1. Introduction

This certification scheme has been designed to allow product manufacturers to demonstrate the environmental performance of their products in order to contribute to credits given under the Code for Sustainable Homes (CSH) see Appendix 1. This scheme includes flow restrictor and aerator devices for terminal fittings including taps and showers. The term shower includes shower heads, shower mixing valves and shower packages. Shower packages consist of a device to supply warm water of around 37°C, a matched showerhead and the pipework to connect the head to the supply. Examples of packages include, for example, an electric shower package, a shower column and an integrated shower cubical.
This scheme will confirm the flowrate of the product tested at 3bar dynamic pressure and indicate the variability of :

1. the determined flowrate with pressure.
2. the outflow temperature with supply temperature (for aerated showers only)

This document details the certification requirements for terminal fittings.

By certificating flowrates for terminal fittings which are less than those generally in current use, there is the opportunity to contribute towards the credits determined under the CSH. Credits for water saving appliances are also being considered in EcoHomes and components of the BRE's Environmental Assessment Methodology (BREEAM). The determination of flowrates at pressures other than 3 bar will be useful when specifying fittings to other schemes and where the water supply pressure is known not to be 3 bar.

2. Scope

This scheme provides ongoing independent, third party assessment, certification of the flowrate of terminal fittings measured at 3 bar to determine the flowrate that can be used in the CSH water calculator and that the device does not significantly reduce the supplied water temperature. The assessment will also ensure that the performance, marking and classification requirements of the appropriate Standards are met and maintained.

The scheme covers

- Terminal fittings with and without flow restrictors
- Flow restrictors and regulators

The functional requirements of mechanical tapware are, with the exception of the minimum flowrates in clause 10.2, covered by BS EN 200:1992 Sanitary tapware: General technical specifications for single taps and mixer taps (nominal size ½) PN 10: Minimum flow pressure of 0.05 MPa (0.5 bar).

The functional requirements of electronically operated tapware are, with the exception of the minimum flowrates in clause 5.3.4, covered by BS EN 15091:2006 Sanitary tapware- Electronic opening and closing sanitary tapware.

The functional requirements of mixer valves are, with the exception of the minimum flowrates in clause 10.6.1.2, covered by BS EN 817:1998 Sanitary tapware - Mechanical mixers (PN 10)- General technical specifications

The functional requirements of shower outlets (handsets, roses etc) are with the exception of the flowrate designations in clause 11.2.5, covered by BS EN 1112:1997 Shower outlets for (PN10) sanitary tapware.

The product must comply with the Water Supply (Water Fittings) Regulations 1999.

Although fittings are available with flow regulators made to EN 246:2003, these are unlikely to be applicable for low flow terminal fittings as the lowest flowrate possible with an EN 246 regulator is 9 litres/ minute (Class Z, 0.15 l/s). However, applicable regulators and restrictors may conform to the dimensional, and other requirements, of EN 246.
Similarly, although spray taps can be specified to BS 5388: 1976 (Specification for Spray taps) and BS 5779: 1979 (Specification for Spray mixing taps), their limited flowrate range of 1.8 to 3.6 litres/minute may not be appropriate.

3. Testing of Products

In order to achieve certification the product must conform to the appropriate clauses of relevant British Standards. (Please see the scope. Appendix 2 sets out the additional specific testing requirements).

The product will be tested periodically by a recognized independent UKAS accredited or equivalent test body or a test body commissioned by BRE Global for continued compliance with aspects of the Water Regulations; Appendix 2 table 6 also sets out the audit testing requirements that BRE Global will undertake during factory visits.

Manufacturers shall provide a written declaration stating that the product tested was a production sample and is fully representative of current production or identifying any modifications to the design, production process or materials. (This should be verified during the assessment of the Factory Production Control (FPC) system).

4. Applications to join the Scheme

To apply for product certification please complete and return application form BF954 'General Application for Certification and Listing of terminal fittings'

Your application will be reviewed and, if accepted, a proposal will be prepared setting out:

- any testing that is required and details of a laboratory or laboratories that might be able to carry out the test work required
- the additional requirements for approval e.g documentation review (such as installation and maintenance manuals)
- certification scheme fees

All proposals and contracts are subject to our Standard Terms and Conditions as detailed in PN101.

For more information or help with your application contact BRE Global on 01923 664100 or e-mail *enquiries@breglobal.com*.

5. Management Systems Certification

In order to ensure terminal fittings meet, and continue to meet, the requirements of this scheme document, applicants are required to maintain full control of their production processes and the quality of the products that they supply through a structured documented management system. *Companies must as a minimum, maintain a current UKAS accredited certificate to ISO 9001:2000.*

If this is not provided by BRE Global, then we will conduct Factory Production Control (FPC) assessments to confirm that the products are manufactured under a documented management system. These assessments concentrate on the product specific aspects of the management system to confirm that the products meet and continue to meet the requirements of the standard or specification. Our generic requirements for FPC are detailed in publication PN111.

The frequency of FPC visits is once a year.

6. Certification and Green Book Listing

Certificates are awarded to Companies when all assessment activities have been satisfactorily completed, the Assessor has recommended that certification is granted and any corrective and preventative actions are complete - see Appendix 3. Certificates will include a graph of pressure verses output flow rate curve along with the determined flow rate at 3 bar dynamic pressure and the potential affect this will have on the CSH credits. Details of the products will also be listed on www.greenbooklive.com.

Certificates and listing are maintained subject to:

- Satisfactory results from the product audit testing programme set out in Table 6 Appendix 2.
- Satisfactory maintenance of FPC and/or ISO 9001:2000 certification.
- Approval by BRE Global of any proposed modifications to the product which may affect performance, production or specification. Requests to assess proposed modifications must be made in writing to BRE Global. The applicant will be advised of the further BRE Global requirements necessary to retain certification.

7. Alternative Marking and Cross-listing

BRE Global certificated terminal fittings may be branded with another company's name and product identification incorporating the BRE Global mark.

The other named company may be entitled to a cross-listing certificate and a separate entry in the BRE Global Green Book Live website subject to:

- the prior agreement of the certificate holder; and
- FPC assessment by BRE Global.

Requests for alternative marking are made to BRE Global by the certificate holder.

8. Certification Mark

Once a certificate has been issued, the BRE Global mark can be used as directed in the publication PN103 'Use of the BRE Marks' and guidance document GD036 'Selection of Certification Mark(s)'.

9. Complaints and Appeals

BRE Global operates procedures for complaints and appeals. Further details are available on request.

Appendix 1: Indication of the CSH Rating Scale

Internal potable water use is a mandatory element of the CSH and the maximum number of credits available for this section (at the time or writing) is 5. The aim of this section of the CSH is to reduce consumption of potable water in the home.

Assessment Criteria

Credits are awarded based on the predicted average household water consumption (calculated using the Code Water Calculator – see *Calculation Procedures*) for the Dwellings type in accordance with the table 1 below:

Table 1 Code for Sustainable Homes credit calculator dependent on water consumption in litres per person per day.

Water consumption (l/person/day)	Credits	Mandatory Levels
≤ 120	1	Levels 1 and 2
≤ 110	2	
≤ 105	3	Levels 3 and 4
≤ 90	4	
≤ 80	5	Levels 5 and 6

Water consumption is calculated in accordance with the table above and the Code for Sustainable Homes Technical Guidance which can be downloaded for free at http://www.planningportal.gov.uk/uploads/code_for_sustainable_homes_techguide.pdf

Various flowrates translate into CSH water consumption values for internal water (see table 2). The impact on the overall achievement of CSH points for internal water will also depend upon the other water-using appliances, but terminal fittings currently have the greatest impact on the calculation.

Table 2 Flowrate Calculator for the CSH

Factors	Shower- Where there is both a bath and shower 5 x 0.6 = 3	Shower- Where there is **only** a shower available 5X 1.0 = **5.0**	Water-break (50%) shower valve Where there is both a bath and shower 0.5 x 0.6 x 5 = 1.5	Water-break (50%) shower valve Where there is **only** a shower available 0.5 x 1.0 x 5 = 2.5	Conventional tap 2/3 x 0.67 x 7.9 = 3.529	Water-break (50%) tap 0.5 x 0.67 x 7.9 = 2.647
L/min Flow Rate	**L/Person/ Day Showers**	**L/Person/ Day Showers**	**L/Person/ Day Water-break showers**	**L/Person/ Day Water-break showers**	**L/Person/ Day Conventional Taps**	**L/Person/ Day Water-break Taps**
10	30	50	15	25	35.3	26.5
8	24	40	12	20	28.2	21.2
6	18	30	9	15	21.2	15.9
4	12	20	6	10	14.1	10.6
2	6	10	3	5	7.1	5.3
1	3	5	1.5	2.5	3.53	2.65

Where a flow restrictor / regulator is evaluated, the impact will depend upon the fitting it is to be connected to.

For example, when fitted to a conventional tap, the physical reduction of flow would be equal to the reduction when fitted to a conventional shower with a similar original flowrate. However, the resulting consumption value to be used in the CSH calculator will be greater than that which would result from a shower with a similar flowrate.
The flowrate that is used for a shower fitting with a multi-function shower head is the average flowrate of all the various settings when supplied with water at a dynamic pressure of 3 bar.

Kitchen and basin mixer taps are not usually thermostatic with automatic shut-off in the event of a hot or cold water supply failure, hence in this Scheme cold water supplies to both the hot and cold inlets may be used for these tests. However, many thermostatic showers incorporate automatic shut-off features for safety of the bather. So, in order for the flow contributions from both hot and cold supplies to be taken into account, the mixed water temperature at the outlet of any thermostatic shower should be 37°C. The water supply temperatures to achieve the set outlet temperature should be <22°C for the cold supply and >45°C for the hot, unless other values have been specified in the standard being used. A hypothetical set of test result curves for a water fitting is represented in figure 1.

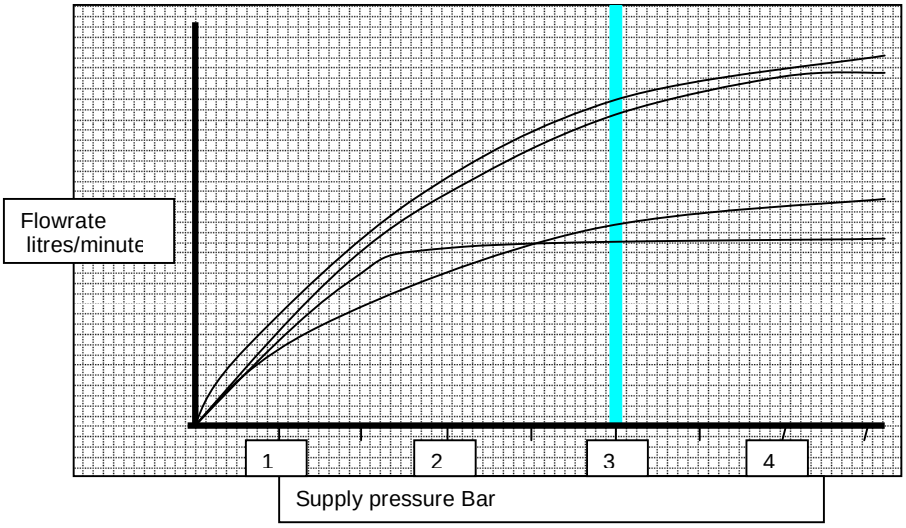


Figure 1: A hypothetical set of test result curves for a water fitting with four options. These could be outlet settings, restrictor options and combinations of both. The 3 bar line indicates which curve values would normally be used in a CSH calculation. If the fitting was a shower, and the curves represented different handset settings, the average value of the flowrates at 3 bar would be calculated and used in the CSH water calculator. Where a fitting is supplied with a range of restrictors, or flow rate settings, the flow at each option needs to be assessed.

Appendix 2: Assessment and Test Requirements

Documentation required:
Current applicable Certificate of compliance to BS EN 200:1992, in English, for taps and BS EN 1112 (showers), BS EN 246:2002 (aerators), BS EN 15091:2006 (test apparatus) from a recognised independent UKAS accredited or equivalent test body.

Note the Certificate could be for a complete tap, water outlet fitting, flow restrictor/ regulator, aerator, shower mixer valve, shower outlet (fixed shower head, movable handset or body jet fitting), or shower package. Where the certification is not for a package, we may require additional testing of the specified associated components.

Composite Samples required:
Two samples of each item to be certified should be supplied to BRE Global complete with appropriate fixings, accessories and instructions for installation and use. Where possible, one sample will be installed for actual use and its function to be informally monitored. In the event of any issues arising regarding the product during its period of certification, reference may be made to the supplied samples. Both samples are non-returnable and the installed sample will become the property of the owner of the building in which it is installed, unless agreed otherwise.

Where taps are to be tested, apparatus and procedure based upon BS EN 15091 and BS EN 200 should be used.

Where shower outlets are to be tested apparatus and procedure based upon BS EN 1112 should be used.

Tests for Taps

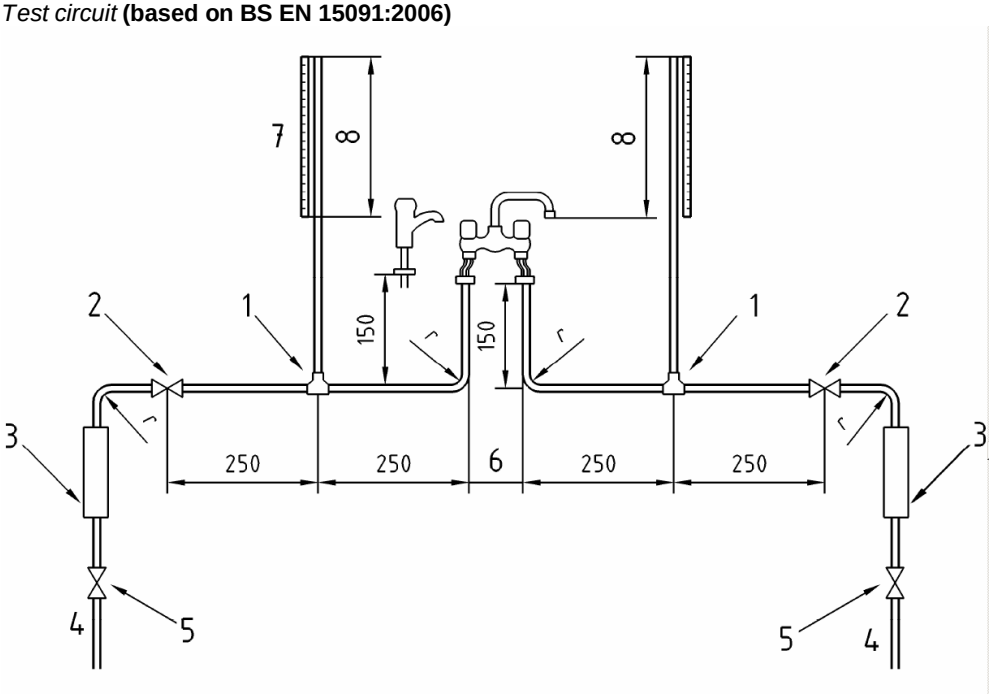
Note : To comply with the scheme, the tests as set out in this document should be followed, not as prescribed by the Standards that have been used to provide principles and test rig designs. (See tables 3-5 to view the relationship between the Scheme Document and the related Standards)

A2.1 Test method for taps (based upon BS EN 200:1992 and EN 15091:2006)

A2.1.1 *Principle*
The principle of the test is to determine the value of the flow rate corresponding to a reference pressure equal to 0,3 MPa (3 bar). The measurement is carried out with the tap fully open and with any supplied accessories fitted, not with standard flow restrictors.

A2.1.2 *Apparatus* (BS EN 200:1992)
The apparatus consists of:
— a supply circuit;
— a test circuit.
The supply circuit assembly consists of:
— a device 1) enabling the required pressures to be achieved;
— piping 2) with a cross section such that the test circuit, without the tap to be tested, enables a flowrate of 50 % greater than the flow rate to be measured, to be achieved;
— a device 3) to measure the flow rate.
Note: Supply pipe mounted flow meters may be used as shown in the figure 2, however, a single device may also be placed downstream of the test circuit, provided it is separate from the test circuit.

Test circuit **(based on BS EN 15091:2006)**



Key
1 Pressure take-off tee
2 Control valve
3 Flow meter
4 Cold supply
5 Stop valve
6 Centres to suit tap assemblies
7 Pressure gauge or manometer
8 manometer scale

Figure 2 Flowrate and pressure test apparatus for taps

Test conditions

Temperature of the water
The tests are carried out only in cold water. The temperature of this water shall be between 10 °C and 25 °C.
Precision of the measurements
The precision of the devices for measuring the flow rates and pressures shall be ± 2 %.

A2.1.3 *Procedure*
Fit the tap to be tested onto the test circuit.
For the taps which cannot be connected directly to the test circuit connector, use intermediate connecting devices which have minimum head loss.
Fully open the tap and any isolation valves.
Supply the test circuit and adjust the dynamic pressure to 0,3 MPa (3 bar). When a stable, continuous flow has been established, measure the corresponding flow rate.

In addition:
— carry out several measurements of the flow rate at different values of pressure
[for example between 0,1 MPa and 0,5 MPa (1 bar and 5 bar)];
— using logarithmic coordinates, plot the curve of the flow rate (Q) as a function of the pressure (P);
— determine on this curve the value of the flow rate corresponding to the pressure of 0,3 MPa (3 bar).

TESTS FOR SHOWER OUTLETS

A2.2 Tests for showers (based upon BS EN 1112:2008)

A2.2.1 General
The test described is a type test (laboratory test) and not a quality control test carried out during manufacture.

A2.2.2 *Principle*
This consists of measuring the shower flow rate.

A2.2.2 *Apparatus*
The test apparatus shown in figure 3 comprises:

- a supply circuit;
- a test circuit.

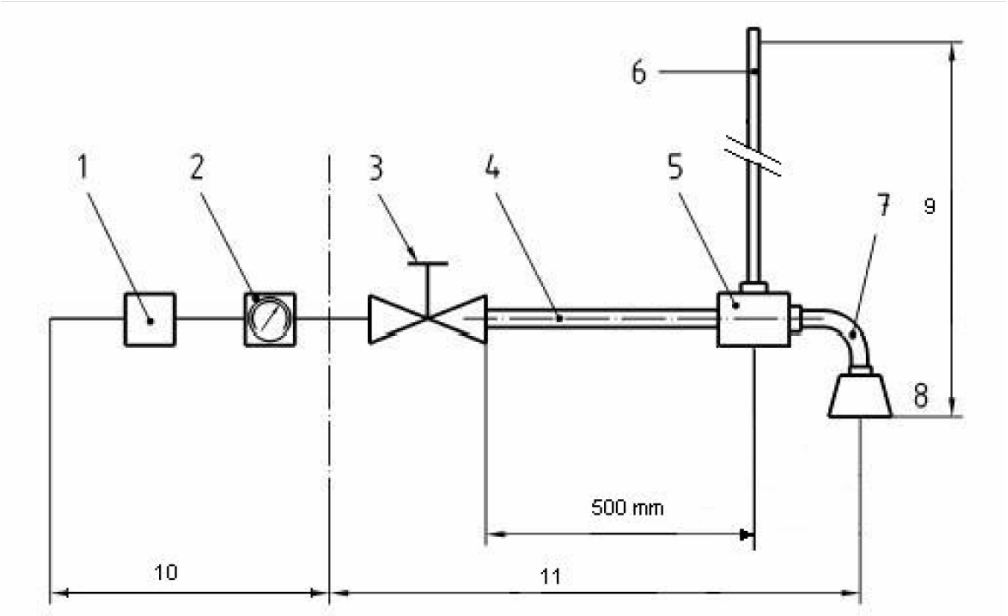


Figure 3 Flowrate and pressure test apparatus for shower outlets

a) supply circuit (10)
The supply circuit comprises:

- a device (1) for measuring the flow rate with an accuracy of ± 2 %;
- a means (2) for measuring and maintaining the required test pressure with an accuracy of ± 1 %

b) test circuit (11)
The test circuit comprises:

- a DN15 regulating valve (3);
- a straight DN15 pipe (4);
- a pressure take-off-tee (5) see figure 4
- a pressure measuring device (6) with an accuracy of ±1 %
- an adaptor (7) (see figure 5) to connect the inlets of the various shower outlets, enabling orientation of the spray to be in a downwards direction;
- a datum (8)
- the test pressure (9)

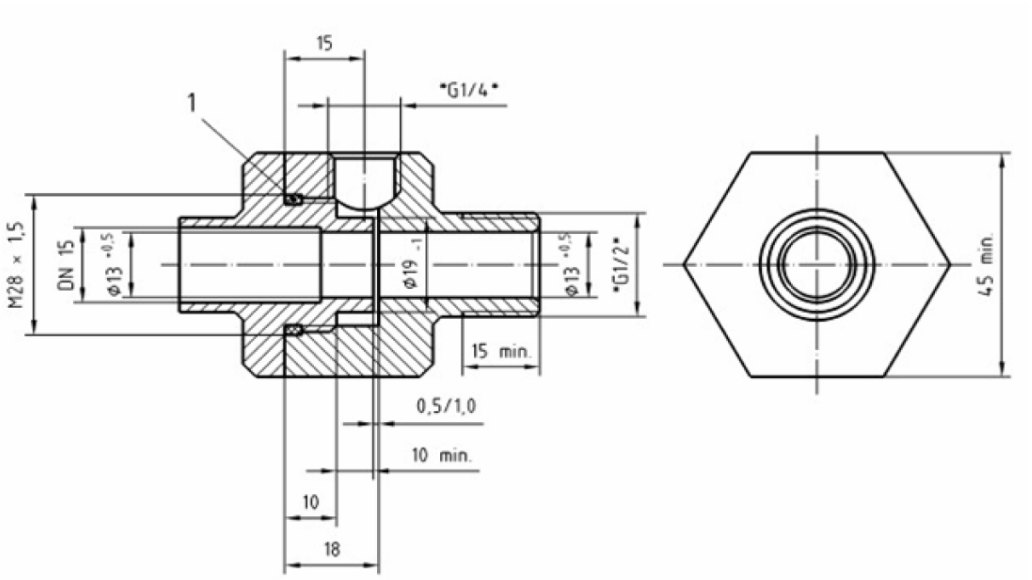


Figure 4 Pressure take-off tee (unspecified tolerances ±0.5mm).

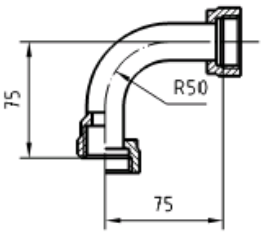


Figure 5 Adaptor detail

The supply and test circuit shall deliver a flow rate of at least 1,5 times the flow rate of fittings under test.

Test conditions

The test is carried out with cold water (T≤ 25°C) at a pressure of (0,3 ±0,02) MPa [(3 ±0,2 bar)] and the other designated pressures.

A2.2.4 *Procedure*

Connect the shower outlet to the supply and test circuits using adapter. Rotate the adaptor around its horizontal axis until the spray plate or spray forming mechanism is in a horizontal position with a vertically downwards discharge. Apply the initial dynamic test pressure of 0,3 MPa (3 bar) using the centre of the spray plate or spray forming mechanism as a datum. Record the flow rate "Q" after stabilisation. Observe the spray formation.

If the shower outlet has options for spray patterns, either select each preset pattern and repeat the test, or rotate the outlet variation control though a series of equal angles and determine the flow at each setting.

In addition:

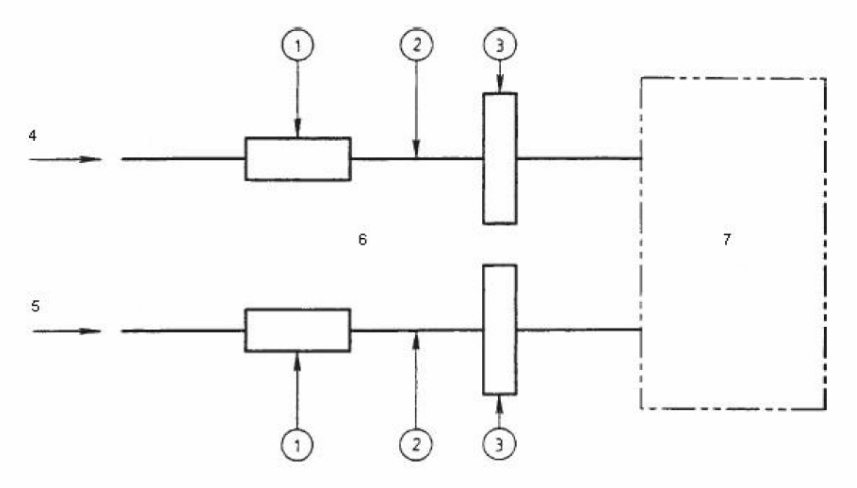
— carry out several measurements of the flow rate at different values of pressure [for example between 0,1 MPa and 0,5 MPa (1 bar and 5 bar)];
— using logarithmic coordinates, plot the curve of the flow rate (Q) as a function of the pressure (P);
— determine on this curve the value of the flow rate corresponding to the pressure of 0,3 MPa (3 bar).

A2.2.5 Test for temperature impact of shower outlet

Some shower outlet fittings can introduce air to the water flow to an extent that the water is cooled significantly. To identify any shower outlet that may cool the supplied water the following test shall be carried out.

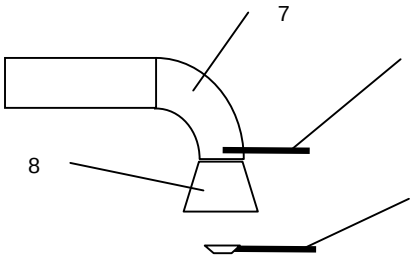
A2.2.6 Apparatus

In addition to the basic equipment used in A2.2.3 (based upon the apparatus from BS EN 1112:2008) the supply circuit shown in figure 6 is required. The combined water supplies shall be capable of producing at least 1.5 times the nominal flowrate of the shower outlet.



1 Pressure regulator
2 Piping
3 Flow rate measurement
4 Cold water
5 Hot water
6 Supply circuits
7 equipment used in 11.2.2 of BS EN 1112:2008

Figure 6 Hot and Cold supplies for temperature test (based upon BS EN 15091:2006)
To determine any change in water temperature the apparatus shown in figures 7 and 8 should be used near the shower outlet.



Formatted: Font: 16 pt

Formatted: Font: 16 pt

Figure 7 Temperature sensor arrangement (based on figure 3 of this document).

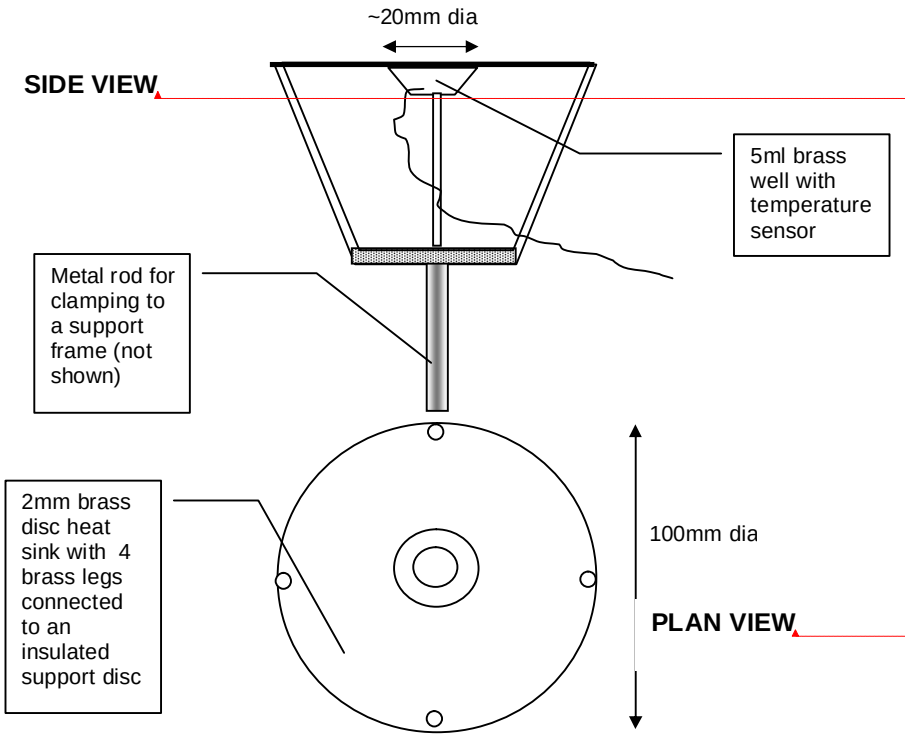


Figure 8 Detail of temperature sensing plate

The temperature sensor T1 shall be mounted within the adaptor pipe close to the outlet, to determine the water temperature prior to entering the shower outlet fitting. Temperature sensor T2 shall be mounted 200 ± 10 mm away from the spray plate of the shower outlet. It shall be at the base of a small well that will collect the discharged water and ensure the submersion of the sensor. The volume of the well shall be 5±2 ml. The well shall be rigidly fixed centrally to the flow vertically below the spray plate. The air temperature should be between 10 and 25 °C.

A2.2.7 Procedure

Adjust the supplies to produce a temperature at T1 of 37±2°C and a steady flow at a dynamic pressure of 3 bar. Once T1 and T2 have stabilised, record the two temperatures.
If T2 is more than T1- 3°C, do not proceed with the remainder of this test.

Where the above procedure has shown that a significant cooling effect has been produced, the impact of the cooling shall be determined.

By adjusting the water supplies, determine the drop in temperature across the shower outlet for a range of temperatures and pressures. For example, from five temperature values from between 30°C to 50°C and dynamic pressures from 1 to 5 bar.

The results shall be plotted on a graph to show the impact of the fitting on discharge temperature.
Procedural warning:

Although the risk should be no more than when using any shower, as these tests will be conducted at temperatures at which legionella may be active, operatives should be isolated from the apparatus when sprays are being produced unless additional anti-legionella precautions have been taken. Additional precautions could include treatment by temperature, chemicals, ionisation, ultra or micofiltration, UV light, electrolysis or electrical pulsing.

Tests for Regulators and Restrictors that may be fitted to Terminal Fittings:

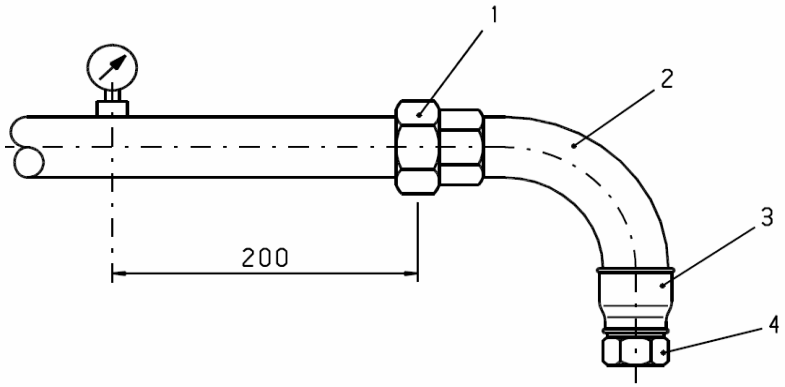
A2.3 Tests for regulators (based upon BS EN 246:2003)

The flow from any terminal fitting with an outlet regulator, except a shower, shall conform to the requirements of BS EN 246:2003 with the exception of clauses 8.2.1.2 and 8.2.2 (relating to flow rate classes that exceed 9 litres/minute).

A2.3.1 Test method

- Connect the flow rate regulator to the adapter 4 shown in Figure 9.
- Open the water supply circuit and adjust to the required dynamic pressures [for example between 0,05 MPa and 0,5 MPa (0.5 bar and 5 bar)].
- At each dynamic pressure measure the flow rate when a stable and continuous flow is established.

- The designated flowrate shall be determined by plotting the results and determining the flowrate at 3 bar.



1 Galvanized union, taper seat 1, U11, in accordance with ISO 49
2 Galvanized male long sweep bend 1, G8, in accordance with ISO 49
3 Galvanized socket, 1 x 3/4, M2, in accordance with ISO 49
4 Adapter in accordance with ISO 3822-4 (see Figure 10 and 11)

Figure 9 Test circuit for regulators

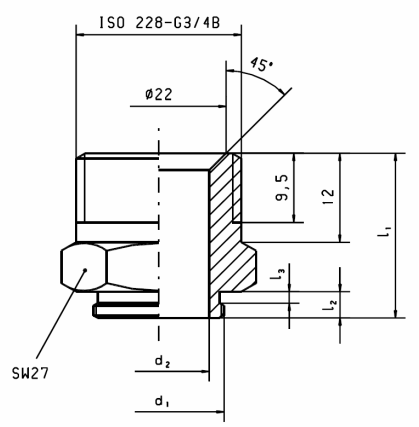


Figure 10 Adapter with external thread

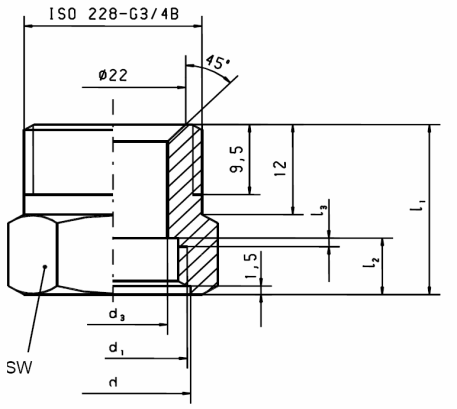


Figure 11 Adapter with internal thread

Dimensions for Figure 10 adapter

Dimensions in mm

Designation	d_1	d_2	l_1	l_2	l_3	SW
Adapter EN ISO 3822-4-A_3 – *M*22x1	*M*22x1 - 6g	17	24	5	1,7	27

Dimensions for Figure 11 adapter

Dimensions in mm

Designation	d_1	d_2	d_3	l_1	l_2	l_3	SW
Adapter EN ISO 3822-4-A_4 – *M*24x1	*M*24x1 - 6H	24,5	17	25	6	1,7	27
Adapter EN ISO 3822-4-A_4 – *M*28x1	*M*28x1 - 6H	28,5	17	26	8	1,7	30

The performance of the regulators should generally be in accordance with the remaining clauses of BS EN 246, modified as shown below.

Requirement for flow rate regulators without aeration

The jet shall be along the axis of the flow rate regulator's outlet and shall flow continuously over a length of 150 mm at the nominal flow rate; It shall be neither flattened nor constricted, nor scattered to such an extent that splashing results. It shall remain compact in the pressure range between 0,05 MPa (0,5 bar) and 0,5 MPa (5 bar).

Requirement for flow rate regulators with aeration

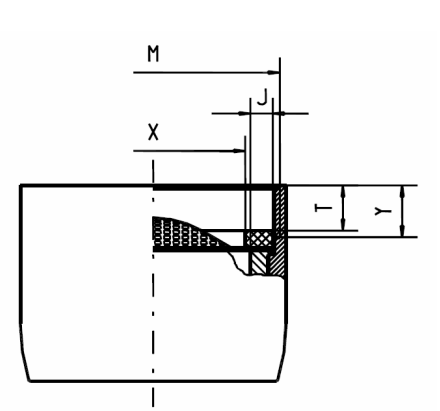
At a dynamic pressure of 0,3 MPa (3 bar), the jet shall be regular and compact and shall visually exhibit regular and adequate aeration over a length of 150 mm. It shall remain full and aerated in the pressure range between 0,05 MPa (0,5 bar) and 0,5 MPa (5 bar).

A2.3.2 Flow regulators / restrictors dimensions

Where flow regulators or restrictors are supplied for subsequent installation to a system or fitting, the dimensions should be appropriate to the intended fitting. Where no specific fitting is intended, the device should be dimensioned appropriately for either inlet or outlet installation.

For outlet location:

Devices to regulate, or restrict, the flow from a terminal fitting shall fit the nozzle outlet of the fitting by using either an internal or external thread. The dimensions should be within the range specified in EN 246:2003 shown in figures 12 and 13.



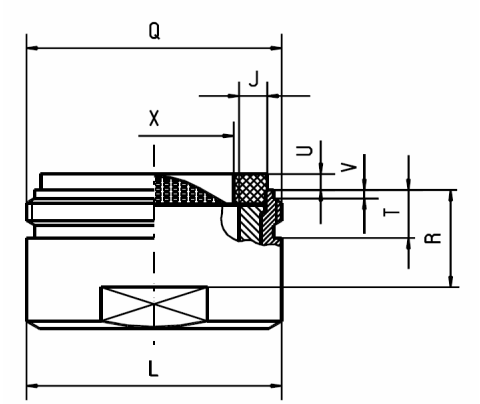


Figure 12 Outlet device with internal thread Figure 13 Outlet device with external thread

Dimensions for Figure 12 device

Symbol	Values (mm)
M	*M*22x1 – 6*H*
X	14 to 17
T	3,5 to 4,3
Y	min 4,5
J	min 2

Dimensions for Figure 13 device

Symbol	Values (mm)	
Q	*M*24x1 – 6*g*	*M*28x1 – 6*g*
X	14 to 17	15 to 19
T	4,5 ± 0,1	7 ± 0,1
R	Min. 9	Min. 14
U	1 + 0,5 / 0	1 + 0,5 / 0
L	24 0/-0,2	28 0/-0,2
V	0,8	0,8
J	Min. 2	Min. 2,5

For inlet location:
Devices to regulate or restrict the flow trough a terminal fitting shall fit the tail of the fitting either by:

- fitting between the tail and the water supply pipe, as an inline fitting, or
- fitting snugly inside the tail.

In the latter case, the dimensions of the device fit either of the connection tail options specified in BS EN 817:1997 clause 8.2.2.1.

8.2.2.1 *Dimensions of connecting ends* (see figure 4 and table 5 of BS EN 817:1998)
If the connecting ends are machined to accept a supply tube, the dimensions shall be as given in table 5 (e.g. Type 1 or Type 2).

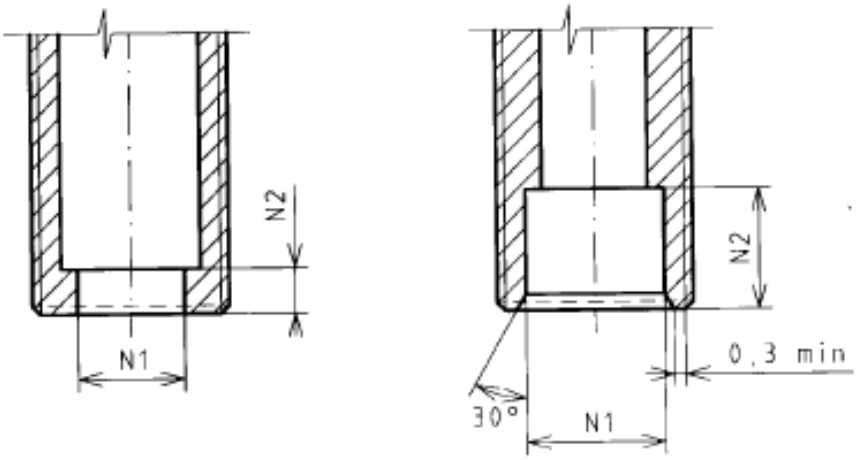
Table 5 of BS EN 817:1998

Table 5. Dimensions of connecting ends

Dimensions in millimetres

Dimension	Measure	
	Type 1	Type 2
N_1	$12{,}3\ ^{+0{,}2}_{0}$	$15{,}2 \pm 0{,}05$
N_2	5 min.	13 min with a 30° chamfer and a flat of 0,3 min. at the entry to the bore

Dimensions in millimetres



Type 1 Type 2

Figure 4. Dimensions of connecting ends

Figure 4 of BSEN 817:1998

Table 3: Standards clauses that have been used as a basis for the requirements in this Scheme Document - Taps

Standard applicable	Clauses	modifications	reference within this Scheme Document
BS EN 200:1992 Sanitary tapware: General technical specifications for single taps and mixer taps (nominal size ½) PN 10: Minimum flow pressure of 0.05 MPa (0.5 bar).	10.1 10.2 10.3.1	The EN specifies that the tests are to be carried out without supplied flow modifiers, and that basin and kitchen taps must have a minimum flowrate of 12 l/min. As these requirements would defeat the object of the Scheme, in supporting the CSH, the Principle has been rewritten.	A2.1.1
BS EN 200:1992 BS EN 15019:2006 Sanitary tapware – Electronic opening and closing sanitary tapware	10.3 5.3.2.7 and 5.3.3	EN 200 only test one supply to a tap at a time, while EN 15019 has two different sets of apparatus for the two basic water systems (vented and unvented).Although the Unvented test system specifies hot and cold supplies it only uses the cold supply. The best elements of these tests have been combined to produce the scheme test. The procedure is based upon EN200, but the apparatus is based upon EN 15019. For details for the design of the pressure take-off tees please see **EN ISO 5167-1 Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full – Part 1: General principles and requirements (ISO 5167-1:2003)**	A2.1.3 A2.1.4

Table 4: Standards clauses that have been used as a basis for the requirements in this Scheme Document– Shower outlets

Standard applicable	Clauses	modifications	reference within this Scheme Document
BS EN 1112:2008 Sanitary tapware – Shower outlets for sanitary tapware for water supply systems of type 1 and type 2 – General technical specification	11.1 11.2 11.2.1 11.2.2 11.2.3 11.24	The principles and procedures are unmodified apart from minor changes in English to aid consistency and additional procedure based upon EN 200 clause 10.3.4 to extend the range of pressures over which the product is tested. This will help identify products with flowrates that are less susceptible to pressure fluctuations.	A2.2 A2.2.2 A2.2.3 A2.2.4
		The test for temperature variation is based upon the apparatus used in BS EN1112:2008 figure 11, but modified in an original way. The additional apparatus and test procedure have been devised specifically for this Scheme.	A2.2.5 A2.2.6 A2.2.7

Table 5: Standards clauses that have been used as a basis for the requirements in this Scheme Document – Restrictors/Regulators

Standard applicable	Clauses	modifications	reference within this Scheme Document
BS EN 246:2003 Sanitary tapware — General specifications for flow rate regulators	All, except 8.2.2	Clause 8.2.2 requires the restrictors/ regulators to exceed 9 l/min, so it is not appropriate for this Scheme. As the pressure range specified within the Standard for 'Limits of use' (Table 1) is from 0.5 to 5.0 bar, the test method in the Scheme has extended the procedure and method set out in the Standard.	A2.4 A2.4.1 A2.4.2

Note:
1. Testing will be performed by a UKAS or equivalent accredited laboratory acceptable to and/or commissioned by BRE Global.

Table 6: Audit test and product review requirements
FPC assessment to include at least:

Requirement
• Review of drawing status against the BRE Global Product Specification Document Register • Examination against drawings • Marking • Witness test at manufacturer's premises to validate performance.

Notes:
1. Audit testing and product review will be conducted annually at the manufacturer's premises or other testing laboratory deemed suitable by BRE Global on one sample of each product identified for audit.
2. Products will be considered for audit test on an annual basis and all products will be reviewed over a three-year period.

Appendix 3 - The certification process