BS EN 14276-1:2020

BSI Standards Publication

# Pressure equipment for refrigerating systems and heat pumps

Part 1: Vessels — General requirements

bsi.

# National foreword

This British Standard is the UK implementation of EN 14276-1:2020. It supersedes BS EN 14276-1:2006+A1:2011, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee RHE/18, Refrigeration safety.

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

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.


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**Compliance with a British Standard cannot confer immunity from legal obligations.**

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# EN 14276-1

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Supersedes EN 14276-1:2006+A1:2011

English Version

# Pressure equipment for refrigerating systems and heat pumps - Part 1: Vessels - General requirements

Équipements sous pression pour systèmes de réfrigération et pompes à chaleur - Partie 1 : Récipients - Exigences générales

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This European Standard was approved by CEN on 1 December 2019.

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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 CEN-CENELEC Management Centre has the same status as the official versions.

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

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## European foreword

This document (EN 14276-1:2020) has been prepared by Technical Committee CEN/TC 182 "Refrigerating systems, safety and environmental requirements", the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by August 2020, and conflicting national standards shall be withdrawn at the latest by August 2020.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document will supersede EN 14276-1:2006+A1:2011.

This document has been prepared under a standardization request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

EN 14276, *Pressure equipment for refrigerating systems and heat pumps*, is currently composed with the following parts:

— *Part 1: Vessels – General requirements*;

— *Part 2: Piping – General requirements*.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

# Introduction

This document recognizes the unique nature of vessels for refrigerating systems or heat pumps and is intended to address the specific needs of the refrigeration and heat pump industry. This document should be read in conjunction with the various parts of the EN 13445 series.

When the text of this document modifies or supplements a clause within the EN 13445 series, then this document should prevail. Where this document does not modify or supplement the requirements of a clause, the requirements of the EN 13445 series should prevail.

The unique nature of a refrigerating system is defined as follows:

a) the purpose of the refrigerating system is to extract and reject heat (this involves both cooling and heating);

b) to operate the refrigerating system a pressure-imposing element (e.g. a compressor or an energy source) is necessary;

c) the refrigerating system has a defined refrigerant charge in a closed circuit;

d) the refrigerant has a chemical composition and purity defined in the relevant standards;

e) the pressure of the refrigerant decreases when the temperature decreases (see typical curve in Annex A of this document);

f) due to the maximum temperature limit of 200 °C and the maximum pressure limit of 160 bar, the time dependant creep and fatigue due to pressure variation or vibrations are not significant design factors except for some materials such as aluminium, copper and titanium where the fatigue should be taken into account;

g) the risk of overpressure is due to:

   1) the pressure imposing element;

   2) an external heat source (e.g. fire or hot water);

   3) improper operation.

h) the refrigerating system is designed to minimize refrigerant emissions and the ingress of contaminants.

Hermetic compressors are covered by this document.

# 1 Scope

This document specifies the requirements for material, design, manufacturing, testing and documentation for stationary pressure vessels intended for use in refrigerating systems and heat pumps. These systems are referenced in this document as refrigerating systems as defined in EN 378-1:2016.

The term "refrigerating system" used in this document includes heat pumps.

This document applies to vessels, including welded or brazed attachments up to and including the nozzle flanges, screwed, welded or brazed connectors, or to the edge to be welded or brazed at the first circumferential joint connecting piping or other elements.

This document applies to pressure vessels with an internal pressure down to –1 bar, to account for the evacuation of the vessel prior to charging with refrigerant.

This document applies to both the mechanical loading conditions and thermal conditions as defined in EN 13445-3:2014[1] associated with refrigerating systems. It applies to pressure vessels subject to the maximum allowable temperatures for which nominal design stresses for materials are derived using EN 13445-2:2014[2] and EN 13445-3:2014[1] or as specified in this document. In addition, vessels designed to this document can have a maximum allowable temperature not exceeding 200 °C and a maximum design pressure not exceeding 160 bar. Outside of these limits, it is important that the EN 13445 series be used for the design, construction and inspection of the vessel. Under these circumstances, it is important that the unique nature of refrigerating plant, as indicated in the introduction to this document, also be taken into account.

It is important that pressure vessels used in refrigerating systems and heat pumps of category less than II as defined in Annex H comply with other relevant clauses of EN 378-2:2016 for vessels.

This document applies to pressure vessels where the main pressure bearing parts are manufactured from metallic ductile materials as defined in Clause 4 and Annex I of this document.

This document does not apply to vessels of the following types:

— vessels of riveted construction;

— multi-layered, autofrettaged or prestressed vessels;

— vessels directly heated by a flame;

— "roll bond" heat exchangers.

# 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 378-1:2016, *Refrigerating systems and heat pumps — Safety and environmental requirements - Part 1: Basic requirements, definitions, classification and selection criteria*

[1] As impacted by EN 13445-3:2014/A1:2015, EN 13445-3:2014/A2:2016, EN 13445-3:2014/A3:2017, EN 13445-3:2014/A4:2018 and EN 13445-3:2014/A5:2018.

[2] As impacted by EN 13445-2:2014/A1:2016, EN 13445-2:2014/A2:2018 and EN 13445-2:2014/A3:2018.