SLOVENSKI STANDARD
SIST EN 1514-6:2004

01-junij-2004

Prirobnice in prirobnični spoji - Mere tesnil za prirobnice z oznako PN - 6. del: Kovinska nazobčana oplaščena tesnila za jeklene prirobnice

Flanges and their joints - Dimensions of gaskets for PN-designated flanges - Part 6: Covered serrated metal gaskets for use with steel flanges

Flansche und ihre Verbindungen - Maße für Dichtungen für Flansche mit PN-Bezeichnung - Teil 6: Kammprofildichtungen für Stahlflansche

Brides et leurs assemblages - Dimensions des joints pour les brides désignées PN - Partie 6: Joints métalliques striés revetus pour utilisation avec des brides en acier

Ta slovenski standard je istoveten z: **EN 1514-6:2003**

ICS:

23.040.60	Prirobnice, oglavki in spojni elementi	Flanges, couplings and joints
23.040.80	Tesnila za cevne zveze	Seals for pipe and hose assemblies

SIST EN 1514-6:2004 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 1514-6

December 2003

ICS 23.040.80

English version

Flanges and their joints - Dimensions of gaskets for PN-designated flanges - Part 6: Covered serrated metal gaskets for use with steel flanges

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This European Standard was approved by CEN on 3 November 2003.

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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 Management Centre has the same status as the official versions.

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Ref. No. EN 1514-6:2003 E

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Foreword

This document (EN 1514-6:2003) has been prepared by Technical Committee CEN/TC 74 "Flanges and their joints", 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of an identical text or by endorsement, at the latest by June 2004, and conflicting national standards shall be withdrawn at the latest by June 2004.

The annex A is informative and contains "Information to be supplied by the purchaser".

EN 1514 consists of 6 parts:

Part 1: Non-metallic flat gaskets with or without inserts
Part 2: Spiral wound gaskets for use with steel flanges
Part 3: Non-metallic PTFE envelope gaskets
Part 4: Corrugated, flat or grooved metallic and filled metallic gaskets for use with steel flanges
Part 6: Covered serrated metal gaskets for use with steel flanges
Part 7: Covered metal jacketed gaskets for use with steel flanges
Part 8: Polymeric O-Ring gaskets for grooved flanges

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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies the construction, dimensions and marking of covered serrated metal gaskets for use with flanges complying with EN 1092-1 for PN 10, PN 16, PN 25, PN 40, PN 63 and PN 100 up to and including DN 3000.

This document does not extend to covered serrated metal based heat exchanger gaskets with pass bars or large vessel gaskets but, in the lack of a dedicated document for such gaskets, the principles set down can be applied to them.

NOTE 1 Dimensions of other types of gaskets for use with flanges to EN 1092-1, EN 1092-2, EN 1092-3 and EN 1092-4 are given in EN 1514-1, EN 1514-2, EN 1514-3, EN 1514-4, prEN 1514-7 and prEN 1514-8.

NOTE 2 Annex A lists information that should be supplied by the purchaser when ordering gaskets in circumstances where the choice of the gasket materials appropriate to the service is left to the supplier.

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).

EN 1092-1, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 1: Steel flanges.*

EN 1092-2, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 2: Cast iron flanges.*

EN 1092-3:2003, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 3: Copper alloy flanges.*

EN 1092-4, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 4: Aluminium alloy flanges.*

EN 1333, *Pipework components — Definition and selection of PN.*

EN ISO 6708:1995, *Pipework components — Definition and selection of DN (nominal size) (ISO 6708:1995).*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 1092-3:2003, EN ISO 6708:1995 and the following apply.

3.1
covered serrated metal gasket
consists of a sealing element with or without a location ring which may or may not be rigidly fixed to the sealing element. The sealing element consists of a metal core with serrated top and lower surfaces and a conformable sealing material adhered to each serrated surface. The serrations into metal core have the function of creating regions of high surface pressure on the conformable sealing material to ensure the required level of tightness in service. The density of the sealing material in the serrations during service should also be high enough to ensure that secondary sealing is provided by the impermeable nature of the material between the tips of the serrations. In service the thickness of the sealing material over the serrations is minimal, often about 0,1 mm. The widths of the tips of the serrations should also be of the order of 0,1 mm

3.2
DN
see EN ISO 6708

3.3
PN
see EN 1333

4 Designations

4.1 Range of PN designations

Gaskets shall be designated as suitable for use with one or more of the following PN designations of flange:

PN 10	PN 40	PN 250
PN 16	PN 63	PN 320
PN 25	PN 100	PN 400

NOTE There are no standards in the EN 1092 series that cover PN 160, PN 250, PN 320 or PN 400 flanges but there are national standards covering these.

4.2 Range of DN (nominal sizes)

Gasket nominal sizes shall be designated in accordance with the ranges specified in Table 1.

The general principles described in this standard shall also be applied to gaskets outside of the range specified in Table 1 by agreement between supplier and customer.

4.3 Gasket types

Gasket types, as illustrated in Figure 1, shall be designated as:

Type NR: Sealing element without any location ring

Type IR: Sealing element with integral location ring.

Type LR: Sealing element with loose location ring.

Types NR is used only with spigot faced or tongue and groove faced flanges

4.4 Information to be supplied by the purchaser

The selection of gasket materials and type should take into account the fluid, the operating conditions and the properties of the gasket materials as well as the type of flange. It is recommended that selection of a gasket for any particular application is made in consultation with the gasket supplier who will advise on the materials required for a particular service (see annex A).

5 Constructional details

5.1 General details

Figure 1 gives illustrations of the cores and, where used, the location rings of the three types of covered serrated metal gasket listed in 4.3.

Figure 2 shows a typical covered serrated metal gasket for use with type A and type B flanges, the Type A and B flange facings are specified in EN 1092-1, EN 1092-2, EN 1092-3 and EN 1092-4.

5.2 Core

5.2.1 Core materials

The material of the core shall be selected to be compatible with the intended service. The core thickness, measured over the tips of the serrations, shall be a minimum of three times the depth of the serrations.

5.2.2 Core welding

If the core is of a welded construction then the method of welding shall be such as to ensure that the weld is throughout the full thickness of the core. The number of welds shall not be more than two.

5.2.3 Dressing of core welds

The welds shall be dressed to preserve the number and depth of the serrations of the rest of the core.

5.2.4 Core flatness

The out of flatness of the serrated core shall not be more than 3 mm for every 300 mm of outside diameter.

5.3 Serrations

The serration depth shall be a minimum of 0,4 mm. The pitch of the serration and the width of the serration shall be arranged so that the width of the tips is 0,1 mm. The first and last tips of the serrated core shall be as near as possible to the respective edges of the core.

Proprietary forms of serrations and core profiles may be used by agreement between the purchaser and manufacturer.

To minimise the possibility of vibration induced cracking of the core, the radius at the bottom of the grooves shall be as large as possible.

5.4 Location rings

5.4.1 Integral ring

The thickness of the integral ring shall be a minimum of 0,5 mm. The location ring shall be undercut on at least one side to protect the sealing element in the event of thermal expansion induced interference between the location ring and the bolts of the flange.

5.4.2 Loose ring

The thickness of the location ring shall be a minimum of 0,5 mm. When installed the ring shall be sufficiently loose in the location slot in the core so that thermal expansion effects never cause the ring to become tight in the location slot. The location ring may be made in sections and assembled around the core. The sections of the assembled ring shall be either welded together or otherwise securely held together. The material of the loose location ring may be carbon steel.

5.5 Facing materials

The facing material shall be selected to be suitable for the intended service and the material of the flanges. Suitable materials range from very soft, rubber bound, sheet material to metal foils.

The facing material may be cut from sheet to the appropriate size, applied in the form of texturised tape or by any other means that meets the other requirements of this standard.

5.6 Facing weight per unit area

The weight per unit area of facing in order to create the required level of tightness in service is a function of the thickness and density of the facing material, the depth, width and pitch of the serrations, the required in service density of the facing material and the thickness of facing required above the core in service. The weight per unit area shall be such that metal to metal contact between the tips of the serrations and the flange surface is avoided.

For guidance, a satisfactory level of sealing is routinely achieved with graphite of 0,5 mm thickness and a density of 1,0 gm/cm^3 as received when used with a core where the serrations are 0,4 mm in depth and the serration tip width is 0,1 mm.

Ignoring the effects of the thickness of any adhesive and the grooving of the flange surfaces, the target weight per unit area of facing can be estimated from the following:

Weight per unit area = ρ_s [t + (A_G / P)]

Where ρ_s is the required density of the facing in service

t is the required thickness in service of facing above the core

A_G is the cross sectional area, perpendicular to the plane of the core, of the serrations

P is the pitch of the serrations

5.7 Attachment of facing

5.7.1 Methods of attachment

The facing may be attached to the core by any means that satisfies the requirement of 5.8 provided that the attachment method does not result in the introduction of any component that is likely to initiate corrosion.

5.7.2 De-greasing of core

Where an adhesive is used the area of the core to which the facing is to be attached shall be de-greased before use of the adhesive and the amount of the adhesive used shall be minimised.

5.7.3 Number of joins

The number of joins in the facing material shall be minimised and shall never exceed two. At joins the facing material shall be overlapped or the two parts chamfered or, where a butt joint is used, overlapped with a thin layer of the facing material.

5.7.4 Excessive facing

Once the sealing faces have been applied any excess material shall be removed paying particular attention that none protrudes inside of the inner diameter of the gasket.

5.8 Integrity of facing attachment

The facing material and the method of attachment shall be selected so that the facing is held securely in place and will withstand reasonable handling during transport and location of the gasket in the flange.

The sealing face shall also be free of surface blemishes, defects and damage that would impair the sealing performance of the gasket.