SLOVENSKI STANDARD
SIST EN 13997:2004

01-junij-2004

Namakalna tehnika ï Priklju ļ itev in nadzor uporabe pripomo ļ kov v namakalnem sistemu ï Tehni ļ ne zna ļ ilnosti in preskuġanje

Irrigation techniques - Connection and control accessories for use in irrigation systems - Technical characteristics and testing

Bewässerungsverfahren - Verbindungs- und Steuerzubehör für den Einsatz in Bewässerungssystemen - Technische Eigenschaften und Prüfung

Techniques d'irrigation - Accessoires de raccord et de commande pour usage dans les systemes d'irrigation - Caractéristiques techniques et essais

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65.060.35	Namakalna in drenažna oprema	Irrigation and drainage equipment

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Irrigation techniques - Connection and control accessories for use in irrigation systems - Technical characteristics and testing

Techniques d'irrigation - Accessoires de raccord et de commande pour usage dans les systèmes d'irrigation - Caractéristiques techniques et essais

Bewässerungsverfahren - Verbindungs- und Steuerzubehör für den Einsatz in Bewässerungssystemen - Technische Eigenschaften und Prüfung

This European Standard was approved by CEN on 19 September 2003.

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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 Management Centre 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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

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

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Foreword

This document (EN 13997:2003) 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of an identical text or by endorsement, at the latest by May 2004, and conflicting national standards shall be withdrawn at the latest by May 2004.

Annexes A and B are informative.

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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This standard describes the technical characteristics and requirements of hydraulic connection and control accessories to ensure a sufficient mechanical resistance for practical use, and specifies the relevant testing methods. It applies to accessories made of steel, brass, aluminium, Polypropylene, Polyethylene or PVC for use in irrigation systems up to a diameter of 250 mm.

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 (including amendments).

EN 10240, *Internal and/or external protective coatings for steel tubes - Specification for hot dip galvanized coatings applied in automatic plants.*

ISO 209-1, *Wrought aluminium and aluminium alloys — Chemical composition and forms of products – Part 1: Chemical composition*.

ISO 209-2, *Wrought aluminium and aluminium alloys — Chemical composition and forms of products – Part 2: Forms of products*.

ISO 3522, *Cast aluminium alloys — Chemical composition and mechanical properties*.

ISO 11678, *Agricultural irrigation equipment - Aluminium irrigation tubes*.

3 Terms and definitions

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

3.1
connection accessory for irrigation
portable device with coupling parts (such as threads, flanges or quick couplings) which give a safe connection with other parts or with a pipe with couplings of the same kind

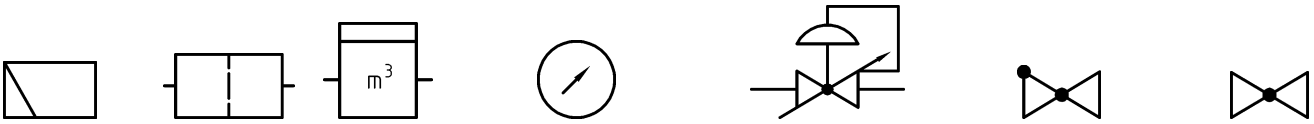
3.2
quick coupling accessory
connection accessory which allows a connection in a few seconds mostly without a tool and which can be loosened in the same easy way

3.3
moulded part
moulded, welded or formed parts for connection of parts of an irrigation plant laid down in straight or modified direction with same or different parameters such as bends, valves (i. e. inline gate valves), online hydrants, opening elbow, pump connection bow, T-pieces, reduced cross, diameter reduction parts, thread pieces, stabilizers, risers, end plugs (male and female). See Figure 1.

a) elbow **b)** T-piece **c)** diameter reduction **d)** riser

Figure 1 — Examples for connection accessories (symbols)

3.4
control accessory
parts which influence the water pressure and the direction of flow or give data for influence in an irrigation plant such as flowmeters, pressure gauges, filters, valves (i. e. inline gate valves), online hydrants, pressure reduction valves, shot valves, control units, non return valves, air escape valves, emptying valves. See Figure 2.



a) Control unit **b)** filter **c)** flow meter **d)** pressure gauge **e)** pressure reduction valve **f)** non return valve **g)** shot valve

Figure 2 — Examples for control accessories (symbols)

4 Technical characteristics and requirements

4.1 Material and method of production of the parts

The methods of production depending on the materials are listed in Table 1.

Table 1 — Materials and methods of production

Material	Method of production
Steel	Welded or moulded
Brass	Welded or moulded
Aluminium alloy	Welded or moulded
Polypropylene (PP)	Extruded
Polyethylene (PE)	Extruded
Polyvinylchloride (PVC)	Extruded

4.2 Corrosion resistance and protection against corrosion

4.2.1 General

Connection and control accessories shall be corrosion resistant against the application.

4.2.2 Steel parts

Parts made of steel plate have to be hot dip zinc galvanized according to EN 10240.

Parts made of moulded steel have to be galvanized or covered with an anticorrosion colour.

4.2.3 Parts made of brass

Parts made of brass are resistant against irrigation water without abrasive and or chemical components. The use with solutions of fertilizer and or agents for plant protection shall be granted by the manufacturer.

4.2.4 Parts made of Aluminium alloy

Parts made of Aluminium alloy shall meet the requirements for tubes given in ISO 209-1, ISO 209-2, ISO 3522 and ISO 11678.

4.2.5 Parts made of Polypropylene (PP) or Polyvinylchloride (PVC)

No specific requirements (parts made of such material are resistant against the chemical influence of soil and water).

4.3 Dimensions

4.3.1 General

If fitted with quick couplings it is to distinguish between the nominal length (l_N) and the overall length (l_O) of accessories. The dimensions of elbows are to be determined along and at the end of the centre line.

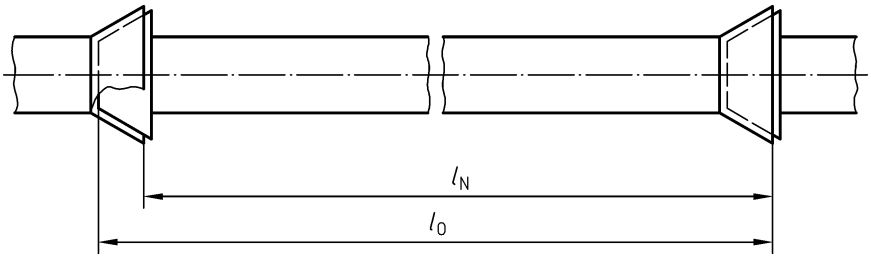
4.3.2 Length

4.3.2.1 Nominal length

The nominal length of a part is declared by the manufacturer and is measured after connection of two identical parts as the distance between two similar points on both parts. (The measurement should be carried out under nominal pressure at (20 ± 5)°C. Deviation of 0 % to 0,4 % is allowable. See Figure 3).

4.3.2.2 Overall length

The overall length of a part fitted with fittings or quick couplings is the total length of a part including coupling parts. See Figure 3.



Key

l_N nominal length

l_O overall length

Figure 3 — Nominal and overall length of parts fitted with quick couplings

4.3.3 Width

The width is to be determined in the same way as described in 4.3.2.

4.3.4 Height

The height is to be determined in the same way as described in 4.3.2.

4.3.5 Diameter

The diameter is to be determined without coupling parts. The diameter of coupling parts is to determined separately.

It is to distinguish between inner diameter (d_i), outside diameter (d_o) or nominal diameter (d_N).

4.4 Smoothness of surface

The inner side of the wall of connection and control accessories shall be smooth; welding residue and flashes are allowed to protrude not more than 2 mm. The protective coating on steel pipes shall have an adhesion strong enough to prevent peeling due to hits caused during transportation or general use. The adhesion of the coating should also avoid hairline cracks caused by the test pressure.

4.5 Coupling

Three kinds of couplings are usually used:

— Spherical coupling with O – ring seal. Closed mechanically;

— Coupling with lip type seal. Closed mechanically;

— Coupling with lip type seal. Closed by water pressure.

For special application lip type couplings may be required to be loose at pressures below 50 kPa by agreement.

The maximum bending angle of adjacent elements in degrees shall be declared by the manufacturer in his documentation. The coupling must be water-tight if filled with water under nominal pressure. If quick coupling pipelines are used as suction line the couplings must be water and air-tight. The couplings must withstand opening and closing for 2000 times.

4.6 Replacement of parts with spherical couplings in a plant

The replacement of one part in the middle of a pipeline with 100 m length shall be possible without moving the whole pipeline in longitudinal direction.

4.7 Allowable operating pressure (nominal pressure)

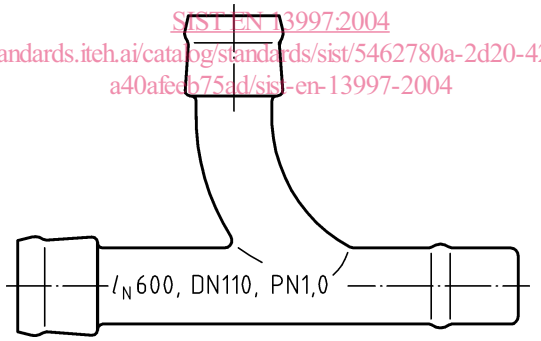
The nominal pressure of parts is declared by the manufacturer. The operating pressure in accessories shall not exceed the nominal pressure of those parts. The selection of accessories shall be made taking into account possible pressure shocks (water hammer).

4.8 Pressure loss

The manufacturer shall declare the head loss at nominal pressure or at nominal flow rate. If the head loss is to be determined without a standardized test method existing the used test method must be described very carefully to enable further measurement under comparable conditions.

5 Marking

Connection and control accessories according to this standard may be marked with the name or the sign of the producer in connection with length, diameter and nominal pressure as shown in Figure 4.



Key

l_N nominal length: 600 mm

DN nominal diameter: 110 mm

PN nominal pressure: 1,0 MPa

Figure 4 — Marking of an accessory part

6 Testing

6.1 Construction and operating tests

6.1.1 Sampling and test forms

For tests of connection and control accessories the forms 1 and 2 are to be used (see annex A and annex B). These forms have to be filled out in duplicate. The test connection, control accessories and documents according to Table 2 are necessary.

Table 2 — List of parts required for testing

No	Connection and control accessories - documents	Quantity
1	Complete quick coupling pipes with sealing elements (not to be tested)	Minimum 100 m
2	Fittings	2 each
3	Bends 90°, 45°, 30°; risers	2 each
4	T-pieces, reduced crosses, diameter reduction parts	2 each
5	Opening elbow	2
6	Valves (i. e. inline gate valve)	2 each
7	Online hydrant	2
8	Threaded pieces with female coupling or flange pieces with female coupling (or symmetric coupling each)	2
9	End plug with male-piece (if not identical) with female-piece (if not identical)	2 2
10	Flow meters, pressure gauges	2 each
11	Filters	2 each
12	Pressure reduction valves, shot valves, control units, non return valves	2 each
13	Air escape valves, emptying valves	2 each
14	Stabilizers	2 each
15	Sectional drawing of the part with main dimensions as well as details about the material, fabrication and corrosion protection.	2
16	Operating instructions	1

6.1.2 Test procedure

6.1.2.1 General

The test should show the dimension and properties according to 6.1.2.2 to 6.1.2.14 (carrying out of the test, see clause 6.2).

6.1.2.2 Dimensions

6.1.2.3 Wall thickness (without corrosion protection)

6.1.2.4 Total length of part

6.1.2.5 Nominal length of part

6.1.2.6 Bending angle in all directions if equipped with quick coupling