# The Voluntary Water Efficiency Labelling Scheme on Flow Controllers

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## 1. Purpose

This document is intended to give a detailed description on the Voluntary Water Efficiency Labelling Scheme (WELS) on Flow Controllers.

## 2. Background

2.1. The voluntary WELS is one of the water conservation initiatives that the Government of the Hong Kong Special Administrative Region (HKSAR) has adopted. The WELS would cover common types of plumbing fixtures and water-consuming appliances. Products participating in the WELS will incorporate a water efficiency label that serves to inform consumers the water consumption level and efficiency rating. Consumers should then be able to take these factors into account in making their purchasing decision.

2.2. In overseas countries, the WELS is in different stages of development and implemented in several forms. In some countries, it is a compulsory requirement to provide water efficiency labels for certain kinds of plumbing fixtures and appliances before they can be put on sale in the market. For others, the WELS is implemented on a voluntary basis so as to allow a lead time for the market to transform towards more water efficient products. The implementation of WELS in Hong Kong currently adopts a mixed[1] approach. The WELS aims to:

(a) To provide consumers with information on the levels of water consumption and efficiency ratings of plumbing fixtures and water-consuming appliances;
(b) To facilitate consumers to select water efficient plumbing fixtures and water-consuming appliances;
(c) To promote public awareness on water conservation and efficiency issues; and
(d) To achieve actual water savings.

2.3. The voluntary WELS in Hong Kong is being implemented in phases for

[1] *Mandatory use of some designated water efficient products in new plumbing works and voluntary labelling in the retail market.*

different groups of plumbing fixtures and water-consuming appliances. The first six groups of products for implementation of the WELS are showers for bathing, water taps, washing machines, urinal equipment, flow controllers and water closets, which had been launched in September 2009, September 2010, March 2011, March 2012, August 2014 and May 2018 respectively.

## 3. Scope

3.1. The Scheme will apply to the flow controllers manufacturers, importers, or other related parties participating in the Scheme.

3.2. The Scheme registration commences from **7 August 2014**. The revision of the Scheme is effective from **1 May 2021** and expires on **30 April 2026** when re-registration may be necessary.

3.3. The Scheme only covers new flow controllers imported to or manufactured in Hong Kong but does not cover second-hand products, products already in existing use, under trans-shipment or manufactured for export, etc.

3.4. The Scheme is operated as a 'Grading Type' labelling system. Under this Scheme, participating flow controllers will be rated to different grades according to their nominal flow rates provided that they have met the performance requirements specified in the Scheme.

3.5. The provisions of this Scheme shall apply to the flow controllers listed below:

(a) flow controllers to be used with water taps;

(b) flow controllers to be used with showers for bathing;

## 4. Definitions

Unless otherwise specified, the following definitions shall apply throughout this document:

| | |
|---|---|
| *Department* | means the Water Supplies Department, the Government of HKSAR. |

| | |
|---|---|
| *Director* | means the Director of the Water Supplies Department, the Government of HKSAR. |
| *Government* | means the Government of HKSAR. |
| *Flow Controllers* | means a device which regulates the flow of water so as to reduce flow rate over a given range of pressures. Flow controllers are supplied in or without bodies. For in bodies type flow controllers, they could be classified as in-line type (for showers or taps) and end-of-line type (for taps), which are normally installed at the end of flexible riser hose or at the spout of taps; while for flow controllers supplied without bodies, they are installed in hoses, bodies or aerators of taps. |
| *HKAS* | means the Hong Kong Accreditation Service. |
| *HOKLAS* | means Hong Kong Laboratory Accreditation Scheme. |
| *Inspecting Officer* | means the officer authorized by the Director to carry out the inspection as described in Section 11 of this document. |
| *ISO* | means the International Organization for Standardization. |
| *Label* | means the water efficiency label as described in Section 7 of this document. |
| *MRA* | means a mutual recognition arrangement. |
| *participant* | means a manufacturer, an importer or other related party of the flow controller registered in the Scheme. |
| *recognized laboratory* | means a laboratory which complies with the requirements for testing laboratory as stated in Section 8 and is acceptable to the Department for carrying out tests |

(including re-tests) and issuing test reports on Flow Controllers.

*Scheme* means the Voluntary Water Efficiency Labelling Scheme on Flow Controllers.

*showers* means a showerhead through which water is intended to flow to form a spray for bathing purposes, which may include a fixed or pivot arm, a flexible hose (with or without a flow controller), tap top assemblies, or other components.

*water taps* means a tap that is designed to turn on and off the flow of water into a basin or bowl or sink that is primarily for washing/rinsing purposes, which may include a fixed or pivot arm or a built-in flexible hose or automatic sensing open/close device or automatic closing mechanism or hot and cold water mixing chamber.

## 5. Testing Methodology and Standard

**General**

5.1. The testing methodology of required tests for flow controllers is described in Annex 1 with reference to the testing conditions and requirements specified in the Australian/New Zealand Standard No. AS 5200.037.2-2008 – Technical Specification for Plumbing and Drainage Products: Flow controllers – For use in heated or cold water plumbing systems or other equivalent international standards approved by the Department.

5.2. The flow controllers installed to use with water taps (Category 1 flow controller) shall be tested to be safe for potable water use in accordance with standards below:

(a) Non-metallic components: Current BS 6920 or other equivalent international standards accepted by the Department;

(b) Metallic components: relevant current BS standards or other equivalent international standards accepted by the Department.

**Flow Rate Test**

5.3. The nominal flow rates of the flow controllers shall be determined in accordance with Annex 1[2]. The water efficiencies of the flow controllers will be rated to different grades according to the type of the flow controllers and the nominal flow rate test results subject to the compliance with other performance requirements mentioned in Section 5.4 below.

**Other Performance Requirements**

5.4. The flow controllers shall also be tested in accordance with Annex 1 for conformity with all the performance requirements as shown in Table 1.

Table 1: Performance Requirements for Flow Controllers

| Performance Property | Performance Requirements |
|---|---|
| Endurance test | The re-measured flow rate after the endurance test of the flow controller shall be within 1 litre/min of the nominal flow rate, as determined in the flow rate test. |
| Watertightness test<br>(not applicable for a flow controller that is supplied as an attachment to an outlet without any closing mechanism) | No signs of cracks, leakage or other failure should be observed. |

5.5. The flow controllers installed to use with water taps (Category 1 flow controller) shall also be tested to be safe for potable water use in accordance with relevant standards as specified in Section 5.2, or other equivalent international standards accepted by the Department.

**Quality Requirement**

5.6. The flow controllers shall be manufactured under a design (if applicable) and production system operating according to a recognized international quality system (such as ISO 9001 or equivalent).

[2] *Where a flow controller is supplied with adjustable settings, adjust the flow controller to the maximum flow setting when undergoing the test.*

## 6. Water Efficiency Grading

### Classification of Flow Controllers

6.1. For the purpose of water efficiency rating assessment, all flow controllers to be registered under the Scheme is classified based on the category or categories submitted by the participants in accordance with Table 2. The flow controllers will be registered and labelled with either one Label for the corresponding category or two Labels, i.e. one Label for Category 1 and the other Label for Category 2.

Table 2: Classification of Flow Controllers

| Category | Description |
|---|---|
| 1 | Flow Controllers for Water Taps |
| 2 | Flow Controllers for Showers for Bathing |

### Water Efficiency Grading

6.2. The water efficiencies of the flow controllers are rated to different grades according to their types and nominal flow rates as shown in Tables 3 and 4. Grade 1 is the most water efficient whereas Grade 4 is the least water efficient.

Table 3: Conversion of Water Consumption to Water Efficiency Grades for Category 1 Flow Controllers

| Nominal Flow Rate of Category 1 Flow Controllers $f$ (litre/minute) | Water Efficiency Grade | Symbolic Presentation on the Water Efficiency Label |
|---|---|---|
| $f \leq 5.0$ | Grade 1 | 1 water droplet  |
| $5.0 < f \leq 7.0$ | Grade 2 | 2 water droplets  |
| $7.0 < f \leq 9.0$ | Grade 3 | 3 water droplets  |
| $9.0 < f$ | Grade 4 | 4 water droplets  |

Table 4: Conversion of Water Consumption to Water Efficiency Grades for Category 2 Flow Controllers

| **Nominal Flow Rate of Category 2 Flow Controllers *f* (litre/minute)** | **Water Efficiency Grade** | **Symbolic Presentation on the Water Efficiency Label** |
|---|---|---|
| $f \leq 9.0$ | Grade 1 | 1 water droplet  |
| $9.0 < f \leq 12.0$ | Grade 2 | 2 water droplets  |
| $12.0 < f \leq 16.0$ | Grade 3 | 3 water droplets  |
| $16.0 < f$ | Grade 4 | 4 water droplets  |

6.3. If the flow controllers are operated with constant flow operation to achieve the maximum difference between the highest and lowest average flow rates in the flow rate test not exceeding 2.0 litres/min as specified in Annex 1, the merit will be shown on the Label for public information and description of the merited function will be referred from the registration certificate.

6.4. If the flow controller cannot fulfil the performance requirements specified in Sections 5.4 and 5.5 respectively, application for registration under the Scheme will not be accepted.

## 7. Water Efficiency Label

**Label Location**

7.1. The Label should be self-adhesive or pre-printed onto the packing. It is a compulsory requirement for the participant to affix or print the Label(s) to his/her registered flow controller or its packing at a prominent location. The participant should also ensure that the registered flow controller shall be displayed for sale with the Label(s) in order to enhance the awareness of installing the water efficient plumbing fixtures.

**Colour Scheme and Dimensions**

7.2. The Label should be printed on white-coloured self-adhesive sheet material

(for self-adhesive type) in accordance with the figures, dimensions, Pantone Colour Codes, font sizes and styles as shown in Annex 2. It should be printed in English and Chinese. Soft copies of WELS labels will be transmitted by the WSD to successful applicants for WELS soon after the approval of the respective application.

**Paper Quality**

7.3. The paper used for the Label should be durable and possess good wear and tear characteristics. It should stick tightly on the flow controller or its packing.

**Information on the Label**

7.4. The information that appears on the Label shall accord with the Label format as indicated in Annex 2 and shall tally with the information listed on the registration certificate issued by the Department.

## 8. Testing Laboratories and Certification Bodies

8.1. The testing specified in Sections 5.3, 5.4 & 5.5 is to be carried out either by an independent testing laboratory or by the manufacturers or the importers or other related parties themselves at their own testing laboratories. The Department will accept the results and certificates issued by the testing laboratories, which fulfill one of the following criteria as specified in Sections 8.2, 8.3 or 8.4.

8.2. The testing laboratory is accredited by the Hong Kong Accreditation Service (HKAS) under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) or a testing laboratory accredited by the manual recognition arrangement partners for HKAS[3] for carrying out the tests stipulated in Sections 5.3, 5.4 & 5.5 of this document; and the test results are issued in an endorsed test

[3] *HKAS has concluded mutual recognition arrangements with overseas accreditation bodies for testing laboratory accreditation. The list of mutual recognition arrangement partners may change from time to time and the up-to-date list is available from the HKAS website of http://www.itc.gov.hk/en/quality/hkas/doc/common/mramla/MRA_HOKLAS_en_ch.pdf. Partners of these arrangements recognise the accreditations granted by one another as equivalent. An up-to-date APLAC MRA list is available from http://www.aplac.org/aplac_mra.html. An up-to-date ILAC MRA is available from https://ilac.org/signatory_print.php.*

report or test certificate bearing the accreditation mark as having the same technical validity as certificates endorsed by HOKLAS.

8.3. A laboratory which achieves HOKLAS accreditation (or is accredited by a scheme with which HKAS has concluded a mutual recognition arrangement) for laboratory testing of plumbing fixtures and water-consuming appliances other than the tests stipulated in Scheme, and the laboratory can demonstrate its capability of carrying out tests on Flow Controllers in accordance with Annex 1.

8.4. An in-house laboratory fulfills the criteria listed below:

(a) Self-declaration by the manufacturer, importer or other related parties that the operations of their in-house laboratory follow the requirements of ISO/IEC 17025; **and**

(b) The manufacturer, importer or other related parties is currently operating according to a recognized international quality system (such as ISO 9001); **and**

(c) The manufacturer's or importer's or related parties' in-house laboratory has been successful in carrying out tests on water consumption appliances and where these tests have been evaluated and certified by internationally recognized third party certification organisations.

## 9. Application for Registration

**Application Procedures**

9.1 All manufacturers, importers and other related parties in the flow controllers business are welcome and encouraged to participate in the Scheme. For known manufacturers and importers, invitation letters will be issued to them. However, any manufacturers, importers and other related parties in the flow controllers business may submit applications for registration no matter whether they are invited or not.

9.2 The application for registration shall be submitted by means of an application letter together with "Performa Letter of Application" in Annex 3 by hand, through post, facsimile or electronic mail to the Water Supplies Department:

| | |
|---|---|
| Address: | 47/F, Immigration Tower<br>7 Gloucester Road, Wanchai, Hong Kong |
| Fax number: | 2824 0578 |
| Email: | wsdinfo@wsd.gov.hk |

A proforma letter of application is attached in Annex 3. In order to ensure effective implementation of the Scheme, the participant must be committed to full compliance with the obligations set out in the Scheme. The proforma letter of application in Annex 3 details the obligations. The proforma application letter is also available at the Water Supplies Department's website (https://www.wsd.gov.hk/filemanager/en/share/wels/proforma_letter_of_application_flow_controllers.pdf) for downloading. The application submission can be made in either English or Chinese.

**Information/Documents/Materials to be Submitted for Application**

9.3 The information/material to be submitted with the application are listed as follows and also listed in Annex 4:

(a) Information of the company, i.e. name, address, telephone number, fax number, e-mail address, website address, contact person, and sale distribution network (names and addresses of the distributor(s)), etc.;

(b) Information of the flow controller being applied for registration in the Scheme, i.e. brand name, model no. and/or name, flow controller category, catalogue (if available), country/region of origin and two photos clearly showing the front and side views of the flow controller;

(c) Parties which will be responsible for making and affixing the water efficiency label (Label);

(d) Proposed commencement date to affix the Label to flow controller (Year _____, Month _____);

(e) Documentary proof of the approval for the flow controller GA issued by the Water Authority;

(f) Documentary proof that the design (if any) and production system for the flow controller is operating according to a recognized international quality system [4] (such as ISO 9001). The submission of product drawings extracted from the product manual or design manual, and

[4] *The details of a recognised international quality system may change from time to time and the up-to-date list is available from the HKAS website https://www.itc.gov.hk/en/quality/psib/standards_res.html/*

international quality system certificate on the manufacturer can be considered as documentary proof of recognition of the quality system. Failure to renew the recognized international quality system may render the model registration null and void;

(g) Detailed test report in accordance with the reporting requirements specified in Annex 1 and relevant test standards for safe for potable water use required in Section 5.2, if applicable. The test report shall be issued by a recognized laboratory complying with the requirements in Section 8. The required information requested in Sections A5, B6 and C5 of Annex 1 of the scheme document have to be provided in a single section of the test report;

(h) Documentary proof that the testing laboratory appointed by the participant has satisfied the requirement of Section 8.2, 8.3 or 8.4. The submission of certificate of accreditation, self-declaration statement that the operation of the testing laboratory meets the requirements of ISO/IEC 17025 can be considered as documentary proof.

(i) For the case of flow controllers of same design but with the variation in colour and finishing, the applicant should consult with the testing laboratory and confirm in writing that such variation will not affect the flow rate performance and other performance requirements stipulated in Section 5.3 to Section 5.5; and

(j) The participant shall submit a reference sample for each flow controllers successfully registered under the Scheme upon the request of the Department.

9.4 For registration in WELS under the recognition mechanism[5], valid test report used for application for registration of the flow controller under the oversea water efficiency labelling scheme. The test report shall include the required information requested in Annex 1 of the Scheme Document issued by a recognized laboratory complying with the requirements in Section 8. Should the above information be inadequate, individual local laboratory test shall be

[5] *The flow controllers registered under the Water Efficiency Scheme in Australia and New Zealand can be recognized under WELS. In applying for registration in WELS under the recognition mechanism for flow controllers registered in Australia and New Zealand, the applicant shall follow the procedures and requirements as stipulated under Section 9 of the Scheme Document of the respective flow controllers in submitting the application, except the need for local laboratory test is replaced by the submission of valid test report used for the original registration overseas as stated in Section 9.3 (e).*

required to provide the missing information. Documentation showing valid registration status of the flow controller in the respective oversea water efficiency labelling scheme (e.g. Certified true copy of the registration document, website link, i.e. URL, to the register in respective scheme).

9.5 Company's chop should be stamped on the Proforma Letter of Application and all the document front covers provided by hand, or through post, facsimile or electronic mail to the Water Supplier Department. All photocopy test reports submitted to the Department shall be certified as true copy issued by the testing laboratory appointed by the participant. Upon the request of the Department, the participant is required to provide the original copy of the test reports.

**Acceptance/Rejection of Application**

9.6 On receipt of the application, the Department will verify whether the flow controller meets the requirements based on the submitted information and will rate the flow controller with a water efficiency grade according to the flow controller's nominal flow rate.

9.7 If the application is accepted, the participant will be notified of the result within 17 working days upon the receipt of all necessary information requested. A registration certificate listing the information to be displayed on the Label will be issued to the participant by the Department. Soft copies of WELS labels will be transmitted by the WSD to successful applicants for WELS soon after the approval of the respective application. The participant will then be allowed to affix the Label to the 'registered' flow controllers or print the Label onto its packing. The participant should ensure that the Label is correctly printed and affixed to the flow controller or its packing or a swing tag securely fastened to the product/packing in accordance with Section 7.

9.8 If the application is rejected, a notification letter with reason(s) of rejection will also be given to the participant within 17 working days upon receipt of all necessary information requested.

9.9 To ensure a more efficient processing of applications of products for registration under WELS, the deadline for submitting all necessary supporting information will be set at six months from the date of receipt of the application. Upon receipt of application, the Department will vet and, if

found necessary, require the applicant to submit outstanding information. For any application that could not be completed in five months due to incomplete information, the Department will issue a final reminder requesting the submission of outstanding application/clarification within one month from the date of such reminder. The application concerned will be rejected automatically without further notification if the required information/ clarification is still outstanding after the deadline specified in the reminder.

9.10 The flow chart for registration is shown in Annex 5.

**Participant's Obligations**

9.11 The participant is obliged to:

(a) submit application for registration by means of an application letter together with "Performa Letter of Application", the information/material required in Section 9.3 and the test results which follow the format set out in Sections I, II and III of Annex 1 and relevant test standards for safe for potable water use required in Section 5.2, if applicable;

(b) at his/her own costs, produce the Label and affix/print the Label either to the flow controller or its packing at a prominent location or a swing tag securely fastened to the product/packing in accordance with Section 7;

(c) ensure that the registered flow controller shall be displayed for sale with the Label;

(d) fully inform other related parties (such as sales agents, retailers, etc.) in the participant's sale distribution network once the flow controller is registered under this Scheme and notify them that the Department may request to enter their premises to carry out the compliance monitoring and inspections as stated in Section 11;

(e) allow annual/ad-hoc inspection/re-inspection to be conducted by Inspecting Officers authorized by the Director on the registered flow controller at his/her premises such as the warehouse and/or its retailing spots;

(f) allow the tested flow rates and performance data of the registered flow controller to be uploaded to the Department's website for public information;

(g) conduct re-test(s) at his/her own costs at a recognized laboratory if non-

compliance is found on the registered flow controller. The result of re-test(s) shall reach the Department within the time specified by the Department;

(h) submit a reference sample of each flow controller successfully registered under the Scheme upon the request of the Department;

(i) provide additional supporting information/material upon request of the Department within the time prescribed. Failure to comply may render rejection of the Application for Registration (see Section 9);

(j) notify the Department by means of a notification letter (in either English or Chinese with the company's chop should be stamped on the Proforma Letter of Application and all submitted documents front covers) through post, facsimile or electronic mail of any changes of the company information (e.g. company name). The notification should be made not less than 14 working days before the change. Failure to comply may render the model registration null and void. Changes of flow controller information (e.g. brand name, model no.) will be considered as major changes that require new applications for registration in the Scheme;

(k) remove within three months all Labels from the flow controller and its packing if it has been de-registered; and

(l) return the corresponding registration certificate to the Department within one month upon receipt of the notification letter of de-registration.

9.12 The details of flow controllers registered under this Scheme will be kept in a register maintained by the Department. The registration records will be regularly uploaded to the Department's website for public information.

**Termination**

9.13 Under circumstances of poor performance such as:

(a) the participant failing to fulfil the obligations set out in the Scheme; or

(b) the flow controller failing to perform in accordance with rated water efficiency grade and/or the performance requirements of the Scheme and the participant not being able to rectify the non-compliance within the time frame specified by the Department; or

(c) where the Director is of the opinion that registration of a flow controller is contrary to the public interest,

the Department may de-register a flow controller from the Scheme with immediate effect by giving the participant notice in writing. Once a flow controller is de-registered, it is not allowed to affix a Label to it. The participant shall remove all Labels from the de-registered flow controller, its packing and/or the swing tag securely fastened to the product/packing within three months from the notice.

9.14 Participant who decides to discontinue participating in the Scheme or to withdraw any registered flow controller from the Scheme shall give at least three months' advance notice to the Department, in writing with the reason(s) for de-registration.

9.15 The participant shall return the registration certificate to the Department within one month after de-registration under the Scheme.

**Arrangement and Procedures upon expiry of the General Acceptance (GA) Approval**

9.16 The flow controllers, if applicable, shall be tested in accordance with the relevant requirements as specified in the Waterworks Regulations (Caps. 102A) and comply with the standards specified for the flow controllers by the Water Authority. Upon completion of the test(s) and compliance with the standards, the approval for the flow controllers shall also be obtained from the Water Authority prior to the WELS application. The WELS registration record will expire on the expiry date of the General Acceptance of the flow controllers.

9.17 The detailed arrangement and procedures for handling WELS registered flow controllers upon expiry of its GA is described as below:

(a) The WELS registration record will expire instantly on the expiry date of the GA of flow controllers;

(b) The WELS on flow controllers register on the Water Supplies Department's website (https://www.wsd.gov.hk/en/plumbing-engineering/water-efficiency-labelling-scheme/wels-on-flow-controllers/register-flow-controllers-/index.html) will be updated accordingly;

(c) Notification will be given to the participant upon the expiry of the WELS registration;

(d) Participant who decides to discontinue participating in the Scheme should inform the Department with written notice and return the

corresponding registration certificate to the Department within one month upon receipt of the notification letter;

(e) Once the WELS registration record of a flow controller is expired, it is not allowed to affix a Label to it;

(f) The participant shall remove all Labels from the flow controller expired under WELS registration as well as its packing within three months from the notice;

(g) Participant who decides to continue registering a flow controller (of expired GA) with the Scheme shall submit a notification letter through post, facsimile or electronic mail within one month of the date of the corresponding letter of the renewed GA of the flow controllers. The notification letter shall include its WELS registration number, manufacturer, brand and model number, together with the documentary proof the renewed GA issued by the Water Authority with the new validity period. If the application is accepted, the participant will be notified of the result within 17 working days upon the receipt of all necessary information requested.

## 10. Legal Provisions

10.1 Without prejudice to any remedy a purchaser may have against the party under the Laws of Hong Kong, a culpable party may be subject to the following sanctions.

10.2 This Scheme is a voluntary scheme. However, a participant who abuses the Scheme by giving false information on the Label may constitute an offence under the Trade Descriptions Ordinance, Cap. 362.

10.3 Unauthorized use of the Label(s) may constitute an offence under the Copyright Ordinance, Cap. 528.

## 11. Compliance Monitoring and Inspection

**Purpose**

11.1 To uphold credibility of the Scheme and to maintain continuous confidence of the consumers, compliance check on the Labels on those flow controllers registered in the Scheme is necessary. In addition, to avoid the unsatisfactory situation that unauthorized Labels are used on non-registered flow controllers,

the Department may also carry out suitable form of inspection on those flow controllers which have not been registered under the Scheme.

**Scope**

11.2 The scope of inspection includes, but not limited to, sample checking and testing for the following items:

(a) whether the Label is affixed/printed to registered flow controllers or their packing or swing tags securely fastened to the product/packing as required in Section 7;
(b) whether the Label being displayed is of correct format in accordance with Section 7;
(c) whether the water efficiency grade rated by the Department based on the data submitted by the participant is in line with the grade rated from the results of testing conducted by the Department in compliance monitoring and inspection;
(d) whether the data shown on the Label tally with the information listed on the registration certificate; and
(e) whether unregistered flow controllers display unauthorized Labels.

11.3 The participants will be requested to take immediate remedial action and report the follow-up action taken if non-compliance is found on their registered flow controllers such as incorrect information shown on the Label.

11.4 The Department will periodically appoint a recognized laboratory to conduct annual testing on the registered flow controllers in accordance with the requirements specified in Sections I, II and III of Annex 1 and relevant test standards for safe for potable water use required in Section 5.2, if applicable. For a registered flow controller which is found to fall within either one of the following cases, the Department may request the participant to conduct separate test at his/her own cost on the registered flow controllers, in accordance with the testing methodology as stated in Annex 1 in a recognized laboratory agreed by the Department.

(a) The flow controller is found not meeting the performance requirements specified in Sections 5.4 and 5.5; or
(b) The flow controller is found not meeting the water efficiency grade rated based on the data of the flow controller samples previously submitted by the participant in the application; or

(c) The measured flow rate of flow controller is found deviated from the registered flow rate by more/less than 20% specified in Section 5.3.

The test should be carried out on at least three further samples of the flow controller provided by the WELS registrant. The WELS registrant shall submit the reference samples for testing within one month upon the request of the Department.

For case 11.4(a) above, the performance test results of the three flow controller samples should meet the requirements specified in Sections 5.4 and 5.5. If the test results fail to meet such requirements, the Department may either require the participant to withdraw his/her registration or de-register the flow controller rated from the Scheme. For cases 11.4(b) and 11.4(c) above, the water efficiency grading rated from the average nominal flow rate of the three flow controller samples should be the same as the grading on the Label, whilst the measured flow rate of three flow controller samples should not be deviated from the registered flow rate by more/less than 20%. Otherwise, the Department will require the participant to take appropriate remedial action including re-registering in the Scheme by replacing a Label with correct grading and nominal flow rate for the registered flow controller at his/her own cost.

11.5 If no remedial action against the non-compliance is taken by the participant within the time prescribed by the Department, the Department may notify the participant of the de-registration of the concerned flow controller from the Scheme. Once a flow controller is de-registered, it is not allowed to affix or print a Label to it. The participant shall remove all Labels from the de-registered flow controller and its packing within three months from the Department's notice. Failure to remove the Labels from the de-registered flow controller may contravene the relevant ordinances as mentioned in Section 10 above. At the same time, the participant shall return the corresponding certificate to the Department within one month after de-registration under the Scheme.

**Inspecting Officers**

11.6 The Director will authorize Inspecting Officers to carry out flow controller compliance monitoring and inspection. The officers will carry proper identification cards which will be produced during their inspection. However, the officers will not inform the participants in advance of their inspection.

11.7 It is the participants' obligation to allow the Inspecting Officers to gain access to their premises to carry out the inspection. Failure to comply may render the model registration null and void.

**Mode of Inspection**

11.8 Inspections will be carried out on registered flow controllers under the Scheme on an annual basis. Based on the record of the registration, annual inspection programmes will be developed. Inspection will also be conducted on the non-registered flow controllers with unauthorized Labels.

11.9 In addition to the annual inspections, the Inspecting Officers will carry out ad-hoc inspections in response to complaints. The items to be inspected in such a case will depend upon the nature of complaints and may include the items as stated in Section 11.2.

11.10 Inspection will normally be carried out at the retail outlets and flow controller showrooms. Where necessary, inspection will also be done at warehouses.

11.11 When necessary, re-inspection of non-compliance identified in flow controllers in the annual/ad-hoc inspection will be carried out.

11.12 The inspection results will be properly recorded for future analysis as well as on evaluation of the effectiveness of the Scheme to provide information on the levels of water consumption and efficiency ratings, to facilitate consumers to select water efficient plumbing fixtures and water consuming appliances and to provide confidence on the registered products under the Scheme.

## 12. Complaints and Appeals

12.1 The Department will be responsible for dealing with complaints from participants and other parties against matters related to the Scheme.

**Complaints Handling Procedure**

12.2 The Department shall ensure that complaints are properly recorded and handled without undue delay.

12.3 The Department shall carry out investigation on complaints and reply to them within a reasonable time. For complaints that require site inspection and laboratory test, the complainant shall be notified through an interim reply.

12.4 The Department shall inform the complainant of the result or decision made on the complaint.

**Appeal Procedure**

12.5 A participant may appeal against the decision or action taken by the Department in writing to the Director stating the reason for the appeal.

12.6 The Director may decide to suspend the decision or action taken by the Department from the day on which the appeal is made until such appeal is disposed of, withdrawn or abandoned unless such suspension would, in the opinion of the Director, be contrary to public interest.

12.7 The Director may, by notice to the appellant, require the appellant to attend meeting(s) with him or his representatives and provide documents and give evidence relevant to the appeal.

12.8 The Director shall notify the appellant of his decision and reasons for it. The decision will be final.

## 13. Maintenance of Scheme

13.1 To ensure that the Scheme can continue to operate effectively and efficiently, the Scheme will be maintained as follows:

(a) Continuous updating of the lists of flow controllers registered in the Scheme as follows:

(i) registered flow controllers with details such as registration numbers in the Scheme, dates of registration, flow rate data, performance data, makes, models and other related information; and;

(ii) manufacturers, importers or other related parties of the registered flow controllers with details such as addresses, telephone numbers,

e-mail addresses, etc.

(b) Periodic review of the Scheme Document, including testing methodologies, procedures for registration application and compliance monitoring etc.

(c) Continuous evaluation of the effectiveness of the Scheme and assessment of what changes are necessary.

# Testing Guidelines for Flow Controllers

## Condensed Testing Requirements with reference to the AS 5200.037.2-2008 Standard

*- Note -*

*This Annex is a guideline to facilitate the participant to grasp the context of water efficiency testing requirements. It makes reference to the Appendices B and C of the captioned standard and focuses on the measurement of water flow rate, the endurance test and watertightness for flow controllers. The participant should be able to obtain from the text a good appreciation of the testing requirements. On the other hand, the captioned standard is much more comprehensive and detailed and contains exact definitions. Due to condensed size, this Annex cannot replace the captioned standard nor is there any intention to do so. In case of doubt, the captioned standard should always be consulted.*

*Section I of this Annex describes the methodology for determination of Nominal Flow Rate. The endurance test for flow controllers are elaborated in Section II.*

*The Department would like to acknowledge the assistance of the SAI Global Limited, Australia for granting permission to reprint the content of the above-mentioned Appendices under Licence 1405-c033.*

## Section I - Methodology for Determination of the Nominal Flow Rate of Flow Controllers

### A1. Scope

This section sets out the method for determining the nominal flow rate of a flow controller.

### A2. Principle

The flow controller to be tested is supported in a test rig and water is passed through the test sample at dynamic flow pressures of 150 kPa, 250 kPa, 350 kPa and 500 kPa; when the flow rate has stabilized it is recorded at each of these pressures at ambient water temperature.

### A3 Apparatus

The following apparatus is required:

(a) A water supply capable of delivering water at:
  (i) A flow rate of more than 20 l/min; and
  (ii) A dynamic flow pressure of at least 500 kPa; and
  (iii) A temperature of 20 ± 5℃.

(b) Test apparatus made from DN 15, Type B copper pipe. The branch for flow pressure measurements shall be located at least 250 mm downstream of any valve or fitting. The flow controller connection shall be not more than 300 mm downstream of the branch for the flow pressure measurements. A typical test arrangement is shown in Figure A1 below.

(c) A pressure gauge having an accuracy of ±2% of the true value.

(d) A flow meter having an accuracy of ±2% of the true value.

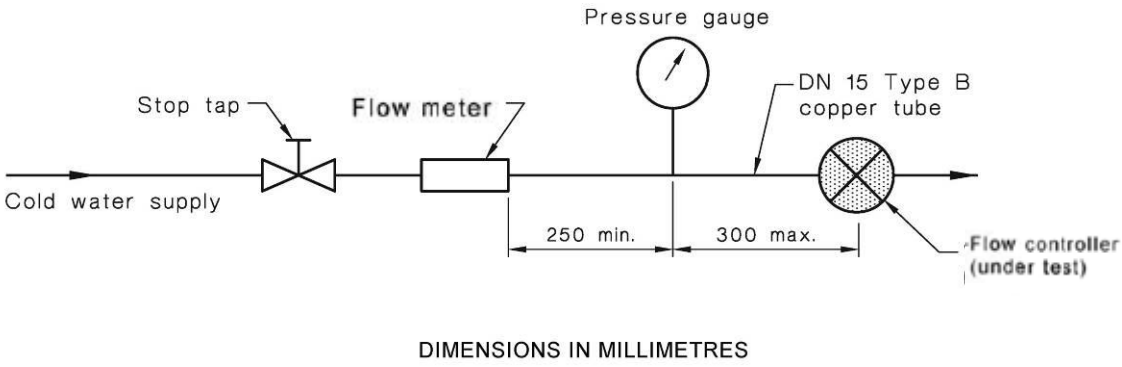


Figure A1 Typical Test Arrangement

## A4 Procedure

The procedure shall be as follows:

(a) Assemble the flow controller in accordance with the manufacturer's specified method of assembly. Where a flow controller is supplied with adjustable settings, adjust the flow controller to the maximum flow setting.

(b) Mount the test sample in the test rig with the water supply connected to the intended inlet.

(c) Condition the flow controller by allowing the water to flow and adjusting the control valve gradually until the dynamic flow pressure of 500 kPa is achieved. Maintain the flow until the flow and pressure remain stable for at least 1 min.

(d) Gradually adjust the control valve to turn off the flow of water.

(e) Gradually turn on the flow of water until a stabilized flow at a dynamic flow pressure of 150 kPa is achieved.

(f) Observe the flow meter and record the flow rate at that dynamic flow pressure.

(g) Repeat Steps (e) and (f) with the dynamic flow pressure increased to 250 kPa, 350 kPa and then to 500 kPa.

(h) Gradually adjust the control valve to turn off the flow of water.

(i) Repeat Steps (e) to (h) to obtain a second reading of the flow rates at the range of pressures.

(j) Calculate and record the average flow rates at each of the following dynamic pressures:

(i) 150 kPa

(ii) 250 kPa

(iii) 350 kPa

(iv) 500 kPa

(k) Calculate the mean of the average flow rates obtained in Step (j) (i) to (j) (iii), and record this value as the nominal flow rate. Please note that although the flow controller is tested to 500 kPa, the recording of the average flow rate at that pressure is to facilitate consumers in making their flow controller selection.

(l) From the averages obtained in Step (j) (i) to (j) (iii), record the highest and lowest average flow rates.

(m) Calculate and record the maximum difference between the highest and lowest average flow rates at Step (l) for the merited function.

## A5 Test Report

The following shall be reported:

(a) Manufacturer, brand name, model name and model number (if these are applicable) of the flow controller.

(b) Provide a table showing the average flow rate through the test sample, at the dynamic flow pressures of:

| | | | | |
|---|---|---|---|---|
| Dynamic flow pressure (kPa) | 150 | 250 | 350 | 500 |
| Average flow rate (litres/minute) | | | | |

NOTE: The average flow rates as determined in paragraph A4 (j)

(c) The nominal flow rate in 1 decimal place (e.g. 5.2 litres/minute).

NOTE: As determined in paragraph A4 (k).

(d) The difference between the highest and lowest average flow rates as determined in paragraph A4 (m) for the merited function.

(e) Two photos clearly showing the front view of the flow controller and the connection hole of the flow controller.

(f) Combine the test report sections as specified in Section II and III, if applicable, to form a complete test report.

## Section II Endurance Test for Flow Controllers

### B1 Scope

This section sets out the method by which flow controllers are tested for the endurance. The test measures the ability of flow controllers to operate satisfactorily with normal heated and cold-water applications during the expected life of the device.

### B2 Principle

The test sample is installed in a test rig and connected to a temperature-controlled heated and cold water supply at a given pressure. A cyclic mechanism is used to open and close the valve providing water to the test sample. On completion of the pressure cycles, the test sample is retested in accordance with Section I of this Annex.

### B3 Application

The method is applicable to the following cycle range:

(a) Where the flow controller is located upstream of the shut-off operating mechanism or forms part of the shut-off operating mechanism: 50 000 ±500 cycles.
(b) For other flow controllers: 10 000 ±100 cycles.

To simulate temperature changes that occur in actual operation, the flow controller is also subjected to alternate supplies of heated and cold water

every 55±5 cycles between the heated water at the temperature specified in paragraph B4(b) and at ambient water temperature.

## B4 Apparatus

A test rig fitted with a counter to count complete cycles, and capable of –

(a) Operating the test sample through 50 000 ±500 cycles from 0 kPa to 350 kPa.
(b) Delivering heated water at a temperature of –
    (i) 80 ±3°C or manufacturer's maximum operating temperature ±3℃ for flow controllers with water taps; or
    (ii) 55 ±3℃ for flow controllers with showers for bathing.
(c) Deliver a flow rate of 20 l/min at 350 kPa.
(d) Provide 12 ±1 cycles per min; and
(e) Alternate ambient and heated water every 55 ±5 cycles.

A typical test arrangement is shown in Figure B1 below.

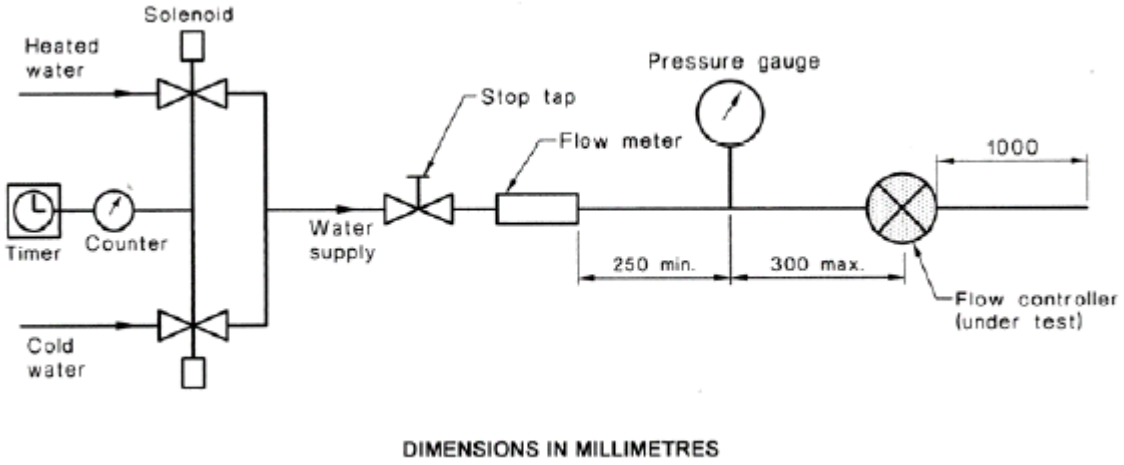


Figure B1 Typical Test Arrangement for Endurance Test

## B5 Procedure

The procedure shall be as follows:

(a) Test the flow controller in accordance with Section I of this Annex to determine and record the initial nominal flow rate and average flow rates at 150 kPa, 250 kPa, 350 kPa of the test sample.
(b) Connect the test sample to the test rig.
(c) Adjust the supply pressures for each water supply and check that the pressures and water temperatures are as specified.
(d) Commence the opening and closing operations of the valves supplying water to the test sample.
(e) Reset the cycle counter to zero.
(f) Operate the timing and control equipment to achieve the following complete cycle:
    (i) Valve opens.
    (ii) Valve remains open for a period of 1 +5, −0 s.

(iii) Valve fully closes.

(iv) Valve remains fully closed for 2 +5, −0 s.

During each cycle, the test sample shall be supplied with water from either the hot supply or the cold supply. After every 55 ±5 cycles, the supply shall be switched from being cold to hot and vice versa.

(g) Regularly check that the prescribed limits are being met throughout the test. The rig may be turned off to perform this test. Record the results and the number of cycles at which these checks occur.

(h) At the completion of Step (g), retest the test sample in accordance with Section I of this Annex to determine and record the final nominal flow rate and average flow rates at 150 kPa, 250 kPa, 350 kPa of the test sample.

(i) Calculate the difference between the nominal flow rates of the test sample determined in Step (a) and Step (h).

## B6 Test Report

The following shall be reported and formed part of the test report specified in paragraph A5:

(a) Manufacturer, model, size, and category of the flow controller.

(b) Water temperature of hot water supply used in paragraph B5 (f).

(c) Number of cycles completed.

(d) Initial nominal flow rate and average flow rates of the flow controller determined in paragraph B5 (a).

(e) Final nominal flow rate and average flow rates of the flow controller determined in paragraph B5 (h).

(f) The difference between the nominal flow rates of the test sample determined in paragraph B5 (i)

## Section III Determination of Watertightness (not applicable for a flow controller that is supplied as an attachment to an outlet without any closing mechanism)

### C1 Scope

This section sets out the method for testing flow controllers for leakage through the flow controller assembly. The method is as follows:

Hydrostatic pressure test at not less than 500 kPa, except where the manufacturer specifies a maximum operating pressure the test pressure to be not less than 1.5 times the maximum operating pressure.

Please note that this test is not applicable for a flow controller, such as an aerator, that is supplied as an attachment to an outlet without any closing mechanism.

### C2 Principle

The test sample is held in a test rig and hydraulic pressure is applied over a predetermined time period, entrapped air being bled off prior to testing.

### C3 Apparatus

#### C3.1 Pressurizing system

Pressurizing system capable of producing the specified test pressure without shock or pulsations. A hydraulic accumulator or pump may be used

for this purpose. The hydrostatic pressure test shall be conducted with water and the system shall be capable of providing the required pressure under no-flow conditions.

### C3.2 End connections

The sample connected to the pressurizing system, supported and held in a suitable jig.

Connection to the flow controller inlet and plugging of the flow controller outlet, if the flow controller is supplied without any closing mechanism, shall be made by threaded or compression ends. The pressurizing unit shall be connected to the inlet of the flow controller.

External clamping forces may be applied to the fitting to hold the flow controller against the connection sealing mechanism. Adequate guarding shall be provided to protect the tester.

The flow controller outlet, except for the flow controller with any closing mechanism, shall have a flow-control valve to allow free discharge or stop the flow against the pressurizing system. The free discharge shall be to atmosphere and readily seen.

## C4 Procedure

The procedure shall be as follows:

(a) Mount the flow controller in a suitable test jig and connect inlets to the pressurizing system.

(b) Open flow-control valve or flow controller, if applicable, allow water to run and discharge freely to atmosphere and remove air. Ensure that the outside of the fitting is free of drops or globules of water.

(c) Close the flow-control valve on the outlet or flow controller, if applicable, and pressurize the entire flow controller assembly to the test pressure. Observe for sealing of end connections and hold pressure for 10 s to 25 s.

(d) While the pressure is being maintained, observe for leakage through the body of the flow controller.

## C5 Test Report

The following shall be reported:

(a) Manufacturer, model, size, and category of the flow controller.

(b) Test pressure applied to the flow controller.

(c) Any visible splits, cracks, leakage or other failure of the flow controller.

(d) Compliance or non-compliance with the criteria specified.

**Annex 2**

# Water Efficiency Label


Grade 1 WELS Label


Grade 2 WELS Label


Grade 3 WELS Label


Grade 4 WELS Label

Notes:

1. Dimension of the water efficiency label is 50mm x 26.5mm.
2. Pantone Color: Green (Grade 1): 390C; Brown (Grade 2): 471C; Purple (Grade 3): 2583C; Red (Grade 4): 214C; WSD logo: 293C
3. The water consumption figure shown in the water efficiency label is the nominal flow rate of the Flow Controller as determined in accordance with the Scheme.

**Annex 3**

# Proforma Letter of Application

Our ref.

Tel.
Fax.

Date

Water Supplies Department
47/F, Immigration Tower
7 Gloucester Road, Wanchai
Hong Kong

Dear Sir/Madam,

**Application for Registration in the Voluntary Water Efficiency Labelling Scheme on Flow Controllers**

Our company is the (manufacturer / importer / other related parties (please specify)*) of_____(brand name, model number and/or name of flow controller) in Hong Kong. We would like to apply for registration of the flow controller in the above Scheme.

We understand fully our obligations as stated in the scheme document of "Voluntary Water Efficiency Labelling Scheme on Flow Controllers" (Scheme Document) and will comply with all relevant requirements, in particular those specified below:

(a) submit application for registration by means of an application letter together with "Proforma Letter of Application", the information/material required in Section 9.3 of the Scheme document and the test report in accordance with the reporting requirements specified in Annex 1 and relevant test standards for safe for potable water use required in Section 5.2, if applicable;
(b) at our own costs, produce the water efficiency label and affix/print the water efficiency label either to the flow controller or its packing at a prominent location or a swing tag securely fastened to the product/packing in accordance with Section 7 of the Scheme Document;
(c) ensure that the registered flow controller shall be displayed for sale with the Label(s);

(d) fully inform other related parties (such as sales agents, retailers, etc.) in the participant's sale distribution network once the flow controller is registered under this Scheme and notify them that the Water Supplies Department (Department) may request to enter their premises to carry out the random/ad-hoc inspections as stated in Section 11 of the Scheme document;

(e) allow random/ad-hoc inspection/re-inspection to be conducted by Inspecting Officers authorized by the Director of Water Supplies on the registered flow controller at his/her premises such as the warehouse and/or its retailing spots;

(f) allow the tested and performance data of the registered flow controller to be uploaded to the Department's website for public information;

(g) submit a reference sample of the registered flow controller for testing at his/her own cost upon the request of the Department;

(h) conduct re-test(s) at his/her own costs at a recognized laboratory complying with the requirements in Section 8 of the scheme document if non-compliance is found on the registered flow controller. The result of re-test(s) shall reach the Department within the time specified by the Department;

(i) provide additional supporting information/ material upon request of the Department within the time prescribed. Failure to comply may render rejection of the application;

(j) inform the Department of any change in accordance with Section 9.11 (j) of the Scheme Document; and

(k) remove within three months all Labels from the flow controller and/or its packing if it has been de-registered; and

(l) return the corresponding registration certificate to the Department within one month after de-registration under the Scheme.

The detailed information of the flow controller which we apply for registration is shown in the attached documents (see Annex 4 for the list of information to be submitted) for your processing.

Yours faithfully,

(Manufacturer/Importer/Agent's Name and Company Chop)

_____

* *delete as appropriate*

# Information/Material to be Submitted to the Water Supplies Department

1. Information of the company, i.e. name, address, telephone number, fax number, e-mail address, website address, and contact person, and sale distribution network (names and addresses of the distributor(s)), etc.;
2. Information of the flow controller being applied for registration in the Scheme, i.e. brand name, model no. and/or name, flow controller category, catalogue (if available), two photos clearly showing the front and bottom views of the flow controllers and country of origin.
3. Parties which will be responsible for making and affixing the water efficiency label (Label);
4. Proposed commencement date to affix the Label(s) to flow controller (Year _____, Month _____).
5. Documentary proof of the approval for the flow controller GA issued by the Water Authority;
6. Documentary proof that the design (if any) and production system for the flow controller is operating according to a recognized international quality system (such as ISO 9001). The submission of product drawings extracted from the product manual or design manual, and international quality system certificate on the manufacturer can be considered as documentary proof of recognition of the quality system. Failure to the renewal of the recognized international quality system may render the model registration null and void;
7. Detailed test report in accordance with the reporting requirements specified in Annex 1 and relevant test standards for safe for potable water use required in Section 5.2, if applicable. The test report shall be issued by a recognized laboratory complying with the requirements in Section 8. The required information requested in Sections A5, B6 and C5 of Annex 1 of the scheme document have to be provided in a single section of the test report; and;
8. Documentary proof that the testing laboratory appointed by the participant has satisfied the requirement of Section 8.2, 8.3 or 8.4. The submission of certificate of accreditation, self-declaration statement that the operation of the testing laboratory meets the requirements of ISO/IEC 17025 can be considered as documentary proof;
9. For the case of flow controller of same design but with the variation in

colour and finishing, the applicant should consult with the testing laboratory and confirm in writing that such variation will not affect the flow rate and other performance requirements stipulated in Section 5.3 to Section 5.5; and

10. A reference sample for each flow controller successfully registered under the Scheme upon the request of the Department.

**Overseas Recognition**

11. General Item no. 1 – 10;
12. Certified true copy of test report used for application for registration of the flow controller under the oversea water efficiency labelling scheme.
13. Certified true copy of documentation showing valid registration status of the flow controller in the respective oversea water efficiency labelling scheme (e.g. Certified true copy of the registration document, website link, i.e. URL, to the register in respective scheme).
14. Website link showing the recognized laboratory under HKAS MRA or equivalent

*Note: Company's chop should be stamped on the Proforma Letter of Application and all the document front covers/pages provided by hand, or through post, facsimile or electronic mail to the Water Supplies Department. All photocopy test reports submitted Department shall be certified as true copy issued by the testing laboratory appointed by the participant. Upon the request of the Department, the participant is required to provide the original copy of the test reports*

# Flow Chart for Registration