SLOVENSKI STANDARD
SIST EN 1736:2000

01-december-2000

Refrigerating systems and heat pumps - Flexible pipe elements, vibration isolators and expansion joints - Requirements, design and installation

Refrigerating systems and heat pumps - Flexible pipe elements, vibration isolators and expansion joints - Requirements, design and installation

Kälteanlagen und Wärmepumpen - Flexible Rohrleitungsteile, Schwingungsabsorber und Kompensatoren - Anforderungen, Konstruktion und Einbau

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Systemes de réfrigération et pompes à chaleur - Eléments flexibles de tuyauterie, isolateurs de vibration et joints de dilatation - Exigences, conception et installation

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Ta slovenski standard je istoveten z: **EN 1736:2000**

ICS:

27.080	Toplotne ļ rpalke	Heat pumps
27.200	Hladilna tehnologija	Refrigerating technology

SIST EN 1736:2000 **en**

2003-01.Slovenski inštitut za standardizacijo. Razmnoževanje celote ali delov tega standarda ni dovoljeno.

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 1736

January 2000

ICS 27.080; 27.200

English version

Refrigerating systems and heat pumps - Flexible pipe elements, vibration isolators and expansion joints - Requirements, design and installation

Systèmes de réfrigération et pompes à chaleur - Eléments flexibles de tuyauterie, isolateurs de vibration et joints de dilatation - Exigences, conception et installation

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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Foreword

This European Standard 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of an identical text or by endorsement, at the latest by July 2000, and conflicting national standards shall be withdrawn at the latest by July 2000.

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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.

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NOTE: Attention is drawn to the Pressure Equipment Directive 97/23/EC.

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Introduction

The use of flexible pipe elements is required where impermissible stresses are to be eliminated from refrigerating circuits and pipe expansion or relative movements of components are to be absorbed.

The use of flexible pipe elements should not be specified unless it is necessary in the design of refrigerant circuits. If necessary, they should be designed and installed in accordance with this standard.

Flexible pipe elements are often the weakest part of a refrigerating system and the part most likely to suffer from fatigue or stress corrosion cracking.

1 Scope

This European Standard describes requirements, design and installation of flexible pipe elements (e. g. metallic flexible pipe, metallic flexible tube, non-metallic flexible tube, vibration isolator, expansion joint) used in the refrigerant circuits of refrigerating systems and heat pumps.

It does not apply to flexible pipes that are only occasionally stressed beyond the elastic limit, e. g. during repair work, or to joints which are free to rotate or hinge.

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.

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EN 378-2 : 1999
Refrigerating systems and heat pumps – Safety and environmental requirements – Part 2: Design, construction, testing, marking and documentation

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3 Definitions

For the purposes of this European Standard the following definitions apply:

3.1 flexible pipe element: Any form of pipe or tube connecting two points which may move relative to each other.

NOTE 1: This generic term includes all types, as defined in 3.2 to 3.6.

NOTE 2: Flexible pipe elements may include a plastic barrier in the construction, either as a liner on the inner surface or as a sandwich in the pipe wall. The main purpose of such a barrier is to reduce the permeation of refrigerant gas.

3.2 metallic flexible pipe (see figure 1): A readily flexible, small bore pipe, e. g. capillary tube which is capable of movement within its elastic limit during operation of the refrigerating system.

NOTE: This type of pipe is flexible by virtue of the shape into which the tube is bent, e. g. coiled capillary tube.

3.3 metallic flexible tube (see figure 1): A tubular flexible element designed to bend within defined limits and containing a corrugated metal bellows, the corrugations of which may be annular or spiral.

NOTE 1: Metallic flexible tubes may be reinforced by metallic braiding which may be covered by rubber or plastic but the whole element should be designed so that, when bent within pre-determined limits, it is not stressed beyond the elastic limit.

NOTE 2: This type of pipe is flexible by virtue of its design and construction, e. g. bellows.

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3.4 non-metallic flexible tube (see figure 1): A tubular flexible element designed to bend within defined limits.

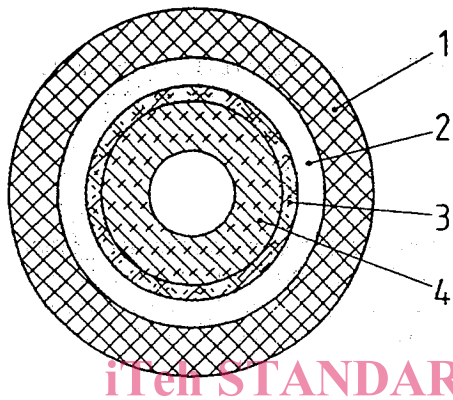
NOTE 1: Non-metallic flexible tubes may have smooth bore or corrugated bore and they may be reinforced to withstand pressure, vacuum or external impact.

NOTE 2: This type of pipe is flexible by virtue of its material, e. g. elastomer.

NOTE 3: Types of non-metallic flexible tubes may be classified as follows:

Type A

A tube having a suitable thermoplastic barrier between elastomeric layers. The reinforcement consists of suitable textile yarn, cord or fabric adhering to the tube and cover. The outer cover is heat and ozone-resistant elastomer.



1 heat and ozon-resistant elastomer
2 textile yarn, cord or fabric reinforcement
3 thermoplastic barrier
4 elastomeric layer

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Type B

A tube having a suitable thermoplastic lining with a thermoplastic barrier between elastomeric layers. The reinforcement consists of suitable textile yarn, cord or fabric adhering to the tube and cover. The cover is heat and ozone-resistant elastomer.

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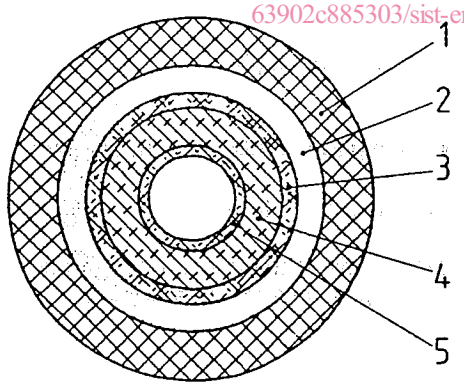

1 heat and ozon-resistant elastomer
2 textile yarn, cord or fabric reinforcement
3 thermoplastic barrier
4 elastomeric layer
5 thermoplastic lining

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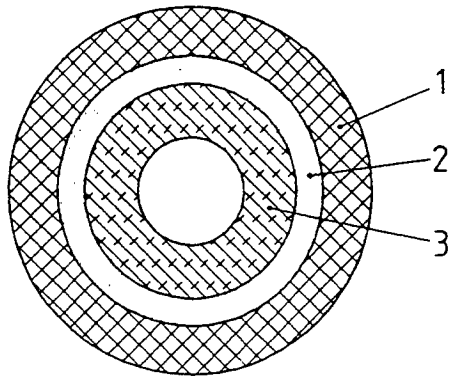
Type C

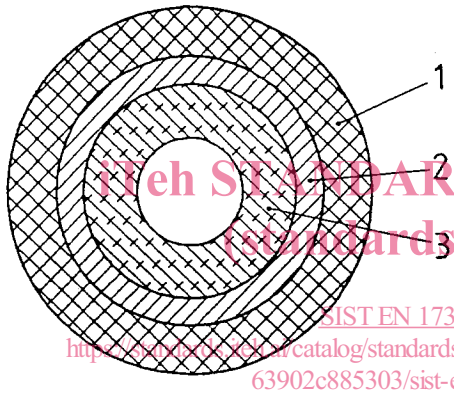
A tube having a suitable seamless elastomeric layer. The reinforcement consists of suitable textile yarn, cord or fabric adhering to the tube and cover. The outer cover is heat and ozone-resistant elastomer.



1 heat and ozon-resistant elastomer
2 textile yarn, cord or fabric reinforcement
3 seamless elastomer

Type D

A tube having a suitable seamless elastomeric layer. The reinforcement consists of steel wire adhering to the elastomeric layer. The cover consists of a heat-resistant textile yarn impregnated with an elastomeric cement.



1 heat resistant textile yarn impregnated with an elastomeric cement
2 steel wire reinforcement
3 seamless elastomeric layer

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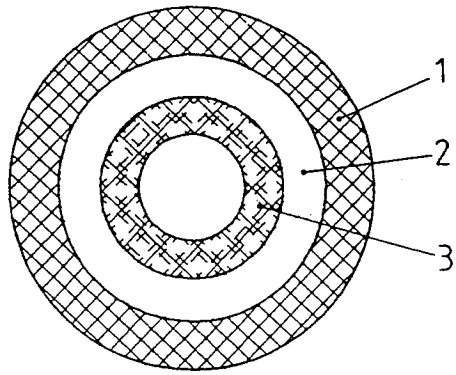
Type E

A tube having a suitable thermoplastic layer. The reinforcement consists of suitable textile yarn, cord or fabric adhering to the tube and cover. The outer cover is heat and ozone-resistant elastomer.



1 heat and ozon-resistant elastomer
2 textile yarn, cord or fabric reinforcement
3 thermoplastic layer

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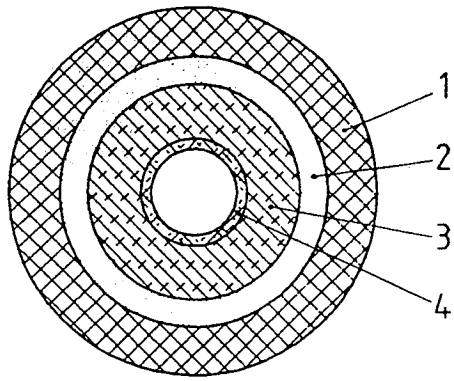
Type F

A tube having a suitable thermoplastic lining with an elastomeric layer. The reinforcement consists of suitable textile yarn, cord or fabric adhering to the tube and cover. The cover is heat and ozone-resistant elastomer.



1 heat and ozon-resistant elastomer
2 textile yarn, cord or fabric reinforcement
3 elastomeric layer
4 thermoplastic lining

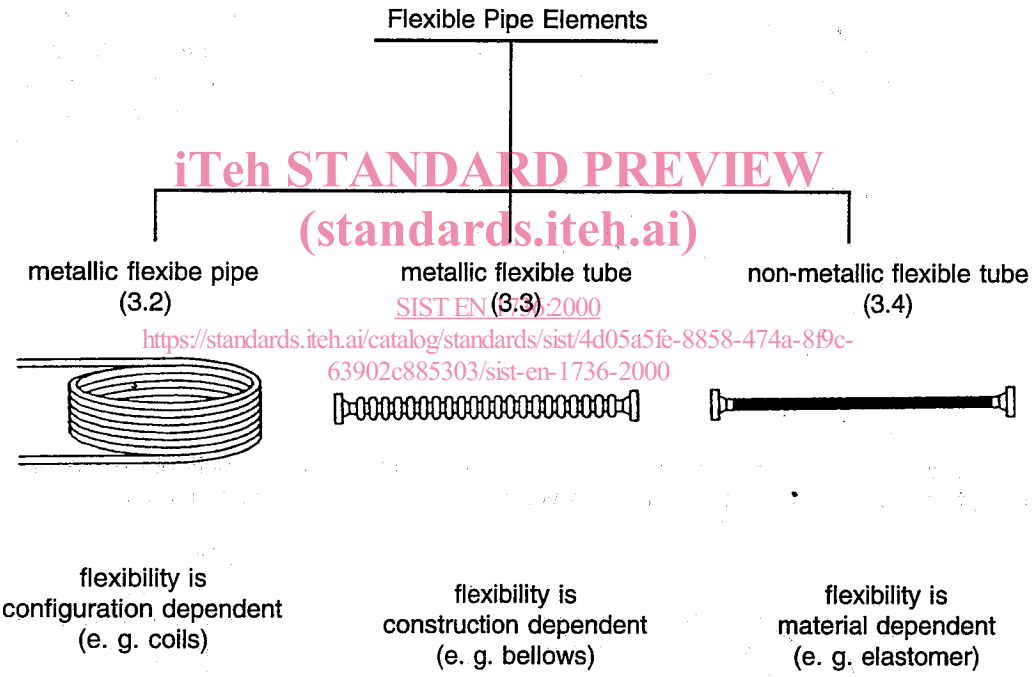


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Figure 1: Types of flexible pipe elements

3.5 expansion joint: A tubular pipe element shaped in such a way that it provides limited movement to accommodate thermal expansion without reaching its elastic limit.

3.6 vibration isolator: A short flexible tube usually of metallic construction which is intended to reduce the effects of vibration from the compressor to other parts of the refrigerating system or vice versa.

4 Applications

4.1 General

4.1.1 The refrigerating system shall be so designed and constructed that the components being connected by the flexible pipe elements cannot move in such a way as to stress the pipe element beyond its elastic limit.

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4.1.2 Flexible pipe elements shall be installed in accordance with the manufacturer's instructions.

4.1.3 Flexible pipe elements, vibration isolators and expansion joints shall be used only if necessary.

4.2 Significantly moved flexible pipe elements

NOTE: Such elements are subjected to regular movement through significant distance to allow the operation of refrigerating equipment such as plate freezers.

4.2.1 Significantly moved flexible pipe elements shall be supported and connected in such a way that they are not bent to radii less than those specified by the manufacturer.

4.2.2 Significantly moved flexible pipe elements shall not allow the generation of static electricity when non-conducting refrigerants pass through them at high velocity.

NOTE: This may be achieved by the use of antistatic plastic as lining.

4.2.3 Significantly moved flexible pipe elements shall be so installed that there is no danger of the outer covering being abraded on stationary objects during movement of the flexible pipe.

4.2.4 Significantly moved flexible pipe elements shall be so constructed and connected that they are not liable to damage by the freezing of water at the surface or at joints.

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4.2.5 The manufacturer of significantly moved non-metallic flexible tubes shall specify the permeability of the pipe element to water vapour and to the refrigerants for which it is suitable (see clause 7).

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4.3 Intermittently moved flexible pipe elements

NOTE: Such elements move intermittently to take up relative movement between components of the refrigerating system.

4.3.1 Intermittently moved flexible pipe elements shall be supported and connected in such a way that they are not bent to radii less than those specified by the manufacturer.

4.3.2 Intermittently moved flexible pipe elements shall not allow the generation of static electricity when non-conducting refrigerants pass through them at high velocity.

NOTE: This may be achieved by the use of antistatic plastic as lining.

4.3.3 Intermittently moved flexible pipe elements shall be so installed that there is no danger of the outer covering being abraded on stationary objects during movement of the flexible pipe.

4.3.4 Intermittently moved flexible pipe elements shall be so constructed and connected that they are not liable to damage by the freezing of water at the surface or at joints.

4.3.5 The manufacturer of intermittently moved non-metallic flexible tubes shall specify the permeability of the pipe element to water vapour and to the refrigerants for which it is suitable (see clause 7).