
**Keramične cevi, fazonski kosi in spoji za odvod odpadne vode in kanalizacijo - 2.
del: Kontrola kakovosti in vzorčenje**

Vitrified clay pipes and fittings and pipe joints for drains and sewers - Part 2: Quality control

Steinzeugrohre und Formstücke sowie Rohrverbindungen für Abwasserleitungen und -kanäle - Teil 2: Güteüberwachung und Probenahme

Tuyaux et accessoires en gres et assemblages de tuyaux pour les réseaux de branchement et d'assainissement - Partie 2: Contrôle de la qualité et échantillonnage

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91.140.80	Drenažni sistemi	Drainage systems
93.030	Zunanji sistemi za odpadno vodo	External sewage systems

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Vitrified clay pipes and fittings and pipe joints
for drains and sewers - Part 2: Quality control
and sampling

Tuyaux et accessoires en grès et
assemblages de tuyaux pour les réseaux
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Foreword

This part of the European Standard for vitrified clay pipes is the second of three parts which were drafted by WG2 "Vitrified clay pipes" of the Technical Committee CEN/TC 165 "Waste Water Engineering", Secretariat of which is held by DIN.

"Vitrified clay pipes and fittings and pipe joints Part 1: Requirements" contains the complete specification, "Vitrified clay pipes and fittings and pipe joints Part 3: Test methods" contains the necessary statements on the testing methods.

On drafting this standard the provisional results already available of CEN/TC 165/WG1 "General requirements on pipes, fittings, pipe joints including sealings and manholes" were taken into account. When further results are received, any necessary amendment will be made.

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In accordance with the Common CEN/CENELEC Rules, the following countries are bound to implement this European Standard:-

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Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

Vitrified clay pipes in permanent or in temporary contact with water intended for human consumption will not affect the quality of that water. Therefore this standard does not contravene the EC-Council Directives 75/440, 79/869, 80/778.

This standard takes into account the essential requirements of the EC-Council Directive for construction products (89/106) and the Draft Directive on the treatment of municipal waste water (COM (89) 518).

1 General

1.1 Object and field of application

This part of this European Standard specifies requirements for manufacturer's internal quality control, third party assessment and inspection.

NOTE: Where reference is made to clauses in EN 295-1 and EN 295-3 it is clearly stated.

1.2 References

EN 295-1	1991	Vitrified clay pipes and fittings and pipe joints for drains and sewers : Part 1: Specification.
EN 295-3	1991	Vitrified clay pipes and fittings and pipe joints for drains and sewers : Part 3: Test Methods.
EN 29002	1987	Quality Systems - Model for quality assurance in production and installation.
EN 45011	1989	General criteria for certification bodies operating product certification.
EN 45012	1989	General criteria for certification bodies operating quality system certification.
ISO 2859-1	1989	Sampling procedures for inspection by attributes : Part 1 Sampling plans indexed by acceptable quality level (AQL) for lot-by-lot inspection.
ISO 2859-2	1989	Sampling procedures for inspection by attributes : Part 2 Sampling plans indexed by limiting quality (QL) for isolated lot inspection.
ISO 3951	1989	Sampling procedures and charts for inspection by variables for percent nonconforming.
ISO/DIS10012	1990	Measurement and calibration systems.

1.3 Definitions

1.3.1 Batch.

A clearly identifiable collection of units manufactured essentially from the same materials and under the same conditions (see 3.2.2, 3.5.2 and 3.9.1 as appropriate).

1.3.2 Isolated batch.

A clearly identifiable collection of unassessed units not exceeding 3200 in number manufactured essentially from the same materials but not necessarily all manufactured or fired at the same time.

1.4 Internal quality control and third party assessment

1.4.1 Quality supervision

Quality supervision shall comprise internal control (1.4.2) and third-party assessment and inspection (1.4.3).

1.4.2 Internal control

Internal quality control shall comprise continuous inspection carried out by the manufacturer as part of an approved third party assessment to ensure compliance with the requirements of EN 295 under a quality system complying with EN 29002.

1.4.3 Inspection and audits by third party assessors

The third party inspection shall be carried out at least twice a year without previous notice.

The assessors shall visit the manufacturer's works to inspect testing and to check records. In addition, the third party assessor shall carry out audits according to Table 1.

The third party assessors shall comply with the requirements of EN 45011 and EN 45012.

1.5 Sampling of fired ware (EN 29002 : 1987 Clause 4.9)

1.5.1 Selection of samples

The samples of fired ware for testing shall be selected at random.

Table 1 Scope of Audit by Third Party Assessors as applicable

Item No.	Subject of test	Property	Requirements as in EN 295-1	Testing as in EN 295-3	Number of samples
1	Pipes and fittings	Materials and Manufacture	2.1	Visual inspection	Three samples of one nominal size
2		Dimensions	2.2 2.3 2.4 2.5 2.6 2.7 2.8	2 & 3	
3		Marking	6.1	-	
4	Pipes	Crushing Strength	2.9	4	One sample of one nominal size
5		Watertightness	2.14	9	
6	Fittings	Bond strength	2.12.1	7	
7		Impermeability	2.18	13	
8	Joint assemblies	Watertightness	3.2.1	18.2 18.3 18.4	One joint assembly of one nominal size
9		Joint interchangeability dimensions	3.6	-	Three samples of one nominal size
10		Marking	6.2	-	
11	Polyurethane sealing elements	Tensile strength	3.1.2	15.2	One sample per moulding plant
12		Elongation at break	3.1.2	15.2	
13		Compression set	3.1.2	15.5	
14		Relaxation	3.1.2	15.4	
15		Resistance to ageing	3.1.2	15.6	
16	Rubber sealing elements attached to pipe	Ozone resistance	3.1.1	14	
17	Polypropylene sleeve couplings (Clause 3.1.3)	Melt flow index	3.1.3	16.1	One sample per moulding plant
18		Tensile strength	3.1.3	16.2	
19		Elongation at break	3.1.3	16.2	
20		Elevated temp.	3.1.3	16.3	
21	Polypropylene sleeve couplings (Clause 3.1.4)	Line displacement	3.1.4	17	Three samples of one nominal size
22	Other joint materials	According to items 8-21 above as applicable			

1.5.2 Change in batch condition

For the purposes of these quality control scheme requirements, each of the following, either singly or in combination, illustrate a change in condition, whereby units of fired clay cannot be considered as being from the same batch as they are not manufactured essentially from the same materials and/or under the same condition:

- (a) Alterations to firing conditions (other than those required to maintain a setting).
- (b) A clay blend formula is changed.
- (c) Any experimental work with temperature or clay blends.

1.6 Calibration. (EN 29002 : 1987 Clause 4.10)

The measurement and calibration of inspection equipment shall be carried out in accordance with the requirements of ISO/DIS 10012

2. Records

Records as required by EN 29002 : 1987 shall be maintained for a minimum period of 10 years.

In addition to maintaining records as required by EN 29002 : 1987 Clause 4.9.4, the following records, where applicable to a firm's production, shall be similarly maintained.

- (a) Data indicating the blend (or stockpile) of clay used and the dates of production of fired ware manufactured from that blend from any kiln.
- (b) Details of pipes and fittings which have been glazed and the glaze used.
- (c) Details of fired fittings which have been surface treated after firing together with the specification(s) of materials used.
- (d) The specification of materials used for fixing fired parts together with certificates from the material supplier(s) in respect of each consignment showing compliance with the Licencee's specification(s) nominated, as required by EN 29002 : 1987 Clause 4.9.1.1.
- (e) Functional dimensions for sealing elements and fairings for every design and nominal size of flexible mechanical joint.

- (f) Details of materials used for fairings and non-rubber sealing elements for every design and nominal size of flexible mechanical joint, together with certificates from the material supplier(s) in respect of each consignment showing compliance with the Licencee's specification(s) nominated, as required by EN 29002:1987 clause 4.9.1.1.

3. Quality Control Testing (EN 29002 : 1987 Clause 4.9.3)

3.1 General

3.1.1 Visual inspection

Products shall be visually inspected for freedom from such flaws as would impair their function when in service. Samples shall be selected for testing after the rejection of such flawed products

3.1.2 Rejection after retest

In the event of a batch being rejected after re-testing, it may be 100% tested for the feature in question, and only those items found to comply will be accepted.

NOTE: Any batch of pipes and/or fittings/or joints which has failed to meet the requirements of EN 295-1 may be offered for an alternative specification for which it qualifies if applicable, and marked accordingly.

3.2 Pipes

3.2.1 Routine testing

Routine testing shall be carried out on pipes for the requirements of EN 295-1 clauses 2.2 to 2.5, 2.9 and 3.6, also Table 11 for the mean values of d_3 and Table 10 for the mean values of d_4 if the diameters are measured to clay surfaces.

3.2.2 Batch sizes

- (a) Continuous kilns - not greater than the production drawn from one kiln, within a one week period, sub-divided according to nominal size and strength class.
- (b) Intermittent kilns - total production from one kiln, per firing, sub-divided according to nominal size and strength class.
- (c) Isolated batch - as in 1.3.2