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Water efficiency labelling programmes – Requirements with guidance for implementation

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Project Committee ISO/PC 316, *Water efficient products - Rating*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The purpose of ISO 31600 is to provide a set of best practices and guidance for the preparation and implementation of a water efficiency labelling programme for plumbing products and water using appliances. A key focus is to provide the criteria for developing countries to establish an effective water efficiency labelling standard that will save water resources.

This project was approved on the basis that consumer empowerment through the communication of a product's water efficiency is a proven way of saving both water and energy. Several countries around the world already have well-established and effective water efficiency labelling programmes which empower consumers to make choices favouring more water efficient fixtures and appliances without compromising on human hygiene and sanitation. These existing labelling programmes were consulted in the development of this document.

ISO 31600 aims to globally encourage the development of national standards for water efficiency labelling, which will further lead to development and marketing of water efficient products, and enable consumers to make an informed choice, positively influencing manufacturers to improve the performance of their products through consumer demand. This document does not seek to establish ways to use water efficiency labelling in policies or programmes. The intention is to provide an understanding of the essential requirements for the development of an effective water efficiency labelling programme.

This document refers to existing national standards for the determination of water consumption and other important test procedures and requirements that form the critical underpinnings of a water efficiency labelling programme. Countries without national standards for products may formulate their own national standard either by adopting a national standard from a supporting country or by preparing an indigenous standard, to meet the requirements in Clause 4.

NOTE National regulations can also apply.

This document contains five informative annexes, with Annex A providing suggested universal tests for the determination of water consumption and Annexes B to E providing descriptions of a number of existing schemes/programmes. Countries that do not have an existing water efficiency labelling programme may consider these examples to select and adopt those best suited for their markets and conditions when developing their own water efficiency labelling programme.

Application of this document presupposes awareness of water efficiency programmes and regulations in the applicable country.

An overview of how to use this document, including the pathway to demonstrate conformance, is provided in Figure 1.

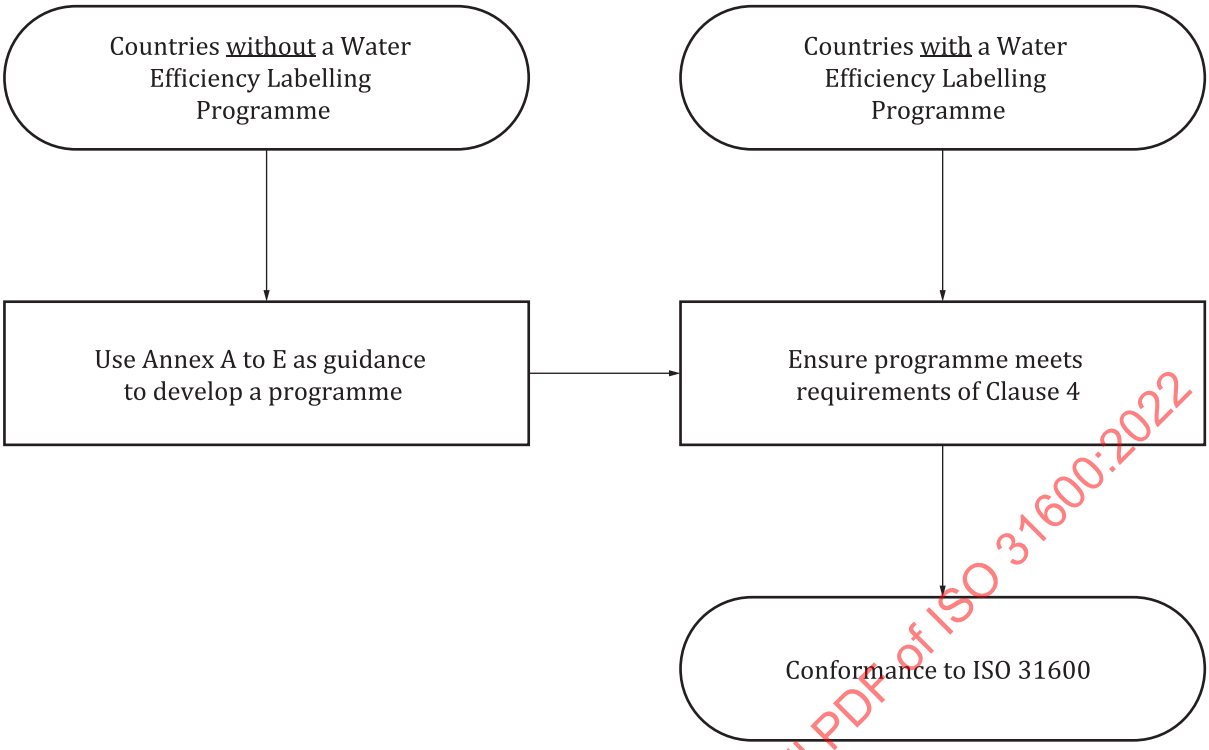


Figure 1 — Pathway to ISO 31600 conformance

Water efficiency labelling programmes – Requirements with guidance for implementation

1 Scope

This document specifies requirements for a water efficiency labelling programme for plumbing products and water using appliances along with guidance for their implementation.

This document applies to the following products:

a) showers;

b) tap (faucet) equipment;

c) flow regulators (flow controllers);

d) water closet (toilet) equipment;

e) urinal equipment;

f) dishwashers;

g) clothes washing machines;

h) the dryer function of combination washer/dryers, where they use water to dry a load.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1 General terms

3.1.1
water efficiency
accomplishment of a function, task, process, service or result, with the minimum amount of water needed for the safe operation of the product

[SOURCE: ISO 24513:2019, 3.4.7, modified — At the end of the definition, "practicable" has been replaced by "needed for the safe operation of the product".]

3.1.2
banded (tiered) labelling programme
programme that allows products to be labelled with various rated levels of water consumption

Note 1 to entry: Products can be differentiated by various visual means, e.g. stars or other markings, for identifying incremental levels of *water efficiency* (3.1.1). See Annex E for examples of existing water efficiency programme labels.

3.1.3
single threshold labelling programme
programme that requires all labelled products to meet a single water consumption requirement, typically expressed as a maximum

Note 1 to entry: Labelled products may or may not include the product's *water efficiency* (3.1.1) rating. See Annex E for examples of existing water efficiency programme labels.

3.1.4
shower assembly
combination of a shower control (valve) complete with shower hose (flexible or rigid) and shower outlet

3.1.5
shower outlet device
device through which water is intended to pass to form spray for bathing purposes

EXAMPLE showerheads, handheld showerheads, body sprays and rain shower outlet devices

Note 1 to entry: A shower outlet device can be sold separately or as part of a shower assembly.

3.1.6
tap(s)
faucet(s)
device through which water is intended to pass with an inlet and connection, and a control (valve) for drawing or regulating the flow of water

Note 1 to entry: A typical application for a tap (faucet) is over a *basin (lavatory)* (3.2.6), sink or laundry tub.

3.1.7
flow regulator
flow controller
flow control device used to control the rate of water flow in a *tap (faucet)* (3.1.6), *shower outlet device* (3.1.5) or *shower assembly* (3.1.4)

Note 1 to entry: Device can be sold separately or located within (upstream of the outlet) or at the very end (forming part of the outlet) of the water flow passage through a product.

Note 2 to entry: When sold separately, they are typically sold as part of an aerator subassembly or as a stand-alone component intended to be installed in a shower outlet device or shower assembly solution.

3.1.8
water closet
toilet
sanitary plumbing fixture that consists typically of a water-flushed bowl connected to a drainage system and fitted with a device for flushing water to cleanse the bowl after defecation and urination

3.1.9
urinal
sanitary plumbing fixture typically connected to a water flushing device for the reception and flushing away of urine into a drainage system

3.1.10
pressure flush valve
flushometer valve
device that controls the release of water to flush a *urinal* (3.1.9) or *water closet (toilet)* (3.1.8)

3.2 Pressure

3.2.1
pressure
measured force behind water system delivered through a plumbing system

Note 1 to entry: The plumbing system water supply of each country will determine the amount of pressure delivered to a water using outlet or fixture.

3.2.2
high pressure
hot-water and cold-water static supply pressures at or above a stated pressure for the country of intended installation

Note 1 to entry: This is typically in a fully pumped plumbing system installation.

3.2.3
low pressure
hot water and cold-water static supply pressures below a stated pressure for the country of intended installation

Note 1 to entry: This is typically in gravity fed plumbing system installations.

3.2.4
static pressure
measure of the at rest pressure in a plumbing system

3.2.5
dynamic pressure
pressure in a plumbing system under flow conditions

3.2.6
basin
lavatory
fixture for holding water for washing the hands or face, whether with one *tap (faucet)* (3.1.6) to allow a single user or a number of taps (faucets) spaced to allow simultaneous users

Note 1 to entry: The term lavatory is used in some countries, but can also refer to the room in which *water closets (toilets)* (3.1.8) or *urinals* (3.1.9) can be positioned, along with a basin for washing of hands.

4 Water efficiency labelling programme requirements

To demonstrate conformance to this document, the water efficiency labelling programme shall:

a) For the product, include or reference to (a) national standard(s);

NOTE 1 A national standard(s) provides the foundation for enabling a water efficiency labelling programme and can cover requirements for inherent product characteristics, e.g. public health and safety, material requirements, interchangeability, durability (life testing), performance requirements, and minimum conformance marking and/or labelling requirements.

NOTE 2 Reference can also be made to national regulations.

b) Include aspects of water efficiency test(s) requirements for the product or reference the applicable water efficiency test in the national standard(s);

c) Have a method to evaluate and determine a product's water efficiency or water efficiency rating based on the results of the water efficiency test(s) as per Clause 4 b);

d) Have a labelling method that identifies the product as being water efficient based on the assessment provided as per Clause 4 c).

NOTE 3 For guidance on the requirements for setting up a complete water efficiency labelling programme, see Annex A.

NOTE 4 For information and guidance on the above requirements and water efficiency tests as applied to existing water efficiency labelling programmes, see Annex B for plumbing products and Annex C for water using appliances.

NOTE 5 For information on conformity assessment procedures for products of a water efficiency labelling programme, see Annex D.

NOTE 6 For examples of labels for a water efficiency labelling programme, see Annex E.

Annex A
(informative)

General guidance for a water efficiency labelling programme

A.1 General

This annex provides the aspects of water efficiency tests for plumbing products and water using appliances that form part of a water efficiency labelling programme. Best practice options are provided, including existing test methodologies and test methods based on parameters as specified in this annex. This annex allows a country to evaluate the most suitable water efficiency labelling programme criteria for that country.

This annex sets the basic principles for what is required for a water efficiency labelling programme that meets the requirements of this document. The use of this annex provides the necessary criteria for the development of a water efficiency labelling programme based on best practices. It provides the methodology parameters to achieve determination of a product's/appliance's water efficiency. Water efficiency testing criteria are provided for guidance and use in this annex.

A.2 Generic labelling programme guidelines

A.2.1 Banded (tiered) and single threshold labelling programmes

A.2.1.1 General

Developers of water efficiency labelling programmes may choose between developing a banded (tiered) labelling programme or a single threshold labelling programme. Both have advantages, as detailed below. Both types of programmes have proven to be effective at improving water efficiency at national levels.

A.2.1.2 Banded (tiered) labelling programmes

Banded (tiered) labelling programmes offer the following advantages:

a) Allow for the use of product with different rated levels of water consumption to support varied water infrastructure needs of the country of intended installation (e.g. to support drainline transport of solid waste in building drains or sewers);

b) Provide manufacturers with an incentive to achieve higher levels of efficiency.

A.2.1.3 Single threshold labelling programmes

Single threshold labelling programmes offer the following advantages:

a) Allow for more precise forecasts of water use as all newly installed products provide the maximum allowed water efficiency level, or less;

b) Allow manufacturers to focus product development efforts on a single, maximum level of efficiency;

c) Allow programme developers to update programme requirements as improved technologies enter the marketplace.

A.2.2 Water efficiency rating systems

A.2.2.1 Objective

A rating system in a water efficiency labelling programme is intended to differentiate the more water efficient product/appliance from less efficient models and to provide water efficiency information of the model.

NOTE As mentioned in Clause 4 d), the label can or cannot include the product's water efficiency rating. The clauses in this Annex serve as a guidance for other countries that intend to develop their own rating system and labelling system.

A.2.2.2 Rating systems

A rating system can consist of a number of metrics applicable to the plumbing fitting or appliance being rated.

Typically, this is based on the consumption of water in relation to the specific use, for example:

a) Litres per minute [typically used for taps (faucets) and showerheads];

b) Litres per cycle, load, place setting, or other such basis for comparison [typically used for clothes washers, dishwashers and metering taps (faucets)];

c) Litres per flush [typically used for water closets (toilets) and urinals].

Additional metrics can be used to help qualify the rating of the water consumption:

— Maximum water consumption;

— Minimum water consumption;

— The test pressure at which a flow rate was determined [typically used for taps (faucets) and showerheads];

— Minimum and / or maximum place settings (typically used for dishwashers).

An example of a rating system in a banded (tiered) labelling programme for basin taps (faucets) is illustrated in Table A.1.

Table A.1 — Basin taps (faucets) rating system example

Rating	Flow rate Q (l/min)
1	$7,5 \leq Q \leq 9,0$
2	$6,0 \leq Q < 7,5$
3	$4,5 \leq Q < 6,0$
4	$1,5 \leq Q < 4,5$
NOTE 1 'Rating 4' is the most water efficient.	
NOTE 2 'Rating 1' is the least water efficient.	
NOTE 3 '9,0 l/min' is the maximum water consumption.	
NOTE 4 '1,5 l/min' is the lowest water consumption.	
NOTE 5 'l/min' is the water consumption unit.	
NOTE 6 '$4,5 \leq Q < 6,0$' is the water consumption range.	

A.2.3 Water consumption

A.2.3.1 Determination of water consumption

The water consumption of the product should be determined in accordance with the following subclauses for plumbing products:

— A.4 Shower Outlet Devices and Shower Assembly Solutions;

— A.5 Taps (faucets);

— A.6 Flow regulators (flow controllers);

— A.7 Water closets (toilets);

— A.8 Urinals.

The water consumption of the product should be determined in accordance with the following subclauses for water using appliances:

— A.9 Dishwashers;

— A.10 Clothes washers;

— A.11 Combination washers / dryers.

A.2.3.2 Rating of product/appliance

The rating of a product/appliance should be determined in accordance with the rating system specified in A.2.2.

A.2.4 Labelling guidelines

A.2.4.1 Labels

Every model should be issued with a water efficiency label. Every label should meet the minimum requirements as specified in A.2.4.2 and A.2.4.3.

NOTE See Annex E for examples of existing water efficiency programme labels.

A.2.4.2 Label specifications

The specifications of a label should consist of the following:

a) Rating representation, e.g. pass, meets, conforms, star rating, tick;

b) Design of label;

c) Font type e.g. Arial;

d) Font size;

e) Language, e.g. all information in English;

f) Water efficiency label information (see A.2.4.3).

A.2.4.3 Label information

A label should contain the following information:

a) Water efficiency rating;

b) Product brand;

c) Product model number;

d) Water consumption;

e) Type of product;

f) Number of place settings (applicable for dishwashers);

g) Rated capacity (applicable for washing machine and washer/dryer).

A.2.4.4 Additional label information

The following additional information can be included on the label:

a) Standard number (e.g. ISO 31600:2022);

b) Name of supplier;

c) Recommended wash programme (applicable for clothes washing machines);

d) Intended application, e.g. shower outlet;

e) Label dimensions;

f) Colour specifications and minimum resolutions, e.g. pantone codes;

g) Registration number or unique number issued to the model, QR code or its equivalent;

h) Any other information.

A.2.4.5 Printed labels

The label should be produced or printed in full or proportionately larger, in accordance with any applicable national label specifications, or in any case of a size such that it can be reasonably read and comprehended by consumers.

A.2.4.6 Display of label

The water efficiency labelling programme should detail the appropriate manner the label is displayed at the point of sale. The label may be affixed securely on the physical model or placed near to the product/appliance or on its packaging at point of sale. For product sold at retail, the label should be affixed in a prominent position for consumers to view the water efficiency information and compare with ease.

A.2.4.7 Use of label in advertisements

The water efficiency labelling programme should detail the appropriate manner for the use of the label in product advertisements or marketing.

Where it is not feasible to place all water efficiency information as specified in A.2.4.3 for each model in a printed advertisement, for example, due to space constraints, the advertisement for the model should contain the following:

a) Water efficiency rating;

b) Product brand;

c) Product model number.

The following additional information can be included on the label:

— Registration number or unique number issued to the model or its equivalent.

A.2.4.8 Modification of a labelled product/appliance

Where there is any change to the critical components of the product that affects its performance and water efficiency, the model should be retested and recertified.

A.2.5 Additional guidance on labelling

Countries that intend to develop their own water efficiency labelling programme are recommended to include the following provisions:

a) requirements to maintain a proper record system of the labels issued to the products for traceability and for review of the water efficiency labelling programme;

b) rules and requirements regarding changes of ownership of the manufacturer, supplier or importer of the labelled product/appliance;

c) rules and requirements on modifications of labelled products that can affect the validity of the label;

d) rules and requirements on altering, falsifying or forging of the label;

e) rules and requirements to monitor the ongoing conformance of products to the labelling programme requirements. General information on the various approaches that countries or regions have taken for this is provided in Annex D.

A.3 General requirements for plumbing products

A.3.1 General

This subclause applies to:

— A.4 Shower Outlet Devices and Shower Assembly Solutions;

— A.5 Taps (faucets);

— A.6 Flow regulators (flow controllers);

— A.7 Water closets (toilets);

— A.8 Urinals.

A.3.2 Conformance to national standard(s)

As a prerequisite, all labelled plumbing products and all components included as part of a labelled product assembly should conform to all the requirements contained in the applicable national standard(s) of the country of intended installation.

NOTE National regulations can also apply.

A.3.3 Instructions

The water efficiency labelling programme should require that all labelled products not be packaged, marked, nor provided with instructions directing the user to an alternative water use setting that would override the rated flow rate or water consumption volume, as established by the water efficiency labelling programme. All included instructions related to the maintenance of the product should direct

the user on ways to maintain the labelled product at the rated flow rate or water consumption volume of the product.

A.4 Shower outlet devices and shower assembly solutions

A.4.1 General

This subclause applies to:

— Shower outlet devices;

— Shower assembly solutions.

A.4.2 Included components

Shower assembly solutions should include a shower control valve [tap (faucet)] and a shower outlet device. Where handheld shower outlet devices are supplied, a compatible flexible hose should also be supplied. All components included with the shower assembly should be installed according to the manufacturer's instructions.

A.4.3 Essential testing

A.4.3.1 General

The following test is considered essential for shower outlet devices and should be included in a water efficiency labelling programme.

A.4.3.2 Determination of shower outlet device flow rate test

The flow rate of the shower outlet device should be determined by the test procedures detailed in the applicable national standard(s) of the country of intended installation. Flow rates should be expressed in terms of litres per minute (l/min).

NOTE National regulations can also apply.

A.4.4 Additional suggested testing

A.4.4.1 General

The following tests are offered for consideration for inclusion in a water efficiency labelling programme. It is possible that they will not be appropriate in all regions.

NOTE 1 The Determination of Spray Coverage and Spray Force tests are only recommended for regions having predominately pressurized (e.g. water utility supplied) plumbing systems. It is possible that it will not be appropriate for regions that have predominately low pressure (e.g. roof cistern supplied) plumbing systems.

NOTE 2 Examples of existing water efficiency labelling programmes for plumbing products and water using appliances are provided in Annexes B and C respectively.

A.4.4.2 Determination of spray coverage

A spray coverage performance test for shower outlet devices should be determined when tested in accordance with the applicable national standard(s) of the country of intended installation.

NOTE 1 The intent of this test is to ensure that the shower outlet device provides an effective spray coverage pattern to facilitate bathing. Performance is recorded and expressed in terms of coverage over a defined area.

NOTE 2 National regulations can also apply.

A.4.4.3 Determination of spray force test

A spray force test for shower outlet devices should be determined when tested in accordance with the applicable national standard(s) of the country of intended installation. Performance should be expressed in terms of newtons (N).

NOTE 1 The intent of this test is to ensure that the shower outlet device provides adequate force to facilitate bathing.

NOTE 2 National regulations can also apply.

A.4.4.4 Pressure independency (minimum flow rate) test

A means to measure the pressure independency of shower outlet devices should be determined when tested in accordance with the applicable national standard(s) of the country of intended installation.

NOTE 1 The intent of this test is to ensure that low water supply pressures do not adversely affect the performance of the shower outlet device.

NOTE 2 National regulations can also apply.

A.5 Taps (faucets)

A.5.1 General

This clause applies to:

— Manually and electronically operated bathroom taps (faucets) and bathroom tap (faucet) assemblies;

— Manually and electronically operated kitchen taps (faucets) and kitchen tap (faucet) assemblies;

— Manually and electronically operated bar sink taps (faucets) and bar sink tap (faucet) assemblies.

A.5.2 Included components

Where flow controls are supplied, they should be included in the tested assembly. All components included with the tap (faucet) assembly should be installed according to the manufacturer's instructions.

A.5.3 Essential testing

A.5.3.1 General

The following tests are considered essential for taps (faucets) devices and should be included in a water efficiency labelling programme.

A.5.3.2 Determination of water consumption

A.5.3.2.1 Flow rate test — Taps (faucets)

The flow rate of taps (faucets) should be determined by the test procedures detailed in the applicable national standard(s) of the country of intended installation. Flow rates should be expressed in terms of litres per minute (l/min).

NOTE National regulations can also apply.

A.5.3.2.2 Consumption test — Metering tap (faucet)

The water consumption of metering taps (faucets) should be determined by the test procedures detailed in the applicable national standard(s) of the country of intended installation. Water consumption should be expressed in terms of litres per on-off cycle of the device.

NOTE National regulations can also apply.

A.5.3.2.3 Pressure independency (minimum flow rate test)

A means to measure the pressure independency of taps (faucets) should be determined in accordance with the applicable national standard(s) of the country of intended installation.

NOTE 1 The intent of this test is to ensure that low water supply pressures do not adversely affect the performance of the tap (faucet).

NOTE 2 National regulations can also apply.

This test is only recommended for regions having predominately pressurized (e.g. water utility supplied) plumbing systems. It is possible that it will not be appropriate for regions that have predominately low pressure (e.g. roof cistern supplied) plumbing systems.

A.6 Flow regulators (flow controllers)

A.6.1 General

This clause applies to separately sold flow regulators (flow controllers) used to control the rate of water flow in a tap (faucet), shower outlet device or shower assembly solutions, fitted as per the manufacturer's instructions.

Where local markets allow flow control devices to be sold separately, they are typically sold as part of an aerator sub-assembly for use on taps (faucets), or as a stand-alone component intended to be installed in a shower assembly solution. When fitting a flow regulator (flow controller) to a terminal fitting or any part of a system, it should be compatible with such a system, any fitting within the system such that the addition of the flow regulator (flow controller) does not adversely affect the safety or performance of the fitting or system for the purpose for which it was originally intended. Installation instructions should be included with separately sold flow control devices, and the flow rate specifications should be provided on the packaging.

A.6.2 Essential testing

A.6.2.1 General

The following test is considered essential for flow regulators (flow controllers) and should be included in a water efficiency labelling programme.

A.6.2.2 Determination of flow regulator (flow controller) flow rate test

The flow rate of flow regulators (flow controllers) should be determined by the test procedures detailed in the applicable national standard(s) of the country of intended installation. Flow rates should be expressed in terms of litres per minute (l/min).

NOTE National regulations can also apply.

A.7 Water closets (toilets)

A.7.1 General

This clause applies to:

— "Seated-type" and "squat-type" water closets (toilets) and water closet (toilet) pans;

— Single and dual-flush volume cistern-type (tank-type) gravity water closets (toilets);

— Single and dual-flush volume cistern-type (tank-type) flushometer-tank (pressure-assist) water closets (toilets);

— Single and dual-flush volume pressure flush valve (flushometer valve) operated water closets (toilets);

— Electro-hydraulic water closets (toilets);

— Separately sold water closet (toilet) pressure flush valve (flushometer valves);

— Separately sold cisterns (tanks) and water closet (toilet) pans (bowls);

— Any other water closet (toilet) technology that meets the intent of this document.

A.7.2 Included components

All included components, including fill (inlet) valves, flush (outlet) valves, water closet (toilet) pressure flush valves (flushometer valves) and other components whether sold separately or as a combined system, should conform to all requirements contained in the applicable national standard(s) of the country of intended installation.

NOTE National regulations can also apply.

A.7.3 Essential testing

A.7.3.1 General

The following test is considered essential for all water closet (toilet) types and should be included in a water efficiency labelling programme.

A.7.3.2 Determination of water consumption (flush volume)

A.7.3.2.1 Water consumption test

The water consumption level of the water closet (toilet) or water closet (toilet) pressure flush valve (flushometer-valve) should be determined by the test procedures detailed in the applicable national standard(s) of the country of intended installation. The water consumption (flush volume) should be expressed in terms of litres per flush (lpf). All components included with the water closet (toilet) or water closet (toilet) pressure flush valve (flushometer-valve) assembly should be installed according to the manufacturer's instructions.

NOTE National regulations can also apply.

A.7.3.2.2 Determination of dual flush water closet (toilet) effective flush volume

For dual-flush water closets (toilets), an effective flush volume should be determined based on a ratio of reduced flushes to full flushes. The ratio of reduced flushes to full flushes should be determined by the test procedures detailed in the applicable national standard(s) of the country of intended installation.

NOTE 1 National regulations can also apply.

NOTE 2 Some national regulations or national standard(s) do not provide a ratio for determining the effective flush volume of a dual flush water closet (toilet) and leave this requirement to the developers of the Water Efficiency Labelling Programme.

A.7.3.2.3 Independent testing of separately sold water closet (toilet) bowls (pans), cisterns (tanks), and water closet (toilet) pressure flush valves (flushometer valves)

Separately sold water closets (toilets) bowls (pans), cisterns (tanks) and water closet (toilet) pressure flush valves (flushometer valves) should be tested as a complete system or tested separately in accordance with the test procedures detailed in the applicable national standard(s) of the country of intended installation.

NOTE National regulations can also apply.

A.7.3.2.4 Product documentation for separately sold water closet (toilet) bowls (pans), cisterns (tanks) and pressure flush valves (flushometer valves)

If sold separately, the water efficiency labelling programme should require the manufacturer of each separately sold component to clearly indicate on product documentation that the part should be used with a labelled counterpart that has a compatible flush performance in order to ensure that the complete system meets the requirements of the water efficiency labelling programme.

A.8 Urinals

A.8.1 General

This clause applies to:

— Wall mounted and floor mounted urinals;

— Pressurized flushing devices that deliver water to urinals;

— Flush cistern (tank) flushing devices (gravity type) that deliver water to urinals;

— Separately sold urinal pressure flush valves (flushometer valves);

— Any other urinal technology that meets the intent of this document.

A.8.2 Included components

All included components, including urinal pressure flush valves (flushometer valves) and other components whether sold separately or as a combined system, should conform to all requirements contained in the applicable national standard(s) of the country of intended installation.

NOTE National regulations can also apply.

A.8.3 Essential testing

A.8.3.1 General

The following test is considered essential for all urinal types and should be included in a water efficiency labelling programme.

A.8.3.2 Determination of urinal water consumption (flush volume)

A.8.3.2.1 Water consumption test

The water consumption level of the urinal or urinal pressure flush valve (flushometer valve) should be determined by the test procedures detailed in the applicable national standard(s) of the country of

intended installation. The water consumption (flush volume) should be expressed in terms of litres per flush (lpf). All components included with the urinal or urinal pressure flush valve (flushometer valve) assembly should be installed according to the manufacturer's instructions.

NOTE National regulations can also apply.

A.8.3.2.2 Independent testing of separately sold urinals and urinal pressure flush valves (flushometer valves)

Urinals and urinal pressure flush valves (flushometer valves) should be tested as a complete system or separately in accordance with the test procedures detailed in the applicable national standard(s) of the country of intended installation.

NOTE National regulations can also apply.

A.8.3.2.3 Product documentation for separately sold urinals and pressure flush valves (flushometer valves)

If sold separately, the water efficiency labelling programme should require the manufacturer of each separately sold component to clearly indicate on product documentation that the part should be used with a labelled counterpart that has a compatible flush performance in order to ensure that the complete system meets the requirements of the water efficiency labelling programme.

A.9 Dishwashers

A.9.1 General

This subclause should apply to dishwashers as described in IEC 60436 or the national standard(s) of the country of intended installation.

NOTE National regulations can also apply.

Water consumption and the water efficiency rating should be determined in accordance with A.9.2 and A.9.3 respectively.

A.9.2 Determination of specific water efficiency

The water consumption of a dishwasher should be determined under the same conditions used for the energy consumption tests as those specified in IEC 60436 or the applicable national standard(s) of the country of intended installation.

NOTE 1 National regulations can also apply.

NOTE 2 Some national regulations or national standard(s) can specify a different method to determine this requirement to the developers of the Water Efficiency Labelling Programme.

A.9.3 Rating

The water efficiency rating of a dishwasher can be determined using the following formula for the water consumption determined under A.9.2:

$$WE_f = 1 + \frac{log_e\left(\frac{WC}{WC_b}\right)}{log_e\,(1\text{-}WR_f)}$$

where

WE_f is the fractional water efficiency rating used to determine the efficiency indicator, rounded down to the nearest half rating increment;

WC is the water consumption of the model in litres, determined in accordance with A.9.2;

WC_b is the base water consumption = 2,5 + P × 1,6;

P = Maximum number of place settings of the dishwasher as specified by the manufacturer;

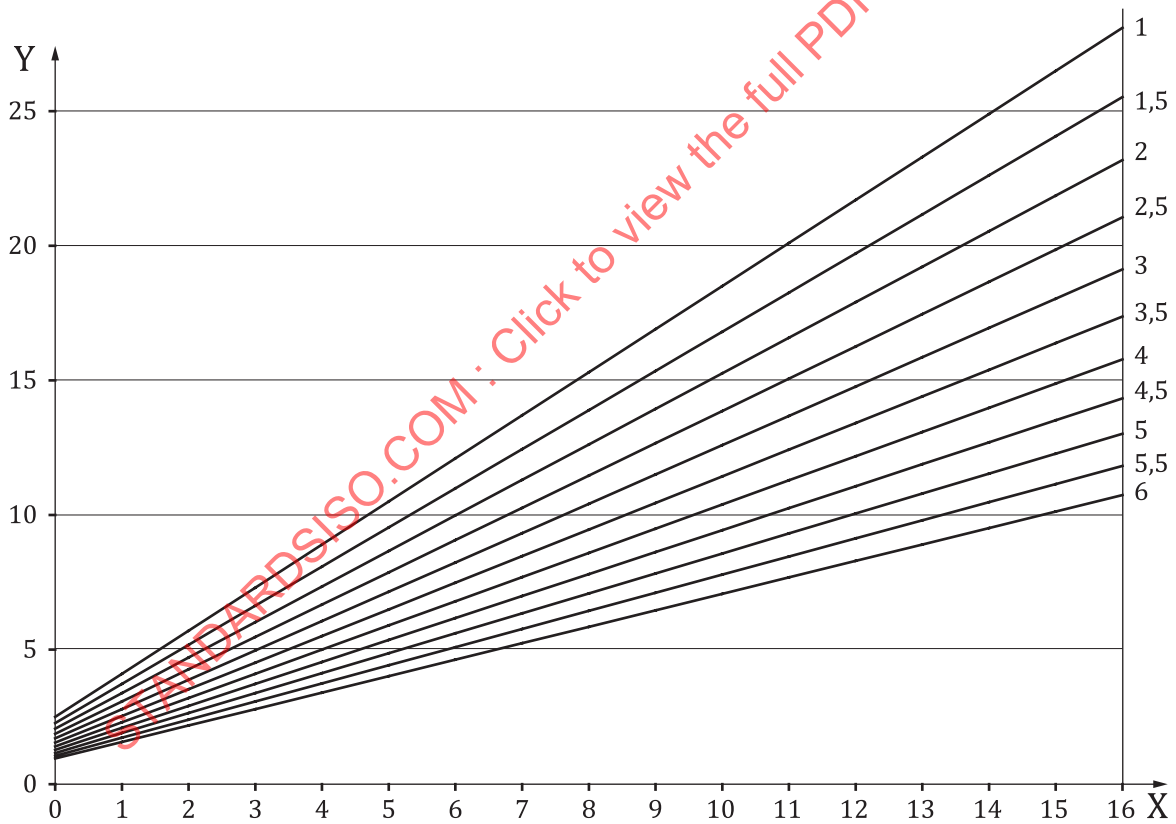
WR_f is the water reduction factor per additional increment e.g. (17,5 %) = 0,175.

If a dishwasher achieves less than 1 on the water efficiency rating, the rating of the dishwasher is null.

A.9.4 Determination of results

A graphical representation of the algorithm for dishwashers is shown in Figure A.1. This is for information only.

The maximum water consumption by efficiency rating and place setting for the algorithm is set out in Table A.2. This is for information only.



Key

X place settings

Y water consumption, l

Figure A.1 — Chart of ratings for dishwashers

Table A.2 — Dishwasher water consumption by rating

Place setting	Maximum water consumption by place setting for a specified rating										
	1	1,5	2	2,5	3	3,5	4	4,5	5	5,5	6
Baseline	2,50	2,27	2,06	1,87	1,70	1,55	1,40	1,28	1,16	1,05	0,96
1	4,10	3,72	3,38	3,07	2,79	2,53	2,30	2,09	1,90	1,73	1,57
2	5,70	5,18	4,70	4,27	3,88	3,52	3,20	2,91	2,64	2,40	2,18
3	7,30	6,63	6,02	5,47	4,97	4,51	4,10	3,72	3,38	3,07	2,79
4	8,90	8,08	7,34	6,67	6,06	5,50	5,00	4,54	4,12	3,74	3,40
5	10,50	9,54	8,66	7,87	7,15	6,49	5,90	5,36	4,86	4,42	4,01
6	12,10	10,99	9,98	9,07	8,24	7,48	6,79	6,17	5,61	5,09	4,62
7	13,70	12,44	11,30	10,27	9,32	8,47	7,69	6,99	6,35	5,76	5,24
8	15,30	13,90	12,62	11,46	10,41	9,46	8,59	7,80	7,09	6,44	5,85
9	16,90	15,35	13,94	12,66	11,50	10,45	9,49	8,62	7,83	7,11	6,46
10	18,50	16,80	15,26	13,86	12,59	11,44	10,39	9,44	8,57	7,78	7,07
11	20,10	18,26	16,58	15,06	13,68	12,43	11,29	10,25	9,31	8,46	7,68
12	21,70	19,71	17,90	16,26	14,77	13,42	12,18	11,07	10,05	9,13	8,29
13	23,30	21,16	19,22	17,46	15,86	14,40	13,08	11,88	10,79	9,80	8,90
14	24,90	22,62	20,54	18,66	16,95	15,39	13,98	12,70	11,53	10,48	9,52
15	26,50	24,07	21,86	19,86	18,04	16,38	14,88	13,52	12,28	11,15	10,13
16	28,10	25,52	23,18	21,06	19,13	17,37	15,78	14,33	13,02	11,82	10,74

NOTE If a dishwasher achieves a water efficiency rating of less than 1,0 then the rating of the dishwasher is Null (refer to A.9.3).

A.10 Clothes washers

A.10.1 General

This Clause should apply to clothes washing machines as described in IEC 60456 or the applicable national standard(s) of the country of intended installation. See A.11 for combination washer/dryers.

NOTE National regulations can also apply.

A.10.2 Rating

The water efficiency rating of a clothes washing machine can be determined using the following formula for the water consumption determined in accordance with A.10.3:

$$WE_f = 1 + \frac{\log_e\left(\frac{WC}{WC_b}\right)}{\log_e(1\text{-}WR_f)}$$

where

WE_f is the fractional water efficiency rating used to determine the efficiency indicator, rounded down to the nearest half rating increment;

WC_b is the base water consumption = 30 × C;

C = rated load capacity of clothes washer (kg) as determined under IEC 60456 or local equivalent

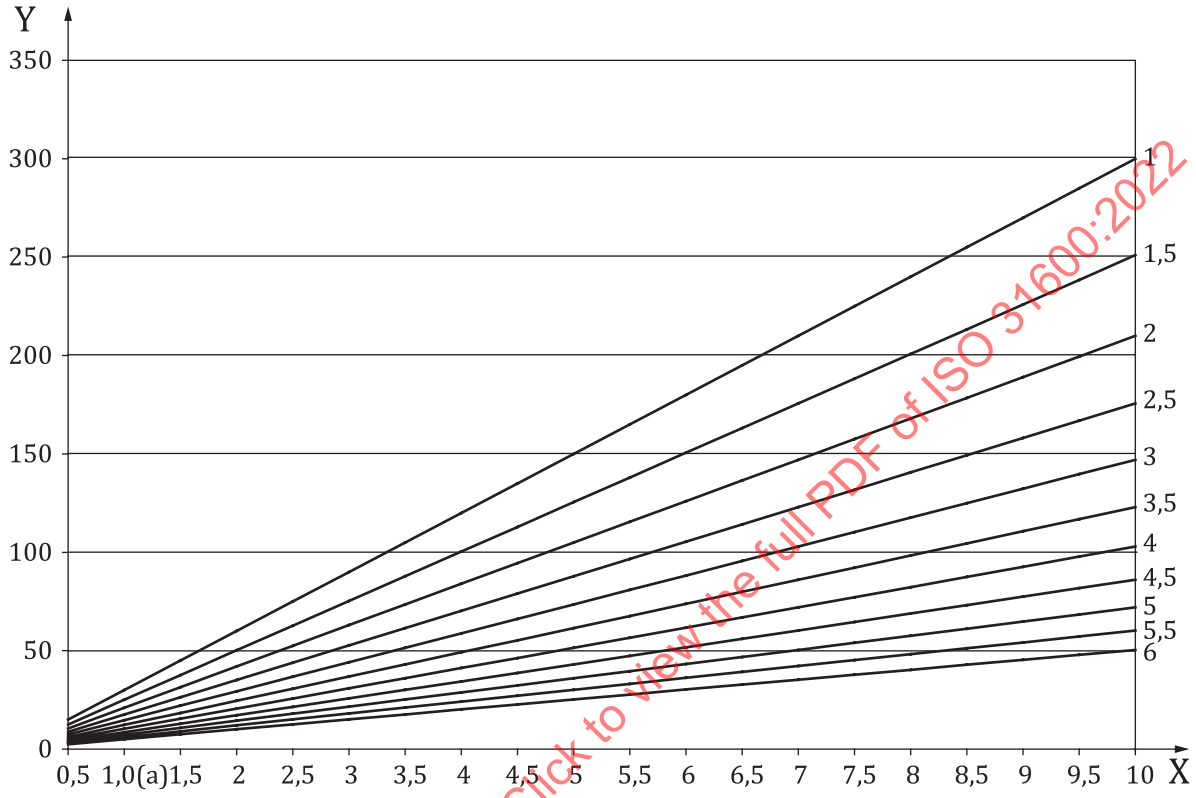
WC is the water consumption of the model in litres, determined under A.10.3;

WR_f is the water reduction factor per additional increment (30 %) = 0,30.

A.10.3 Determination of results

A graphical representation of the algorithm for clothes washing machines is shown in Figure A.2. This is for information only.

The maximum water consumption by rating for the algorithm is also set out in Table A.3. This is for information only.



Key

X load capacity, kg

Y water consumption, l

Figure A.2 — Chart of rating for clothes washing machines

Table A.3 — Clothes washing machines water consumption by rating (for information only)

Load capacity (kg)	Maximum water consumption by load capacity for a specified rating										
	1	1,5	2	2,5	3	3,5	4	4,5	5	5,5	6
1,0	30,0	25,1	21,0	17,6	14,7	12,3	10,3	8,6	7,2	6,0	5,0
1,5	45,0	37,6	31,5	26,4	22,1	18,4	15,4	12,9	10,8	9,0	7,6
2,0	60,0	50,2	42,0	35,1	29,4	24,6	20,6	17,2	14,4	12,1	10,1
2,5	75,0	62,7	52,5	43,9	36,8	30,7	25,7	21,5	18,0	15,1	12,6
3,0	90,0	75,3	63,0	52,7	44,1	36,9	30,9	25,8	21,6	18,1	15,1
3,5	105,0	87,8	73,5	61,5	51,5	43,0	36,0	30,1	25,2	21,1	17,6
4,0	120,0	100,4	84,0	70,3	58,8	49,2	41,2	34,4	28,8	24,1	20,2
4,5	135,0	112,9	94,5	79,1	66,2	55,3	46,3	38,7	32,4	27,1	22,7
5,0	150,0	125,5	105,0	87,8	73,5	61,5	51,5	43,0	36,0	30,1	25,2

NOTE The water consumption for a load capacity of 1 kg is used for the base water consumption.

Table A.3 *(continued)*

Load capacity (kg)	Maximum water consumption by load capacity for a specified rating										
	1	1,5	2	2,5	3	3,5	4	4,5	5	5,5	6
5,5	165,0	138,0	115,5	96,6	80,9	67,6	56,6	47,4	39,6	33,1	27,7
6,0	180,0	150,6	126,0	105,4	88,2	73,8	61,7	51,7	43,2	36,2	30,3
6,5	195,0	163,1	136,5	114,2	95,6	79,9	66,9	56,0	46,8	39,2	32,8
7,0	210,0	175,7	147,0	123,0	102,9	86,1	72,0	60,3	50,4	42,2	35,3
7,5	225,0	188,2	157,5	131,8	110,3	92,2	77,2	64,6	54,0	45,2	37,8
8,0	240,0	200,8	168,0	140,6	117,6	98,4	82,3	68,9	57,6	48,2	40,3
8,5	225,0	213,3	178,5	149,3	125,0	104,5	87,5	73,2	61,2	51,2	42,9
9,0	270,0	225,9	189,0	158,1	132,3	110,7	92,6	77,5	64,8	54,2	45,4
9,5	285,0	238,4	199,5	166,9	139,7	116,8	97,8	81,8	68,4	57,3	47,9
10,0	300,0	251,0	210,0	175,7	147,0	123,0	102,9	86,1	72,0	60,3	50,4
NOTE The water consumption for a load capacity of 1 kg is used for the base water consumption.											

A.11 Combination washers / dryers

A.11.1 General

This subclause should apply to combination washer/dryers as described in IEC 62512 or the national standard(s) of the country of intended installation.

NOTE National regulations can also apply.

In general, due to drum size construction constraints, the maximum drying load is approximately half that of the maximum washing load capacity. A combination washer/dryer may be used and evaluated in the following four principal programme modes.

A.11.1.1 Single load washed and dried in a continuous operation

Since the rated drying load capacity is generally approximately half that of the rated washing load capacity, a single continuous combined washing/drying programme should be at a reduced capacity, compared to maximum wash load rating.

Water consumption is the total water consumed in both washing and drying operations as described in IEC 62512 or the applicable national standard(s) of the country of intended installation.

NOTE National regulations can also apply.

A.11.1.2 Single load washed in one operation and dried in two operations

Since the rated drying load capacity is generally approximately half that of the rated washing load capacity, a rated wash load should be split after washing and dried in at least two drying operations.

Water consumption is the total water consumed in both washing and drying operations as described in IEC 62512 or the applicable national standard(s) of the country of intended installation.

NOTE National regulations can also apply.

A.11.1.3 Single load washed only

Water consumption is the total water consumed in washing operation as described in IEC 60456 or the applicable national standard(s) of the country of intended installation.

NOTE National regulations can also apply.

A.11.1.4 Single load dried only

Water consumption is the total water consumed in drying operation as described in IEC 61121 or the applicable national standard(s) of the country of intended installation.

NOTE National regulations can also apply.

A.11.2 Determination of specific water efficiency

A.11.2.1 Single load washed and dried in a continuous operation

In general, due to drum size construction constraints, the maximum drying load is approximately half that of the maximum washing load capacity. If a continuous wash/dry programme mode is selected, refer to the method for clothes washer in A.10.2, using the value of water consumed in the combination programme.

A.11.2.2 Single load washed in one operation and dried in two operations

In general, due to drum size construction constraints, the maximum drying load is approximately half that of the maximum washing load capacity. If the washing load exceeds the rated drying load, the load should be split before drying in two operations. Refer to the method for clothes washer in A.10.2, using the value of water consumed in the washing and both drying programmes.

A.11.2.3 Single load washed only

Refer to the method for clothes washer in A.10.2.

A.11.2.4 Single load dried only

Refer to the method for clothes washer in A.10.2.

A.11.3 Rating

Refer to the method for clothes washer in A.10.2.

A.11.4 Determination of results

Refer to the method for clothes washer in A.10.3.

Annex B
(informative)

Existing water efficiency labelling programmes by country or region — Plumbing products

B.1 General

This Annex provides descriptions of a number of schemes/programmes for existing water efficiency labelling programmes for plumbing products. The following countries and regions have provided an overview of their scheme/programme:

— Australia (Table B.1);

— China (Table B.2);

— Europe (Unified Water Label) (Table B.3);

— India (Table B.4);

— Japan (Table B.5);

— Singapore (Table B.6);

— United States (Table B.7);

Countries that do not have an existing water efficiency labelling programme can consider these examples to select and adopt those best suited for their markets and conditions when developing their own water efficiency labelling programme.

The information provided in this Annex is a summary of the current requirements at the time this document was developed, to provide guidance to users. It is possible that these requirements have changed and the current reference documents should be reviewed for the most up-to-date information.

Table B.1 — Australia

Water using plumbing product	Water efficiency measurement	Performance parameters	Water consumption determination	Additional characteristics that affect water efficiency rating	Method of water efficiency rating and labelling	Additional information	Reference documents
Showers	Nominal flow rate – litres per minute (l/min).	High pressure shower flow rate is measured twice at each dynamic pressure of 150 kPa, 250 kPa and 350 kPa and an average flow rate calculated at each pressure. The maximum difference between the highest and lowest average flow rate cannot exceed 2,0 litres per minute (l/min). The highest and lowest average flow rate cannot exceed the upper limit or lower limit respectively of the flow range of the determined nominal flow rate by more than 1,0 l/min. Low pressure shower flow rate is measured twice at a dynamic pressure of 35 kPa.	High pressure shower nominal flow rate is determined from the sum of the 3 average flow rates (150 kPa, 250 kPa, 350 kPa) divided by 3. Low pressure shower nominal flow rate is determined from the sum of measured flow rate results at 35 kPa divided by 2.	High pressure showers with a nominal flow rate greater than 4,5 l/min and up to 7,5 l/min, compliance with spray force and spray coverage testing is required to achieve a 4 Star rating. Showers with a water consumption of 4,5 l/min or less, or showers that do not comply with the spray force and spray coverage tests are given a 'Not Star Rated' rating.	Water consumption values are divided into ranges with a star rating applied to each range, 0 Stars least efficient to 4 Stars most efficient. Over 90 % of showers registered have a 3 Star or higher rating.	N/A	AS/NZS 3662 AS/NZS 6400
Taps (faucets)	Nominal flow rate – litres per minute (l/min).	High pressure tap (faucet) flow rate is measured twice at each dynamic pressure of 150 kPa, 250 kPa and 350 kPa and an average flow rate calculated at each pressure. The maximum difference between the highest and lowest average flow rate cannot exceed 2,0 l/min. The highest and lowest average flow rate cannot exceed the upper limit or lower limit respectively of the flow range of the determined nominal flow rate by more than 1,0 l/min. Low pressure tap (faucet) flow rate is measured twice at a dynamic pressure of 35 kPa.	High pressure tap (faucet) nominal flow rate is determined from the sum of the 3 average flow rates (150 kPa, 250 kPa, 350 kPa) divided by 3. Low pressure tap (faucet) nominal flow rate is determined from the sum of measured flow rate results at 35 kPa divided by 2.	For tap (faucet) equipment with an effective automatic shut-off device, where after the flow of water is turned on, the water flow is automatically shut-off, after a maximum time of 15 seconds or within 2 seconds after the end of user activity, the water efficiency rating is elevated to the next higher rating (if any).	Water consumption values are divided into ranges with a star rating applied to each range, 0 Stars least efficient to 6 Stars most efficient. Over 90 % of taps (faucets) registered have a 4 Star or higher rating.	N/A	AS/NZS 3718 AS/NZS 6400

Table B.1 *(continued)*

Water using plumbing product	Water efficiency measurement	Performance parameters	Water consumption determination	Additional characteristics that affect water efficiency rating	Method of water efficiency rating and labelling	Additional information	Reference documents
Flow regulators (flow controllers)	Nominal flow rate – litres per minute (l/min).	The flow rate is measured twice at each dynamic pressure of 150 kPa, 250 kPa and 350 kPa and an average flow rate calculated at each pressure. The maximum difference between the highest and lowest average flow rate cannot exceed 2,0 l/min. The highest and lowest average flow rate cannot exceed the upper limit or lower limit respectively of the flow range of the determined nominal flow rate by more than 1,0 l/min. The nominal flow rate cannot be greater than 16 l/min.	The nominal flow rate is determined from the sum of the 3 average flow rates (150 kPa, 250 kPa, 350 kPa) divided by 3.	N/A	Water consumption values are divided into ranges with a star rating applied to each range, 0 Stars least efficient to 6 Stars most efficient. Over 90 % of flow regulators (flow controllers) registered have a 3 Star or higher rating.	N/A	AS/NZS 6400 AS 5200.037.2
Water closet (toilet)	Average flush volume – litres.	Dual flush water closet (toilet) - Full flush volume is measured three times and an average full flush volume calculated. The reduced flush volume is measured four times. Single flush water closet (toilet) volume is measured three times.	Dual flush water closet (toilet) - Average flush volume is determined from the sum of 4 reduced flush volumes and the average full flush volume divided by 5. Single flush water closet (toilet) - Average flush volume is determined from the sum of 3 measured full flushes divided by 3.	Where a water closet (toilet) has an integral basin or a basin directly connected to it, and the water from the basin is used to flush the water closet (toilet), the average flush volume for the water closet (toilet) can be reduced by 0,3 litres.	Water consumption values divided into ranges with star rating applied to each range, 1 Star least efficient to 6 Stars most efficient. Over 90 % of water closets (toilets) registered have a 4 Star or higher rating.	N/A	AS 1172.1 AS 1172.2 AS/NZS 6400
Urinal equipment	Flush volume – litres.	Slab and stall urinals (of a minimum 600 mm length continuous urinal wall) - the flush must disperse water over the entire back wall from a minimum height of 900 mm above the step or floor level. The flush must extend to cover the corner areas and end returns for a distance of not less than 70 mm at 800 mm above the step or floor level to a distance not less than 150 mm at the step or floor level. Wall hung urinals - the flush must disperse water over the serviced area.	Flush volume is determined from the volume recorded in litres to flush the urinal and meet the performance parameters.	Water discharged cannot exceed more than 2,5 L for each single stall or each 600 mm length of continuous urinal wall. A maximum 3 star rating applies for urinals that are operated only by conscious operation (manually operated by the user) or by demand driven operation (automatically flushes each time the sensor is activated).	Water consumption values divided into ranges with star rating applied to each range, 0 Stars least efficient to 6 Stars most efficient. Over 80 % of urinals registered have a 3 Star or higher rating.	N/A	AS/NZS 3982 AS/NZS 6400

Table B.2 — China

Water using plumbing product	Water efficiency measurement	Performance parameters	Water consumption determination	Additional characteristics that affect water efficiency rating	Method of water efficiency rating and labelling	Additional information	Reference documents
Showers	Nominal flow rate – litres per minute (l/min).	**Flow rate test** Test water temperature is (25 ± 3) °C, test pressure (dynamic) in the process is (0,10 ± 0,01) MPa. Single-handle dual-control/dual-handle dual-control shower open the handle to the maximum position of cold and hot water and the maximum position of mixed water flow rate respectively, take the maximum value of the flow rate. Single-handle single-control shower open the handle to the maximum flow rate position, and record the maximum flow rate value. If the shower has multiple ways of water outlet, the flow rate of each way of water outlet must be tested respectively, and the water efficiency grade reached by the maximum flow rate must be taken as the water efficiency grade of the shower. **Uniformity of flow test** The shower flow rate is measured three times at each dynamic pressure of 0,1 MPa, 0,2 MPa and 0,3 MPa and an average flow rate calculated at each pressure. The maximum difference between the highest and lowest average flow rate cannot exceed 4,0 l/min. The highest and lowest average flow rate cannot exceed the upper limit or lower limit respectively of the flow range of the determined.	The shower nominal flow rate is determined of the maximum flow rates (dynamic pressure 0,1 Mpa).	If the shower has multiple functions of water outlet, the flow of each function of water outlet is to be tested respectively, and the water efficiency grade reached by the maximum flow is taken as the water efficiency grade of the shower. The average spray force of the hand-held shower must not be less than 0,85 N.	Water consumption values are divided into ranges with a grade applied to each range. Grade 3 means the least efficient, Grade 1 means the most efficient. Minimum allowable consumption of water efficiency is Grade 3.	N/A	GB 28378
Taps (faucets)	Nominal flow rate – litres per minute (l/min).	The tap (faucet) flow rate is measured three times at each dynamic pressure of 0,1 Mpa, 0,2 Mpa and 0,3 Mpa and an average flow rate calculated at each pressure. The maximum difference between the highest and lowest average flow rate cannot exceed 3,0 l/min. The highest and lowest average flow rate cannot exceed the upper limit or lower limit respectively of the flow range of the determined nominal flow rate.	The tap (faucet) nominal flow rate is determined of the maximum flow rates (dynamic pressure 0,1 Mpa).	Not applicable for the effective automatic shut-off device.	Water consumption values are divided into ranges with a grade applied to each range. Grade 3 means the least efficient, Grade 1 means the most efficient.	N/A	GB 25501
Flow regulators (flow controllers)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table B.2 *(continued)*

Water using plumbing product	Water efficiency measurement	Performance parameters	Water consumption determination	Additional characteristics that affect water efficiency rating	Method of water efficiency rating and labelling	Additional information	Reference documents
Water closet (toilet)	Average flush volume – litres.	Dual flush water closet (toilet) - Full flush volume is measured three times and an average full flush volume calculated. The reduced flush volume is measured three times. Single flush water closet (toilet) volume is measured three times.	Dual flush water closet (toilet) - Average flush volume is determined from the sum of 2 reduced flush volumes and 1 average full flush volume divided by 3. Single flush water closet (toilet) - Average flush volume is determined from the sum of 3 measured full flushes divided by 3.	Flushing functions.	Water consumption values are divided into ranges with a grade applied to each range. Grade 3 means the least efficient, Grade 1 means the most efficient.	N/A	GB 25502
Urinal equipment	Average flush volume – litres.	The flush urinal volume is measured six times.	Flush volume is determined from the volume recorded in litres to flush the urinal and meet the performance parameters.	Flushing functions.	Water consumption values are divided into ranges with a grade applied to each range. Grade 3 means the least efficient, Grade 1 means the most efficient.	N/A	GB 28377 GB/T 6952
Bathtubs	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table B.3 — Europe (Unified water label)

Water using plumbing product	Water efficiency measure-ment	Performance parameters	Water consumption determination	Additional characteristics that affect water efficiency rating	Method of water efficiency rating and labelling	Additional information	Reference documents
Showers	Flow rate l/ min.	Maximum available flow rate is measured at 3 bar. Where a fitting is below 8 l/min it must be verified at 1,5 bar for performance for pressure dependency. For low pressure flow rate must be measured at ,02 bar.	Flow rate is determined by maximum flow.	Pressure dependency is checked for fittings with a flow rate less than 8 l/min must be 60 % at 1,5 bar of the max flow rate.	Water use divided into 5 bands from ≤ 6, ≤ 8, ≤ 10, ≤ 13 and greater than 13 l/min.	N/A	EN 200 EN 817 EN 1111 EN 1112 EN 1287
Taps (faucets)	Flow rate l/ min.	Maximum available flow rate is measured at 3 bar. Where a fitting is below 8 l/min it must be verified at 1,5 bar for performance for pressure dependency. For low pressure flow rate must be measured at ,02 bar	Flow rate is determined by maximum flow.	Pressure dependency is checked for fittings with a flow rate less than 8 l/min must be 60 % at 1,5 bar of the max flow rate.	Water use divided into 5 bands from ≤ 6, ≤ 8, ≤ 10, ≤ 13 and greater than 13 l/min.	N/A	EN 200 EN 817 EN 1111 EN 1287
Flow regulators (flow controllers)	Flow rate l/ min.	Maximum available flow verified at 3 bar.	Claimed flow rate tested +/- 20 % tested at 1,5 and 3 bar.	N/A	Water use divided into 5 bands from ≤ 6, ≤ 8, ≤ 10, ≤ 13 and greater than 13 l/min.	N/A	EN 246
Water closets (toilets) Includes independent cisterns	Flush volume – litres per flush.	Single flush water closets (toilets) flush volume determined by average of 4 flushes. Dual flush water closets (toilets) volume determined by 3 short flushes and 1 full flush.	Flush volume determined by average.	N/A	Water use divided into 5 bands from ≤ 3,5, ≤ 4,5, ≤ 5,5, ≤ 6 and greater than 6 litres.	N/A	EN 997 EN 14055
Urinal equipment	Flush volume – litres per flush.	Urinal Flush must be determined by average of 4 flushes.	Flush volume determined by average.	N/A	Water use divided into 5 bands from ≤ 1, ≤ 2, ≤ 3, ≤ 4 and greater than 4 l/min.	N/A	EN 14055
Bathtubs	Capacity litres (40 % Capacity).	Water volume must be measured at the point of overflow. Or at a point 86 mm below the spill over where an overflow is not present.	Effective capacity must determine the volume i.e. 40 % of the actual capacity.	N/A	40 % of capacity Water use divided into 5 bands from ≤ 62, ≤ 68, ≤ 74, ≤ 80 and greater than 80 litres.	N/A	EN 806-5 EN 14516

Table B.4 — India

Water using plumbing product	Water efficiency measure-ment	Performance parameters	Water consumption determination	Additional characteristics that affect water efficiency rating	Method of water efficiency rating and labelling	Additional information	Reference documents
Showers	Average flow rate-l/min, for non-metered faucets	The flow rate to be measured three times at three different pressures of 0,1 MPa, 0,3 MPa and 0,5 MPa, and average flow rate shall be calculated at each pressure.	The flow rate corresponding to the pressure of 0,42 MPa to be used for water efficiency rating. In addition, the average maximum difference between the highest and the lowest average flow rate shall not exceed 2,0 l/min.	Considering low water pressures at various locations, the requirement of minimum flow rate of 6,0 l/min and 4,0 l/min at 0,05 MPa has been specified for over-head showers and hand-held showers, respectively. Such showers are to be tested without flow straightening or aerating device.	Flow rate values are divided into three ranges with a star rating applied to each range. 1 star means the least efficient, and 3 stars means the most efficient. For 1 star rating, the flow rate shall be not more than 10,0 l/min and 8,0 l/min for over-head showers and hand-held showers, respectively.	N/A	N/A (Indian Standard under development)
Taps (faucets)	Average flow rate-l/min, for non-metered faucets Average flow rate-litres/use, for metered faucets	The flow rate to be measured three times at three different pressures of 0,1 MPa, 0,3 MPa and 0,5 MPa, and average flow rate shall be calculated at each pressure.	The flow rate corresponding to the pressure of 0,42 MPa to be used for water efficiency rating. In addition, for non-metered fittings, the average maximum difference between the highest and the lowest average flow rate shall not exceed 2,0 l/min.	Considering low water pressures at various locations, the requirement of minimum flow rate of 3 l/min at 0,05 MPa has been specified for non-metered faucets. Such taps are to be tested without flow straightening or aerating device.	Flow rate values are divided into ranges with a star rating applied to each range. 1 star means the least efficient, and 3 stars means the most efficient. For 1 star rating, the flow rate shall be not more than 8,0 l/min for wash basin/ lavatory faucet (also applies to sensor faucets) and sink faucets. The same shall be not more than 6.0 l/min for hand-held ablution spray. In case of metered faucets for basin use, the flow rate shall be not more than 1.0 l/use for 1 star rating.	N/A	IS 8931 IS 17650 (Part 2)
Flow regulators (flow controllers)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Water closet (toilet)	Average Full flush- litres per flush (lpf) and Average Reduced flush-litres per flush (lpf)	Full flush volume is measured three times and an average full flush volume obtained. Similarly, reduced flush volume is measured three times and an average reduced flush volume obtained.	The average full flush volume and average reduced flush volume to be used for water efficiency rating.	Flushing requirements to be checked by conducting tests like surface wash test, granule and ball test, waste extraction test, drain line transport characterization test and overflow test for gravity flush tanks.	Water consumption values are divided into three ranges with a star rating applied to each range. 1 star means the least efficient, and 3 stars means the most efficient. For 1 star rating, average full flush shall be not more than 6,0 lpf, and average reduced flush shall be not more than 3,0 lpf.	N/A	IS 774 IS 2556 (Part 1) IS 2556 (Part 2) IS 2556 (Part 3) IS 2556 (Part 8) IS 2556 (Part 14) IS 2556 (Part 15) IS 2556 (Part 16) IS 7231 IS 9758 IS 17650 (Part 1)

Table B.4 *(continued)*

Water using plumbing product	Water efficiency measurement	Performance parameters	Water consumption determination	Additional characteristics that affect water efficiency rating	Method of water efficiency rating and labelling	Additional information	Reference documents
Urinal equipment	Average flush volume - litres per flush (lpf)	The quantity of water flushed for cleaning the urinal to be measured for three operations (inclusive of pre-flush and post-flush, in case of sensor urinal), and the average of the results to be obtained.	The average flush volume to be used for water efficiency rating.	N/A	Water consumption values are divided into three ranges with a star rating applied to each range. 1 star means the least efficient, and 3 stars means the most efficient. For 1 star rating, water consumption shall be not more than 3,0 lpf	N/A	IS 2556 (Part 1) IS 2556 (Part 6) IS 17650 (Part 1)
Bathtubs	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table B.5 — Japan

Water using plumbing product	Water efficiency measurement	Performance parameters	Water consumption determination	Additional characteristics that affect water efficiency rating	Method of water efficiency rating and labelling	Additional information	Reference documents
Showers	The spray force F' must satisfy the following conditions: Type of shower spray - a) Foamed (aerated) spray 0,55(N) or more b) Normal spray 0,6(N) or more.	The recommended water pressure in Japan is from 0,05(MPa) (dynamic pressure) to 0,75(MPa) (static pressure). But the situation under 0,1(MPa) is not minor condition, then showers with a flow regulator (flow controller) is not common in Japan. The Japanese (Hot) Water Saving Hand shower is evaluated its spray force generating 8,5 (l/min) which satisfy both of comfortability and low water consumption.	Obtain an approximate curve based on Formula A using the relation between all of the measured spray forces and flow rates by the least-square method. The spray force F ′at a flow rate of 8,5 l/min of this approximate curve is obtained. F' = C × Q2 ⋯ A Q : flow rate (l/min) C : coefficient	N/A	The hand showers which fulfilled the Hot Water Saving norm can be allowed to put the marking for Hot Water Saving on packaging.	The Hot Water Saving Scheme which is aimed at reducing water and energy consumption of showers and taps (faucets) is standardized in JIS B 2061. The target products of this programme are thermostat shower (and tub) mixer, single lever mixer etc but except 2 handle mixer.	JIS B 2061
Taps (faucets)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flow regulators (flow controllers)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table B.5 *(continued)*

Water using plumbing product	Water efficiency measurement	Performance parameters	Water consumption determination	Additional characteristics that affect water efficiency rating	Method of water efficiency rating and labelling	Additional information	Reference documents
Water closet (toilet)	Average flush volume – litres per flush.	Both dual and single flush water closet (toilet). Full flush volume is measured three times.	Both dual and single flush water closet (toilet). Average flush volume is determined from the sum of 3 measured full flushes divided by 3.	There are two bands for water efficiency ratings in JIS A5207 Standard. Both ratings are specified with full flush volume only. From the aspects of public health and safety of users, no excessive restriction of water consumption is required for JIS as it is aimed at higher level of water saving with keeping performances such as transportation performance. (Noting that more than 90 % of certificated domestic products are categorised as type II) As stated above, that is the reason why JIS A5207 has higher level of water consumption ratings than other countries' standards have.	Water consumption values divided into ranges with Numbers I or II applied to each range. "II"means the water consumption range is 6,5L or less. "I"means the water consumption range is 8,5L or less.	Followings should be taken into account for water saving: a) Toilet Waste extraction b) Toilet surface wash c) Drain-line transportation d) Backflow prevention (See JIS for details)	JIS A 5207 JIS B 2061
Urinal equipment	Planned to be established at the end of 2022.	⇐	⇐	⇐	⇐	⇐	JIS A 5207 JIS B 2061
Bathtubs	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table B.6 — Singapore

Water using plumbing product	Water efficiency measurement	Performance parameters	Water consumption determination	Additional characteristics that affect water efficiency rating	Method of water efficiency rating and labelling	Additional information	Reference documents
Showers	Average flow rate – litres per minute.	Flow rates are measured at dynamic flow pressures of 0,5 bar, 1,0 bar, 1,5 bars, 2,0 bars, 2,5 bars, 3,0 bars, 3,5 bars, 4,5 bars, 5,0 bars, and 5,5 bars.	The nominal flow rate is determined from the sum of the 5 average flow rates (1,5, 2,5, 3,5, 4,5, and 5,0 bar) divided by 5.	The following requirements must be complied: a) the difference between the highest and lowest flow rate (measured at dynamic flow pressures of 1,5 bars, 2,5 bars, 3,5 bars, 4,5 bars, 5,0 bars) must not exceed 2 l/min b) the highest flow rate must not exceed the upper limit by more than 0,5 l/min c) the lowest flow rate must not be lower than the lower limit by more than 0,5 l/min d) have a flow rate of not more than 9 l/min See 'Additional information' for summary of higher and lower limit. Recommended additional test for 3-tick showerheads: a) spray force test; and b) spray coverage test under AS/NZS 3662	Water consumption values ranges from 2-tick to 3-tick with 3-tick as the highly efficient. 2-tick: > 5 to 7 litres per minute 3-tick: 5 litres per minute or less	Showerheads are under Voluntary Water Efficiency Labelling Scheme (VWELS) **Shower taps (faucets)** 2-tick: higher limit 7,5, lower limit 4,5 3-tick: higher limit 5,5, lower limit 4,5	AS/NZS 3662 PUB WELS Guidebook

Table B.6 *(continued)*

Water using plumbing product	Water efficiency measurement	Performance parameters	Water consumption determination	Additional characteristics that affect water efficiency rating	Method of water efficiency rating and labelling	Additional information	Reference documents
Taps (faucets) Including basin, sink, bib, shower	Average flow rate – litres per minute (l/min).	Adjust the dynamic pressure to 1,5, 2,5, 3,5, 4,5, 5,0 and 5,5 bar and measure the flow rate at each pressure. Calculate the average flowrate from these readings.	The nominal flow rate is determined from the sum of the 5 average flow rates (1,5, 2,5, 3,5, 4,5, and 5,0 bar) divided by 5.	a) Difference between the highest and lowest flow rates (measured at dynamic flow pressures of 1,5 bars, 2,5 bars, 3,5 bars, 4,5 bars and 5,0 bars) must not exceed 2 litres per minute. At any of the test pressures: b) Highest flow rate must not exceed the upper limit of the range of flow rates within which the flow rate of the taps (faucets) by more than 0,5 litres per minute. c) Lowest flow rate for sink tap (faucet) specified for 3-tick must not be lower than 2,5 litres per minute. d) Lowest flow rate for sink tap (faucet) specified for 2-tick must not be lower than 3,5 litres per minute. e) Lowest flow rate for basin tap (faucet) specified for 2-tick and 3-tick must not be lower than 1,5 litres per minute. f) Lowest flow rate for bib tap (faucet) specified for 2-tick and 3-tick must not be lower than 3,5 litres per minute. g) Lowest flow rate for shower tap (faucet) specified for 2-tick and 3-tick must not be lower than 4,5 litres per minute. See 'Additional information' for summary of higher and lower limits.	Water consumption values ranges from 2-tick to 3-tick with 3-tick as the highly efficient. **Basin taps (faucets)** - not more than 4 litres per minute: 2-tick: > 2 to 4 litres per minute 3-tick: 2 litres per minute or less **Sink/bib taps (faucets)** - not more than 6 litres per minute: 2-tick: > 4 to 6 litres per minute 3-tick: 4 litres per minute or less **Shower taps (faucets)** - not more than 7 litres per minute: 2-tick: > 5 to 7 litres per minute 3-tick: 5 litres per minute or less	Taps (faucets) are under Mandatory Water Efficiency Labelling Scheme (MWELS) Summary of additional characteristics that affect water efficiency rating: **Basin taps (faucets)** 2-tick: higher limit 4,5, lower limit 1,5 3-tick: higher limit 1,5, lower limit 2,5 **Sink taps (faucets)** 2-tick: higher limit 6,5, lower limit 3,5 3-tick: higher limit 4,5, lower limit 2,5 **Bib taps (faucets)** 2-tick: higher limit 6,5, lower limit 3,5 3-tick: higher limit 4,5, lower limit 3,5 **Shower taps (faucets)** 2-tick: higher limit 7,5, lower limit 4,5 3-tick: higher limit 5,5, lower limit 4,5	EN 200 EN 817 EN 1111 PUB's Stipulation of Standards & Requirements for Water Fittings for Use in Potable Water Service Installations Public Utilities (Water Supply) Regulations PUB WELS Guidebook
Flow regulators (flow controllers)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table B.6 *(continued)*

Water using plumbing product	Water efficiency measurement	Performance parameters	Water consumption determination	Additional characteristics that affect water efficiency rating	Method of water efficiency rating and labelling	Additional information	Reference documents
Water closet (toilet)	Average flush volume – litres per flush.	Dual flush water closets (toilets)- Full flush - Paper, ball, towel test - cleared in 4 out of 5 times operations. Sawdust - unflushed area <5 000 mm2 Reduced flush - Paper - Cleared in 2 out of 3 times operations. Dye test - lighter than control sample	Dual flush water closet (toilet) (flushing cistern type) - Full flush volume is measured three times and an average full flush volume calculated. Reduced flush volume is measured three times and an average full flush volume calculated.	Additional test is mandatory for water closet (toilet) with full flush volume of less than 3,5 litres - Laboratory simulation test on waste transportation efficiency in pipes in accordance with Singapore Standard SS 574-1.	Water consumption values ranges from 2-tick to 3-tick with 3-tick as the highly efficient. 2-tick: > 3,5 to 4 litres (full flush) > 2,5 to 3,0 litres (reduced flush) 3-tick: > 3,5 litres or less (full flush) > 2,5 litres or less (reduced flush)	Water closets (toilets) are under Mandatory Water Efficiency Labelling Scheme	PUB's Stipulation of Standards & Requirements for Water Fittings for Use in Potable Water Service Installations Public Utilities (Water Supply) Regulations PUB WELS Guidebook SS 574-1

Table B.6 *(continued)*

Water using plumbing product	Water efficiency measurement	Performance parameters	Water consumption determination	Additional characteristics that affect water efficiency rating	Method of water efficiency rating and labelling	Additional information	Reference documents
Urinal equipment	Average flush volume – litres per flush.	Volume of discharge test. The flow regulator (flow controller) is to be set at maximum, flush volume is collected at the following dynamic pressure: 1,0, 1,5, 2,0 and 3,0 bars. The discharge volume is not to be more than 1,5 litres and less than 0,5 litres.	The urinal flush valve is tested at dynamic pressure of 3,0 bars. The discharge volume per flush is measured with the following test method: a) the flush pipe is to be 300 mm long with an internal diameter of at least 13 mm and is to be secured to the outlet of the valve; b) the pressure gauge and control valve are to be fitted at the inlet of the flush valve; c) the flush valve is to be connected to a water supply system and the dynamic pressure of the water supply adjusted to 0,7 bars; d) the flow regulator (flow controller) is to be set at maximum; e) the operating member must continue to be held actuated until the flow of water ceases; f) the flush volume is the volume of water that is discharged from the flush pipe from the actuation of the operating member to cessation of flow of water.	Additional test is mandatory for urinal flush valve flush volume of less than 0,5 litres: Dye test as specified in ASME A112.19.2.	Water consumption values ranges from 2-tick to 3-tick with 3-tick as the highly efficient. 2-tick: > 1,5 to 1 litre 3-tick: > 1,0 litre or less	Urinal flush valves are under Mandatory Water Efficiency Labelling Scheme (MWELS)	ASME A112.19.2 PUB's Stipulation of Standards & Requirements for Water Fittings for Use in Potable Water Service Installations Public Utilities (Water Supply) Regulations PUB WELS Guidebook
Bathtubs	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table B.7 — United States

Water using plumbing product	Water efficiency measurement	Performance parameters	Water consumption determination	Additional characteristics that affect water efficiency rating	Method of water efficiency rating and labelling	Additional information	Reference documents
Showers	Gallons per minute (gpm) and litres per minute (l/min).[a]	WaterSense® [1] labelled shower heads are required to have a maximum flow rate of 2 gpm (7,6 l/min) at 80 psi (550 kPa) and minimum flow rate of 60 % of the maximum at 20 psi (140 kPa) and 75 % of the maximum flow rate at 45 psi (310 kPa) and 80 psi (550 kPa)	Flow rate test in ASME A112.18.1/CSA B125.1, Section 5.4	**Spray Force Criteria** The minimum spray force for high-efficiency showerheads and hand-held showers must not be less than 2,0 ounces (0,56 newtons [N]) at a flowing pressure of 20 ± 1 psi (140 ± 7 kPa) at the inlet. The minimum spray force for high-efficiency rain showers must not be less than 1,4 ounces (0,40 N) at a flowing pressure of 20 ± 1 psi (140 ± 7 kPa) at the inlet. **Spray Coverage Criteria** The total combined maximum volume of water collected in the 2- and 4-inch (50-, 101-millimeter [mm]) annular rings must not exceed 75 % of the total volume of water collected, and; The total combined minimum volume of water collected in the 2-, 4-, and 6-inch (50-, 101-, 152-mm) annular rings must not be less than 25 % of the total volume of water collected.	Showerheads and associated packaging must conform to the applicable marking and packaging requirements in ASME A112.18.1/CSA B125.1. The maximum flow rate must be specified by the manufacturer, verified through testing, and in compliance with the flow rate requirements. Flow rate marking must be in gpm and l/min in two or three digit resolutions (e.g. 2,0 gpm [7,6 l/min]).	N/A	ASME A112.18.1/CSA B125.1 US EPA WaterSense®, Specification for Showerheads
Taps (faucets)	Gallons per minute (gpm) and litres per minute (l/min).	WaterSense® labelled lavatory tap (faucets) are required to have a maximum flow rate of 1,5 gpm (5,7 l/min) at 60 psi (415 kPa) and a minimum of 0,8 gpm (3 l/min) at 20 psi (140 kPa)	Flow rate test in ASME A112.18.1/CSA B125.1, Section 5.4	Metered taps (faucets) must deliver a maximum of 0,25 gallons (0,95 l) per metering cycle (US Code of Federal Regulations, Title 42, Subsection 6295)	The product and/or the product packaging must be marked in accordance with the US Code of Federal Regulations (Title 16, Part 305.24 (a) with the maximum flow rate in gpm and l/min as determined through testing and compliance with this specification. Marking must be in gpm and l/min in two-digit resolutions (e.g. 1,5 gpm [5,7 l/min]).	The lavatory tap (faucet) or lavatory tap (faucet) accessory must not be packaged, marked, or provided with instructions directing the user to an alternative water-use setting that would override the maximum flow rate of 1,5 gpm (5,7 l/min) at 60 psi (415 kPa), as established by this specification. Any instruction related to the maintenance of the product, including changing or cleaning tap (faucet) accessories, must direct the user on how to return the product to its intended maximum flow rate.	ASME A112.18.1/CSA B125.1 US Code of Federal Regulations, Title 16, Part 305.24 US Code of Federal Regulations, Title 42, Subsection 6295 US EPA WaterSense®, High-Efficiency Lavatory Faucet Specification

[a] WaterSense® is a trademarked certification program administrated by the United States Environmental Protection Agency (US EPA). This information is given for the convenience of users of this document and does not constitute an endorsement by ISO.

Table B.7 *(continued)*

Water using plumbing product	Water efficiency measurement	Performance parameters	Water consumption determination	Additional characteristics that affect water efficiency rating	Method of water efficiency rating and labelling	Additional information	Reference documents
Flow regulators (flow controllers)	Gallons per minute (gpm) and litres per minute (l/min).	WaterSense® labelled flow regulators (flow controllers) are required to have a maximum flow rate of 1,5 gpm (5,7 l/min) at 60 psi (415 kPa) and a minimum of 0,8 gpm (3 l/min) at 20 psi (140 kPa)	Flow rate test in ASME A112.18.1/CSA B125.1, Section 5.4	Flow regulators (flow controllers) must deliver a maximum of 0,25 gallons (0,95 l) per metering cycle (US Code of Federal Regulations, Title 42, Subsection 6295)	The product and/or the product packaging must be marked in accordance with the US Code of Federal Regulations (Title 16, Part 305.24 (a) with the maximum flow rate in gpm and l/min as determined through testing and compliance with this specification. Marking must be in gpm and l/min in two-digit resolutions (e.g. 1,5 gpm [5,7 l/min]).	The flow regulators (flow controllers) accessory must not be packaged, marked, or provided with instructions directing the user to an alternative water-use setting that would override the maximum flow rate of 1,5 gpm (5,7 l/min) at 60 psi (415 kPa), as established by this specification. Any instruction related to the maintenance of the product, including changing or flow regulators (flow controllers) accessories, must direct the user on how to return the product to its intended maximum flow rate.	ASME A112.18.1/CSA B125.1 US Code of Federal Regulations, Title 16, Part 305.24 US Code of Federal Regulations, Title 42, Subsection 6295 US EPA WaterSense®, High-Efficiency Lavatory Faucet Specification
Water closet (toilet) Tank type	Gallons per flush (gpf) and litres per flush (lpf).	WaterSense® labelled tank type water closets (toilets) are required to have a maximum of 1,28 gpf (4,8 lpf).	**Single-flush water closets (toilets)** The effective flush volume must not exceed 1,28 gallons (4,8 litres) when evaluated in accordance with the sampling plan in the US Code of Federal Regulations (Title 10,Part 429.30). **Dual-flush water closets (toilets)** The effective flush volume must not exceed 1,28 gallons (4,8 litres) when evaluated in accordance with the sampling plan in the US Code of Federal Regulations (Title 10 Part 429.30).	**For single-flush water closets (toilets)** The effective flush volume is the average flush volume when tested in accordance with ASME A112.19.2/CSA B45.1. **For dual-flush water closets (toilets)** The effective flush volume is the average flush volume of two reduced flushes and one full flush. Flush volumes must be tested in accordance with ASME A112.19.2/CSA B45.1 and ASME A112.19.14.	Water closet (toilet) fixtures must be marked in accordance with requirements in ASME A112.19.2/CSA B45.1 with the exception identified below: Water closet (toilet) bowls intended to be used with tanks of varying consumption levels (e.g. 1,6 and 1,28 gpf [6,0 and 4,8 lpf]) must be marked with a dual consumption marking or a consumption range, as indicated in ASME A112.19.2/CSA B45.1; however, water closet (toilet) bowls must not be marked with the words "or less" to indicate compatibility with tanks of varying consumption levels.	Water closet (toilet) tanks must not be packaged, marked, nor provided with instructions directing the user to an alternative water use setting that would override the rated flush volume, as established by this specification. Any instruction related to the maintenance of the product must direct the user on how to return the product to its rated flush volume.	ASME A112.19.2/CSA B45.1 ASME A112.19.14 US Code of Federal Regulations, Title 10, Part 429.30 US EPA WaterSense®, Specification for Tank-Type Toilets

[a] WaterSense® is a trademarked certification program administrated by the United States Environmental Protection Agency (US EPA). This information is given for the convenience of users of this document and does not constitute an endorsement by ISO.

Table B.7 *(continued)*

Water using plumbing product	Water efficiency measurement	Performance parameters	Water consumption determination	Additional characteristics that affect water efficiency rating	Method of water efficiency rating and labelling	Additional information	Reference documents
Water closet (toilet) Flush valve	Gallons per flush (gpf) and litres per flush (lpf).	WaterSense® labelled flush valve water closets (toilets) are required to have a maximum of 1,28 gpf (4,8 lpf) and a minimum of 1 gpf (3,8 lpf).	Water consumption is to be tested in accordance with the following ANSI standards as applicable: ASME A112.19.2/ CSA B45.1 *Ceramic Plumbing Fixtures*, ASME A112.19.3/ CSA B45.4 *Stainless Steel Plumbing Fixtures*, or CSA B45.5/ IAPMO Z124 *Plastic Plumbing Fixtures*	For pressure flush valves (flushometer valves) with dual-flush capabilities, the manufacturer must specify the rated flush volume of both the full-flush and reduced-flush modes and the water efficiency requirements must apply to both the full-flush and reduced-flush modes.	Water closet (toilet) fixtures and associated packaging must be marked with the rated flush volume and in accordance with requirements in ASME A112.19.2/CSA B45.1 with the exceptions identified below: Water closet (toilet) fixtures intended to be used with pressure flush valves (flushometer valves) of varying consumption levels (e.g. 1,6 and 1,28 gpf [6,1 and 4,8 lpf]) must be marked with a dual-consumption or consumption range marking as indicated in ASME A112.19.2/CSA B45.1.The rated flush volume must be included within this dual-consumption or consumption range marking. Water closet (toilet) fixtures must not be marked with the words “or less” to indicate compatibility with pressure flush valves (flushometer valves) of varying consumption levels. The lowest flush volume marked on the water closet (toilet) fixture must not be less than the minimum allowable flush volume (i.e. 1,0 gpf [3,8 lpf]). Pressure flush valves (flushometer valves) and associated packaging must be marked with the rated flush volume and in accordance with requirements in ASSE 1037/ ASME A112.1037/CSA B125.37. For pressure flush valves (flushometer valves) with dual-flush capabilities, the pressure flush valve (flushometer valve) and associated packaging must be marked with the rated flush volume for both the full-flush and reduced-flush modes. Additional marking requirements for pressure flush valves (flushometer valves) are provided below:	* Continued from ‘Method of water efficiency rating and labelling’ column Water closet (toilet) fixtures intended to be used with pressure flush valves (flushometer valves) of varying consumption levels (e.g. 1,6 and 1,28 gpf [6,1 and 4,8 lpf]) must be marked with a dual-consumption or consumption range marking as indicated in ASME A112.19.2/CSA B45.1. The rated flush volume must be included within this dual-consumption or consumption range marking. Water closet (toilet) fixtures must not be marked with the words “or less” to indicate compatibility with pressure flush valves (flushometer valves) of varying consumption levels. The lowest flush volume marked on the water closet (toilet) fixture must not be less than the minimum allowable flush volume (i.e. 1,0 gpf [3,8 lpf]). Pressure flush valves (flushometer valves) and associated packaging must be marked with the rated flush volume and in accordance with requirements in ASSE 1037/ ASME A112.1037/CSA B125.37. For pressure flush valves (flushometer valves) with dual-flush capabilities, the pressure flush valve (flushometer valve) and associated packaging must be marked with the rated flush volume for both the full-flush and reduced-flush modes. Additional marking requirements for pressure flush valves (flushometer valves) are provided below:	ASME A112.19.2/ CSA B45.1 ASME A112.19.3/ CSA B45.4 ASSE 1037/ ASME A112.1037/ CSA B125.37 B45.5/IAPMO Z124 US EPA WaterSense®, Specification for Flushometer-Valve Water Closets

[a] WaterSense® is a trademarked certification program administrated by the United States Environmental Protection Agency (US EPA). This information is given for the convenience of users of this document and does not constitute an endorsement by ISO.

Table B.7 *(continued)*

Water using plumbing product	Water efficiency measurement	Performance parameters	Water consumption determination	Additional characteristics that affect water efficiency rating	Method of water efficiency rating and labelling	Additional information	Reference documents
					Product documentation must be clearly marked with specific maintenance instructions and must identify replacement parts (e.g.pistons, Water closet (toilet) fixtures and associated packaging must be marked with the rated flush volume and in accordance with requirements in ASME A112.19.2/CSA B45.1with the exceptions below: * Continued in 'Additional information' column	Product documentation must be clearly marked with specific maintenance instructions and must identify replacement parts (e.g. pistons, diaphragms, repair kits) that should be used to ensure that the device maintains its rated flush volume. The pressure flush valve (flushometer valve) must not be packaged, marked, or provided with instructions directing the user to an alternative flush volume setting that would override the rated flush volume.	
Urinal equipment	Gallons per flush (gpf) and litres per flush (lpf).	WaterSense® labelled urinals are required to have a maximum of 0,5 gpf (1,9 lpf).	The average maximum water consumption must be tested in accordance with the following ANSI standards as applicable: ASME A112.19.2/ CSA B45.1, ASME A112.19.3/ CSA B45.4, or CSA B45.5/IAPMO Z124, and must meet the following criteria: The manufacturer must specify a maximum flush volume (rated flush volume) of the flushing device or urinal fixture, which must be equal to or less than 0,5 gpf (1,9 lpf).	N/A	The urinal fixture and flushing device product and product packaging must be marked with the rated flush volume in gpf and lpf as specified by the manufacturer, verified through testing and in compliance with this specification. Marking must be in gpf and lpf in at least two-digit resolutions (e.g., 0,5 gpf [1,9 lpf]).	N/A	ASME A112.19.2/ CSA B45.1 CSA B45.5/IAPMO Z124 US EPA WaterSense®, Specification for Flushing Urinals
Bathtubs	N/A	N/A	N/A	N/A	N/A	N/A	N/A

[a] WaterSense® is a trademarked certification program administrated by the United States Environmental Protection Agency (US EPA). This information is given for the convenience of users of this document and does not constitute an endorsement by ISO.

Annex C
(informative)

Existing water efficiency labelling programmes by country – Water using appliances

C.1 General

This Annex provides descriptions of a number of schemes/programmes for existing water efficiency labelling programmes for water using appliances. The following countries and regions have provided an overview of their scheme/programme:

— Australia (Table C.1);

— China (Table C.2);

— Singapore (Table C.3);

— United States (Table C.4).

Countries that do not have an existing water efficiency labelling programme can consider these examples to select and adopt those best suited for their markets and conditions when developing their own water efficiency labelling programme.

NOTE The information provided in this Annex is a summary of the current requirements at the time this document was developed, to provide guidance to users. It is possible that these requirements have changed and the current reference documents should be reviewed for the most up-to-date information.

Table C.1 — Australia

Water using appliance	Water efficiency measurement	Performance parameters	Water consumption determination	Additional characteristics that affect water efficiency rating	Method of water efficiency rating and labelling	Additional information	Reference documents
Dishwashers	Total water consumption for complete wash cycle – litres.	Programme recommended for dishwasher loaded to the rated capacity for cleaning a normally soiled load.	Average of total water consumption from three dishwasher units tested using recommended programme.	N/A	Water consumption values divided into ranges with star rating applied to each range, 1 Star least efficient to 6 Stars most efficient. Over 95 % of dishwashers registered have a 3,5 Star or higher rating.	N/A	AS/NZS 6400
Clothes washing machines	Total water consumption for complete wash cycle – litres.	Programme recommended for clothes washing machine loaded to the rated capacity for washing a normally soiled cotton load.	Average of total water consumption from three clothes washing machine units tested using recommended programme.	Minimum water efficiency rating of 2,5 stars for machines with a load capacity of less than 5 kg. Minimum water efficiency rating of 3 Stars for machines with a load capacity of 5kg or greater.	Water consumption values divided into ranges with star rating applied to each range, 1 Star least efficient to 6 Stars most efficient. Over 70 % of clothes washing machines registered have a 4 Star or higher rating.	N/A	AS/NZS 2040.1 AS/NZS 2040.2 AS/NZS 6400
Combination clothes washer dryers	Total water consumption for complete wash cycle – litres.	Programme recommended for clothes washing machine loaded to the rated capacity for washing a normally soiled cotton load.	Average of total water consumption from three clothes washing machine units tested using recommended programme.	Minimum water efficiency rating of 2,5 stars for machines with a load capacity of less than 5 kg. Minimum water efficiency rating of 3 Stars for machines with a load capacity of 5 kg or greater.	Water consumption values divided into ranges with star rating applied to each range, 1 Star least efficient to 6 Stars most efficient. Over 70 % of clothes washing machines registered have a 4 Star or higher rating.	N/A	AS/NZS 2040.1 AS/NZS 2040.2 AS/NZS 6400
	Additional water consumption in dryer mode – litres.	Dryer loaded to the rated capacity for drying a damp load of standard mixed cotton clothes. Initial damp load mass 190 % of the bone-dry mass of the load. The dryer must reduce the moisture content of the test load to no more than 6 % of the bone-dry mass.	Additional water consumption is determined from the volume recorded in litres, of mains water consumed from the completed drying cycle to meet the performance parameters.	N/A	No rating is applied, the water consumption measured for the dryer function is added to the water efficiency rating label.	N/A	AS/NZS 2442.1 AS/NZS 2442.2 AS/NZS 6400

Table C.2 — China

Water using appliance	Water efficiency measurement	Performance parameters	Water consumption determination	Additional characteristics that affect water efficiency rating	Method of water efficiency rating and labelling	Additional information	Reference documents
Dishwashers	Total water consumption for complete wash cycle – litres.	Programme recommended for dishwasher loaded to the rated capacity for cleaning a normally soiled load.	Average of total water consumption from one dishwasher units tested 5 times using recommended programme.	N/A	Water consumption values divided into 5 classes, class 1 most efficient to class 5 least efficient.	Label requirement is under discussion and is expected to be mandatory from the beginning of next year.	GB 38383
Clothes washing machines	Measure water consumption of full load and half load for complete wash cycle – litres. Then calculate water efficiency.	Programme recommended for clothes washing machine loaded to the rated capacity for washing a normally soiled cotton load.	Average of total water consumption from three clothes washing machine units tested using recommended programme.	N/A	Water consumption values divided into 5 classes, class 1 most efficient to class 5 least efficient. Near 100 % of front load washer on the market declare to be class 1 and over 70 % of top load washer declare to be class 2 or higher rating.	Rating on the energy label combines water and energy consumption together. Only energy label shows on the washing machine.	GB 12021.4
Combination clothes washer dryers	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table C.3 — Singapore

Water using appliance	Water efficiency measurement	Performance parameters	Water consumption determination	Additional characteristics that affect water efficiency rating	Method of water efficiency rating and labelling	Additional information	Reference documents
Dishwashers	Water consumption in litres per place setting.	Recommended wash programme by manufacturer for a normally soiled tableware in EN 50242, EN 60436; or IEC 60436. The water consumption is measured using the wash programme or other associated settings recommended in the manufacturer's product literature for a normally soiled load at rated load capacity and the followings are NOT required as test condition: a) the use of a reference dishwasher for normalisation of base load items; b) the parallel operation of a reference dishwasher with the tested dishwasher; c) the use of a specific inlet water temperature, water hardness, water pressure, ambient temperature or humidity; d) the use of soiling agents; e) the use of detergent, rinse agent or salt; f) the use of an electric supply at a specific voltage; g) the use of regeneration operations; h) the preparation and application of soiling agents.	Water consumption is measured five times and an average water consumption calculated.	N/A	Not more than 1,5 litres of water per place setting for normally soiled tableware. 1-tick: >1,2 to 1,5 litres/place setting 2-tick: >0,9 to 1,2 litres/place setting 3-tick: >0,6 to 0,9 litres/place setting 4-tick: 0,6 litres/place setting or less	N/A	IEC 60436 EN 50242 EN 60436 Public Utilities (Water Supply) Regulations PUB WELS Guidebook
Clothes washing machines	Water consumption in litres per kilogram.	Recommended wash programme by manufacturer for a normally soiled load in IEC 60456; or EN 60456 relating to measurement of water consumption The following parameters are NOT required as test condition: The water consumption for a clothes washing machine is to be measured using the wash programme or other associated settings recommended in the manufacturer's product literature for normally soiled load at rated clothes washing machine capacity. The following are NOT required as test condition: a) the use of a reference clothes washing machine for normalisation of base load items; b) the parallel operation of a reference clothes washing machine with the tested clothes washing machine; c) the use of a specific inlet water temperature, water hardness, water pressure, ambient temperature or humidity; d) the use of stain test strips; e) the use of detergent.	Water consumption is measured five times and an average water consumption calculated.	N/A	Not more than 12 litres of water per kilogram of wash load for a normally soiled load. 2-tick: > 9 to 12 litres/kg 3-tick: > 6 to 9 litres/kg 4-tick: 6 litres/kg or less	N/A	IEC 60456 EN 60456 Public Utilities (Water Supply) Regulations PUB WELS Guidebook

Table C.3 *(continued)*

Water using appliance	Water efficiency measurement	Performance parameters	Water consumption determination	Additional characteristics that affect water efficiency rating	Method of water efficiency rating and labelling	Additional information	Reference documents
Combination clothes washer dryers	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table C.4 — United States

Water using appliance	Water efficiency measurement	Performance parameters	Water consumption determination	Additional characteristics that affect water efficiency rating	Method of water efficiency rating and labelling	Additional information	Reference documents
Dishwashers	Total water consumption in gallons per cycle.	Non-soil-sensing dishwasher machines tested at a nominal inlet temperature of 140 °F (60 °C) must use the normal cycle and truncated normal cycle without a load if the dishwasher machines do not heat water in the normal cycle. Non-soil-sensing dishwasher machines tested at a nominal inlet temperature of 50 °F or 120 °F (10 °C or 49 °C) use the normal cycle, loaded to the rated capacity with a clean load. Soil-sensing dishwasher machines tested at a nominal inlet temperature of 50 °F, 120 °F, or 140 °F (10 °C, 49 °C or 60 °C) must be tested first for the sensor heavy response, then tested for the sensor medium response, and finally for the sensor light response, loaded to the rated capacity with specified combinations of soiled and clean test loads.	For non-soil-sensing dishwasher machines: use the total water consumption following required parameters. For soil-sending dishwasher machines: use the weighted average of total water consumption for heavy, medium, and light soil sensing levels.	Energy efficiency and partnership requirements must be met to be considered ENERGY STAR®[a].	For standard (capacity ≥ eight place settings plus six serving pieces) products water efficiency requirements are: Federal Standard: ≤ 5,0 gallons/cycle (≤ 18,9 litres/cycle) ENERGY STAR® Version 6: ≤ 3,5 gallons/cycle. (≤ 13,2 litres/cycle) For compact (capacity < eight place settings plus six serving pieces) products water efficiency requirements are: Federal Standard: ≤ 3,5 gallons/cycle (≤ 13,2 litres/cycle) ENERGY STAR® Version 6: ≤ 3,1 gallons/cycle (≤ 11,7 litres/cycle)	Currently under revision. ENERGY STAR® specifications are reviewed approximately every three years.	ANSI/AHAM DW-1 ENERGY STAR® Program Requirements Product Specification for Residential Dishwashers Eligibility Criteria US Code of Federal Regulations, Title 10, Part 430, Subpart B, Appendix C.1
Clothes washing machines	Integrated Water Factor (IWF) in gallons per cycle per cubic foot.	The clothes washer machine loaded at minimum, average, and maximum load size; and water fill for wash/rinse cycles of extra-hot/cold, hot/cold, warm/cold, warm/warm, cold/cold using a normal cycle when possible.	Integrated Water Factor (IWF) is the weighted average of measured hot- and cold-water usage by load size for each cycle combination divided by the clothes container capacity.	Energy efficiency and partnership requirements must be met to be considered ENERGY STAR®.	For front-loading (> 2,5 ft^3) products water efficiency requirements are: Federal Standard: Maximum IWEF = 4,7 ENERGY STAR® Version 8,0: Maximum IWEF = 3,2 For top-loading (> 2,5 ft^3) products water efficiency requirements are: Federal Standard: Maximum IWEF = 6,5 ENERGY STAR® Version 8,0: Maximum IWEF = 4,3 For ≤ 2,5 ft^3 products water efficiency requirements are: ENERGY STAR® Version 8,0: Maximum IWEF = 4,2 For front-loading (< 1,6 ft^3) products water efficiency requirements are:	ENERGY STAR® specifications are reviewed approximately every three years.	ENERGY STAR Program Requirements Product Specification for Clothes Washers Eligibility Criteria US Code of Federal Regulations, Title 10 Part 430, Subpart B, Appendix J2

[a] ENERGY STAR® is a trademarked certification program administrated by the United States Environmental Protection Agency (US EPA). This information is given for the convenience of users of this document and does not constitute an endorsement by ISO.

Table C.4 *(continued)*

Water using appliance	Water efficiency measurement	Performance parameters	Water consumption determination	Additional characteristics that affect water efficiency rating	Method of water efficiency rating and labelling	Additional information	Reference documents
					Federal Standard: Maximum IWEF = 8,3 For top-loading (< 1,6 ft^3) products water efficiency requirements are: Federal Standard: Maximum IWEF = 12,0		
Combination clothes washer dryers (excluded from ENERGY STAR®)	Integrated Water Factor (IWF) in gallons per cycle per cubic foot.	Same as clothes washing machines	Integrated Water Factor (IWF) is the weighted average of measured hot- and cold-water usage by load size for each cycle combination divided by the clothes container capacity.	The water consumption during the drying cycle is not measured.	For front-loading (≥ 1,6 ft^3) products water efficiency requirements are: Federal Standard: Maximum IWEF = 4,7 For front-loading (< 1,6 ft^3) products water efficiency requirements are: Federal Standard: Maximum IWEF = 8,3 For top-loading (≥ 1,6 ft^3) products water efficiency requirements are: Federal Standard: Maximum IWEF = 6,5 For top-loading (< 1,6 ft^3) products water efficiency requirements are: Federal Standard: Maximum IWEF = 12,0	N/A	US Code of Federal Regulations, Title 10, Part 430, Subpart B, Appendix J2

[a] ENERGY STAR® is a trademarked certification program administrated by the United States Environmental Protection Agency (US EPA). This information is given for the convenience of users of this document and does not constitute an endorsement by ISO.

Annex D
(informative)

Guidance on conformity assessment

D.1 General

This annex provides general information on the various approaches that countries or regions have taken regarding conformity assessment for their own labelling programmes. Programmes from Australia, China, Japan, Europe, Singapore and the USA are included.

D.2 How to use this annex

Countries who have implemented or plan to implement a water efficiency labelling programme should include the following requirements in their conformity assessment:

— Declaration of conformity;

— Test report from a laboratory deemed acceptable by the country;

— Product and factory audit;

— Market inspection.

For more information, see D.3 to D.8.

D.3 Australia

D.3.1 Registration

Seven types of water-using and water-saving products are regulated under the Australian Water Efficiency Labelling and Standards (WELS) scheme and must be registered (see: www.waterrating.gov.au). The Australian WELS scheme has an online product registration database that must be used. The following requirements must be met to register the product:

— Current WaterMark®[1] certification [for showers, water closets (toilets), taps (faucets), urinals and flow regulators (flow controllers)].

— Test report/s to show that the product met product testing requirements for WaterMark® (if applicable) and WELS.

— Photo of the product/s to upload with application.

— Written permission to register the product/s from the manufacturer, if the requester is not the manufacturer of the product.

NOTE WaterMark® is a certification mark provided by independent certifying authorities. WaterMark® is administered by the Australian Building Codes Board.

1) WaterMark® is a trademarked certification program administrated by the Australian Building Codes Board. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO.

D.3.2 Testing requirements

All products have to be tested for performance and water efficiency before being registered. This applies to all products regulated under the Australian WELS scheme.

Testing needs to be conducted:

— At an accredited laboratory,

— In line with requirements for the Australian standard relevant to the product.

Plumbing products must have a valid WaterMark® certification before being registered under the Australian WELS scheme.

D.3.3 Assessment and certification

All regulated products must be tested, rated and labelled to meet requirements detailed in AS/NZS 6400. AS/NZS 6400 also identifies product-specific standards that need to be met.

The details of testing, performance requirements and technical specifications available in AS/NZS 6400 should be reviewed and complied with for each product type

These water efficiency and performance standards are managed by Standards Australia.

WaterMark® is administered by the Australian Building Codes Board.

Product registrations must be renewed each year between 15 September and 5 December. The original registrant is responsible for renewing registrations. All suppliers, even if they are not the original registrant, are responsible for tracking the registration status of products they are selling or supplying. All registrations have a common expiry date of 22 January each year. Products not renewed by 22 January must have their status changed to 'ceasing' in product registration database.

D.3.4 Audit

Australian WELS inspectors conduct inspections of businesses that supply regulated products in stores, online and as part of new homes or property developments in Australia.

Australian WELS inspectors must help potential applicants regarding the obligations set out in the Australian WELS Act, including requirements detailed in AS/NZS 6400.

D.3.5 Cancellation or suspension of registrations

It is a requirement under Section 14 of the Australian WELS Determination that registrants must notify the Regulator if the product has been altered in a way that affects the performance of the product, including water consumption and or conformance with the AS/NZS 6400.

The Regulator may cancel or suspend a registration under Section 15 of the Australian WELS Determination, where this requirement is not met.

Registration of products may also be cancelled or suspended under Section 15 of the Australian WELS Determination if information provided in the application for registration of a product:

— Was not accurate at the time of the application, or

— Is no longer accurate.

A decision to cancel or suspend the registration of a regulated product is a reviewable decision under Sections 69-72 of the Australian WELS Act.

The Australian WELS Determination is authorized under The Water Efficiency Labelling and Standards Act 2005 (the WELS Act) and permits the establishment of a national regulatory scheme administered by the Australian Government on behalf of participating States and Territories. Subsection 18(1) of the

WELS Act provides that the Commonwealth Minister (the Minister) may determine, in writing, that water-use products or water-saving products of a specified kind are "WELS products". A determination made under subsection 18(1) must set out, or incorporate by reference, the WELS standard for those products (see subsection 18(2) of the WELS Act). To do this the Minister must have agreement to the terms of the determination from a majority of the participating States and Territories (see subsection 18(4) of the WELS Act).

D.4 China

D.4.1 Implementation process

The implementation process of Water Efficiency Labelling Programme in China is shown in Figure D.1.

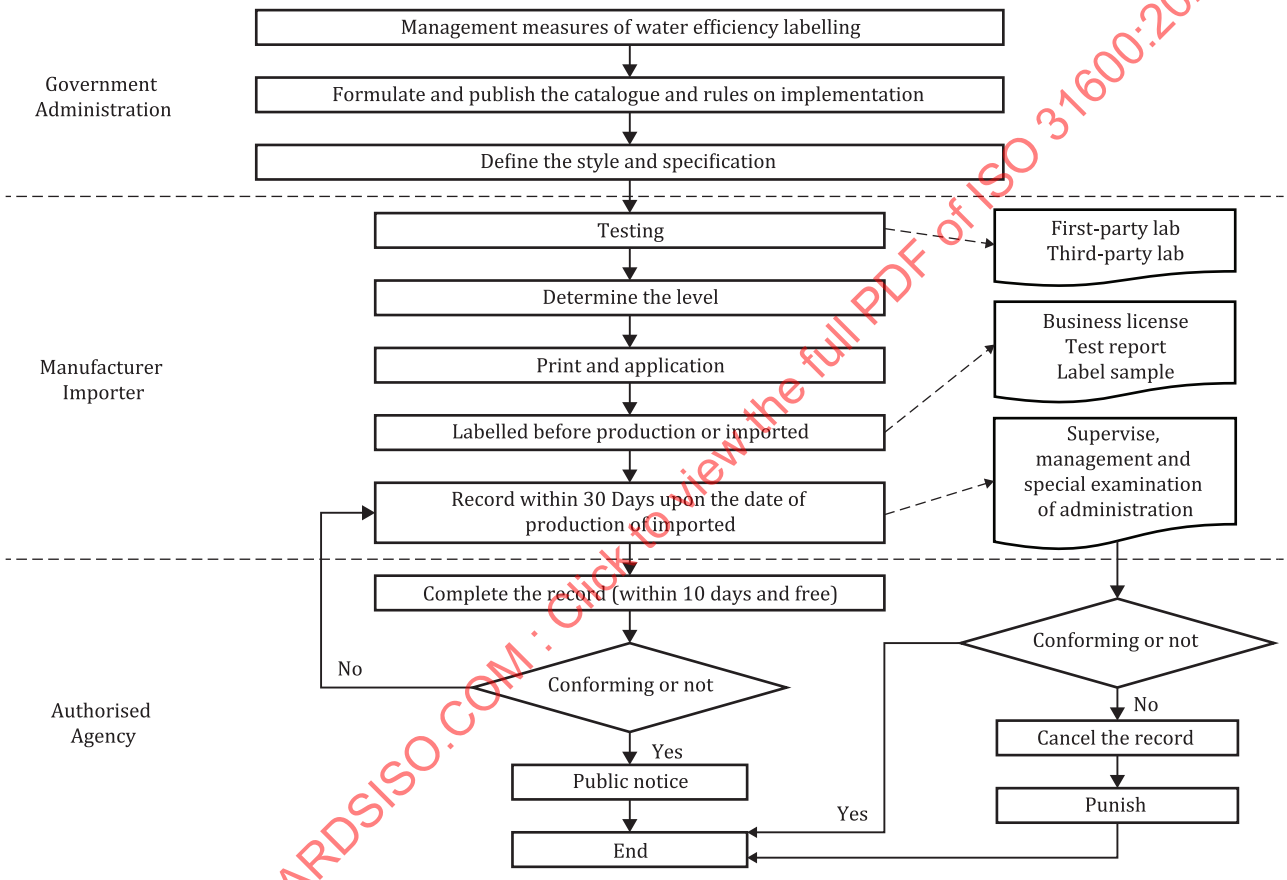


Figure D.1 — Implementation process of Water Efficiency Labelling Programme in China

D.4.2 Self-declaration by manufacturers

Water efficiency testing of products can be arranged by manufacturers independently (e.g. by the competent first-party laboratory or a non-accredited third-party laboratory). According to the test report of the product's water efficiency, the manufacturers may make a declaration regarding the water efficiency rating and relevant parameters of the product and print and publish the water efficiency label.

D.4.3 Information to be submitted

Manufacturers must submit the following information to the China National Institute of Standardization (CNIS):

— The completed application form;

— The test report of product water efficiency;

— The layout of water efficiency label;

— Pictures of the product.

The completeness and normalization of the submitted information must be verified by the authorized institution. The submitted information must be made public through the CNIS website for water efficiency labelling and identified by the two-dimensional code on the label.

D.4.4 Market surveillance

Market surveillance of labelled products is conducted through various modes, in order to ensure conformance and compliance. The surveillance modes include:

a) Inspection by National departments and surveillance of product quality;

b) Special inspection and surveillance of CNIS Water Efficiency Labelling staff;

c) Surveillance by local departments;

d) Surveillance by social groups or consumers.

Inspection and surveillance activities include:

— Verifying the accuracy of the records of water efficiency information supplied;

— Verifying the conformity of the layout and information provided on the water efficiency label;

— Verifying the accuracy of the water efficiency indicators and rating.

D.5 Europe

D.5.1 General

The Unified Water Label Scheme is a voluntary scheme developed to raise awareness of water labelled products and to promote best practice for water saving within the bathroom environment (www.europeanwaterlabel.eu). The scheme is administered by Unified Water Label Company.

D.5.2 Registration

Companies wishing to register their products are asked to submit a Declaration of Conformity, signed and dated by authorized personnel of the applicant company, testifying that the product complies with the relevant criteria. Copies of certificates of compliance/test reports from bona fide 3rd Parties or copies of certificates/test reports confirming witness testing by bona fide 3rd Parties can be provided in support of Declarations of Conformity. Unified Water Label may from time to time request original certificates/test reports, which must be returned.

D.5.3 Term of validity

Product listings must remain on the Scheme database for one year from date of approval. If the characteristics have changed for any reason, then the company in question must submit a new application and listing and undergo a new procedure.

NOTE 1 If the product undergoes slight modifications, then the listing can be modified, it is not necessary to have a new application, complete a modification form.

NOTE 2 Registration is a rolling one, with an annual payment, supported by a termination clause.

D.5.4 Audit

The Unified Water Label must arrange for 5 % of the approved products and accompanying literature. Point of sale material and advertisements in relationship to the listed products on the database must undergo an audit for compliance with the Scheme's requirements on an annual basis. The 5 % must be selected, across the qualifying product ranges. The audit testing must be conducted by a bona fide 3rd Party. Audit test fees are payable by the registered company to the bone fide 3rd Party. If approved product already has 3rd party approval from ILAC registered ISO/IEC 17025 accredited test house, they must be exempt from audit testing but undergo a certificate check of 3rd party approval.

D.5.5 Cancellation

The Unified Water Label retains the right to cancel or suspend any listing of a product which carries the water label. If a company does not adhere to the rules and regulations of the Scheme, or if The Water Label Company has proven that the information given at the application stage is inaccurate, The Unified Water Label retains the right to cancel or suspend the product listing. The Unified Water Label also retains the right to cancel or suspend a product listing where the characteristics of the product have been amended but the company has failed to notify The Unified Water Label or applied for a new application. if the product undergoes slight modifications by completing a modification form, then the listing can be modified, it is not necessary to have a new application.

D.6 Japan

D.6.1 General

Certification of sanitary ceramic products in Japan must be performed in accordance with JIS Q 1001 and JIS A 5207.

Certification of showers and taps (faucets) in Japan must be performed generally in accordance with JIS Q 1001, JIS Q 17050-1 and JIS B 2061. And the Hot Water Saving Scheme which is aimed at reducing water and energy consumption of showers and taps (faucets) is standardized on JIS B 2061.

The registered certification body must abide by JIS Q 17025 (ISO/IEC 17025 IDT). Factory audit and business operation must be performed in accordance with JIS Q 9001 (ISO/IEC 9001 IDT) or in line with the requirements of the TQC system.

D.6.2 Certification by JIS

D.6.2.1 Certification process

D.6.2.1.1 Application for certification

The process of the application for certification in Japan is shown in Figure D.2.

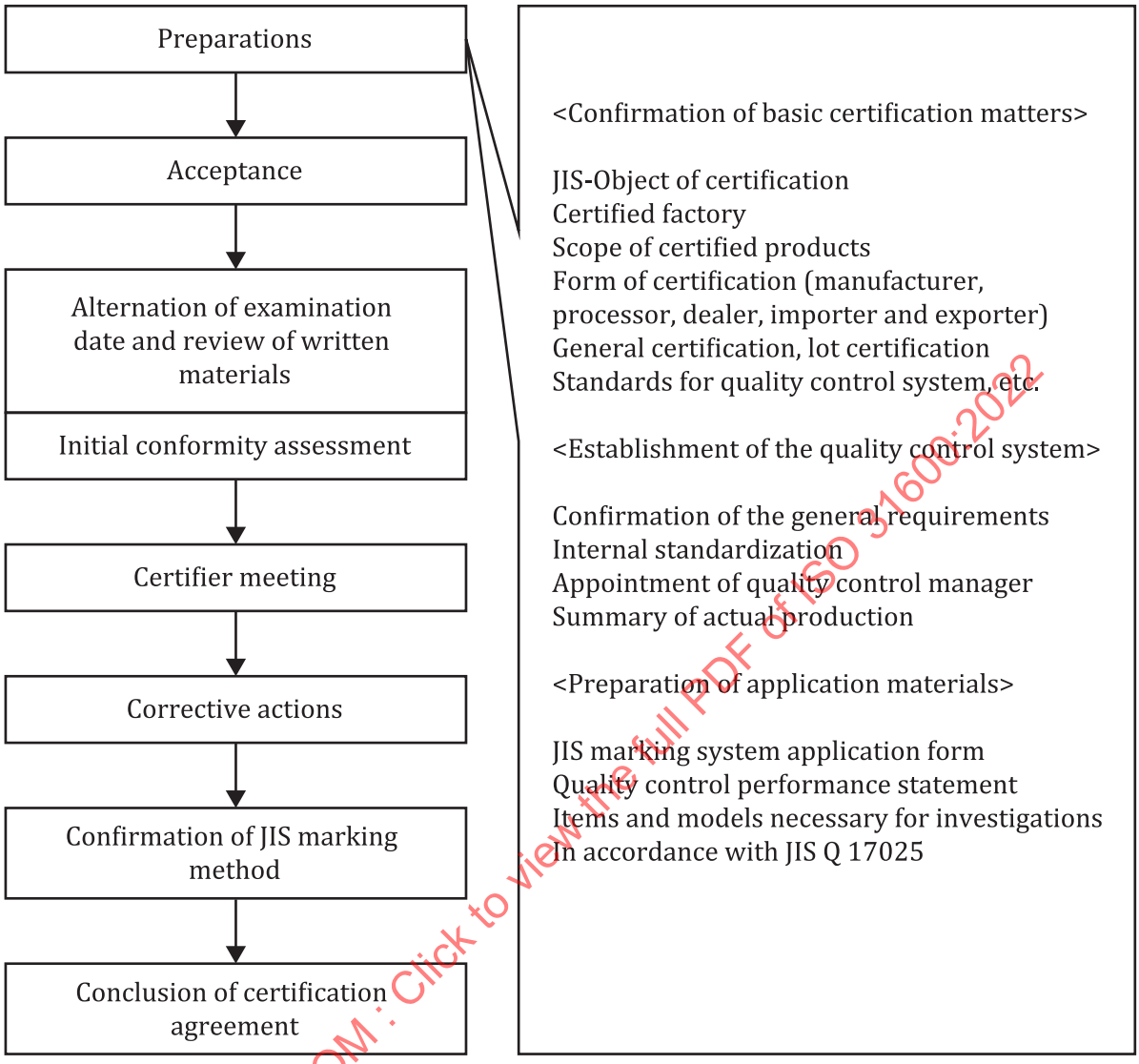


Figure D.2 — Process of the application for certification in Japan

D.6.2.1.2 Conformity assessment procedures

The procedures for conformity assessment in Japan are shown as Figure D.3. The certification qualification must be subject to a periodic examination with the conformity assessment flow every three years.

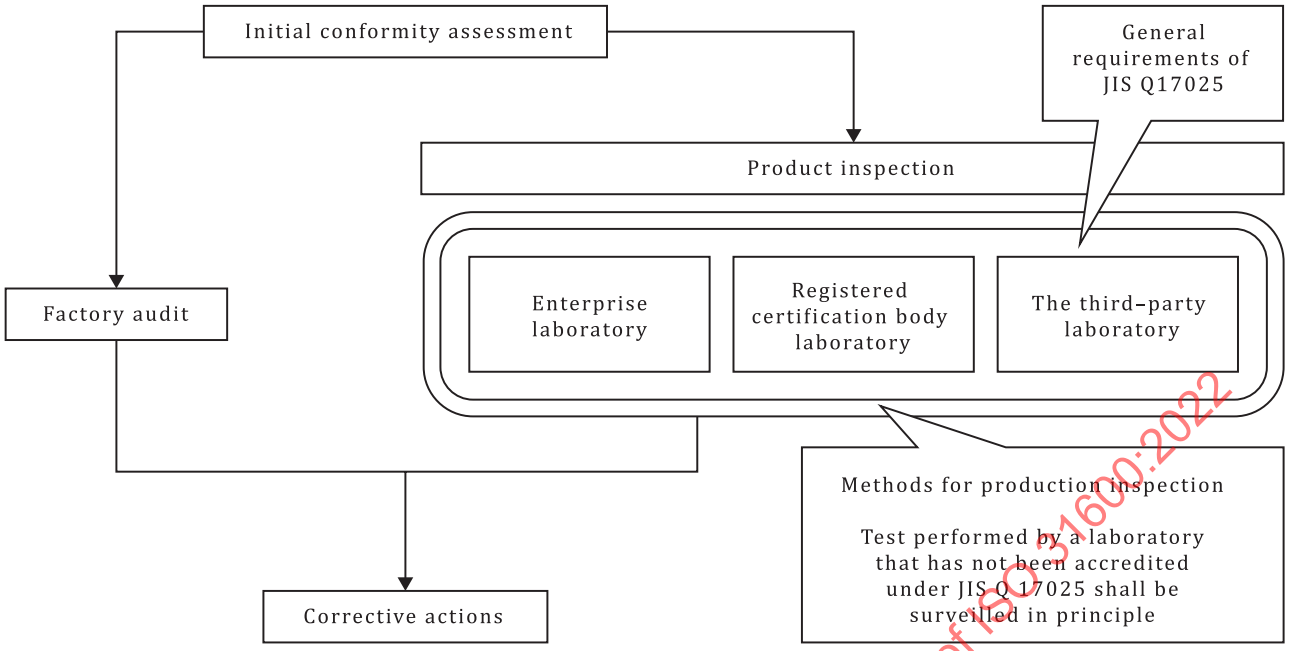


Figure D.3 — Procedures for conformity assessment in Japan

D.6.2.2 Certification maintenance surveillance

The registered certification body must check and certify whether the quality control system of the factory (place of business) conforms to the following items in JIS Q 1001:

— Annex B: Criteria of Audit of Quality Control System;

— B.1: Total quality control (TQC) system;

— B.2: Conformity to the quality control requirements of JIS Q 9001.

Requirements specified by the registered certification body:

— Certification guidance (criteria of audit);

— Certification agreement.

D.6.2.3 Product testing

D.6.2.3.1 Testing items

The registered certification body must confirm that all items subject to testing are tested with the methods specified in JIS.

D.6.2.3.2 Sampling

The registered certification body must take sampling from acceptable products.

Factors that should be considered in the production process include:

— type of product;

— type of material;

— whether or not the product comes with or without adjustable drain pipe.

D.6.2.3.3 Test place

The registered certification body must check whether the test place meets the applicable requirements (JIS Q 17025 investigation).

D.6.2.4 Requirements on the third-party certification body

The registered certification body must check whether the third-party certification body meets the applicable requirements of ISO/IEC 17025.

D.6.3 Other regulations

D.6.3.1 General

Plumbing products must follow the Structure and Material of Water Service Installations based on Article 16 of the Waterworks Act.

There are 2 schemes to conform with Article 16 of the Waterworks Act.

D.6.3.2 Certification by the third-party certification body

Plumbing products can be certified by 3rd party certification body to conform with the Article 16 of the Waterworks Act.

The certification body must carry out product certification and verify the manufacturer's capabilities with e.g. product design/ quality control system of manufacturing/ testing product.

The products certified by the certification body and produced by certified manufacturer (or factory) can be handled with certification label to be recognised by end consumer or water supply utilities.

D.6.3.3 Certification by supplier (self-declaration)

Manufacturers and import and sales business entities can make self-declaration with examination data arranged by them independently (e.g. the accredited third part laboratory or the own laboratory of them) to conform plumbing products to Article 16 of the Waterworks Act.

D.7 Singapore

D.7.1 General

PUB national water agency in Singapore, is the regulatory body for the Singapore WELS which was introduced in 2009. Water fittings and appliances regulated under the scheme must be registered before they are allowed for supply in Singapore. The legislative requirements on the Singapore WELS are specified in the Public Utilities (Water Supply) Regulations. The types of water fittings and appliances covered under the scheme can be found in PUB's WELS website at https://www.pub.gov.sg/wels.

D.7.2 Registration

Application requirements, procedures and water efficiency requirements can be found in the Singapore WELS Guidebook and PUB's WELS website at https://www.pub.gov.sg/wels. All applications should be submitted via online at PUB's WELS website.

To register a product, the product must meet the following requirements:

— Tested for compliance to the relevant requirements in the Public Utilities (Water Supply) Regulations and PUB S&R (*PUB's Stipulation of Standards & Requirements for Water Fittings for Use in Potable Water Service Installations*);