



**International
Standard**

ISO 6626-1

**Internal combustion engines —
Piston rings —**

**Part 1:
Coil spring loaded oil control rings
made of cast iron**

Moteurs à combustion interne — Segments de piston —

Partie 1: Anneaux de contrôle de l'huile à ressort hélicoïdal en fonte

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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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

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

For an explanation of 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 www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 34, *Propulsion, powertrain and powertrain fluids*.

This first edition cancels and replaces ISO 6626:1989, which has been technically revised.

The main changes are as follows:

- classes of nominal contact pressure were moved to [Annex A](#) and the normalized tangential force was introduced;
- verification and correction of figures;
- update of dimension [Tables 8](#) to [25](#).

A list of all parts in the ISO 6626 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The ISO 6626 series is one of a set of International Standards dealing with piston rings for reciprocating internal combustion engines. Others are the ISO 6621 series, ISO 6622, ISO 6623, ISO 6624, ISO 6625, the ISO 6626 series, and ISO 6627.

The common features and dimensional tables presented in this document constitute a broad range of variables. When selecting a particular ring type, the designer should bear in mind the conditions under which it will be required to operate.

It is also important that the designer refer to the specifications and requirements of ISO 6621-3 and ISO 6621-4 before completing selection.

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Internal combustion engines — Piston rings —

Part 1: Coil spring loaded oil control rings made of cast iron

1 Scope

This document specifies the essential dimensional features of coil-spring loaded oil control rings made of cast iron, types DSF-C, DSF-CNP, SSF, GSF, DSF, DSF-NG and SSF-L. It is applicable to piston rings in sizes from 60 mm up to and including 200 mm for reciprocating internal combustion engines for road vehicles and other applications.

2 Normative references

The following documents are referred to in the text in such a way that some or all 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 6621-1, *Internal combustion engines — Piston rings — Part 1: Vocabulary*

ISO 6621-4, *Internal combustion engines — Piston rings — Part 4: General specifications*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 6621-1 apply.

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

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

4 Overview

Coil-spring loaded oil control ring types are specified in [Figures 1](#) to [8](#). Their common features and the features' dimensions are specified in [Tables 1](#) to [5](#) and shown in [Figures 9](#) to [11](#). Essential features of coil springs are shown in [Figures 12](#) to [16](#). [Table 7](#) specifies different classes of contact pressure. [Tables 8](#) to [19](#) give the dimensions and forces of coil-spring loaded oil control rings.

The normal range for axial width of coil-spring loaded oil control rings (3 mm to 8 mm inclusive) is divided into 0,5 mm or 1,0 mm increments. In [Tables 20](#) to [25](#), dimensions are given for coil-spring loaded oil control rings with an axial width of 4,75 mm (i.e. 3/16 inch) for existing applications in inch units.

For the cast iron part, the recommended material is Class 10 in accordance with ISO 6621-3. For special applications, material Classes 20 to 50 may be used.

Variation from these in face design and spring groove may be used, as recommended by individual manufacturers, in plain or chromed versions.

5 Piston ring types and designation

5.1 Types DSF-C, DSF-CNP, SSF, GSF, DSF, DSF-NG and SSF-L — General features and dimensions

See [Figure 1](#) and [Tables 8](#) to [25](#). [Figure 1](#) is applicable to [Figures 2](#) to [8](#). [Figures 2](#) to [8](#) show detailed cross sections corresponding to [Figure 1](#).

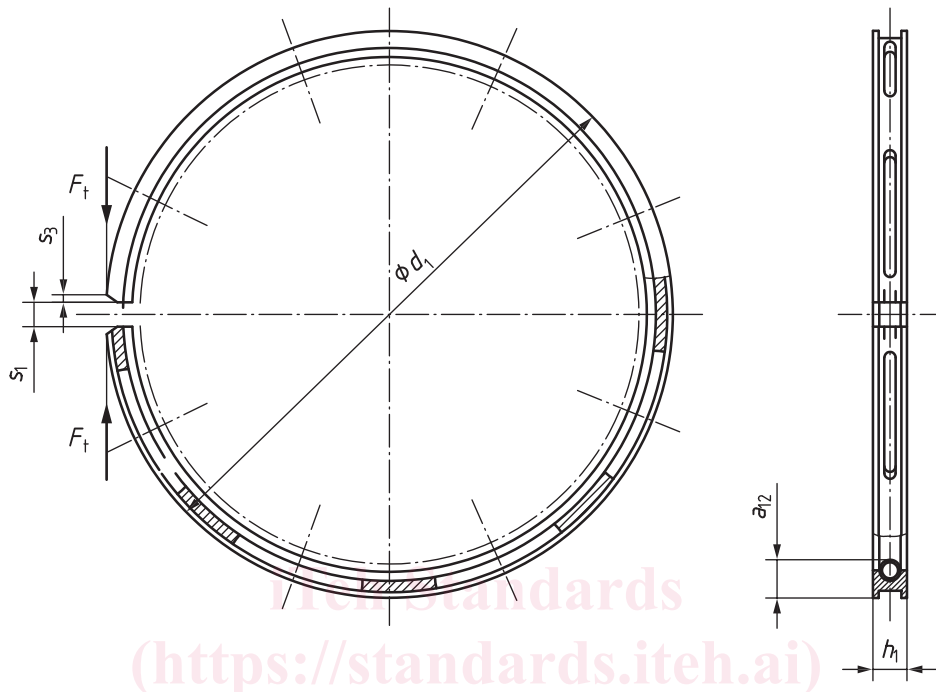


Figure 1 — Types DSF-C, DSF-CNP, SSF, GSF, DSF, DSF-NG and SSF-L

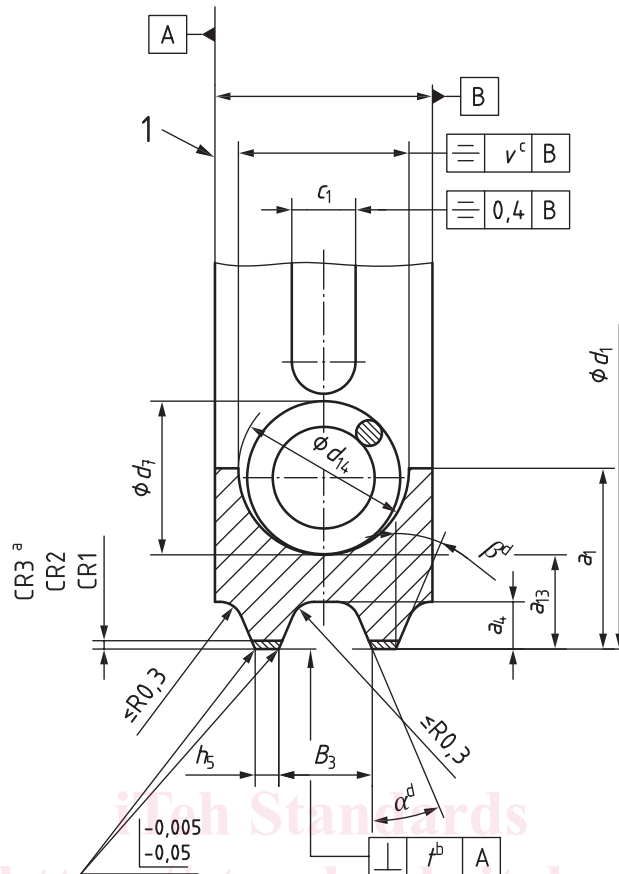
NOTE Gap chamfer s_3 is for coated rings only.

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5.2 Type DSF-C — Coil-spring loaded bevelled edge oil control ring, chromium plated and profile ground

5.2.1 General features and dimensions

See [Figure 2](#) and [Tables 8](#), [9](#) and [20](#).



Key

- 1 reference plane
- a See [Table 3](#).
- b See [Table 4](#).
- c See [Table 5](#).
- d Angles α and β to be agreed between manufacturer and customer. Angles can be different (historical value is 35°).

Figure 2 — Type DSF-C

5.2.2 Example designation of a type DSF-C piston ring in accordance with this document

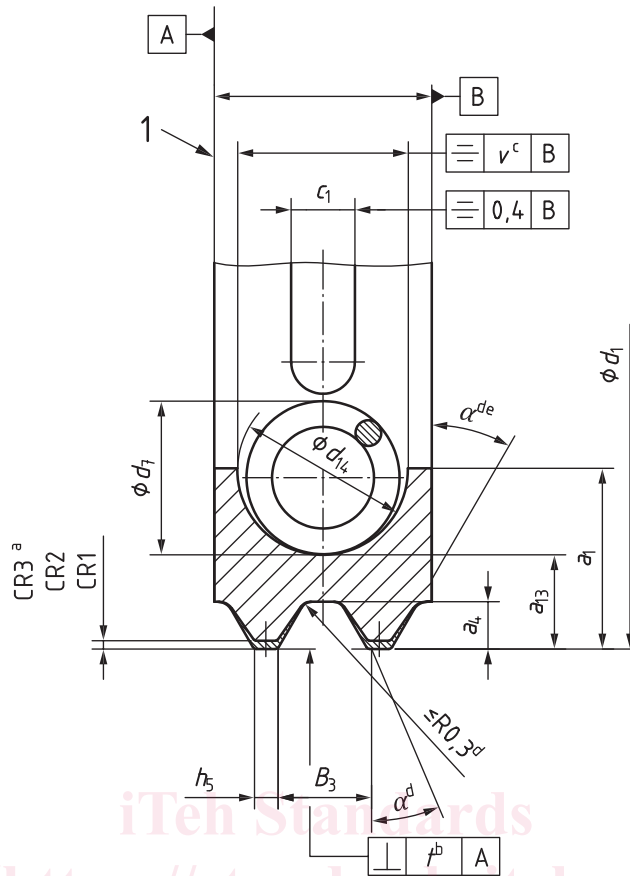
EXAMPLE Coil-spring loaded bevelled edge oil control ring, chromium plated and profile ground (DSF-C), of nominal diameter $d_1 = 124$ mm (124), nominal ring width $h_1 = 3,5$ mm (3,5), a land width $h_5 = 0,25$ mm (0,25), made of grey cast iron, non-heat treated, material subclass 11 (MC11), having a selected closed gap of 0,20 mm min. (S020), a chromium layer thickness on the lands of 0,15 mm (CR3), phosphated on all cast iron surfaces to depth of 0,002 mm min. (PO), reduced slot length (WK), a coil-spring with reduced heat set (WF), and a variable pitch with coil-diameter d_7 ground (CSE), with tangential force F_t in accordance with the nominal contact pressure of 1,5 N/mm² (PN1,5) and the ring marked with the manufacturer's mark (MM). Parameters in parenthesis are used in the ISO ring designation:

Piston ring ISO 6626-1 DSF-C - 124 × 3,5 × 0,25 - MC11 / S020 CR3 PO WK WF CSE PN1,5 MM

5.3 Type DSF-CNP — Coil-spring loaded bevelled edge oil control ring, chromium plated not profile ground

5.3.1 General features and dimensions

See [Figure 3](#) and [Tables 10, 11](#) and [21](#).



Key

- 1 reference plane
- a See Table 3.
- b See Table 4.
- c See Table 5.
- d Angles α and β to be agreed between manufacturer and customer. Angles can be different (historical value is 35°).
- e Before plating.

Figure 3 — Type DSF-CNP

5.3.2 Example designation of a type DSF-CNP piston ring in accordance with this document

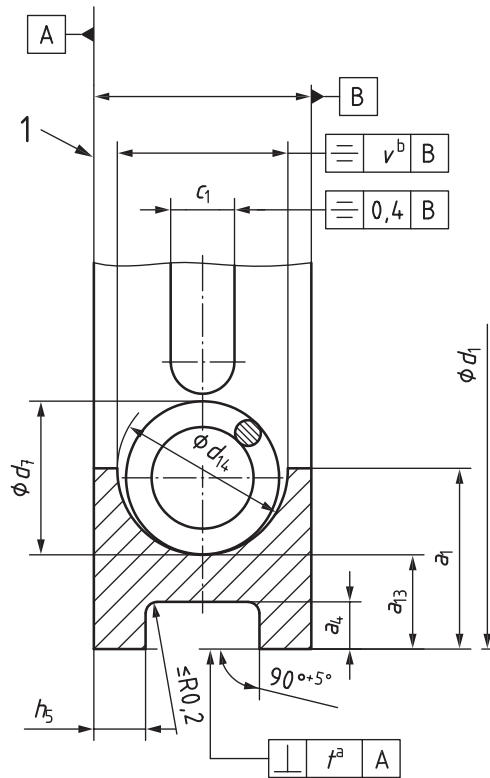
EXAMPLE Coil-spring loaded bevelled edge oil control ring, chromium plated, not profile ground (DSF-CNP) of nominal diameter $d_1 = 100$ mm (100), nominal ring width $h_1 = 4,0$ mm (4,0), a land width $h_5 = 0,40$ mm (0,40), made of grey cast iron, non-heat treated, material subclass 12 (MC12), constant spring pitch (CSN) and tangential force F_t in accordance with the nominal contact pressure of $P_0 = 1,0$ N/mm² (PN1,0). Parameters in parenthesis are used in the ISO ring designation:

Piston ring ISO 6626-1 DSF-CNP - 100 × 4 × 0,40 - MC12 / CSN PN1,0

5.4 Type SSF — Coil-spring loaded slotted oil control ring

5.4.1 General features and dimensions

See Figure 4 and Table 12, 13 and 22.



Key

- 1 reference plane
- a See [Table 4](#).
- b See [Table 5](#).

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Figure 4 — Type SSF

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5.4.2 Example designation of a type SSF piston ring in accordance with this document

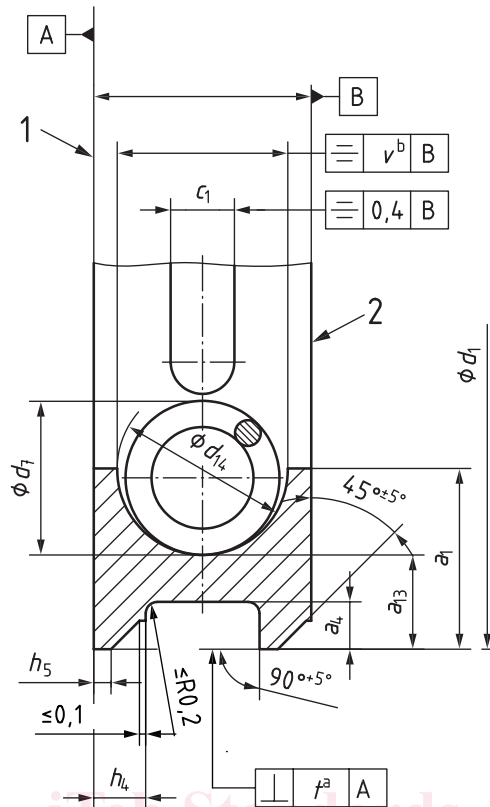
EXAMPLE Coil-spring loaded slotted oil control ring with rectangular groove (SSF) of nominal diameter $d_1 = 80$ mm (80), nominal ring width $h_1 = 4$ mm (4,0), a land width $h_5 = 0,70$ mm (0,70), made of grey cast iron, non-heat treated, material subclass 12 (MC12), constant spring pitch (CSN) and tangential force F_t in accordance with the nominal contact pressure of $P_0 = 1,0$ N/mm² (PN1,0). Parameters in parenthesis are used in the ISO ring designation:

Piston ring ISO 6626-1 SSF- 80 × 4,0 × 0,70 - MC12 / CSN PN1,0

5.5 Type GSF — Coil-spring loaded double bevelled oil control ring

5.5.1 General features and dimensions

See [Figure 5](#) and [Tables 14](#), [15](#) and [23](#). Top side marking is mandatory and shall be performed in accordance with ISO 6621-4.



Key

- 1 reference plane
- 2 top side identification mark
- a See [Table 4](#).
- b See [Table 5](#).

Figure 5 — Type GSF

5.5.2 Example designation of a type GSF piston ring in accordance with this document

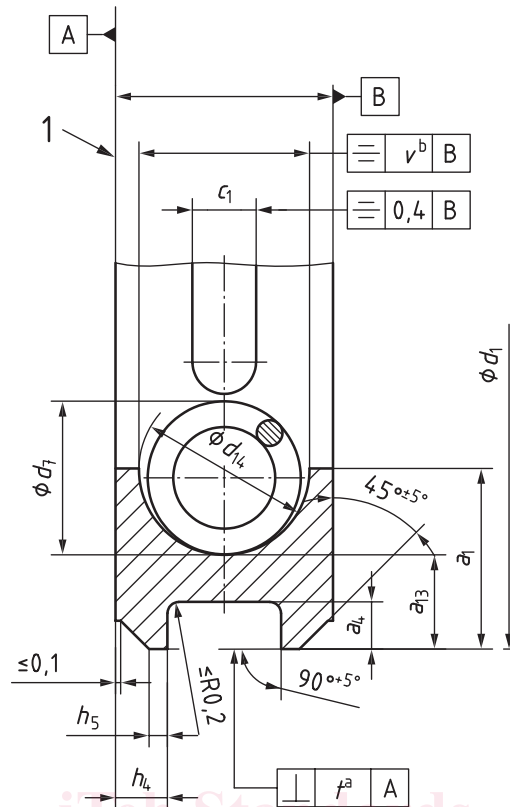
EXAMPLE Coil-spring loaded double bevelled oil control ring (GSF) of nominal diameter $d_1 = 75$ mm (75), nominal ring width $h_1 = 3,5$ mm (3,5), a land width $h_5 = 0,35$ mm (0,35), made of grey cast iron, non-heat treated, material subclass 12 (MC12), with constant spring pitch (CSN) and tangential force F_t in accordance with the nominal contact pressure of $P_0 = 1,0$ N/mm² (PN1,0). Parameters in parenthesis are used in the ISO ring designation:

Piston ring ISO 6626-1 GSF- 75 × 3,5 × 0,35 - MC12 / CSN PN1,0

5.6 Type DSF — Coil-spring loaded bevelled edge oil control ring

5.6.1 General features and dimensions

See [Figure 6](#) and [Tables 14](#), [15](#) and [23](#).



Key

- 1 reference plane
- a See [Table 4](#).
- b See [Table 5](#).

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Figure 6 — Type DSF

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5.6.2 Example designation of a type DSF piston ring in accordance with this document

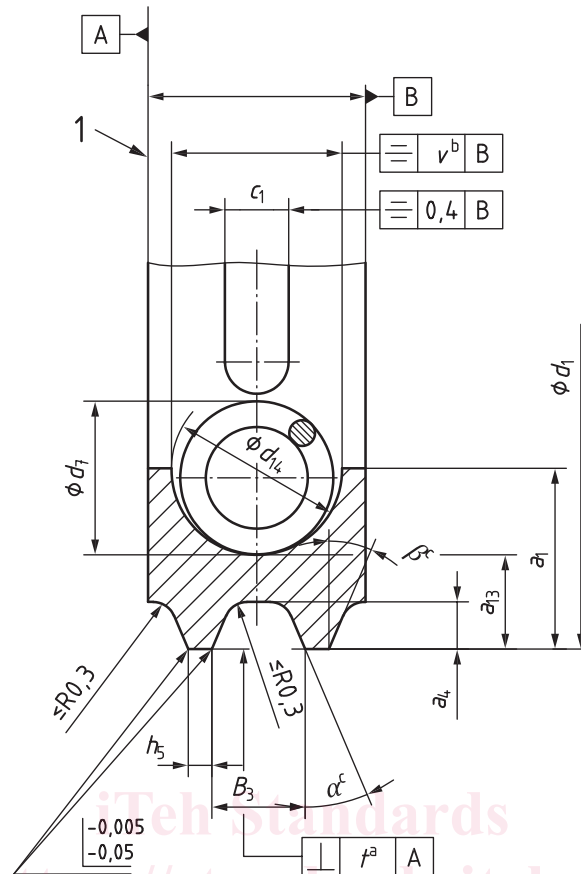
EXAMPLE Coil-spring loaded bevelled edge oil control ring (DSF) of nominal diameter $d_1 = 90$ mm (90), nominal ring width $h_1 = 3,5$ mm (3,5), a land width $h_5 = 0,35$ mm (0,35), made of grey cast iron, non-heat treated, material subclass 12 (MC12), with constant spring pitch (CSN) and tangential force F_t in accordance with the nominal contact pressure of $P_0 = 1,0$ N/mm² (PN1,0). Parameters in parenthesis are used in the ISO ring designation:

Piston ring ISO 6626-1 DSF- 90 × 3,5 × 0,35 - MC12 / CSN PN1,0

5.7 Type DSF-NG — Coil-spring loaded bevelled edge oil control ring (face geometry similar to type DSF-C or type DSF-CNP)

5.7.1 General features and dimensions

See [Figure 7](#) and [Tables 16, 17](#) and [24](#).



Key

- 1 reference plane
- a See [Table 4](#).
- b See [Table 5](#).
- c Angles α and β to be agreed between manufacturer and customer. Angles can be different (historical value is 35°).

Figure 7 — Type DSF-NG

5.7.2 Example designation of a type DSF-NG piston ring in accordance with this document

EXAMPLE Coil-spring loaded bevelled edge oil control ring (DSF-NG, face geometry similar to type DSF-C or type DSF-CNP) of nominal diameter $d_1 = 140$ mm (140), nominal ring width $h_1 = 4,5$ mm (4,5), a land width $h_5 = 0,40$ mm (0,40), made of grey cast iron, non-heat treated, material subclass 12 (MC12), constant spring pitch (CSN) and tangential force F_t in accordance with the nominal contact pressure of $P_0 = 1,0$ N/mm² (PN1,0). Parameters in parenthesis are used in the ISO ring designation:

Piston ring ISO 6626-1 DSF-NG - 140 × 4,5 × 0,40 - MC12 / CSN PN1,0

5.8 Type SSF-L — Coil-spring loaded slotted oil control ring with $h_1 = 4,75$ mm (3/16 in) ring width and 0,6 mm nominal land width

5.8.1 General features and dimensions

See [Figure 8](#) and [Tables 18, 19](#) and [25](#).