

# Building valves — Combined temperature and pressure relief valves — Tests and requirements

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British Standard

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# National foreword

This British Standard is the official English language version of EN 1490:2000. It supersedes BS 6283-3:1991 which is withdrawn.

The UK participation in its preparation was entrusted by Technical Committee B/504, Water supply, to Subcommittee B/504/7, Control and safety devices in drinking water systems, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

## Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Find” facility of the BSI Standards Electronic Catalogue.

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## Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 25 and a back cover.

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English version

## Building valves - Combined temperature and pressure relief valves - Tests and requirements

Robinetterie de bâtiment - Soupapes combinées  
température et pression - Essais et prescriptions

Gebäudearmaturen - Kombinierte Druck-Temperaturventile  
- Prüfungen und Anforderungen

This European Standard was approved by CEN on 3 January 2000.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.



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## FOREWORD

This European Standard has been prepared by Technical Committee CEN/TC 164, Water supply, the Secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2000, and conflicting national standards shall be withdrawn at the latest by September 2000.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Annex A of this European Standard is informative.

## INTRODUCTION

In respect of potential adverse effect on the quality of water intended for human consumption caused by the product covered by this standard:

- a) this standard provides no information as to whether the product may be used without restriction in any of the Member States of the EU or EFTA;
- b) it should be noted that, whilst awaiting the adoption of verifiable European criteria, existing national regulations concerning the use and or the characteristics of this product remain in force.

## 1 SCOPE

This European Standard specifies, dimensions, materials and performance requirements (including methods of test) for combined temperature and pressure relief valves, of nominal sizes from DN 15 to DN 40, having working pressures<sup>1)</sup> from 0,1 MPa (1 bar) to 1,0 MPa (10 bar).

Combined temperature and pressure relief valves are intended for fitting to storage water heaters, having a maximum distribution temperature of 95 °C, for all energy sources.

Combined temperature and pressure relief valves control and limit the temperature and pressure of the water contained in a hot water heater to the valves rating pressure and a temperature not exceeding 100 °C and will prevent water to steam formation when other temperature controls fail.

They are not intended to act as an expansion valve under normal conditions and do not control cold water flow.

Alone the valve does not constitute the control functions for a water heater.

NOTE: The use of the device specified in this standard does not override the need to use controls (e.g. thermostats and cut-outs) which act directly on the power sources of water heaters.

## 2 NORMATIVE REFERENCES

This European Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest addition of the publication referred to applies.

|                 |                                                                                                                       |
|-----------------|-----------------------------------------------------------------------------------------------------------------------|
| EN 1254-2       | Copper and copper alloys - Plumbing fittings - Part 2: Fittings with compression ends for use with copper tubes.      |
| EN 1982         | Copper and copper alloys - Ingots and castings.                                                                       |
| EN 12420        | Copper and copper alloys – Forgings.                                                                                  |
| EN ISO 6509     | Corrosion of metals and alloys - Determination of dezincification resistance of brass (ISO 6509:1981).                |
| ISO 7-1:1994    | Pipe threads where pressure-tight joints are made on the threads - Part 1: Dimensions, tolerances and designation.    |
| ISO 228-1:1994  | Pipe threads where pressure-tight joints are not made on the thread - Part 1: Dimensions, tolerances and designation. |
| ISO 7005-3:1988 | Metallic flanges - Part 3: Copper alloy and composite flanges.                                                        |

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<sup>1)</sup> All pressures are gauge unless otherwise stated.

### 3 DEFINITIONS

For the purposes of this standard, the following definitions apply.

**3.1 temperature relief valve** temperature activated valve which opens automatically at a specified set temperature to discharge fluid. It is fitted to water heaters to prevent the temperature of the contained water from exceeding 100 °C

**3.2 pressure relief valve** pressure activated valve which opens automatically at a specified set pressure to discharge fluid. It is fitted to prevent the pressure in a water heater from exceeding the maximum working pressure

**3.3 combined temperature and pressure relief valve** valve which is capable of performing the function of both a temperature relief valve and a pressure relief valve

**3.4 thermal element** provides the thermal control; comprising a thermal probe and associated control rods

#### 3.5 Pressures

**3.5.1 nominal set pressure ( $P_{nr}$ )** pressure of the combined temperature and pressure relief valve which is set on production

**3.5.2 water tightness pressure ( $P_e$ )** pressure up to which the combined temperature and pressure relief valve is closed (see Figure 1)

**3.5.3 initial opening pressure ( $P_{dc}$ )** pressure at which the combined temperature and pressure relief valve opens for the first time, as indicated by the first droplet of water, after a period of storage (see Figure 1)

**3.5.4 opening pressure ( $P_o$ )** pressure at which a flow rate of 2,4 litre/hour of water is attained through the combined temperature and pressure relief valve (see Figure 1)

**3.5.5 rating pressure ( $P_{dn}$ )** pressure at which the water discharge capacity of the combined temperature and pressure relief valve corresponds to the rated flow (see Figure 1)

**3.5.6 closing pressure ( $P_f$ )** pressure at which the combined temperature and pressure relief valve closes after having reached the rating pressure (see Figure 1)

#### 3.6 Temperatures

**3.6.1 maximum working temperature** maximum temperature at which the combined temperature and pressure relief valve is designed to be used

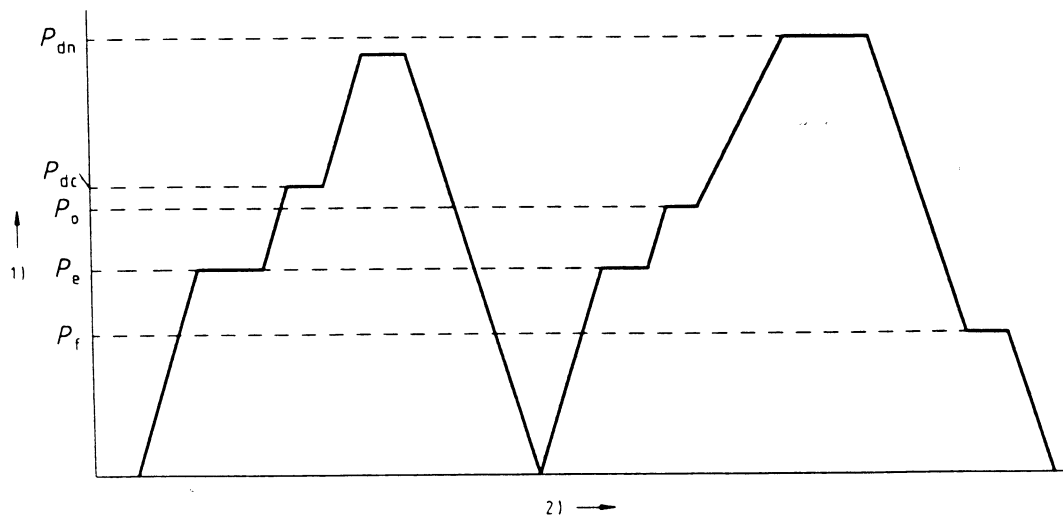
**3.6.2 nominal set temperature** temperature range, 90 °C to 95 °C, in which the combined temperature and pressure relief valve is set to operate

**3.6.3 initial opening temperature** temperature at which the combined temperature and pressure relief valve opens, as indicated by the first droplet of water, after a period of storage

**3.6.4 closing temperature** temperature at which the combined temperature and pressure relief valve closes after discharging under temperature conditions

**3.6.5 rated steam discharge capacity** minimum rate of steam discharge, kilogram/hour, that can be discharged through the valve under the conditions specified in the test in section 6.5

**3.6.6 water discharge capacity** rate of water discharge, litre/hour, that can be discharged through the combined temperature and pressure relief valve under the conditions specified in the test in section 6.4



### Key

- 1) Pressure
- 2) Time

**Figure 1 - Pressures - see Definitions**

**3.6.7 nominal power rating** power rating, in Table 9, to be assigned to a combined temperature and pressure relief valve, as appropriate, which meets the test criteria of tests in sections 6.4 and 6.5

## 4 MATERIALS AND SURFACE FINISHES

### 4.1 General

The selection of materials is the responsibility of the manufacturer, provided they satisfy the following requirements:

- a) materials and coatings shall not contaminate the drinking water, when in normal or accidental contact;
- b) in a technical document, the manufacturer shall state the nature of the materials and coatings used;
- c) material with inadequate corrosion resistance shall have additional protection; and
- d) the materials used shall not deteriorate at a temperature of 95 °C for 1 hour and be suitable under the temperatures specified in the tests in this standard.

### 4.2 Nature of materials

Examples of bronze and brass which may be used, without coating, for manufacturing purposes are given in Table 1.

**Table 1 - Examples of copper alloys**

| Material designation  |                  | European Standard |
|-----------------------|------------------|-------------------|
| Symbol                | Reference number |                   |
| Cu Sn 5 Pb 5 Zn 5 - C | CC491K           | EN 1982           |
| Cu Sn 3 Zn 8 Pb 5 - C | CC490K           | EN 1982           |
| Cu Zn 39 Pb 3         | CW614N           | EN 12420          |
| Cu Zn 40 Pb 2         | CW617N           | EN 12420          |
| Cu Zn 36 Pb 2 As      | CZ132            | —                 |

Copper-zinc alloys containing more than 10 % zinc are subject to dezincification when submitted to water capable of dezincification. In the countries where the use of products made of dezincification resistant materials is required, the products have to guarantee a dezincification depth less than 200 µm in any direction; they have to be tested in accordance with the standard EN ISO 6509 and have to be marked in compliance with the indications under section 11.

## 5 DESIGN AND DIMENSIONAL REQUIREMENTS

### 5.1 General guidance

- The combined temperature and pressure relief valve shall be of the type where the spring is isolated from the water.
- All components shall be designed so as to avoid any risk of seizing, scaling or sticking.
- Sliding or rotating parts shall not be in contact with water, except for the thermal element.
- The components controlling the setting of pressure and temperature valve shall not be accessible to the end user without damage to the valve.
- The thermal element shall be so designed that contact by water on the thermally responsive material is prevented.
- Wing or similar guides shall not be used on the inlet side of the combined temperature and pressure relief valve [see Figure 2d)].
- For combined temperature and pressure relief valves with threaded ends, two spanner flats shall be provided on the body.
- The normal operation of the combined temperature and pressure relief valve shall not be influenced by external forces.
- If there is only one direction for operation of rotary controls of a combined temperature and pressure relief valve, it shall be anti-clockwise.
- Where separate seats are fitted to the combined temperature and pressure relief valve disc or body, they shall be secured to prevent them from working loose in normal service.

### 5.2 Pressures

For set pressures below 0,3 MPa (3 bar), the same differential pressures shall be used as for 0,3 MPa (3 bar).

EXAMPLE: a combined temperature and pressure relief valve with a set pressure of 0,2 MPa (2 bar) shall have a rating pressure of  $P_{dn}$  equal to 0,23 MPa (2,3 bar), see Figure 1.