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TITOLO INGLESE Pressure equipment - Terminology - Part 1: Pressure, temperature, volume, nominal size

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## Pressure equipment - Terminology - Part 1: Pressure, temperature, volume, nominal size

Équipement sous pression - Terminologie - Partie 1:  
Pression, température, volume, dimension nominale

Druckgeräte - Terminologie - Teil 1: Druck, Temperatur,  
Volumen, Nennweite

This draft European Standard is submitted to CEN members for formal vote. It has been drawn up by the Technical Committee CEN/TC 54.

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## Foreword

This document (prEN 764-1:2003) has been prepared by Technical Committee CEN/TC 54 “Unfired Pressure Vessels”, the secretariat of which is held by BSI.

This document is currently submitted to the Formal Vote.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association. This European Standard is considered to be a supporting standard to those application and product standards which in themselves support an essential safety requirement of a New Approach Directive and which make reference to this European Standard.

This European Standard consists of seven parts which are :

Part 1 Pressure, temperature and volume ;

Part 2 Quantities, symbols and units ;

Part 3 Definition of parties involved ;

Part 4 Establishment of technical delivery conditions for metallic materials ;

Part 5 Compliance and inspection documentation of materials ;

Part 6 Operating instructions

Part 7 Safety systems for unfired pressure equipment

Annex A of this European Standard is informative.

This document replaces EN 764:1994

## 1 Scope

This part of the European standard defines the basic terminology and symbols to be used for pressure equipment addressed by the European Directive 97/23/EC with regard to pressure, temperature, volume and nominal size.

For the purpose of this standard "pressure equipment" means vessel, piping, pressure accessory and safety accessory.

Relations between pressure quantities defined in this standard are shown in Figures 4 and 5 of EN 764-7. These figures also illustrate relations between these pressures and those related to the safety accessory.

NOTE 1 In addition to terms used in the three official CEN languages (English, French and German), this European Standard gives in annex A the equivalent terms in the Danish, Dutch, Finnish, Greek, Icelandic, Italian, Norwegian, Portuguese, Spanish, and Swedish languages; these are published under the responsibility of the respective member bodies for those countries. However, only the terms and definitions given in the official languages can be considered as EN terms and definitions.

NOTE 2 This part of the European Standard does not stipulate the units to be used for the quantities defined. These are to be taken from the other parts of the standard.

## 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 edition of the publication referred to applies (including amendments).

ISO 31-0:1992, *Quantities and units - Part 0: General principles*.

## 3 Terms, definitions and symbols

For the purposes of this European Standard, the terms and definitions given in ISO 31-0:1992 and the following apply.

NOTE 1 All fluid pressures referred to (except 4.5 and 4.12) are relative to atmospheric pressure (also called gauge pressures). As a consequence, vacuum is designated by a negative value.

NOTE 2 Upper case letters may also be used. Additional suffixes, such as min or max, may be necessary.

### 3.1

#### **chamber**

fluid space within a unit of pressure equipment

NOTE The chambers are not intended to communicate between each other.

### 3.2

#### **component**

part of pressure equipment which can be considered as an individual item for the calculation

### 3.3

#### **pressure**

pressure relative to atmospheric pressure, i.e. gauge pressure. As a consequence, vacuum is designated by a negative value

**3.4****absolute pressure**

pressure for which the zero value is associated with absolute vacuum

**3.5****differential pressure**

pressure which algebraic value is equal to the pressure difference on either side of a separation wall

NOTE The gauge pressure (4.3) is a particular case of the differential pressure.

**3.6****operating pressure** PO,  $p_o$ 

fluid pressure occurring during specified operating conditions

**3.7****operating temperature** TO,  $t_o$ 

fluid temperature occurring during specified operating conditions

**3.8****maximum allowable pressure** PS,  $p_s$ 

maximum pressure for which the equipment is designed, as specified by the manufacturer

NOTE The subscript "max" is added to the symbol for maximum values.

**3.9****maximum/minimum allowable temperature** TS,  $t_s$ 

maximum/minimum temperatures for which the equipment is designed, as specified by the manufacturer

NOTES The subscript "max" is added to the symbol for maximum values.

The subscript "min" is added to the symbol for minimum values.

**3.10****design pressure** PD,  $p_d$ 

pressure at the top<sup>1)</sup> of each chamber of the pressure equipment chosen for the derivation of the calculation pressure of each component <sup>2)</sup>

**3.11****design temperature** TD,  $t_d$ 

temperature chosen for the derivation of the calculation temperature of each component <sup>2)</sup>

**3.12****calculation pressure** PC,  $p_c$ <sup>3)</sup>

differential pressure used for the purpose of the design calculations for a component <sup>4)</sup>

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<sup>1)</sup> This location is specified as a reference point to account for the effects of static head of the contained fluid. There may be cases where another location needs to be specified.

<sup>2)</sup> During the life of the pressure equipment the loadings are time dependent and determined by the combined effects of pressure, temperature and other factors. For complex equipment many such loadings may need consideration, governing loadings are not necessarily those which act at the same time and the same location. When cumulative damage may occur, e. g. in the creep range, the choice of design conditions may be affected.

<sup>3)</sup> In formulas for calculations the suffix "c" may be omitted.

<sup>4)</sup> Depending on the component and the operating conditions the design process may be governed by one or more sets of calculation pressures/temperatures.

**3.13**

**calculation temperature** TC,  $t_c^{(3)}$

temperature used for the purpose of the design calculations for a component <sup>4)</sup>

**3.14**

**test pressure** PT,  $p_t$

pressure to which the equipment is subjected for test purposes

**3.15**

**test temperature** TT,  $t_t$

temperature at which the pressure test of the pressure equipment is carried out

**3.16**

**accumulation**

temporary maximum amount by which the pressure may exceed the maximum allowable pressure PS, while a safety device is operating

**3.17**

**volume** V,  $V$

internal volume of a chamber, including the volume of nozzles to the first connection (flange, coupling, weld) and excluding the volume of internal permanent parts (e.g. baffles, agitators)

**3.18**

**nominal size** DN,  $DN$

numerical designation of size which is common to all components in a piping system other than components indicated by outside diameters or by thread size. It is a convenient round number for reference purposes and is only loosely related to manufacturing dimensions

## **Annex A** (informative)

### **Glossary**

The language Symbols are according to ISO 639:

|     |            |
|-----|------------|
| da: | Danish     |
| de: | German     |
| el: | Greek      |
| en: | English    |
| es: | Spanish    |
| fi: | Finnish    |
| fr: | French     |
| is: | Icelandic  |
| it: | Italian    |
| nl: | Dutch      |
| no: | Norwegian  |
| pt: | Portuguese |
| sv: | Swedish    |

|                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>to 4.1:</b></p> <p>da: trykbærende undstyr</p> <p>de: Druckgerät</p> <p>el: εξοπλισμός πίεσης</p> <p>en: pressure equipment</p> <p>es: aparato a presión</p> <p>fi: paineastia</p> <p>fr: équipement sous pression</p> <p>is: þrýstitæki</p> <p>it: apparecchio a pressione</p> <p>nl: druk-apparaat</p> <p>no: trykkpåkjent utstyr</p> <p>pt: equipamento sob pressão</p> <p>sv: tryckbärande anordning</p> | <p><b>to 4.2:</b></p> <p>da: tryktrum</p> <p>de: Druckraum</p> <p>el: διαμέρισμα</p> <p>en: Compartment</p> <p>es: compartimento</p> <p>fi: tila</p> <p>fr: compartiment</p> <p>is: þrýstirými</p> <p>it: camera</p> <p>nl: ruimte</p> <p>no: trykkrom</p> <p>pt: compartimento</p> <p>sv: tryckrum</p> |
| <p><b>to 4.3:</b></p> <p>da: komponent</p> <p>de: Bauteil</p> <p>el: συστατικό</p> <p>en: component</p> <p>es: componente</p> <p>fi: osakokonaisuus</p> <p>fr: composant</p> <p>is: þrýstihluti</p> <p>it: componente</p>                                                                                                                                                                                          | <p><b>to 4.4:</b></p> <p>da: absolut tryk</p> <p>de: Absolutdruck</p> <p>el: απόλυτη πίεση</p> <p>en: absolute pressure</p> <p>es: presión absoluta</p> <p>fi: absoluutinen paine</p> <p>fr: pression absolue</p> <p>is: raunþrýstingur</p> <p>it: pressione assoluta</p>                               |

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|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| nl: onderdeel<br>no: komponent<br>pt: componente<br>sv: komponent                                                                                                                                                                                                                           | nl: absolute druk<br>no: absolutt trykk<br>pt: pressão absoluta<br>sv: absoluttryck                                                                                                                                                                                                                                                          |
| <b>to 4.5:</b><br><br>da: overtryk<br>de: Überdruck<br>el: πίεση μετρητή<br>en: gauge pressure<br>es: presión relativa<br>fi: ylipaine<br>fr: pression effective<br>is: yfirþrýstingur<br>it: pressione effettiva<br>nl: overdruk<br>no: overtrykk<br>pt: pressão relativa<br>sv: övertryck | <b>to 4.6:</b><br><br>da: differenstryk<br>de: Differenzdruck<br>el: διαφορική πίεση<br>en: differential pressure<br>es: presión diferencial<br>fi: paine-ero<br>fr: pression différentielle<br>is: þrýstimunur<br>it: pressione differenziale<br>nl: verschildruk<br>no: differensialtrykk<br>pt: pressão diferencial<br>sv: differenstryck |
| <b>to 4.7: <math>P_o</math></b><br><br>da: driftstryk<br>de: Arbeitsdruck<br>el: πίεση λειτουργίαζ<br>en: operating pressure<br>es: presión de servicio                                                                                                                                     | <b>to 4.8: <math>t_o</math></b><br><br>da: driftstemperatur<br>de: Arbeitstemperatur<br>el: θερμοκρασία λειτουργίαζ<br>en: operating temperature<br>es: temperatura de servicio                                                                                                                                                              |

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|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>fi: käyttöpain</p> <p>fr: pression en service</p> <p>is: vinnuþrýstingur</p> <p>it: pressione di esercizio</p> <p>nl: gebruiksdruk</p> <p>no: driftstrykk</p> <p>pt: pressão de serviço</p> <p>sv: drifttryck</p>                                                                                                                                                                                                         | <p>fi: käyttölämpötila</p> <p>fr: température en service</p> <p>is: vinnuhiti</p> <p>it: temperatura di esercizio</p> <p>nl: gebruikstemperatuur</p> <p>no: driftstemperatur</p> <p>pt: temperatura de serviço</p> <p>sv: drifttemperatur</p>                                                                                                                                                                                                                                |
| <p><b>to 4.9: <math>P_s</math></b></p> <p>da: tilladeligt tryk</p> <p>de: zulässiger Druck</p> <p>el: επιτρεπτή πίεση</p> <p>en: allowable pressure</p> <p>es: presión admisible</p> <p>fi: sallittu paine</p> <p>fr: pression admissible</p> <p>is: leyfilegur þrýstingur</p> <p>it: pressione ammissibile</p> <p>nl: toelaatbare druk</p> <p>no: tillatt trykk</p> <p>pt: pressão admissível</p> <p>sv: tillåtet tryck</p> | <p><b>to 4.10: <math>t_s</math></b></p> <p>da: tilladelig temperatur</p> <p>de: zulässige Temperatur</p> <p>el: επιτρεπτή θερμοκρασία</p> <p>en: allowable temperature</p> <p>es: temperatura admisible</p> <p>fi: sallittu lämpötila</p> <p>fr: température admissible</p> <p>is: ley filegur hiti</p> <p>it: temperatura ammissibile</p> <p>nl: toelaatbare temperatuur</p> <p>no: tillatt temperatur</p> <p>pt: temperatura admissível</p> <p>sv: tillåten temperatur</p> |

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| <p><b>to 4.11: <math>P_d</math></b></p> <p>da: konstruktionstryk</p> <p>de: Konstruktionsdruck</p> <p>el: πίεση χατασχευήζ</p> <p>en: design pressure</p> <p>es: presión de diseño</p> <p>fi: suunnittelupaine</p> <p>fr: pression de conception</p> <p>is: hönnunarþrýstingur</p> <p>it: pressione di progetto</p> <p>nl: ontwerpdruk</p> <p>no: konstruksjonstrykk</p> <p>pt: pressão de projecto</p> <p>sv: konstruktionstryck</p> | <p><b>to 4.12: <math>t_d</math></b></p> <p>da: konstruktionstemperatur</p> <p>de: Konstruktionstemperatur</p> <p>el: θερμοκρασία χατασχευήζ</p> <p>en: design temperature</p> <p>es: temperatura de diseño</p> <p>fi: suunnittelulämpötila</p> <p>fr: température de conception</p> <p>is: hönnunarhiti</p> <p>it: temperatura di progetto</p> <p>nl: ontwerptemperatuur</p> <p>no: konstruksjonstemperatur</p> <p>pt: temperatura de projecto</p> <p>sv: konstruktionstemperatur</p> |
| <p><b>to 4.13: <math>P_c</math></b></p> <p>da: regningsmæssigt tryk</p> <p>de: Berechnungsdruck</p> <p>el: πίεση υπολογισμών</p> <p>en: calculation pressure</p> <p>es: presión de cálculo</p> <p>fi: laskentapaine</p>                                                                                                                                                                                                               | <p><b>to 4.14: <math>t_c</math></b></p> <p>da: regningsmæssig temperatur</p> <p>de: Berechnungstemperatur</p> <p>el: θερμοκρασία υπολογισμών</p> <p>en: calculation temperature</p> <p>es: temperatura de cálculo</p> <p>fi: laskentalämpötila</p>                                                                                                                                                                                                                                    |

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|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| fr: pression de calcul<br>is: reikniþrýstingur<br>it: pressione di calcolo<br>nl: berekeningsdruk<br>no: beregningstrykk<br>pt: pressão de cálculo<br>sv: beräkningstryck                                                                                                                                                | fr: température de calcul<br>is: reiknihiti<br>it: temperatura di calcolo<br>nl: berekeningstemperatuur<br>no: beregningstemperatur<br>pt: temperatura de cálculo<br>sv: beräkningstemperatur                                                                                                                                                                            |
| <b>to 4.15: <math>P_t</math></b><br><br>da: prøvningstryk<br>de: Prüfdruck<br>el: πίεση δοκιμής<br>en: test pressure<br>es: presión de prueba<br>fi: koepaine<br>fr: pression d'essai<br>is: prófþrýstingur<br>it: pressione di prova<br>nl: persdruk<br>no: prøvingstrykk<br>pt: pressão de ensaio<br>sv: kontrolltryck | <b>to 4.16: <math>t_t</math></b><br><br>da: prøvningstemperatur<br>de: Prüftemperatur<br>el: θερμοκρασία δοκιμής<br>en: test temperature<br>es: temperatura de prueba<br>fi: koelämpötila<br>fr: température d'essai<br>is: prófhiti<br>it: temperatura di prova<br>nl: perstemperatuur<br>no: prøvingstemperatur<br>pt: temperatura de ensaio<br>sv: kontrolltemperatur |

| to 4.17:                                                                                                                                                                                                                                                                                      | to 4.18: <i>V</i>                                                                                                                                                                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| da: akkumulering<br>de: Drucküberschreitung<br>el: υπέρβαση πίεσης<br>en: accumulation<br>es: acumulación<br>fi: paineen nousu<br>fr: accumulation<br>is: þrýstifirskot<br>it: accumulazione<br>nl: accumulatie<br>no: trykkoppbygging<br>pt: acumulação de pressão<br>sv: trycköverskridning | da: volumen<br>de: Volumen<br>el: όγκος<br>en: volume<br>es: volumen<br>fi: tilavuus<br>fr: volume<br>is: rúmmál<br>it: volume<br>nl: volume<br>no: volum<br>pt: volume<br>sv: volym |

## **Bibliography**

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EN 764-7:2002, *Pressure equipment – Part 7 : Safety systems for unfired pressure equipment.*