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Internal combustion engines — Piston rings — Part 3: Coil-spring-loaded oil control rings made of steel

Contents

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 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 second edition cancels and replaces the first edition (ISO 6266-3:2008), which has been technically revised. The main changes compared to the previous edition are as follows:

- added subclause 5.8.2, Actual tangential force, .F_t and tolerance;
- added subclause 5.8.3, Normalized tangential force, F_N;
- added Table 9, Normalized tangential forces, F_N;
- raised table numbers by one from Table 9 onward;
- made editorial changes to Table 16.

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

ISO 6626 (all parts) is one of a series of International Standards dealing with piston rings for reciprocating internal combustion engines. Others are ISO 6621 (all parts), ISO 6622 (all parts), ISO 6623, ISO 6624 (all parts), ISO 6625 and ISO 6627 (see Clause 2 and Bibliography).

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

Internal combustion engines — Piston rings — Part 3: Coil-spring-loaded oil control rings made of steel

1 Scope

This document specifies the essential dimensions of coil-spring-loaded oil control rings made of steel, of piston ring types SOR (with R-shaped groove) and SOV (with V-shaped groove).

This document applies to coil-spring-loaded oil control rings made of steel with a diameter from 60 mm up to and including 160 mm for reciprocating internal combustion engines. It can also be used for piston rings in compressors working under analogous conditions.

2 Normative references

There are no normative references in this document.

3 Terms, definitions and symbols

No terms and definitions are listed in this document.

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1 Symbols

a_1	radial wall thickness
a_4	groove depth
a_{12}	radial thickness over coil spring
a_{13}	groove depth and bridge
a_{17}	external land depth
B_3	land spacing
c_1	slot width
d_1	nominal diameter (nominal bore diameter)
d_7	coil-spring diameter
d_{14}	coil-spring groove diameter for type SOR
f_1	coil-spring excursion
F_t	tangential force
h_1	ring width
h_5	land width
p_0	contact pressure
s_1	closed gap
w_1	slot length

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w_3 slot spacing

α land angle inside

β land angle outside

θ groove angle for type SOV

NOTE These symbols (including associated indices) are in accordance with the symbols used in ISO 6621 (all parts), ISO 6622 (all parts), ISO 6623, ISO 6624 (all parts), ISO 6625, ISO 6627 and other parts of the ISO 6626 series.

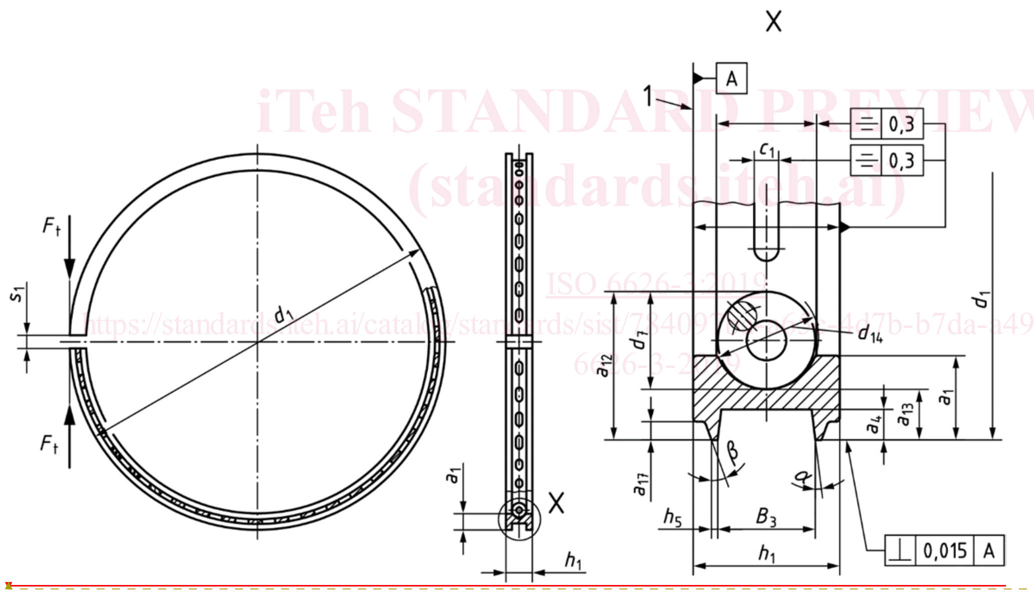
4 Piston ring types and designation examples

4.1 Type SOR — Steel oil control rings with R-shaped groove

4.1.1 General features and dimensions

Figure 1 shows the general features and dimensions of piston ring type SOR.

Dimensions in millimetres



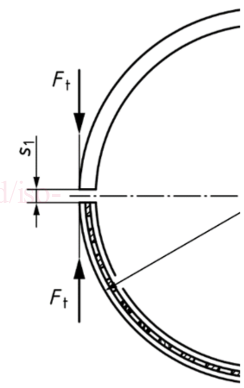
Key

1 reference plane

NOTE 1 For definitions of symbols, see Clause 3.

NOTE 2 For dimensions, see Tables 1, 2, 3, 4, 5, 11, 12, 14, 15, 16, 17, 18 and 19.

Figure 1 — General features and dimensions of piston ring type SOR



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NOTE 1 For definitions of symbols, see Clause 3.¶
NOTE 2 For dimensions, see Tables 3, 4, 5, 11, 14, 15, 16 and 17.¶

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4.1.2 Designation

EXAMPLE A coil-spring-loaded oil control ring with R-shaped groove (SOR), a radial wall thickness class = small (S), of nominal diameter d_1 = 100 mm (100), a nominal ring width h_1 = 3 mm (3), a land width h_5 = 0,20 mm (0,20), made of steel MC65 (MC65), a nitrided depth of 0,030 mm min. (NT030), coil spring with reduced heat set (WF), and variable pitch with coil diameter d_7 ground (CSE), medium nominal contact pressure p_0 = 1,5 MPa (PN1,5):

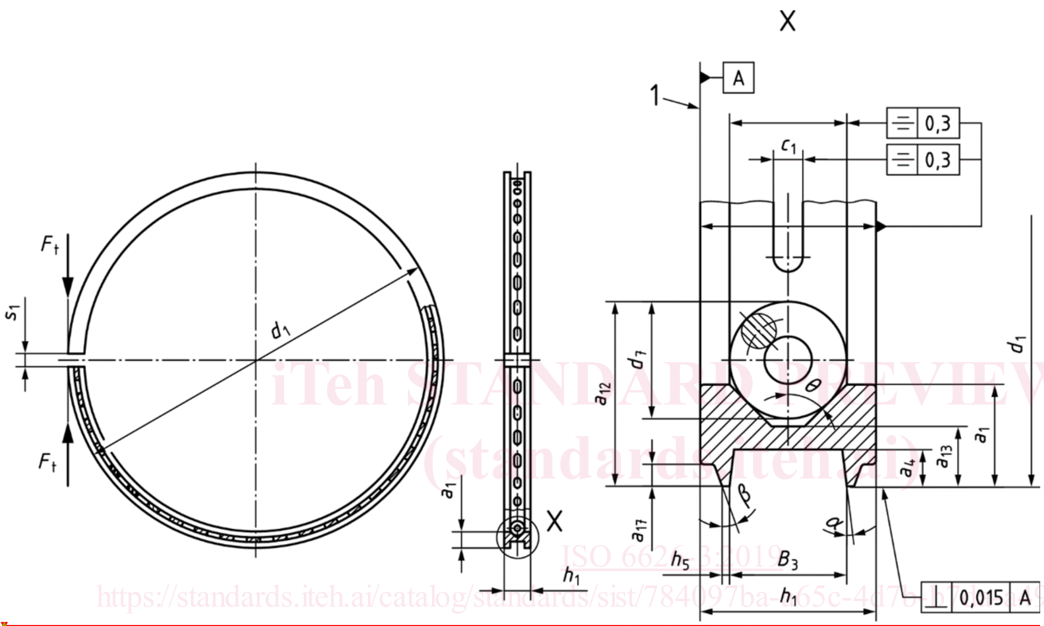
Piston ring ISO 6626-3 SOR-S - 100 × 3 × 0,20 – MC65/NT030 WF CSE PN1,5

4.2 Type SOV — Steel oil control rings with V-shaped groove

4.2.1 General features and dimensions

Figure 2 shows the general features and dimensions of piston ring type SOV.

Dimensions in millimetres

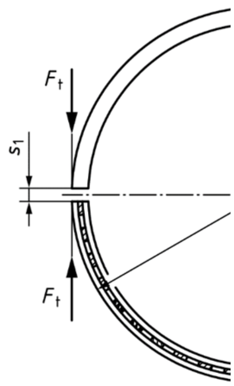


Key

1 reference plane

NOTE 1 For definitions of symbols, see Clause 3.

NOTE 2 For dimensions, see Tables 1, 2, 3, 4, 5, 11, 13, 14, 20, 21 and 22.



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NOTE 2 For dimensions, see Tables 3, 4, 5, 12, 18, 19 and 20.¶

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Figure 2 — General features and dimensions of piston ring type SOV

4.2.2 Designation

EXAMPLE A coil-spring-loaded oil control ring with V-shaped groove (SOV), a radial wall thickness class = small (S), V-shaped groove angle 40° (V40), of nominal diameter d_1 = 100 mm (100), a nominal ring width h_1 = 3 mm (3), a land width h_5 = 0,20 mm (0,20), made of steel MC65 (MC65), a nitrided depth of 0,030 mm min. (NT030), coil spring with reduced heat set (WF), and constant pitch with coil diameter d_7 ground (CSN), medium nominal contact pressure p_0 = 1,5 MPa (PN1,5):

Piston ring ISO 6626-3 SOV-S-V40 - 100 × 3 × 0,20 – MC65/NT030 WF CSN PN1,5

5 Common features

5.1 Ring width h_1 and radial wall thickness a_1

Table 1 shows common features for ring width h_1 and radial wall thickness a_1.

Table 1 — Ring width h_1 and radial wall thickness a_1

Dimensions in millimetres

Ring width $h_1 = {}^{-0,01}_{-0,03}$	Radial wall thickness $a_1 \pm 0,15$		Type
	Small (Code: S)	Large (Code: L)	
1,5	1,5 to 1,8	—	SOR
2,0	1,8 to 2,0	—	SOR
2,5	1,8 to 2,0	—	SOR
3,0	1,8 to 2,0	2,3 to 2,6	SOR and SOV
4,0	2,0 to 2,6	2,8 to 3,2	SOR and SOV

5.2 Land width h_5

Table 2 shows common features for land width h_5.

Table 2 — Land width h_5

Dimensions in millimetres

Ring width h_1	Land width $h_5 \pm 0,07$		
1,5	0,18	—	—
2,0	0,20	—	—
2,5	0,20	0,25	—
3,0	0,20	0,25	0,30
4,0	0,20[a]	0,25	0,30

[a] For diameters greater than 120 mm and ring width equal to 4,0 mm, land width equal to 0,20 mm shall not be used.

5.3 Land angle α, β

Table 3 shows common features for land angle α, β.

Table 3 — Land angle α, β

Land angle	Range of nominal angle	Tolerance
inside α	5° to 20°[a]	±5°
outside β	10° to 30°[a]	±5°

[a] Nominal angle subject to agreement between manufacturer and customer.

5.4 Land spacing B_3

Table 4 shows common features for land spacing B_3.

Table 4 — Land spacing B_3

Dimensions in millimetres

Ring width h_1	Land spacing B_3