



**SLOVENSKI STANDARD**  
**oSIST prEN 1111:2024**

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**SIST EN 1111:2017**

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**Sanitarne armature - Termostatska mešalna armatura (PN 10) - Splošne tehnične zahteve**

Sanitary tapware - Thermostatic mixing valves (PN 10) - General technical specification

Sanitärarmaturen - Thermostatischer Mischer (PN 10) - Allgemeine technische Spezifikation

Robinetterie sanitaire - Mitigeurs thermostatiques (PN 10) - Spécifications techniques générales

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**ICS:**

91.140.70      Sanitarne naprave      Sanitary installations

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## Sanitary tapware - Thermostatic mixing valves (PN 10) - General technical specification

Robinetterie sanitaire - Mitigeurs thermostatiques (PN 10) - Spécifications techniques générales

Sanitärarmaturen - Thermostatische Mischer (PN 10) - Allgemeine technische Spezifikation

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

## Contents

	Page
European foreword.....	6
Introduction .....	7
1 Scope.....	8
2 Normative references.....	8
3 Terms and definitions .....	9
4 Symbols and units.....	10
5 Classification.....	11
6 Designation.....	11
7 Marking/identification .....	12
7.1 Marking.....	12
7.2 Identification .....	12
8 Materials.....	12
8.1 Chemical and hygiene requirements .....	12
8.2 Exposed surface condition and quality of coating.....	12
9 Dimensional characteristics.....	13
9.1 General remarks.....	13
9.2 Inlet dimensions.....	13
9.3 Outlet dimensions.....	15
9.4 Mounting dimensions.....	17
9.5 Special cases.....	19
9.6 Flexible hoses for outlet 2 .....	19
9.7 Outlet 2.....	19
10 Backflow protection.....	19
11 Test sequence .....	20
12 Leaktightness.....	20
12.1 General.....	20
12.1.1 Principle .....	20
12.1.2 Apparatus.....	20
12.2 Leaktightness of the obturator and upstream thereof.....	20
12.2.1 General.....	20
12.2.2 Procedure.....	20
12.2.3 Requirements.....	20
12.3 Cross-flow between inlets.....	21
12.3.1 General.....	21
12.3.2 Procedure.....	21
12.3.3 Requirements.....	21
12.4 Leaktightness downstream of the obturator .....	21
12.4.1 Procedure.....	21
12.4.2 Requirements.....	21
12.5 Leaktightness of manually operated diverter .....	21
12.5.1 Procedure.....	21
12.5.2 Requirement.....	22

12.6	Leaktightness of diverters with automatic return .....	22
12.6.1	Procedure .....	22
12.6.2	Requirement.....	22
13	Performance .....	22
13.1	General .....	22
13.1.1	Initial settings .....	22
13.1.2	Apparatus .....	23
13.1.3	Procedure .....	23
13.2	Determination of flow rate.....	24
13.2.1	Principle.....	24
13.2.2	Procedure .....	24
13.2.3	Evaluation of the results .....	25
13.2.4	Requirements.....	25
13.3	Sensitivity .....	25
13.3.1	General .....	25
13.3.2	Principle.....	25
13.3.3	Procedure .....	25
13.3.4	Evaluation of results.....	26
13.3.5	Requirements.....	26
13.4	Fidelity.....	27
13.4.1	General .....	27
13.4.2	Principle.....	27
13.4.3	Procedure .....	27
13.4.4	Evaluation of results.....	27
13.4.5	Requirements.....	27
13.5	Temperature stability.....	28
13.5.1	Temperature control operation.....	28
13.5.2	Flow rate reduction.....	29
13.5.3	Cold supply failure and restoration.....	30
13.5.4	Supply pressure variation .....	31
13.5.5	Supply temperature variation .....	32
13.5.6	Temperature Override Stops .....	33
14	Pressure resistance.....	34
14.1	General .....	34
14.2	Apparatus .....	34
14.3	Testing of mechanical performance of the thermostatic mixing valve upstream of the obturator in the closed position.....	34
14.3.1	Procedure .....	34
14.3.2	Requirement.....	34
14.4	Mechanical behaviour downstream of the obturator – Obturator in the open position ....	35
14.4.1	Procedure .....	35
14.4.2	Requirement.....	35
15	Torsional resistance of the operating controls.....	35
15.1	General .....	35
15.2	Test method.....	35
15.2.1	Principle of the test.....	35
15.2.2	Apparatus .....	35
15.2.3	Procedure .....	35
16	Mechanical endurance characteristics .....	36
16.1	General .....	36
16.2	Endurance test for single sequential control device.....	36

## prEN 1111:2024 (E)

16.2.1	Principle .....	36
16.2.2	Apparatus.....	36
16.2.3	Procedure.....	36
16.2.4	Requirement.....	37
16.3	Endurance test for on/off flow control device operated by rotating the control handle.....	37
16.3.1	Principle .....	37
16.3.2	General.....	37
16.4	Endurance test for on/off flow control device, combined with diverter mechanism .....	37
16.4.1	Principle .....	37
16.4.2	Apparatus.....	37
16.4.3	Procedure.....	37
16.4.4	Requirement.....	38
16.5	Endurance test for other on-off flow control device .....	38
16.5.1	Principle .....	38
16.5.2	Apparatus.....	38
16.5.3	Procedure.....	38
16.5.4	Requirement.....	39
16.6	Mechanical endurance of diverters of thermostatic mixing valves .....	39
16.6.1	General.....	39
16.6.2	Test method .....	39
16.6.3	Requirements .....	40
16.7	Mechanical endurance of swivel spouts .....	40
16.7.1	General.....	40
16.7.2	Test method .....	40
16.7.3	Requirements .....	41
16.8	Thermal Element.....	41
16.8.1	Principle .....	41
16.8.2	Temperature adjustable valves (Type 1, 2, 4) .....	41
16.8.3	Temperature set valves (Type 5) .....	42
16.8.4	Other valves with special control devices (Type 6).....	42
17	Acoustic characteristics.....	43
17.1	General.....	43
17.2	Procedure.....	43
17.2.1	Fitting and operating conditions for thermostatic mixing valves .....	43
17.2.2	Test method .....	43
17.3	Requirements .....	43
17.3.1	Expression of results.....	43
17.3.2	Determination of acoustic groups.....	43
17.3.3	Flow rate classes (thermostatic mixing valves Type 1, 2, 3) .....	43
Annex A	(normative) Test Set-up Descriptions.....	45
A.1	General.....	45
A.2	Inlet pipework.....	45
A.2.1	Thermostat endurance.....	45
A.2.2	Performance .....	46
A.3	Outlet pipework.....	46
A.3.1	General.....	46
A.3.2	Outlet for valves without integral atmospheric discharge spouts .....	47

<b>A.3.3</b>	<b>Outlet for valves with atmospheric discharge nozzles .....</b>	<b>50</b>
<b>Annex B</b>	<b>(informative) Measurements .....</b>	<b>51</b>
<b>B.1</b>	<b>Pressure .....</b>	<b>51</b>
<b>B.2</b>	<b>Flow .....</b>	<b>51</b>
<b>B.3</b>	<b>Temperature .....</b>	<b>51</b>
<b>B.3.1</b>	<b>Mounting.....</b>	<b>51</b>
<b>B.3.2</b>	<b>Accuracy.....</b>	<b>51</b>
<b>B.3.3</b>	<b>Response time.....</b>	<b>51</b>
<b>B.4</b>	<b>Angular position.....</b>	<b>51</b>
<b>B.5</b>	<b>Duration of transients.....</b>	<b>51</b>
<b>Annex C</b>	<b>(informative) Temperature transient.....</b>	<b>54</b>
<b>C.1</b>	<b>Positive temperature transient.....</b>	<b>54</b>
<b>C.2</b>	<b>Negative temperature transient.....</b>	<b>55</b>
<b>Annex D</b>	<b>(informative) Acoustic classification (example).....</b>	<b>56</b>
<b>D.1</b>	<b>Thermostatic mixing valve with nozzle.....</b>	<b>56</b>
<b>D.2</b>	<b>Thermostatic mixing valves with shower or shower head outlet.....</b>	<b>56</b>
<b>D.3</b>	<b>Thermostatic mixing valves with nozzle and shower or shower head outlet .....</b>	<b>56</b>
<b>Bibliography</b>	<b>.....</b>	<b>58</b>

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[oSIST prEN 1111:2024](https://standards.iteh.ai/catalog/standards/sist/f076f24c-86c2-4201-8505-a862d818fbef/osist-pren-1111-2024)

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**prEN 1111:2024 (E)****European foreword**

This document (prEN 1111:2024) has been prepared by Technical Committee CEN/TC 164 “Water Supply”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 1111:2017.

prEN 1111:2024 includes the following significant technical changes with respect to EN 1111:2017:

- a) the introduction of Clause 10 on backflow protection;
- b) the introduction of Clause 11 on test sequence;
- c) the introduction of Clause 13 on performance;
- d) the update of chapters on pressure resistance, torsional resistance and mechanical resistance;
- e) new Annexes A, B, C and D.

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## Introduction

In respect of potential adverse effects on the quality of water intended for human consumption, caused by the product covered by this document, it provides no information as to whether the product can be used without restriction in any of the Member state of the EU or EFTA;

NOTE While awaiting the adoption of verifiable European criteria, attention is also drawn to national regulations that can apply.

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## 1 Scope

This document specifies general construction, performance and material requirements for PN 10 thermostatic mixing valves (TMV) and includes test methods for the verification of mixed water temperature performance at the point of use below 45 °C. This does not exclude the selection of higher temperatures where available. When these devices are used to provide anti-scald protection for children, elderly and disabled persons, the mixed water temperature needs to be set at a suitable bathing temperature (body temperature approximately 38 °C) as children are at risk to scalding at lower temperatures than adults. This does not obviate the need for supervision of young children during bathing.

It applies to valves intended for use on sanitary appliances in kitchens, washrooms (incl. all rooms with sanitary tapware, e.g. toilets and cloakrooms) and bath rooms operating under the conditions specified in Table 1.

This document allows TMVs to supply a single outlet or a small number of outlets in a “domestic” application (e.g. one valve controlling a shower, bath, basin and/or bidet), excluding valves specifically designed for supplying a large number of outlets (i.e. for institutional use).

The tests described are type tests (laboratory tests) and not quality control tests carried out during manufacture.

**Table 1 — Conditions of use**

Supply	Operating range	
	limits	recommended
Pressure		
Static	≤ 1 MPa [≤10 bar]	
Dynamic	≥ 0,05 MPa [≥0,5 bar]	(0,1 to 0,5) MPa [(1 to 5) bar]
Temperature		
Hot	≤ 90°C	(55 to 65) °C
Cold	≤ 25°C	(5 to 20) °C

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 200, *Sanitary tapware — Single taps and combination taps for water supply systems of type 1 and type 2 — General technical specification*

EN 246, *Sanitary tapware — General specifications for aerators*

EN 248, *Sanitary tapware — General specification for electrodeposited coatings of Ni-Cr*

EN 1057, *Copper and copper alloys — Seamless, round copper tubes for water and gas in sanitary and heating applications*

EN 1112, *Sanitary tapware — Shower outlets for sanitary tapware for water supply systems of type 1 and type 2 — General technical specification*

EN 1113, *Sanitary tapware — Shower hoses for sanitary tapware for water supply systems of type 1 and type 2 - General technical specification*

EN 1717, *Protection against pollution of potable water in water installations and general requirements of devices to prevent pollution by backflow*

EN 13618, *Flexible hose assemblies in drinking water installations — Functional requirements and test methods*

EN 13959, *Anti-pollution check valves — DN 6 to DN 250 inclusive family E, type A, B, C and D*

EN 14506, *Devices to prevent pollution by backflow of potable water — Automatic diverter — Family H, type C*

EN 16145, *Sanitary tapware — Extractable outlets for sink and basin mixers — General technical specification*

EN 60584 (all parts), *Thermocouples (IEC 60584)*

EN ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation (ISO 228-1)*

EN ISO 3822-1, *Acoustics — Laboratory tests on noise emission from appliances and equipment used in water supply installations — Part 1: Method of measurement (ISO 3822-1)*

EN ISO 3822-2, *Acoustics — Laboratory tests on noise emission from appliances and equipment used in water supply installations — Part 2: Mounting and operating conditions for draw-off taps and mixing valves (ISO 3822-2)*

EN ISO 3822-3, *Acoustics — Laboratory tests on noise emission from appliances and equipment used in water supply installations — Part 3: Mounting and operating conditions for in-line valves and appliances (ISO 3822-3)*

EN ISO 3822-4:1997, *Acoustics — Laboratory tests on noise emission from appliances and equipment used in water supply installations — Part 4: Mounting and operating conditions for special appliances (ISO 3822-4)*

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### 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

##### **thermostatic mixing valve**

##### **TMV**

valve, with one or more outlets, which mixes hot and cold water and automatically controls the mixed water to a selected temperature

#### 3.2

##### **fidelity**

reproducibility and accuracy of temperature selection

**prEN 1111:2024 (E)**

**3.3 obturator**  
movable component of the valve whose position in the fluid flow path permits, restricts or obstructs the fluid flow

Note 1 to entry: The flow rate between no flow and maximum flow conditions can be affected either by the same control device or a separate flow control device, where fitted.

**3.4 outlet 1**  
default position of the diverter

**3.5 outlet 2**  
outlet(s) other than outlet 1

**4 Symbols and units**

For the purposes of this document, the symbols and units given in Table 2 apply.

**Table 2 — Symbols and units**

Symbol	Characteristic	Unit
$D$	internal diameter of tube or casing	mm
$f$	thickness of the annular slit of Type C pressure take-off tees	mm
$i$	width of the annular slit of Type C pressure take-off tees	mm
$\vartheta_{pp}$	temperature peak to peak	°C
$p_c$	pressure of cold water supply	MPa (bar)
$p_h$	pressure of hot water supply	MPa (bar)
$Q_c$	flow rate of cold water	l/s (l/min)
$Q_h$	flow rate of hot water	l/s (l/min)
$Q_c + Q_h$	flow rate of mixed water	l/s (l/min)
$t_0$	time when equilibrium is disturbed	s
$t_1$	time when $\vartheta_{mix} = \vartheta_0 + \vartheta_x$	s
$t_2$	$= t_1 + 1 \text{ s}$	s
$t_3$	$= 5 \text{ s}$	s
$T_c$	temperature of cold water supply	°C
$T_h$	temperature of hot water supply	°C
$T_m$	temperature of mixed water	°C
$x_1$	distance	mm
$x_2$	distance	mm

Symbol	Characteristic	Unit
$\vartheta_0$	Set temperature	°C
$\vartheta_x$	Temperature amplitude	°C
$\vartheta_c$	Cold water temperature (Outlet temperature)	°C
$\vartheta_h$	Hot water temperature (Outlet temperature)	°C
$\vartheta_{mix}$	Mixed water temperature	°C

## 5 Classification

This classification covers the following types of TMVs:

- a) Type 1 - Single control: valves with a single control device regulating flow and temperature; (actuator movement in two planes);
- b) Type 2 - Dual control: valves with separate control devices regulating flow and temperature;
- c) Type 3 - Single sequential control: valves with a single control operating through a predetermined sequence of flow and temperature. These shall have a shut-off device; (actuator movement in one plane);
- d) Type 4 - TMVs without flow control device;
- e) Type 5 - Preset: valves not adjustable by the user of a sanitary appliance;
- f) Type 6 - Other: valves with special control devices.

## 6 Designation

TMVs covered by this document are designated as follows:

- a) its nominal inlet size, with or without diverter (see Table 3);
- b) type of body (see Table 3);
- c) type of outlet (see Table 3);
- d) the sanitary appliance on which it shall be used (Table 3);
- e) the method of mounting (see Table 3);
- f) its acoustic group and flow rate classes (Clause 17 and Clause 13);
- g) the reference to this document (EN 1111).

EXAMPLE TMV 1/2 with diverter, exposed body, fixed nozzle outlet bath/shower, horizontal mounting, group I class C/B EN 1111.

**Table 3 — Designation**

Type of tap	TMV with or without diverter and type of diverter (if applicable)
Type of body	Single or multi-hole, exposed, or concealed
Type of outlet	Fixed, moveable spout, with or without flow rate regulator
Intended use	Basin, bidet, sink, bath or shower
Mounting method	Horizontal or vertical surfaces
Acoustic group and classification	Group I, or group II, or unclassified
Flow rate class	Z, A, S, B, C, D
Reference to this document	EN 1111
Water saving properties	Yes / No

## 7 Marking/identification

### 7.1 Marking

TMVs shall be permanently and legibly marked with:

- the manufacturer's or agent's name or identification on the body or handle;
- the acoustic group and flow rate class or classes if classified.

A bath/shower mixer shall indicate both flow rate classes (the first for the bath outlet (outlet 1) and the second for the shower outlet (outlet 2)).

For water saving mixing valves, appropriate information to installers and users shall be provided.

### 7.2 Identification

The temperature control device for the valve shall be identified by means of a scale or symbols or colours or any combination thereof.

TMVs shall be legibly marked to indicate cold / hot inlets.

NOTE Exposed valves need only one identification of cold or hot inlet.

## 8 Materials

### 8.1 Chemical and hygiene requirements

All materials coming into contact with water intended for human consumption shall present no health risk nor cause any change to the water in terms of quality, appearances, smell or taste.

### 8.2 Exposed surface condition and quality of coating

Exposed chromium plated surfaces and Ni-Cr coatings shall comply with the requirements of EN 248.