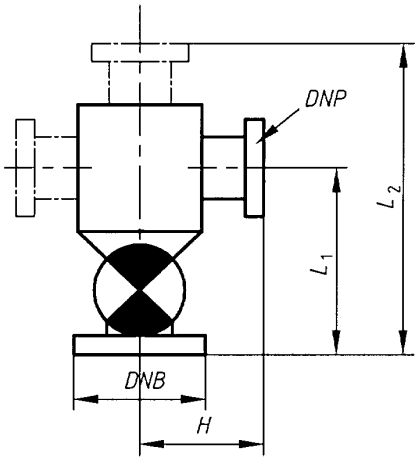

Figure 1 — Hydrant dimensions

Face to face (*L2*) and face to axis (*H* and *L1*) dimensions shall be specified in the manufacturer's documentation.

DNP: nominal diameter of the outlets.

DNB: nominal diameter of the hydrant body.

6.2 Requirements for total head loss in the hydrant

The total head loss (Δh) measured between the upstream flange which connects to the distribution network and connection to the user network shall not exceed, for the nominal flow-rate of the hydrant, the following values according to the classification given in 4.1 and 8.4:

— for type 1: maximum head loss of 0,5 bar;

— for type 2: maximum head loss of 0,8 bar;

— for type 3: maximum head loss of 0,8 bar;

— for type 4: maximum head loss of 1,1 bar.

The flow-rate passing through the body of the hydrant (*DNB*, see Figure 1) shall be established at the nominal flow-rate of the hydrant (*QNB*) in the following manner:

— The test is carried with wide-open hydrant and with regulation elements deactivated.