



The European Committee for the Valve Industry

STANDARDISATION GUIDE FOR SANITARY TAPWARE

Standardisation Guide for Sanitary Tapware

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Standardisation Guide for Sanitary Tapware

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CEIR represents the common economic, technical and scientific interests
of the European valves manufacturers.

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FOREWORD

“Standardisation is a tool for exchange and economic development which guarantees transparency and allows technical progress. It is also a public policy tool in addition to regulations. It is, at least, a strategic tool for all stakeholders and in particular for the companies involved.”¹

That is the reason why, as soon as technical committees were created, several European manufacturers decided to participate in standardisation work.

Thus, Working Group WG8 “Sanitary Tapware”, hosted by CEN/TC164 “Water Supply”, has been chaired by the tapware industry for years. Currently, the WG8 working programme has fifteen standards and is still growing, due to technical progress and new technologies. This work has required a great involvement of manufacturers in recent years.

Nowadays, this work is enhanced by the European New Approach system which recognises standards issued by CEN as being technical reference documents for assessment of conformity of equipment (see § 2).

The role of industry is to promote this standardisation work, for example through quality marks, and at the same time to comply with mandatory national or European requirements.

The first step, which was to harmonise existing national standards, is now almost complete. After years of discussions, sanitary tapware manufacturers must now comply with European Standards.

Manufacturers must now focus on the harmonisation of test methods, enhanced by certification through quality marking or regulations. This is the next challenge for WG8 over the coming years and implies very close cooperation between manufacturers, to be lead within CEIR. CEIR is a “mirror committee” for manufacturers, where orientation to be given to standards is discussed.

CEIR thanks its experts (listed in § 14) for the work already done, which encourages good engineering practices in the tap industry. This guide gives a summary of all the standards issued by WG8 and their role within regulations and quality mark frameworks, completed by particular specifications related to some standards.

All these standards are available from national standardisation bodies.

CEIR hopes that in the future this guide will be amended to present the results of this close cooperation between all European manufacturers.

¹ Excerpt from the AFNOR website

1. STANDARDISATION

The purpose of **standardisation** is to provide reference documents which include solutions to technical and commercial problems concerning products, goods and services repeatedly encountered in relations between economic, scientific, technical and social partners².

This reference document, the **standard**, provides rules, guidelines or characteristics for common and repeated use, or for activities or their results. It establishes and formalises a compromise between the state of the art and the economic constraints at a given moment in time.

The standard should be the result of a **consensus**, or general agreement, without sustained opposition after all parties concerned were consulted. Consensus does not necessarily imply unanimity.

In a few cases (linked to safety or government procurements for example), the standard may be mandatory. But, as a general rule, standards are of **voluntary application**. As the way a standard is drawn up guarantees its impartiality, it is often used as a reference (for technical specifications, acceptance tests...) in commercial contracts. It is a document that can be used in order to examine jurisprudence.

In order to achieve coherence between all European and national standards, when a European standard is transposed into a national one, all conflicting standards must be withdrawn.

1.1 Standardisation stakeholders

CEN, the European Committee for Standardisation, was founded in 1961 by the national standards bodies from the European Economic Community and EFTA countries. Now, the standards published by CEN contribute to free trade and safety objectives fixed by the European Union.

The **national standardisation system** in various countries is composed of a national standardisation body dedicated to sectors, experts and the authorities. The national standardisation body inventories the needs of standardisation, develops standardisation strategies, coordinates and directs the activity of the standardisation boards which are in charge of the standardisation work the national standardisation body has delegated to them. The national standardisation body also ensures that all the interested parties are represented in the standards commissions, organises public enquiries and approves national standards.

The experts belong to all economic sectors and constitute the very basis of the national standardisation system. For each subject, they provide their competence based on their origin: trade associations, producers, distributors, consumer associations, laboratories, labour unions and prevention bodies, environmental protection associations, public purchasers, local authorities, ministries... This plurality is essential because it ensures the impartiality of standards.

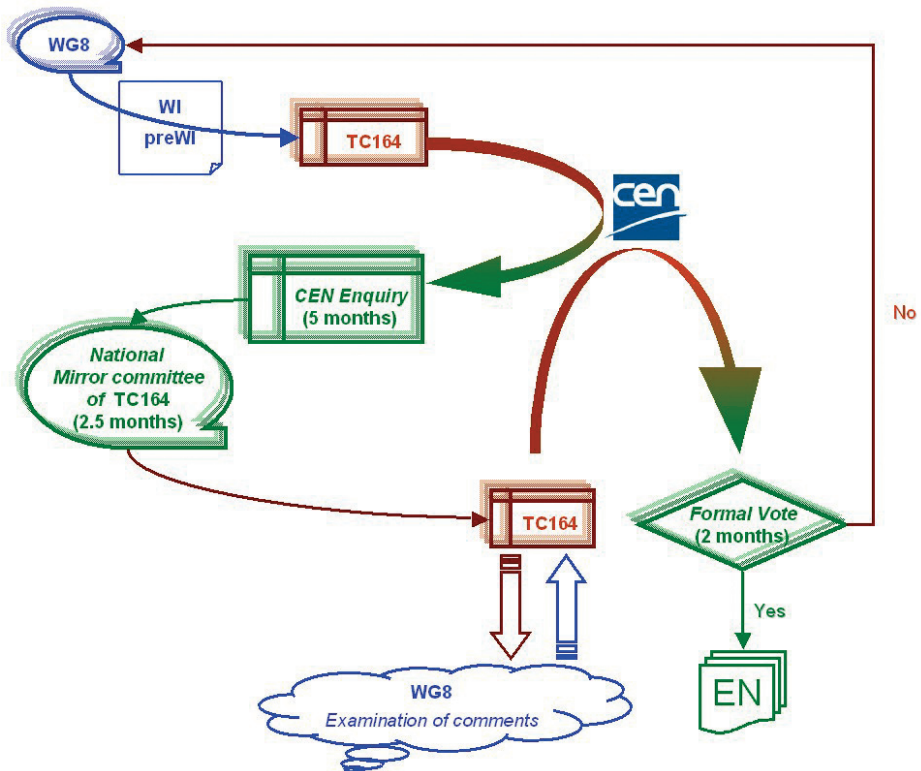
In addition to their expertise, **the authorities** play a specific role: all ministries are concerned by standardisation policy but sometimes a standards delegate, appointed by the Minister for Industry, sets out the general guidelines for the development of standards, checks their implementation and the requests for derogation, and monitors the work of the standardisation bodies.

² Excerpt from the French Decree 84-74 of 26 January 1984

1.2 CEN rules

The elaboration of standards or specific documents must be done according to the rules established by CEN. These rules explicitly define the role of Technical Committees (TC) helped, if needed, by Working Groups (WG). They also impose the rule that documents must be issued within three years after the launch of drafting work. This short timescale allows continuity of the work of experts.

The “classical” procedure is as follows:



Key:

WG: Working Group
(pre)WI: (provisional) Work Item
TC: Technical Committee
EN: European Standard

2. NEW APPROACH DIRECTIVES & CE MARKING

CE marking symbolises conformity of the product to all the European regulations it must comply with. It means that the product conforms to all applicable provisions, and that it has been subject to the appropriate conformity assessment procedures. CE marking

is not a quality mark but rather a kind of visa, required for the product to be sold in the EU.

New Approach directives are based on the principle that harmonised standards are presumed to comply with the corresponding Directive.

A harmonised standard expresses the essential requirements of a Directive in a practical way that can be used by manufacturers. It is drafted by one of the CEN Technical Committees, when mandated to do so by the European Commission. A standard is harmonised when: it has been ratified by CEN, its reference has been published in the Official Journal of the European Union, it has been transposed into a national standard, and its reference has been published in the national Official Journal.

For example, the Construction Products Directive 89/106/EEC (CPD) will allow CE marking on sanitary tapware³.

3. QUALITY MARKS

Quality marks are voluntary certification schemes applied by manufacturers. They guarantee the quality and safety of the certified products. The quality mark guarantees compliance not only with current standards, but also with additional quality criteria that meet consumers' needs.

It provides indisputable proof that the product meets the market's needs and complies with the safety, fitness for purpose and quality characteristics defined in a corresponding certification reference system, approved by a corresponding committee.

4. COMPLETE REFERENCES OF STANDARDS

Standards	Title	Date	ICS ⁴
EN 200	Single taps and combination taps - General technical specification	2005-05	91.140.70
EN 246	General specifications for flow rate regulators	2003-12	91.140.70
EN 248	General specification for electrodeposited coatings of Ni-Cr	2002-12	23.060.01 25.220.40 91.140.70
EN 274	Waste fittings for sanitary appliances	2002-12	91.140.70
EN 274-1	Part 1 - Requirements		
EN 274-2	Part 2 - Test methods		
EN 274-3	Part 3 - Quality control		
EN 816	Automatic shut-off valves (PN10)	1996-12	91.140.70
EN 817	Mechanical mixers (PN10) - General technical specifications	1997-10	91.140.70
EN 1111	Thermostatic mixing valves (PN10) - General technical specification	1998-11	91.140.70
EN 1112	Shower outlets for (PN10) sanitary tapware	1997-04	91.140.70

³ Although CPD is not a "New Approach Directive", it refers to the system of harmonised standard.

⁴ ICS: International Classification of Standards (see § 5 below)

EN 1113	Showers hoses for (PN10) sanitary tapware	1997-04	91.140.70
EN 1286	Low pressure mechanical mixing valves – General technical specification	1999-12	91.140.70
EN 1287	Low pressure thermostatic mixing valves – General technical specification	1999-12	91.140.70
EN 1717	Protection against pollution of potable water in water installations and general requirements of devices to prevent pollution by backflow	2001-03	23.060.10 23.060.50 91.140.60
EN 12541	Pressure flushing valves and automatic closing urinal valves (PN10)	2003-05	91.140.70
prEN 13618-1	Flexible hose assembly - Part 1: product standard for flexible hose assemblies (with or without braiding)	2006-05	23.040.70 91.140.60
EN 13904	Low resistance shower outlets for sanitary tapware	2004-01	91.140.70
EN 13905	Low resistance shower hoses for sanitary tapware	2004-01	91.140.70
EN 14124	Inlet valves for flushing cisterns with internal overflow	2004-12	91.140.70
prEN 15091	Electronic opening and closing sanitary tapware	-	23.060.01 91.140.70
ISO 228-1	Pipe threads where pressure-tight joints are not made on the threads - Part 1: dimensions, tolerances and designation	2003-06	21.040.30
ISO 3822	Acoustic - Laboratory tests on noise emission from appliances and equipment used in water supply installations		
ISO 3822-1	Part 1 - Method of measurements	1999-09	
ISO 3822-2	Part 2 - Mounting and operating conditions for draw-off taps and mixing valves	1995-09	17.140.20 17.140.99
ISO 3822-3	Part 3 - Mounting and operating conditions for in-line valves and appliances	1997-10	91.140.60

5. INTERNATIONAL CLASSIFICATION OF STANDARDS (ICS)

ICS	Theme
17.140.20	Noise emitted by machines and equipment
17.140.99	Other standards related to acoustics
21.040.30	Special screw threads
23.040.70	Hoses and hose assemblies
23.060.01	Valves in general
25.220.40	Metallic coatings
91.140.60	Water supply systems
91.140.70	Sanitary installations

6. SUPPORTING STANDARDS

6.1 Developed by CEN/TC164

a. EN 248 Ni-Cr Coatings

This standard specifies the condition of the exposed surfaces of tapware, the characteristics (resistance to corrosion, adherence) of the surface coating and the tests for verifying these characteristics.

It applies to all sanitary fittings (supply or waste fittings) which have a metallic Ni-Cr coating, whatever the nature of the substrate material.

b. EN 1717 Backflow protection

This standard deals with the means to be used to prevent the pollution of potable water supplies and the general requirements of protection devices to avoid pollution by backflow.

The hygiene protection specifications of this standard are applicable to all the standards for systems or appliances connected to the private supply system for water intended for human consumption.

This standard specifies the minimum requirements for product standards covering protection units.

Product standards are used to detail product specifications. In the absence of a product standard, this standard is used as a reference in order to draw up a specification for newly-developed products.

c. EN 13618-1 Flexible hose assembly

This European standard specifies the requirements and test methods for materials, dimensions and function for “hose assemblies” designed for use with water with a maximum static pressure of 10 bar and a maximum operating temperature (*still to be defined*).

The standard is applicable to hose assemblies intended to be used in water systems to connect sanitary tapware, heaters and similar appliances.

6.2 Other supporting standards not developed by CEN/TC164

a. ISO 228-1 Threads

This standard specifies the requirements relating to the shape, dimensions, tolerances and designation of threadings of piping for connection (threading size 1/16 to 6). Both internal and external screw threads are cylindrical threadings which apply to the mechanical assemblies of the parts of connections, valves and fittings, accessories, etc. They are not appropriate for tight threadings.

b. ISO 3822-1 to 4 Acoustic

The standards of the series ISO 3822 allow laboratory measurement of the noise emitted by valves and hydraulic equipment used in water supply systems.

ISO 3822-1

Specifies the test method for measuring. This method allows comparable measurements to be obtained between various laboratories.

ISO 3822-2

Defines the conditions of assembly and operation to use draw-off taps and sanitary tapware.

Scope:

All types of draw-off taps and sanitary tapware of conventional design, for a range of pressure recommended from 0.1 to 0.5 MPa (1 to 5 bar) and equipped with the accessories which are normally provided with these taps.

Exclusions:

Interchangeable outlets (these accessories are replaced by hydraulic resistances of flow acoustics standardised of lower class), thermostatic mixing valves designed for supplying a large number of outlets, taps for bidets on throat and electronic tapware.

ISO 3822-3

Specifies the conditions of assembly and operation for valves and fittings and in-line hydraulic equipment.

Scope:

Equipment which controls the flow, pressure or temperature of water, of conventional design, of nominal size DN32 and in which the maximum water flow in the device does not exceed 2 L/s.

ISO 3822-4

Specifies the conditions of assembly and operation for hydraulic equipment which cannot be considered as draw-off taps or in-line hydraulic equipment.

7. MEASURED CHARACTERISTICS

Sanitary tapware standards deal with the following characteristics:

- *Classification*
- *Designation*
- *Marking*
- *Materials*
- *Dimensions*
- *(Leak)tightness*
- *Mechanical performance under pressure*
- *Mechanical strength*
- *Acoustic*
- *Hydraulic*
- *Sensitivity*
- *Mechanical endurance*
- *Backflow protection*
- *Maintenance*

Depending on the conditions of use as described in § 10, not all these characteristics are measured.

8. INTENDED USE

Sanitary tapware (including waste fittings) and its accessories are intended to equip kitchens or washrooms. Washrooms can be bathrooms or toilets.

Sanitary tapware can be mounted on vertical or horizontal surfaces on sanitary appliance

equipment. Sanitary appliances can be sinks, baths, wash basins, bidets, showers or baths/showers.

With the exception of:

- thermostatic mixing valves specifically designed for supplying a large number of outlets;
- high and low pressure showers and shower hoses which can only be used with sanitary tapware used in washrooms.

Note 1 : Outlet connection devices shall only be connected downstream of the obturator of the tapware.

9. DIFFERENT SUPPLY SYSTEMS

The installations most usually encountered are those with “high” supply pressure range of (pressure ranges of 0.05 –1.0) MPa [(0.5 - 10) bar]. They are described in Figure 1.

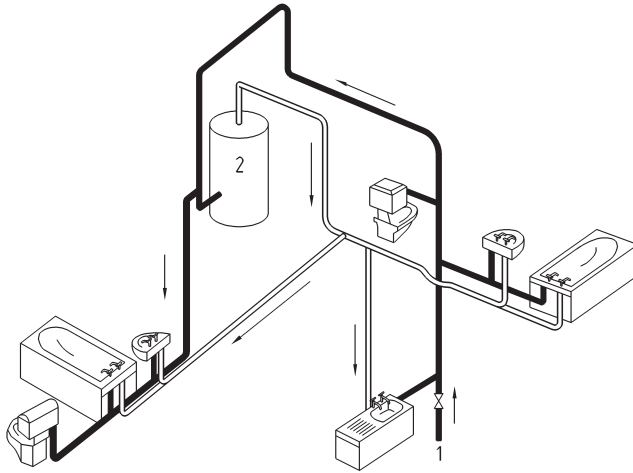
This type of supply system is called “HP” (High Pressure) and its conditions of use are detailed in § 10.

However, in some parts of the world, installations are cistern-fed or have to accommodate very low water pressures. The common minimum pressure level for cistern-fed systems is 0.01 MPa (0.1 bar) and, because of the flow rate requirement demanded by the end user, this necessitates “low pressure” equipment. These installations are described in Figure 1.

This type of supply system is called “LP” (Low Pressure) and its conditions of use are detailed in § 10.

	EN 200	EN 246	EN 816	EN 817	EN 1111	EN 1112	EN 1113	EN 1286	EN 1287	EN 13904	EN 13905	EN 14124	EN 240	EN 15091
HP Type	X	X	X	X	X	X	X					X	X	X
LP Type	X							X	X	X	X			X

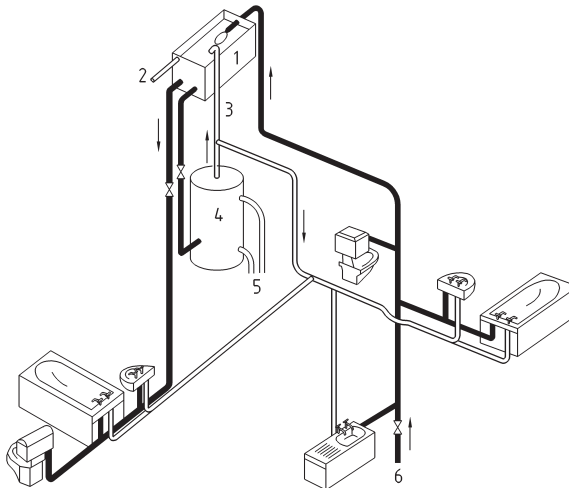
Table 1 - Standards vs supply systems



Key⁵:

- 1 Mains supply pipe
- 2 Water heater

Figure 1 - Supply system with a pressure range of (0.05 - 1.0) MPa [(0.5 - 10) bar]



Key:

- | | |
|------------------------------|----------------------|
| 1 Cold water storage cistern | 4 Hot water cylinder |
| 2 Warning pipe | 5 To boiler |
| 3 Vent pipe | 6 Mains supply pipe |

Figure 2 - Supply system with a pressure range of (0.01 - 1.0) MPa [(0.1 - 10) bar]

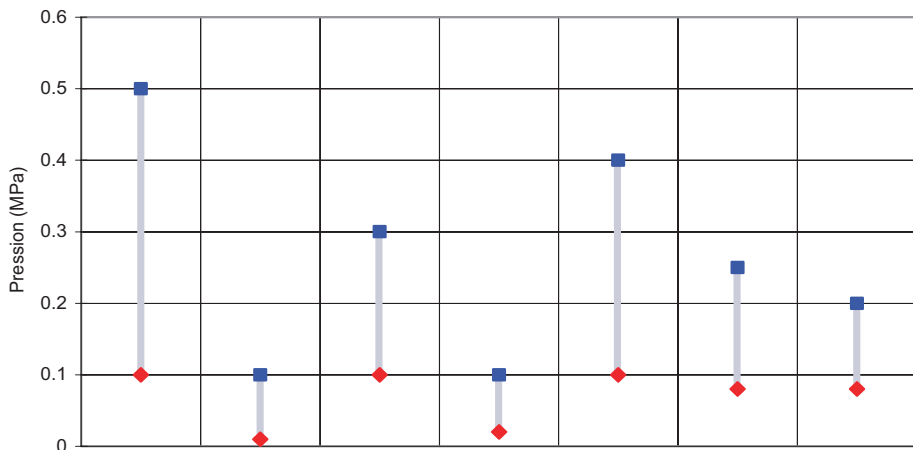
⁵ Excerpt from EN 200:2006

10. CONDITIONS OF USE

Optimum conditions of use are explained in the relevant product standard. They are summarised in Table 2 and in Figure 3 & Figure 4.

	Dynamic pressure		Maximum static pressure
EN 200 (Type 1) EN 246 EN 816 EN 817 EN 1111 EN 1112 EN 1113 EN 14124 EN 15091 (Type 1)	$0.05 \text{ MPa} \leq P$ ($0.5 \text{ bar} \leq P$)	EN 200 EN 246 EN 816 EN 817 EN 1111 EN 1286 EN 1287 EN 12541	1 Mpa (10 bar)
EN 1286 EN 1287	$0.01 \text{ MPa} \leq P \leq 0.1 \text{ MPa}$ ($0.1 \text{ bar} \leq P \leq 1 \text{ bar}$)	EN 15091 (Type 1) ²⁾³⁾	²⁾ 1 Mpa (10 bar)
EN 13904 EN 13905	$0.01 \text{ MPa} \leq P \leq 0.2 \text{ MPa}$ ($0.1 \text{ bar} \leq P \leq 2 \text{ bar}$)		³⁾ 0.8 Mpa (8 bar)
EN 200 (Type 2) EN 15091 (Type 2) EN 14124 ¹⁾	$0.01 \text{ MPa} \leq P$ ($0.1 \text{ bar} \leq P$)	EN 15091 (Type 2) ²⁾³⁾	²⁾ 0.8 Mpa (8 bar) ³⁾ 0.6 MPa (6 bar)
¹⁾ at the manufacturer's request, the minimum pressure (opening-closing) can be lowered		²⁾ tapware with monostable solenoid valves ³⁾ tapware with bistable solenoid valves	
The pressures given are flow pressures			

Table 2 – Limits of use



	EN 200 (Type 1) EN 816 EN 817 EN 1111 EN 1112 EN 1113 EN 14124 EN 15091 (Type 1)	EN 200 (Type 2) EN 15091 (Type 2)	EN 246	EN 1286 EN 1287 EN 13904 EN 13905	EN 12541 (Urinoirs + WC DN15 & DN20)	EN 12541 (WC DN25)	EN 12541 (WC DN32)
Recommended limits for correct operation	MPa (bar)						
■ Upper limit	0.5 (5)	0.1 (1)	0.3 (3)	0.1 (1)	0.4 (4)	0.5 (2,5)	0.2 (2)
◆ Lower limit	0.1 (1)	0.01 (0.1)	0.1 (1)	0.02 (0.2)	0.1 (1)	0.08 (0.8)	0.08 (0.8)

Figure 3 – Recommended limits for correct operation

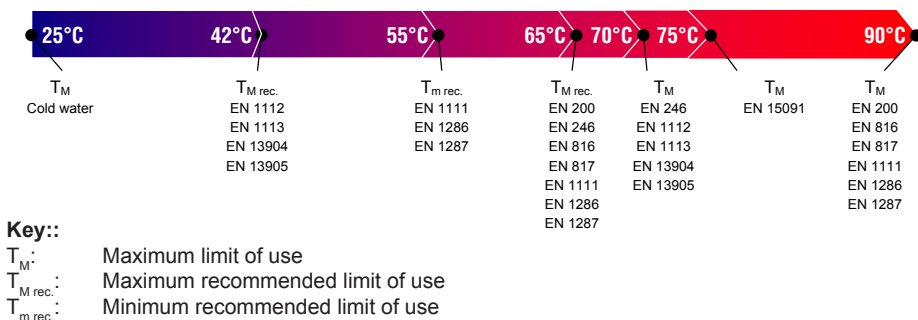


Figure 4 – Temperature limits

11. COMPLEMENTARY SPECIFICATIONS

11.1 EN 200 Single and combination taps

Applies to taps of nominal size $\frac{1}{2}$ and $\frac{3}{4}$.

11.2 EN 274 Waste fittings

Applies to waste fittings, traps and overflows for sanitary appliances which are connected to a gravity evacuation system, whatever the use of the building.

Exclusion:

Does not cover waste fittings, traps and overflows integrated into sanitary appliances.

11.3 EN 1112 HP Shower outlets

Exclusion:

Does not cover integral and remote spray attachments incorporated into tapware.

11.4 EN 1113 HP Shower hoses

Exclusion:

Does not cover hoses incorporated in sanitary tapware or hoses intended to connect sanitary tapware to the water supply (covered by prEN 13618-1).

11.5 EN 12541 Automatic flushing and urinal valves

Applies to flushing valves for WCs and valves for urinals, with automatic hydraulic closure, intended for WC pans (EN 997), single flush urinals (prEN 13407) and siphon acting urinals (prEN 13407).

Also covers the atmospheric interrupter which shall be an integral part of the WC flushing valve.

Exclusion:

Does not apply to no-contact detection valves.

11.6 EN 13904 Low resistance showers

Fittings complying with this standard can also be used with inlet supply pressures between 0.1 and 0.2 MPa (1 to 2 bar) in installations not subject to acoustic requirements.

Exclusion:

Does not cover integral and remote spray attachments incorporated in tapware.

11.7 EN 13905 LP shower hoses

Exclusion:

Does not cover hoses incorporated in sanitary tapware or hoses intended to connect sanitary tapware to the water supply.

11.8 EN 14124 Inlet valves for flushing cisterns

Applies to valves such as float valves operating at pressures up to DN 10 designed to supply cold water to flushing cisterns for use with WC pans that are permanently connected to a potable water supply system.

Applies exclusively to the valve itself and does not prejudice compliance with health regulations as the inlet valve is fitted into the cistern.

Exclusion:

Does not cover valves intended to equip flushing cisterns with external overflow.

Does not apply to valves used for other applications: pumping tanks, storage tanks, etc.

11.9 EN 15091 Electronic tapware

Such tapware can be operated by any electrical source e.g., mains, battery, etc.

Exclusion:

Does not cover flow and temperature regulation devices installed either upstream or downstream of the tapware.

12. WORK IN PROGRESS⁶

Standards	Date	Step
EN 200	2006-08	Negative result of the UAP procedure
	Work in progress	
	Next step	2 nd CEN enquiry
EN 817	2006-05	End of 2 nd CEN enquiry
	2006-09	Examination of comments
	Next step	Formal Vote
EN 1111	Work in progress	
	Next step	CEN enquiry
EN 1112	2006-11	End of CEN enquiry
EN 1113	Next step	Examination of comments
EN 1287	Work in progress	
	Next step	CEN enquiry
EN 1717	Envisaged revision	
	Next step	preWI inscription
EN 15091	2006-11	CEN Ratification

13. MORE ABOUT...

- *“Guide to the implementation of directives based on the New Approach and the Global Approach” published by European Commission*
http://ec.europa.eu/enterprise/newapproach/legislation/guide/document/1999_1282_en.pdf
- *Pocket-Guide “Réglementation 2006” for AFPR members (in French language only)*
<http://www.profluid.org/francais/visiteurs/html/publicationspocket.asp>

⁶ Other documents are underway but are not mentioned here because their status is not sufficiently advanced

14. WG8 EXPERTS

14.1 Manufacturers

AMERICAN STANDARD SA
CISAL RUBINETTERIA SPA
DAMIKA
FRIEDRICH GROHE
GEBERIT INTERNATIONAL AG
HANSA METALLWERKE AG
HANSGROHE
HUBER SPA
KOHLER (JACOB DELAFON)
KOHLER (MIRA LTD)
KWC AG
NEOPERL GMBH
ORAS OY
PRESTO (LES ROBINETS)
RAMON SOLER
ROCA RADIADORES
ROCA SANITARIO SA
RUBINETTERIE RAPETTI SPA
RUBINETTERIE STELLA SPA
SIMILOR KUGLER SA/URS
VOLA
WATTS EUROTHERM

14.2 Manufacturer associations

ANIMA/AVR
BATHROOM MANUFACTURERS ASSOCIATION
PROFLUID
Swiss Society of Engineers and Architects - SIA
VDMA

14.3 Test laboratories

CSTB
DVGW
KIWA NV
SVGW
WATER RELIANCE CONTROLS
WRC NSF LTD

And, of course, the national standardisation bodies of the EU and EFTA members.

15. USEFUL LINKS




International Organization for Standardization
www.iso.ch



European Committee for Standardization
<http://www.cen.eu/>

TC164/WG8 – Sanitary Tapware

Secretariat held by  *Profluid* (French pump, compressor and valve association)
www.profluid.org/e-committee/



The European Committee for the Valve Industry
<http://www.ceir.eu/>

CE marking

New Approach Directives
www.newapproach.org

16. CREDITS

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