

Fibre-cement products — Pressure pipes and joints

The European Standard EN 512:1994, with the incorporation of amendment A1:2001, has the status of a British Standard

UDC 621.643.2: 621.643.05: 621.1/.3: 666.961

Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee B/504, Water supply, upon which the following bodies were represented:

- Association of Consulting Engineers
- Association of Manufacturers of Domestic Unvented Supply Systems Equipment (MODUSSE)
- British Bathroom Council
- British Foundry Association
- British Non-ferrous Metals Federation
- British Plastics Federation
- British Plumbing Fittings Manufacturers' Association
- Department of the Environment
- Department of the Environment (Drinking Water Inspectorate)
- Fibre Cement Manufacturers' Association Limited
- Institute of Plumbing
- Institution of Water and Environmental Management
- Local Authority Organizations
- Scottish Association of Directors of Water and Sewerage Services
- Water Companies Association
- Water Research Centre
- Water Services Association of England and Wales

The following bodies were represented in the drafting of the standard, through subcommittees and panels:

- Association of Metropolitan Authorities
- British Precast Concrete Federation Ltd.
- Concrete Pipe Association
- Concrete Society
- Department of Transport
- Federation of Civil Engineering Contractors
- Institution of Civil Engineers
- Institution of Highways and Transportation

This British Standard, having been prepared under the direction of the Sector Board for Building and Civil Engineering, was published under the authority of the Standards Board and comes into effect on 15 August 1995

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National foreword

This British Standard has been prepared by Technical Committee B/504 and is the English language version of EN 512:1994 *Fibre-cement products — Pressure pipes and joints, including amendment A1:2001*, published by the European Committee for Standardization (CEN).

EN 512 was published as a result of international discussion in which the UK took an active part.

This standard supersedes BS 486:1990 which is withdrawn as a result of this publication.

This standard together with a number of other ENs will form a comprehensive series of standards in the field of concrete pressure pipes.

The manufacture of all asbestos products is covered by the requirements of The Control of Asbestos at Work Regulations 1987, introduced on 1 March 1988.

These set out comprehensive provisions covering work activities involving exposure to asbestos. Advice on how to comply with these regulations can be obtained from the manufacturers of the material, from the Asbestos Information Centre Ltd, Derby Road, Cheshire WH8 9ND, from the local area office of the Health and Safety Executive or from the Environmental Health Department of the Local Authority.

WARNING. Breathing asbestos dust is dangerous to health and precautions have to be taken during the manufacture and use of these products.

Particular note has to be taken of the Asbestos Products (Safety) Regulations 1985, made under the Consumer Safety Act 1978, and of the Asbestos (Prohibitions) (Amendment) Regulations 1988¹⁾, made under the Health and Safety at Work etc. Act 1974, which prohibit the supply of products containing amosite or crocidolite and set out requirements for the labelling of all products containing asbestos.

All the above legislation implements EEC Directives.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Find” facility of the BSI Standards Electronic Catalogue.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 23 and a back cover.

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¹⁾ Parallel regulations for Northern Ireland came into force on 6 March 1986.

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Descriptors: Water distribution, pressure pipes, asbestos cement products, pipes, tubes, joints, classification, characteristics, dimensions, tests, marking

English version

Fibre-cement products — Pressure pipes and joints

(includes amendment A1:2001)

Produits en fibre-ciment —
Tuyaux pression et joints
(inclut l'amendement A1:2001)

Faserzement-Produkte —
Druckrohre und Verbindungen
(enthält Änderung A1:2001)

This European Standard was approved by CEN on 1994-08-09. Amendment A1:2001 was approved by CEN on 2001-06-23. 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, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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

Foreword

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

This European Standard was prepared by Working Group 6 under the direction of CEN Technical Committee CEN/TC 164, Water supply, the Secretariat of which is held by AFNOR.

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 February 1995, and conflicting national standards shall be withdrawn at the latest by February 1995.

This standard will be brought in line with prEN 805 *Water supply — Requirements for external systems and components*, prepared by CEN/164/WG 1, when issued.

In this standard a distinction has been made between product appraisal (type tests) and routine quality control requirements (acceptance tests).

Attention is drawn to the need for observance of EC and/or EFTA and national legal requirements restricting the use of certain materials and to the related marking and labelling requirements.

Fibre-cement pressure pipes and joints which are in permanent or in temporary contact with water intended for human consumption shall not adversely affect the quality of the drinking water and do not contravene the EC Directives and EFTA Regulations on the quality of drinking water.

The performance of a network constructed with these products depends not only on the properties of the product as required by this standard, but also on the design, construction and performance of the network as a whole in relation to the environment and conditions of use (standards covering these matters are in preparation).

According to the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.

Foreword to amendment A1

This amendment EN 512:1994/A1:2001 to the EN 512:1994 has been prepared by Technical Committee CEN/TC 164, Water supply, the Secretariat of which is held by AFNOR.

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 February 2002, and conflicting national standards shall be withdrawn at the latest by February 2002.

This amendment to the European Standard EN 512:1994 has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirement of EU Directives(s).

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 standard specifies the characteristics of fibre-cement pipes and joints for use under pressure for conveying potable and non potable water and sewage.

It is concerned with composition, classification, geometrical, mechanical and physical characteristics, acceptance tests and type tests.

NOTE Other media may be conveyed provided it is compatible with the fibre-cement pipes and joints. A full discussion should take place between the customer and the manufacturer to determine if the pipes and joints need additional protection.

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.

ENV 197-1:1992, *Cement — Composition, specifications and conformity criteria — Part 1: Common cements*.

prEN 805, *Water supply — Requirements for external systems and components*.

prEN 1295, *Structural design of buried pipelines under various conditions of loading*.

EN 29001:1990, *Quality systems — Model for quality assurance in design, development, production, installation and servicing*.

EN 29002:1990, *Quality systems — Model for quality assurance in production and installation*.

ISO 390:1993, *Products in fibre reinforced cement — Sampling and inspection*.

ISO 2785:1986, *Directives for selection of asbestos-cement pipes subject to external loads with or without internal pressure*.

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 3951:1989, *Sampling procedures and charts for inspection by variables for percent non-conforming*.

ISO 7337:1984, *Asbestos reinforced cement products — Guidelines for on-site work practices*.

3 Definitions

For the purposes of this standard the following definitions apply.

3.1

nominal diameter (DN)

a numerical designation of size of a component, which is a convenient round number approximately equal to the manufacturing dimension in mm of the internal diameter

3.2

nominal pressure (PN)

a numerical designation of pressure used for reference purposes related to the mechanical characteristics of a component

3.3

test pressure in factory (PT)

value of the hydrostatic pressure to which the components are tested in the factory according to 4.6.4

3.4

bursting pressure (PB)

value of the hydrostatic pressure at which a component fails when tested in the factory according to 4.6.5

3.5

acceptance test

test to establish whether a batch of products conforms to a specification. The tests are performed on samples drawn either from continuous production or from a consignment

NOTE Test methods, specification and limit values are given in this standard. Sampling levels and acceptance criteria are defined in ISO 390.

3.6

type test

test carried out for the approval of a new product and/or when a fundamental change is made in formulation and/or method of manufacture the effects of which cannot be predicted on the basis of previous experience

the test is performed on the as delivered product; it is required to demonstrate conformity of the generic product to a specification but is not required for each production batch

3.7

acceptable quality level (AQL)

the quality level which, in a sampling plan corresponds to a specified and relatively high probability of acceptance. It is the maximum percent defective (or maximum number of defects per 100 units) that for purposes of sampling inspection can be considered satisfactory as a process average

NOTE A sampling scheme with an AQL of 4 % means that batches containing up to 4 % defective items have a high probability of acceptance.

4 Pipes

4.1 Composition

Fibre-cement pipes shall consist essentially of cement or a calcium silicate formed by a chemical reaction of a siliceous and calcareous material reinforced by fibres. The cement shall comply with relevant national standards of CEN members and/or ENV 197-1.

NOTE Other components which are compatible with the composite and have no negative influence on the performance in use of the product, may be added.

Two types of fibre reinforced cement pipes are included in this standard:

- type AT (Asbestos Technology) for products the formulation of which contains chrysotile asbestos;
- type NT (Non-asbestos Technology) for products reinforced by other fibres and not containing asbestos.

For pipes of type AT, all the requirements of this standard shall be fulfilled. For pipes of type NT, all the requirements of this standard shall be fulfilled and, in addition, evidence of long term performance of the product shall be given by a technical agreement.

4.2 Classification

4.2.1 Pipes of nominal diameter up to DN 1 000

Pipes of nominal diameter up to DN 1 000 are classified according to the nominal pressure (PN) given in Table 1.

The relationship between the bursting pressure (PB) expressed in hundred of kilopascals (bars) and the nominal pressure (PN) and the relationship between the test pressure in the factory (PT) expressed in hundred of kilopascals (bars) and the nominal pressure (PN) shall be not less than the values indicated in Table 2.

The purchaser's engineer shall decide upon the nominal pressure of pipe to be used in relation to the hydraulic working pressure and other conditions of laying and of operation he has determined. Pipes subjected to external loads shall be calculated according to the relevant national standard transposing the corresponding EN standard if existing, failing this to ISO 2785.