



SLOVENSKI STANDARD SIST EN ISO 14903:2017

01-oktober-2017

Nadomešča:
SIST EN 16084:2011

Hladilni sistemi in toplotne črpalke - Ocena tesnosti sestavnih delov in spojev (ISO 14903:2017)

Refrigerating systems and heat pumps - Qualification of tightness of components and joints (ISO 14903:2017)

Kälteanlagen und Wärmepumpen - Qualifizierung der Dichtigkeit der Bauteile und Verbindungen (ISO 14903:2017)

Systèmes de réfrigération et pompes à chaleur - Qualification de l'étanchéité des composants et des joints (ISO 14903:2017)

Ta slovenski standard je istoveten z: EN ISO 14903:2017

ICS:

| | | |
|--------|----------------------|--------------------------|
| 27.080 | Toplotne črpalke | Heat pumps |
| 27.200 | Hladilna tehnologija | Refrigerating technology |

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EUROPEAN STANDARD

EN ISO 14903

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2017

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Supersedes EN 16084:2011

English Version

Refrigerating systems and heat pumps - Qualification of tightness of components and joints (ISO 14903:2017)

Systèmes de réfrigération et pompes à chaleur -
Qualification de l'étanchéité des composants et des
joints (ISO 14903:2017)

Kälteanlagen und Wärmepumpen - Qualifizierung der
Dichtheit der Bauteile und Verbindungen (ISO
14903:2017)

This European Standard was approved by CEN on 10 June 2017.

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European foreword

This document (EN ISO 14903:2017) has been prepared by Technical Committee ISO/TC 86 “Refrigeration and air-conditioning” in collaboration with 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of an identical text or by endorsement, at the latest by February 2018 and conflicting national standards shall be withdrawn at the latest by February 2018.

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.

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INTERNATIONAL
STANDARD

ISO
14903

Second edition
2017-07

**Refrigerating systems and heat
pumps — Qualification of tightness of
components and joints**

*Systèmes de réfrigération et pompes à chaleur — Qualification de
l'étanchéité des composants et des joints*

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html. (standards.iteh.ai)

This document was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 182, *Refrigerating systems, safety and environmental requirements*, in collaboration with ISO Technical Committee TC 86, *Refrigeration and air-conditioning*, Subcommittee SC 1, *Safety and environmental requirements for refrigerating systems*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 14903:2012), which has been technically revised.

Refrigerating systems and heat pumps — Qualification of tightness of components and joints

1 Scope

This document provides the qualification procedure for type approval of the tightness of hermetically sealed and closed components, joints and parts used in refrigerating systems and heat pumps as described in relevant parts of ISO 5149. The sealed and closed components, joints and parts concerned are, in particular, fittings, bursting discs, flanged or fitted assemblies. The tightness of flexible piping made from non-metallic materials is dealt with in ISO 13971. Metal flexible piping are covered by this document.

The requirements contained in this document are applicable to joints of maximum DN 50 and components of internal volume of maximum 5 l and maximum weight of 50 kg.

This document is intended to characterize their tightness stresses met during their operations, following the fitting procedure specified by the manufacturer, and to specify the minimal list of necessary information to be provided by the supplier of a component to the person in charge of carrying out this procedure.

It specifies the level of tightness of the component, as a whole, and its assembly as specified by its manufacturer.

It applies to the hermetically sealed and closed components, joints and parts used in the refrigerating installations, including those with seals, whatever their material and their design are.

This document specifies additional requirements for mechanical joints that can be recognized as hermetically sealed joints.

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.

ISO 175, *Plastics — Methods of test for the determination of the effects of immersion in liquid chemicals*

ISO 1817, *Rubber, vulcanized or thermoplastic — Determination of the effect of liquids*

ISO 5149-1, *Refrigerating systems and heat pumps — Safety and environmental requirements — Part 1: Definitions, classification and selection criteria*

ISO 5149-2, *Refrigerating systems and heat pumps — Safety and environmental requirements — Part 2: Design, construction, testing, marking and documentation*

ISO 13971, *Refrigeration systems and heat pumps — Flexible pipe elements, vibration isolators, expansion joints and non-metallic tubes — Requirements and classification*

IEC 60068-2-64, *Environmental testing — Part 2-64: Tests — Test Fh: Vibration, broadband random and guidance*

EN 1593, *Non-destructive testing — Leak testing — Bubble emission techniques*

EN 13185:2001, *Non-destructive testing — Leak testing — Tracer gas method*

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3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5149-1 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1 mass flow rate

Q_m
value of the leak mass flow rate at any point of the component

Note 1 to entry: The mass flow rate is expressed in grams (g) per year.

3.2 volume flow rate

Q
value of the leak volume flow rate at any point of the component

Note 1 to entry: The volume flow rate is expressed in Pascal cubic metres per second (Pa·m³/s).

3.3 hermetically-sealed system

system in which all refrigerant containing parts are made tight by welding, brazing or a similar permanent connection which may include capped valves and capped service ports that allow proper repair or disposal and which have a tested tightness control level of less than 3 g per year under a pressure of at least a quarter of the maximum allowable pressure

Note 1 to entry: Sealed systems as defined in ISO 5149-1 are equal to hermetically-sealed systems.

3.4 product family

group of products that have the same function, technology, and material for each functional part and sealing materials

3.5 closed joint

joint other than hermetically-sealed joints where there is no movement between the sealing surfaces except for service purposes

EXAMPLE Flanged joints.

3.6 closed component

component other than hermetically-sealed components where there is no movement between the sealing surfaces except for service purpose

EXAMPLE Stop valves, service ports, pressure-relief valves.

3.7 hermetically-sealed joint

joint that are made tight by welding, brazing or a similar permanent connection

3.8 hermetically-sealed component

component that are made tight by welding, brazing or a similar permanent connection

3.9**permanent joint**

joint which cannot be disconnected except by destructive methods

[SOURCE: Pressure Equipment Directive 2014/68/EU, modified]

3.10**reusable joint**

joint made without replacing the sealing material in general procedure

Note 1 to entry: In some cases, the tube is used as sealing material (e.g. flared joint).

3.11**same base material**

material belonging to the same group

EXAMPLE Steel group, aluminium and aluminium alloy group or copper group.

Note 1 to entry: Subgroups of these material groups are considered to be same base materials (refer to EN 14276-2).

4 Symbols

| Symbol | Denomination | Unit |
|--------------------|--|----------|
| D_K | Percentage deviation of the minimum and maximum torque from the average of the minimum and maximum torque, $(K_{\max} - K_{\min}) / (K_{\min} + K_{\max})$ | — |
| f | Frequency of vibrations | Hz |
| K_{ave} | Average torques of the respective joint standard | Nm |
| K_{\max} | Required maximum torques of the respective joint standard, if specified. Otherwise, the maximum torque values supplied by the manufacturer. | Nm |
| K_{\min} | Required minimum torques of the respective joint standard, if specified. Otherwise, the minimum torque values supplied by the manufacturer. | Nm |
| L | Length of tube | mm |
| n | Number of cycles in temperature and in pressure (method 1) | — |
| n_1 | Number of cycles in temperature and in pressure (method 2) | — |
| n_2 | Number of cycles in pressure | — |
| n_3 | Number of cycles in vibration | — |
| n_{total} | Total number of cycles in temperature and in pressure | — |
| N | Number of samples | — |
| P | Tightness test pressure | bar |
| P_{\max} | Maximal pressure of cycle | bar |
| P_{\min} | Minimal pressure of cycle | bar |
| PS | Maximal allowable pressure | bar |
| P_{set} | Nominal set pressure of the device | bar |
| Q | Volume flow leakage rate | mbar l/s |
| Q_m | Mass flow leakage rate | g/a |
| s | Vibration displacement (peak to peak value) | mm |
| t_{\max} | Maximal temperature of cycle | °C |
| t_{\min} | Minimal temperature of cycle | °C |

5 Test requirements

The required tests to be applied to component bodies and joint used in refrigerating systems and heat pumps are given in [Table 1](#) and in [Table 2](#).