INTERNATIONAL STANDARD

ISO 6623

Second edition
2004-02-01

Internal combustion engines — Piston rings — Scraper rings made of cast iron

Moteurs à combustion interne — Segments de piston — Segments racleurs mixtes en fonte moulée

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Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 6623 was prepared by Technical Committee ISO/TC 22, *Road vehicles*.

This second edition cancels and replaces the first edition (ISO 6623:1986), which has been technically revised.

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Introduction

ISO 6623 is one of a number of series of International Standards dealing with piston rings for reciprocating internal combustion engines. Others are ISO 6621 [2], [3], [4], [5], ISO 6622 [6], [7], ISO 6624 [8], [9], [10], [11], ISO 6625 [12], ISO 6626 [13], [14] and ISO 6627 [15] (see Bibliography for details).

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

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

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Internal combustion engines — Piston rings — Scraper rings made of cast iron

1 Scope

This International Standard specifies the essential dimensional features of scraper rings made of cast iron, types N, NM, E and EM, having diameters of from 30 mm up to and including 200 mm, used in reciprocating internal combustion engines. It is also applicable to piston rings of compressors working under similar conditions.

2 Normative references

The following referenced documents are indispensable for the application 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.

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

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3 Overview

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The scraper ring types are specified in Tables 1 and 2 and Figures 1 to 5. Their common features and the dimensions of those features are specified in Tables 3 to 5 and Figures 6 to 9. Tables 6 and 7 give the force factors for the different ring types, while Tables 8 and 9 give the dimensions and forces of the scraper rings.

Tables 8 and 9, respectively, offer a choice between two radial wall thicknesses:

— radial wall thickness “regular”;

— radial wall thickness “D/22”.

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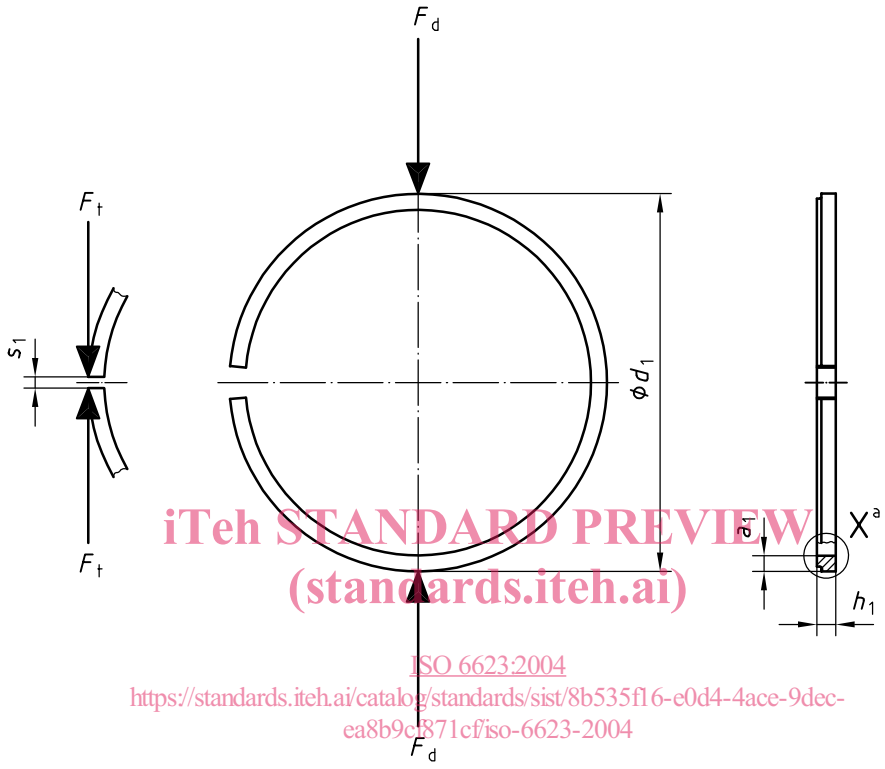
4 Ring types and designation examples

4.1 Types N, NM, E and EM Scraper rings — General features

The general features of type N, NM, E and EM scraper rings are shown in Figure 1.

NOTE See Tables 8 and 9 for dimensions and forces.



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Key

[a] See 4.2, 4.3, 4.4 and 4.5, and Figures 2, 3, 4 and 5, for Detail X of N, NM, E and EM respectively.

Figure 1 — Types N, NM, E and EM

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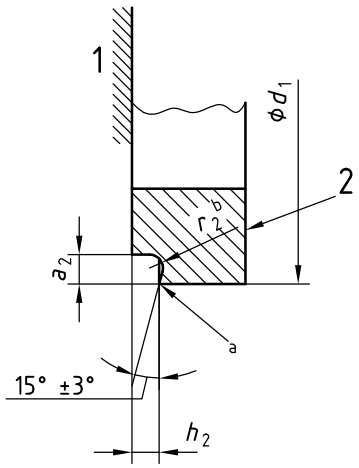
4.2 Type N

4.2.1 Napier ring (undercut step)

The general features of type N Napier rings with undercut step shall be in accordance with Figures 1 and 2, except for rings $h_1 < 1{,}5$ mm.



Key

1 reference plane

2 mark

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a When the ring is closed, this edge shall be in contact with the cylinder bore.

b See Table 1.

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Figure 2 — Type N (Detail X of Figure 1)

Table 1 — r_2 dimensions

Dimensions in millimetres

d_1	r_2 max.
$30 \leqslant d_1 < 175$	0,3
$175 \leqslant d_1 \leqslant 200$	0,7

4.2.2 Designation

EXAMPLE Designation of a piston ring complying with the requirements of ISO 6623, being a cast iron Napier ring with straight faced peripheral surface (N), of nominal diameter d_1 = 90 mm (90), of radial wall thickness “regular”, of nominal ring width h_1 = 25 mm (2,5), made of non-heat-treated grey cast iron subclass 12 (MC12), with chamfered internal edges (KI):

Piston ring ISO 6623 N - 90 × 2,5 - MC 12/K I

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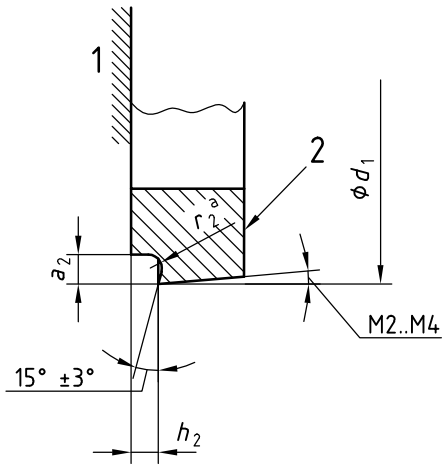
4.3 Type NM

4.3.1 Napier ring (undercut step) taper faced

The general features of type NM Napier rings with undercut step, taper faced, shall be in accordance with Figures 1 and 3, except for rings $h_1 < 1{,}5$ mm.



Key

1 reference plane
2 mark

a See Table 1.

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Figure 3 — Type NM (Detail X of Figure 1)

Table 2 — Taper

Dimensions in minutes

Code	Uncoated rings and chromium plated or spray coated rings with peripheral surface ground	
	Taper	Tolerance[a]
M2	30	+60 0
M3	60	
M4	90	

[a] For chromium plated rings with a tapered peripheral surface that is not ground, the tolerance shall be increased by 10 (e.g. $M3 = 60^{+70}_{0}$)

4.3.2 Designation

EXAMPLE Designation of a piston ring complying with the requirements of ISO 6623, being a cast iron Napier ring with a 90′ taper faced peripheral surface (NM4), of nominal diameter d_1 = 90 mm (90), of radial wall thickness “regular”, of ring width h_1 = 2,5 mm (2,5), made of heat-treated grey cast iron, subclass 21 (MC21), phosphated on all sides (PO):

Piston ring ISO 6623 NM4 - 90 × 2,5 - MC21/PO

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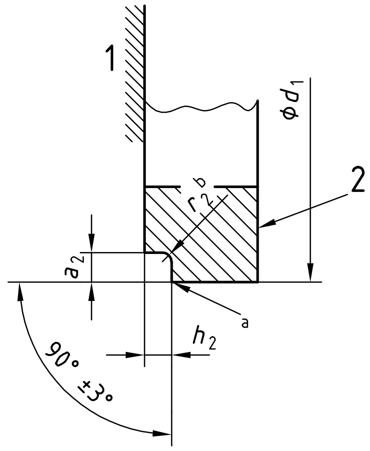
4.4 Type E

4.4.1 Scraper ring (stepped)

The general features of type E stepped scraper rings shall be in accordance with Figures 1 and 4.



Key

1 reference plane

2 mark

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a When the ring is closed, this edge shall be in contact with the cylinder bore.

b See Table 1.

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Figure 4 — Type E (Detail X of Figure 1)

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4.4.2 Designation

EXAMPLE Designation of a piston ring complying with the requirements of ISO 6623, being a cast iron scraper ring with straight faced peripheral surface (E), of nominal diameter d_1 = 90 mm (90), of nominal ring width h_1 = 2,5 mm (2,5), radial wall thickness “regular”, made of non-heat-treated grey cast iron, subclass 12 (MC12), with an inlaid spray coating on the peripheral surface, and minimum thickness 0,1 mm (SC2F):

Piston ring ISO 6623 E - 90 × 2,5 - MC12/SC2F

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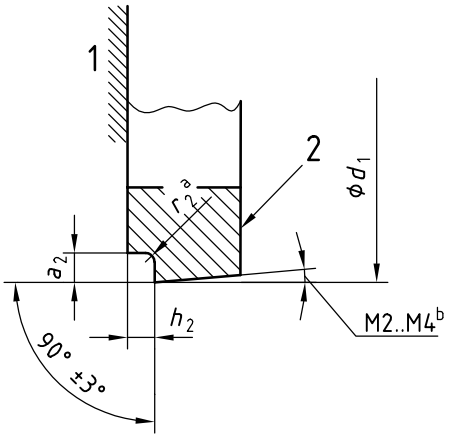
4.5 Type EM

4.5.1 Scraper ring (stepped) taper faced

The general features of type EM scraper rings stepped and taper faced shall be in accordance with Figures 1 and 5.



Key

1 reference plane
2 mark

[a] See Table 1.
[b] See Table 2.

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Figure 5 — Type EM (Detail X of Figure 1)

4.5.2 Designation

EXAMPLE Designation of a piston ring complying with the requirements of ISO 6623, being a cast iron scraper ring with a 30′ taper faced peripheral surface (EM2), of nominal diameter d_1 = 90 mm (90), of nominal ring width h_1 = 2,5 mm (2,5), of radial wall thickness “regular”, made of heat-treated grey cast iron, subclass 22 (MC22), with inside chamfered edges (KI):

Piston ring ISO 6623 EM2 - 90 × 2,5 - MC22/KI

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