

BS 8525-2:2011



BSI Standards Publication

Greywater systems – Part 2: Domestic greywater treatment equipment – Requirements and test methods

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Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 24, an inside back cover and a back cover.

Foreword

Publishing information

This part of BS 8525 is published by BSI and came into effect on 15 August 2011. It was prepared by Technical Committee CB/506, *Water reuse*. A list of organizations represented on this committee can be obtained on request to its secretary.

Relationship with other publications

BS 8525 is published in two parts:

- Part 1: *Code of practice*;
- Part 2: *Domestic greywater treatment equipment – Requirements and test methods*.

Use of this document

It has been assumed in the preparation of this British Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

Hazard warnings

WARNING. This British Standard calls for the use of sewage effluent and this can be injurious to health if adequate precautions are not taken, such as the use of suitable personal protective equipment. It refers only to technical suitability and does not absolve the user from legal obligations relating to health and safety at any stage.

Assessed capability. Users of this part of BS 8525 are advised to consider the desirability of quality system assessment and registration against the appropriate standard in the BS EN ISO 9000 series by an accredited third-party certification body.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is "shall".

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

In particular, attention is drawn to the following regulations:

- The Water Industry Act 1999 [1];
- The Water (Scotland) Act 1980 [2];
- The Water and Sewerage Services (2006 Order) (Commencement No. 3) Order (Northern Ireland) 2010 [3];
- The Water Fittings Regulations [4];

NOTE In this standard, the following national regulations, which apply to plumbing systems in water has been, or is to be, provided, are referred to as the “Water Fittings Regulations [4]”:

a) *The Water Supply (Water Fittings) (Amendment) Regulations 1999, in England & Wales;*

b) *The Water Byelaws 2004 (Scotland), in Scotland;*

c) *The Water Supply (Water Fittings) Regulations (Northern Ireland) 2009, in Northern Ireland.*

- The Private Water Supplies Regulations 2009 [5];
- The Private Water Supplies (Scotland) Regulations 2006 [6];
- The Private Water Supplies (Wales) (Amendment) Regulations 2010 [7];
- The Private Water Supplies (Amendment) Regulations (Northern Ireland) 2010 [8];
- The Health and Safety at Work etc. Act 1974 [9];
- The Workplace (Health, Safety and Welfare) Regulations 1992 [10];
- The Building Regulations (England and Wales) 2010 [11];
- The Building Standards (Scotland) Amendment Regulations 2001 Amendment Regulations 2002 [12];
- The Building (Amendment) Regulations (Northern Ireland) 2010 [13];
- The Confined Spaces Regulations 1997 [14];
- The Work at Height Regulations 2005 [15].

1 Scope

This part of BS 8525 specifies requirements and gives methods of test for packaged and/or site-assembled domestic greywater treatment equipment. This standard applies to treatment equipment where all prefabricated components are factory- or site-assembled by one manufacturer and tested as a single unit.

This part of BS 8525 does not require specific water treatment processes to be used. However, it applies to equipment that treats bathroom greywater so that it is of a quality suitable for prescribed domestic uses in residential, commercial, industrial or public premises. It is not applicable to treatment equipment which processes waste from WCs and kitchens.

The test methods described in Annex B and Annex D have been devised for the type testing of domestic greywater treatment equipment with a nominal treatment capacity of up to 10 m³ per day. They are intended to be carried out on greywater treatment equipment under controlled conditions using public mains water and synthetic greywater. These test methods are not intended for commissioning or validation of the on-site performance of the domestic greywater treatment equipment.

NOTE 1 Recommendations for the installation, commissioning and validation of on-site performance of packaged and/or site-assembled domestic greywater treatment equipment as part of a greywater system are given in BS 8525-1.

NOTE 2 Annex A specifies requirements for the greywater treatment equipment test set-up and preparation; Annex B to Annex D specify greywater treatment equipment test methods; Annex E and Annex F are informative annexes, the former giving recommendations regarding analytical methods and the latter providing an example of a product information sheet.

2 Normative references

Standards publications

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.

BS 1427, *Guide to on-site test methods for the analysis of waters*

BS 6068-2.34, *Water quality – Part 2: Physical, chemical and biochemical methods – Section 2.34: Method for the determination of the chemical oxygen demand*

BS 8525-1:2010, *Greywater systems – Part 1: Code of practice*

BS EN 1899-1 (BS 6068-2.63), *Water quality – Determination of biochemical oxygen demand after n days (BOD_n) – Part 1: Dilution and seeding method with allylthiourea addition*

BS EN ISO 7027 (BS 6068-2.13), *Water quality – Determination of turbidity*

BS EN ISO 7393-2 (BS 6068-2.26), *Water quality – Determination of free chlorine and total chlorine – Part 2: Colorimetric method using N,N-diethyl-1,4-phenylenediamine for routine control purposes*

BS EN ISO 7899-1 (BS 6068-4.3), *Water quality – Detection and enumeration of intestinal enterococci – Part 1: Miniaturized method (Most Probable Number) for surface and waste water*

BS EN ISO 7899-2 (BS 6068-4.4), *Water quality – Detection and enumeration of intestinal enterococci – Part 2: Membrane filtration method*

BS EN ISO 9308-1 (BS 6068-4.14), *Water quality – Detection and enumeration of Escherichia coli and coliform bacteria – Part 1: Membrane filtration method*

BS EN ISO 9308-3 (BS 6068-4.10), *Water quality – Detection and enumeration of Escherichia coli and coliform bacteria – Part 3: Miniaturized method (Most Probable Number) for the detection and enumeration of E. coli in surface and waste water*

BS EN ISO 10304-1, *Water quality – Determination of dissolved anions by liquid chromatography of ions – Part 1: Determination of bromide, chloride, fluoride, nitrate, nitrite, phosphate and sulfate*

BS EN ISO 13395, *Water quality – Determination of nitrite nitrogen and nitrate nitrogen and the sum of both by flow analysis (CFA and FIA) and spectrometric detection*

Other publications

[N1] ENVIRONMENT AGENCY. *The chemical disinfecting agents in waters and effluents – Methods for the examination of waters and associated materials*. Blue book 218. Bristol: Environment Agency, 2008. ¹⁾

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this part of BS 8525, the terms and definitions given in BS 8525-1 and the following apply.

3.1.1 acceptance flow rate

flow rate of greywater that the domestic greywater treatment equipment can accept without overflow or spillage

3.1.2 acceptance volume

volume of greywater that the domestic greywater treatment equipment can accept without overflow

3.1.3 back-up water supply

supply of potable water, e.g. from the public mains water supply, that can supplement the non-potable water supply in times of drought and/or heavy demand

3.1.4 bathroom greywater

greywater from domestic baths, basins, showers and clothes washing machines

3.1.5 domestic greywater treatment equipment

purpose-designed equipment containing one or more treatment processes with associated storage, pumping and control systems that accepts and treats bathroom greywater for defined applications

NOTE Examples of defined applications are WC flushing and garden irrigation.

3.1.6 greywater

domestic wastewater excluding faecal matter and urine

[BS EN 1085]

NOTE This British Standard covers equipment treating bathroom greywater. For ease of reference, where the standard refers to “greywater”, this is assumed to be “bathroom greywater”. See 3.1.4.

¹⁾ This is available from the Environment Agency website, <http://www.environment-agency.gov.uk>.

3.1.7 greywater system

system for collecting, treating and distributing greywater which includes the treatment equipment, collection and distribution pipework and controls

3.1.8 maximum pumping head

maximum working pressure of the treated greywater pump

NOTE This is expressed in metres.

3.1.9 maximum storage period

maximum period that treated greywater can be stored without a deterioration in water quality

NOTE The water quality and maximum storage period is declared by the greywater treatment equipment manufacturer.

3.1.10 nominal hydraulic daily flow

daily flow of untreated greywater for which the greywater treatment equipment is considered suitable by the manufacturer

NOTE This can be measured in L/day or m³/day.

3.1.11 public mains water

wholesome water supplied by a water undertaker or licensed water supplier

NOTE Attention is drawn to the Water Industry Act 1999 [1] in England & Wales, the Water (Scotland) Act 1980 [2] in Scotland, and the Water and Sewerage Services (2006 Order) (Commencement No. 3) Order (Northern Ireland) 2010 [3] in Northern Ireland.

3.2 Abbreviations

For the purposes of this part of BS 8525, the following abbreviations apply.

BOD biochemical oxygen demand

COD chemical oxygen demand

NTU nephelometric turbidity units

4 Nominal designation

The greywater treatment equipment shall be designated according to the following parameters:

- type of greywater input as defined in BS 8525-1 (for example, bathroom greywater from shower and bath);
- category of treated greywater output as defined in BS 8525-1 (for example, bathroom greywater for WC flushing and non-spray garden watering);
- nominal hydraulic daily flow;
- acceptance flow rate (see Clause 5);
- acceptance volume (see Clause 5);
- maximum storage period.

5 Acceptance flow rate and acceptance volume

Preparation for testing shall be carried out in accordance with Annex A. A test method for hydraulic functions shall subsequently be carried out in accordance with Annex B.

When tested in accordance with **B.3.1**, the greywater treatment equipment shall accept public mains water at the acceptance flow rate and acceptance volume declared by the manufacturer, without overflow. Unless higher minimum values are specified by the manufacturer, the acceptance flow rate shall be not less than 0.4 L/s and the acceptance volume shall be not less than 80 L.

NOTE 1 These values are deemed to be suitable for single family housing containing one bathroom. Higher values might be necessary for larger greywater systems and manufacturers might declare higher values for these systems.

NOTE 2 Acceptance volume is assessed with the treated greywater cistern empty, but otherwise normal resident levels of water within the greywater treatment equipment. The acceptance volume may be determined using the minimum acceptance flow rate (see 3.1.1).

6 Water tightness and overflow

When tested in accordance with **B.3.2**, the greywater treatment equipment shall be free from leaks.

When tested in accordance with **B.3.3**, any overflow(s) shall accommodate 110% of the acceptance flow rate.

NOTE Attention is drawn to the Water Fittings Regulations [4].

7 Controls and failsafe provisions

7.1 Controls

7.1.1 General

For electrically powered treatment equipment, a control panel and at least one alarm shall be provided to indicate different operational conditions in accordance with 7.1.2.

For non-electrically powered treatment equipment, a manual control regime shall be specified in the information provided by the manufacturer in accordance with Clause 9.

NOTE Attention is drawn to the Water Fittings Regulations [4] which require adequate backflow prevention to be provided so that water supplied from the public mains for domestic uses does not become contaminated. In premises where a public mains water supply exists, or is to be provided, notification needs to be given to the local water supplier prior to work commencing, with a plan, schematic diagram and details of what is proposed.

Backflow prevention devices shall conform to BS 8525-1:2010, 4.7.2.

7.1.2 Control panel and alarm(s)

Where a control panel is provided, when tested in accordance with Annex B, it shall give visual indicators to demonstrate the following conditions:

- that the system is powered;
- that the system is connected to the back-up supply (e.g. public mains water).

Where an alarm is provided, when tested in accordance with Annex B, it shall give either visual or audible indicators for the following conditions:

- electrical failure;
- failure of the back-up water supply, where fitted.