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Pipes and fittings of longitudinally welded hot-dip galvanized steel pipes with spigot and socket for waste water systems – Part 1: Requirements, testing, quality control

The European Standard EN 1123-1:1999 has the status of a Swedish Standard. This document contains the official English version of EN 1123-1:1999.

Swedish Standards corresponding to documents referred to in this Standard are listed in "Catalogue of Swedish Standards", issued by SIS. The Catalogue lists, with reference number and year of Swedish approval, International and European Standards approved as Swedish Standards as well as other Swedish Standards.

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English version

Pipes and fittings of longitudinally welded hot-dip galvanized steel pipes with spigot and socket for waste water systems - Part 1: Requirements, testing, quality control

Tubes et raccords de tube soudés longitudinalement en acier galvanisé à chaud, à manchon enfichable pour réseaux d'assainissement - Partie 1: Prescriptions, essais, contrôle de qualité

Rohre und Formstücke aus längsnahtgeschweißtem, feuerverzinktem Stahlrohr mit Steckmuffe für Abwasserleitungen - Teil 1: Anforderungen, Prüfungen, Güteüberwachung

This European Standard was approved by CEN on 16 December 1998.

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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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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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 July 1999, and conflicting national standards shall be withdrawn at the latest by July 1999.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

This European standard consists of the following parts:

- Part 1: Requirements, testing, quality control
- Part 2: Dimensions

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 standard specifies requirements, tests and quality control for longitudinally welded, hot-dip galvanized steel pipes and fittings with spigot and socket for use in waste water systems usually operating under gravity or at a low head of pressure.

For the purposes of this standard, components are pipes, fittings, joints and seals.

This standard is for components used for the discharge of

- domestic waste water
- surface water and
- groundwater

This standard is also for components discharging other waste water (e.g. industrial waste water) as long as it does not damage the components or endanger the safety and health of personnel.

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 476	General requirements for components used in discharge pipes, drains and sewers for gravity systems
EN 681-1:1996	Elastomeric seals - Material requirements for pipe joint seals used in water and drainage applications - Part 1: Vulcanized rubber
EN 1123-2 : 1999	Pipes and fittings of longitudinally welded, hot-dip galvanized steel pipes with spigot and socket for waste water systems - Part 2: Dimensions
EN 12068	Cathodic protection - External organic coatings for the corrosion protection of buried or immersed steel pipelines used in conjunction with cathodic protection - Tapes and shrinkable materials
prEN ISO 1461	Hot dip galvanized coatings on fabricated ferrous products - Specifications (ISO/DIS 1461:1996)
ISO 37 : 1994	Rubber, vulcanized or thermoplastic – Determination of tensile stress-strain properties
ISO 48 : 1994	Rubber, vulcanized or thermoplastic – Determination of hardness (Hardness between 10 IRHD and 100 IRHD)
ISO 188 : 1982	Rubber, vulcanized – Accelerated ageing or heat-resistance tests
ISO 559 : 1991	Steel tubes for water and sewage
ISO 815 : 1991	Rubber, vulcanized or thermoplastic – Determination of compression set at ambient, elevated or low temperatures
ISO 1431-1 : 1989	Rubber, vulcanized or thermoplastic – Resistance to ozone cracking – Part 1: Static strain test
ISO 1817 : 1985	Rubber, vulcanized – Determination of the effect of liquids
ISO 2285 : 1996	Rubber, vulcanized or thermoplastic – Determination of tension set at normal and high temperatures
ISO 3306 : 1985	Plain end as-welded and sized precision steel tubes – Technical conditions for delivery
ISO 3384 : 1991	Rubber, vulcanized or thermoplastic – Determination of stress relaxation in compression at ambient and at elevated temperatures
ISO 3387 : 1994	Rubbers – Determination of crystallization effects by hardness measurements
ISO 8770 : 1991	High-density polyethylene (PE-HD) pipes and fittings for soil and waste

discharge (low and high temperature) systems inside buildings –
Specifications

3 Definitions

For the purposes of this standard, the definitions of nominal size (DN) and inside diameter (ID) as specified in EN 476 apply.

4 Materials and prefabricated components

The sized precision steel tube from which the pipes and fittings are made shall be of unalloyed steel with a quality of at least R 33 according to ISO 3306:1985

Prefabricated components are assembled at the manufacturer's plant. They shall be designed so as to function permanently and be interchangeable.

Until a European Standard for as welded precision steel pipes is produced, national regulations for the testing of steel pipe before finished into pipes and fittings for drainage continue to exist.

5 Dimensions

The dimensions shall comply with EN 1123-2.

5.1 Socket shape

The socket shape shall meet the requirements of EN 1123-2.

5.2 Nominal sizes

The nominal sizes of pipes and fittings according to EN 1123-2 shall be DN/ID 40, 50, 70, 80, 100, 125, 150, 200, 250, 300.

6 Requirements of pipes and fittings

6.1 Straightness

The pipes shall be straight. In the pipe axis, the bend over a length of 1 m shall not be more than 1,5 mm.

6.2 Ends of pipes and fittings

The pipes and fittings shall be cut perpendicular to the pipe axis (see EN 476). For fittings up to DN/ID 100 a variation of the right angle of up to 3° is allowed. For the ends of pipes and fittings with nominal sizes larger than DN/ID 100 the deviation of the right angle shall not be more than 1° 45'. All burrs shall be removed.

6.3 Inner surface finish

The inner surface shall be completely galvanized and shall be smooth and free from

blowholes, cracks and impurities affecting flow. The inner surface of the sockets shall meet the requirements in 6.4. Both requirements apply also to the weld area.

6.4 Outside surface finish

The outside surface shall be smooth and free from sharp irregularities which could damage the seals during insertion.

6.5 Roundness

The permissible variations of the pipe diameter, according to table 5 of EN 1123-2:1999 shall be satisfied.

6.6 Welds

Burrs, edges and lugs in the weld area shall be avoided. Welding burrs or occlusions shall be so small that acceptable hot-dip galvanization is possible.

The inner burr of the longitudinal weld shall, following ISO 559:1991, be worked down to a maximum of 0,3 mm.

The weld shall withstand the stresses to be expected under normal working conditions and shall also be watertight at internal pressures of 0 kPa to 50 kPa.

7 Requirements of pipe joints

7.1 Seals

Seals shall be resistant to rainwater, domestic waste water and industrial sewage. Industrial sewage may only be discharged if it does not damage the components nor the health and safety of the personnel.

Where pipes and fittings are fitted with joint seals, these shall be supplied with the pipe or fitting before it leaves the manufacturer or installed in the socket factory made.

The seals shall be homogeneous. The surface shall not have any defects or irregularities which could affect the waste water drainage.

Dimensions, shape and tolerances of sealings shall conform to EN 1123-2.

7.2 Requirements of the physical characteristics of seals

The requirements of the physical characteristics specified in table 1 shall be met.

Table 1: Requirements of the physical characteristics of seals and test methods

Type: WC and WG ¹⁾		Requirements				Test method
Property	Unit	according to clause of this standard	for hardness class			
			50	60	70	
Permissible tolerance on nominal hardness	IRHD	7.2.1	±5	±5	±5	ISO 48:1994
Tensile strength, min.	MPa	7.2.2	9	9	9	ISO 37:1994
Elongation at break, min.	%	7.2.2	375	300	200	ISO 37:1994
Compression set, max. 72 h at 23 °C 24 h at 70 °C 70 h at -10 °C	% % %	7.2.3 7.2.3 7.2.4	12 20 40	12 20 50	15 20 50	ISO 815:1991 ISO 815:1991 ISO 815:1991
Ageing 7 days at 70 °C; change of initial values, max.		7.2.5				ISO 188:1982
Hardness	IRHD		± ₅ ⁸	± ₅ ⁸	± ₅ ⁸	ISO 48:1994
Tensile strength	%		-20	-20	-20	ISO 37:1994
Elongation strength	%		± ₃₀ ¹⁰	± ₃₀ ¹⁰	± ₃₀ ¹⁰	ISO 37:1994
Stress relaxation, max. 7 days at 23 °C 100 days at 23 °C per logarithm. decade	% % %	7.2.6	14 20 5,5	15 22 5,9	16 23 6,3	ISO 3384:1991
Volume change in water, max. 7 days at 70 °C	%	7.2.7	± ₁ ⁸	± ₁ ⁸	± ₁ ⁸	ISO 1817:1985
Ozone resistance	-	7.2.8	No cracking when viewed without magnification			ISO 1431-1:1989
Optional additional requirements						
Compression set, max. 72 h at -25 °C	%	7.2.9.2	60	60	70	ISO 815:1991
Hardness change, max. 168 h at -25 °C	IRHD	7.2.9.2	+18	+18	-	ISO 3387:1994
Volume change in oil, max. 72 h at 70 °C		7.2.9.3				ISO 1817:1985
Oil N° 1	%		±10	±10	±10	
Oil N° 2	%		+50	+50	+50	

¹⁾ designation of elastomeric seals according to table 4 of EN 681-1:1996

7.2.1 Hardness

The test shall be carried out by the micro-test method specified in ISO 48:1994, the hardness shall comply with the requirements given in table 1.

NOTE: If the dimensions of a seal are appropriate, the normal test method specified in ISO 48:1994 can be used, provided that the micro-test method is used for reference purposes.

For the same seal the difference between the minimum and maximum hardness shall not be more than 5 IRHD. Each value shall be within the specified tolerances.

7.2.2 Tensile strength and elongation at break

The tensile strength and elongation at break shall be determined by the method specified in ISO 37:1994. Dumb-bell shaped test pieces of types 1, 2, 3 or 4 shall be used. Type 2 is the preferred type. The test report shall state the dumb-bell type whenever type 2 is not used.

The tensile strength and the elongation at break shall comply with the requirements given in table 1.

7.2.3 Compression set in air

7.2.3.1 General

If the test piece is taken from a seal, then the measurement shall be carried out as far as possible in the direction of compression of the seal in service.

7.2.3.2 Compression set at 23 °C and 70 °C

When determined by the method specified in ISO 815:1991 at 23 °C and 70 °C, using the small type B test piece, the compression set shall comply with the requirements given in table 1.

Where the cross section is too small to obtain compression buttons from the product, as an alternative to moulding buttons, the tension set of the product may be determined using the method specified in ISO 2285:1996 with a strain of 50 % and shall comply with the same test conditions (except strain) and requirements as for compression set.

7.2.4 Low temperature compression set at (-10 °C)

When determined by the method specified in ISO 815:1991, at -10 °C, using the small type B test piece and the (30±3) min recovery measurement, the compression set of seals, drainage and sewerage applications shall comply with the requirements given in table 1.