



Internal combustion engines — Piston rings —

Part 2: Rectangular rings with narrow ring width

Moteurs à combustion interne — Segments de piston —

Partie 2: Segments rectangulaires de section réduite

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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.

The main task of ISO technical committees is to prepare International Standards. In exceptional circumstances a technical committee may propose the publication of a technical report of one of the following types :

- type 1, when the necessary support within the technical committee cannot be obtained for the publication of an International Standard, despite repeated efforts;
- type 2, when the subject is still under technical development requiring wider exposure;
- type 3, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example).

Technical reports are accepted for publication directly by ISO Council. Technical reports types 1 and 2 are subject to review within three years of publication, to decide if they can be transformed into International Standards. Technical reports type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

ISO/TR 6622-2 was prepared by Technical Committee ISO/TC 22, *Road vehicles*.

The reasons which led to the decision to publish this document in the form of a technical report type 2 are explained in the Introduction.

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0 Introduction

This Technical Report, part 2 of ISO 6622, is one of a series of International Standards dealing with piston rings for reciprocating internal combustion engines:

ISO 6621, *Internal combustion engines — Piston rings —*

Part 1: Vocabulary.

Part 2: Measuring principles.

Part 3: Material specifications.

Part 4: General specifications.

Part 5: Quality requirements.

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[ISO/TR 6622-2:1988](https://standards.iteh.ai/catalog/standards/sist/8453467b-433f-4dfe-a063-7d3d3479c611/iso-tr-6622-2-1988)

<https://standards.iteh.ai/catalog/standards/sist/8453467b-433f-4dfe-a063-7d3d3479c611/iso-tr-6622-2-1988>

ISO 6622, *Internal combustion engines — Piston rings —*

Part 1: Rectangular rings.

*Part 2: Rectangular rings with narrow ring width.*¹⁾

ISO 6623, *Internal combustion engines — Piston rings — Scraper rings.*

ISO 6624, *Internal combustion engines — Piston rings —*

Part 1: Keystone rings.

*Part 2: Half keystone rings.*¹⁾

ISO 6625, *Internal combustion engines — Piston rings — Oil control rings.*

ISO 6626, *Internal combustion engines — Coil-spring-loaded oil control rings.*

Rectangular piston rings with narrow ring width are, in most countries, still under development and little used. Specifications are therefore still liable to change: publication of a Technical Report was consequently agreed on, before finalising an International Standard.

The common features and dimensional tables presented in this Technical Report (ISO/TR 6622-2) 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 refers to the specifications and requirements of ISO 6621-3 and ISO 6621-4 before completing his selection.

¹⁾ Part published as a Technical Report (ISO/TR 6622-2 and ISO/TR 6624-2).

1 Scope and field of application

This Technical Report specifies the essential dimensional features of R-, B- and M-rectangular piston ring types with narrow ring width.

Dimension tables 8 and 9 allow for the use of cast iron (table 8) or steel (table 9). Since the modulus of elasticity of steel rings is higher than that of cast iron rings, the fluctuation in the surface pressure will become greater if the free gap is set as the reference for forces. Therefore forces are set using the surface pressure as the reference, in order to minimize the effect of the fluctuation.

The requirements of this Technical Report apply to rectangular piston rings of reciprocating internal combustion piston engines, up to and including 90 mm diameter for cast iron rings and up to and including 100 mm diameter for steel. It may also be used for piston rings of compressors working under similar conditions.

2 References

ISO 1101, *Technical drawings — Geometrical tolerancing — Tolerancing of form, orientation, location and run-out — Generalities, definitions, symbols, indications on drawings.*

ISO 6621, *Internal combustion engines — Piston rings —*

Part 3: Material specifications.

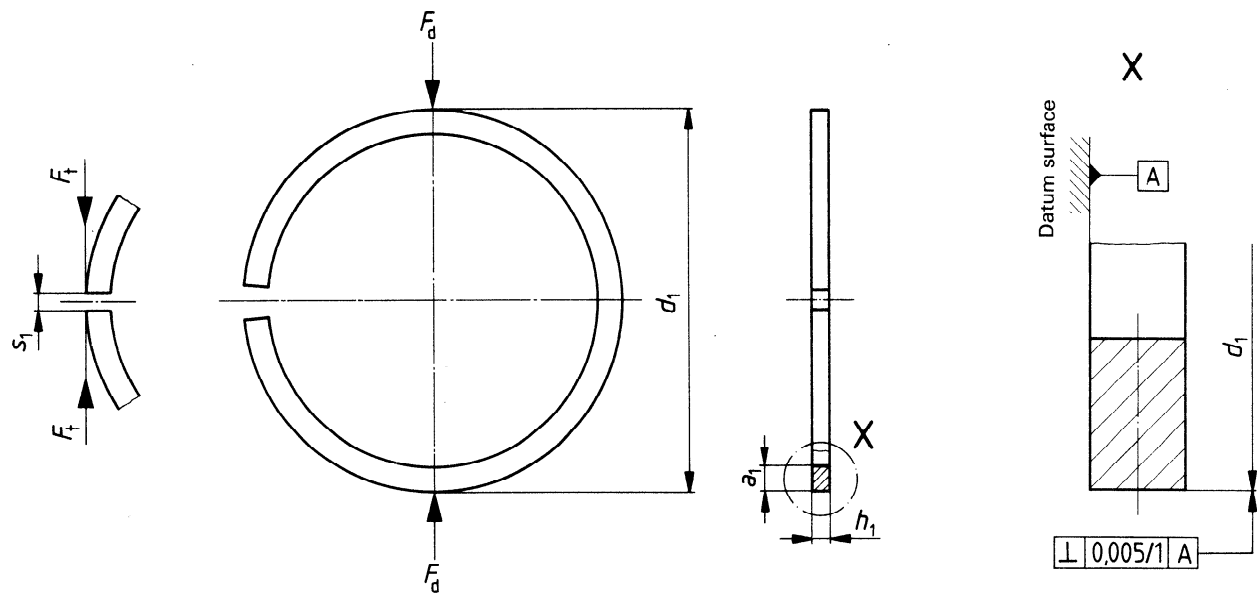
Part 4: General specifications.

3 Ring types and designation examples

3.1 Type R — Straight-faced rectangular ring

3.1.1 General features

NOTE — See table 8 or 9 for dimensions and forces.



3.1.2 Designation example

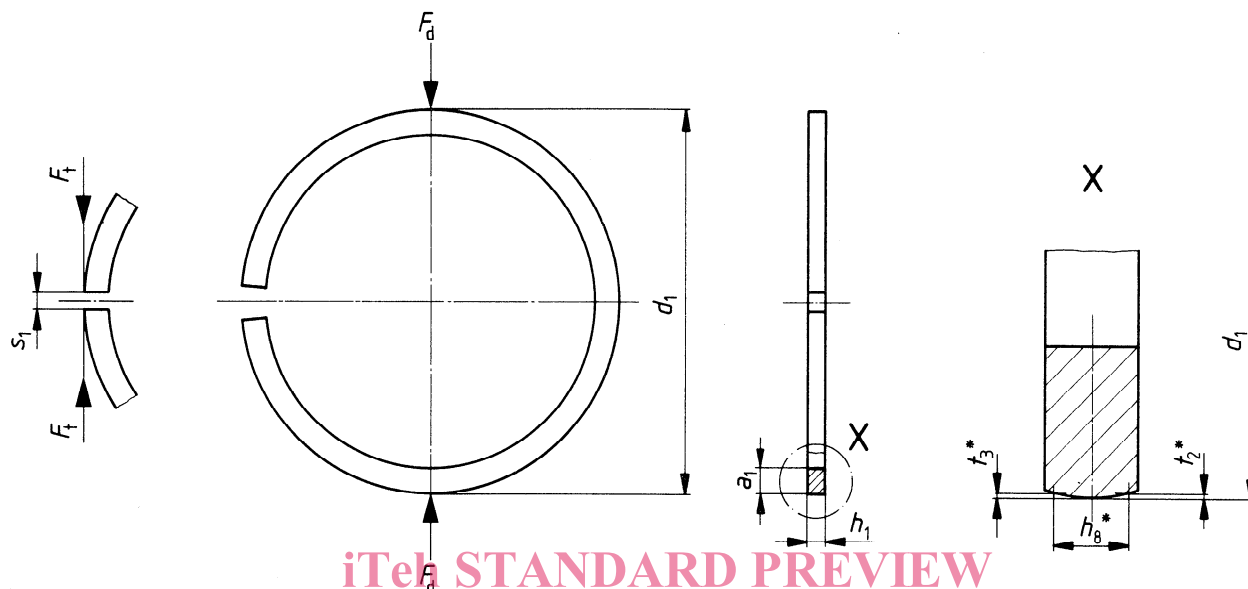
Designation of a straight-faced rectangular ring with narrow ring width of $d_1 = 60$ mm nominal diameter, $h_1 = 1,2$ mm ring width, made of spheroidal graphite cast iron heat-treated (material subclass 51), general features as shown in figure 1, and periphery chromium-coated fully faced design 0,1 mm minimum thickness:

Piston ring ISO/TR 6622-2 R - 60 × 1,2 - MC 51/CR2

3.2 Type B — Barrel-faced rectangular ring

3.2.1 General features

NOTE — See table 8 or 9 for dimensions and forces.



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* See table 1.

Figure 2. Type B

<https://standards.iteh.ai/catalog/standards/sist/8453467b-433f-4dfe-a063-7d3d3479c611/iso-tr-6622-2-1988>

Table 1 — Gauge width (h_8) and barrel dimensions

Dimensions in millimetres

h_1	h_8	t_2, t_3		Maximum peak off centre
1,2	0,6	0,002	0,012	0,2
1,5	0,8	0,003	0,015	0,25

3.2.2 Designation example

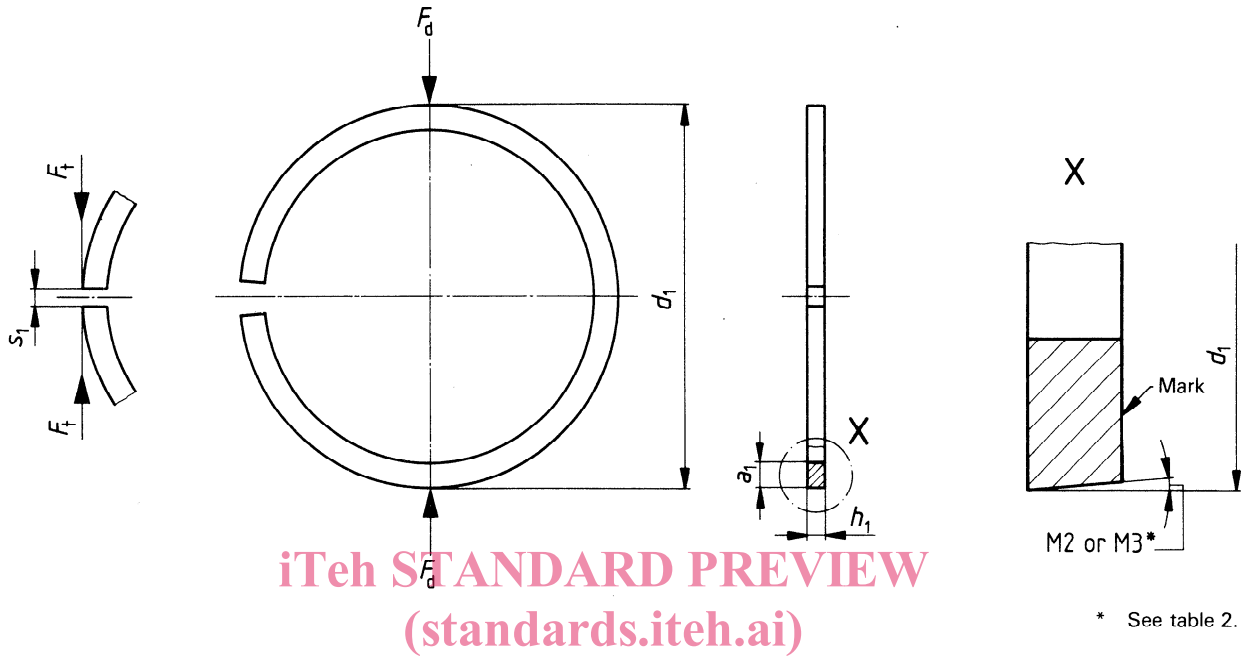
Designation of a barrel-faced rectangular ring with narrow ring width of $d_1 = 60$ mm nominal diameter, $h_1 = 1,2$ mm ring width, made of steel (material subclass 62), general features as shown in figure 2, and periphery chromium-coated fully faced design 0,1 mm minimum thickness:

Piston ring ISO/TR 6622-2 B - 60 × 1,2 - MC 62/CR2

3.3 Type M — Taper-faced rectangular ring

3.3.1 General features

NOTE — See table 8 or 9 for dimensions and forces.



* See table 2.

Figure 3 — Type M

<https://standards.iteh.ai/catalog/standards/sist/8453467b-433f-4dfe-a063-7d3d3479c611/iso-tr-6622-2-1988>

Table 2 — Taper

Taper	Uncoated and coated rings (molybdenum or chromium with tapered periphery ground)			
		Tolerance ²⁾	with IF or IW ¹⁾ (Top side)	Tolerance ²⁾
M2	30°	+ 50° 0	30°	+ 60° 0
M3	60°		60°	

1) IF and IW are explained in figures 16 and 17.

2) For coated rings with tapered periphery *not* ground, the tolerance shall be increased by 10° (e.g. M3 = 60° : +60°₀ for M-rings or +70°₀ for M-rings with IF or IW).

3.3.2 Designation example

Designation of a taper-faced rectangular ring with narrow ring width of $d_1 = 60$ mm nominal diameter, $h_1 = 1,2$ mm ring width, made of spheroidal graphite cast iron, heat-treated (material subclass 51) general features as shown in figure 3 with taper M3 = 60° and periphery chromium-coated fully faced design 0,1 mm minimum thickness:

Piston ring ISO/TR 6622-2 M3 - 60 × 1,2 - MC 51/CR2

4 Common features

4.1 Type R — Straight-faced rectangular ring

4.1.1 Uncoated rings

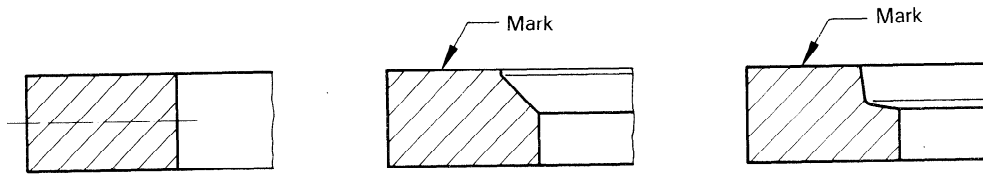


Figure 4 — Uncoated type R rings

4.1.2 Coated rings (chromium or molybdenum)

4.1.2.1 Fully faced

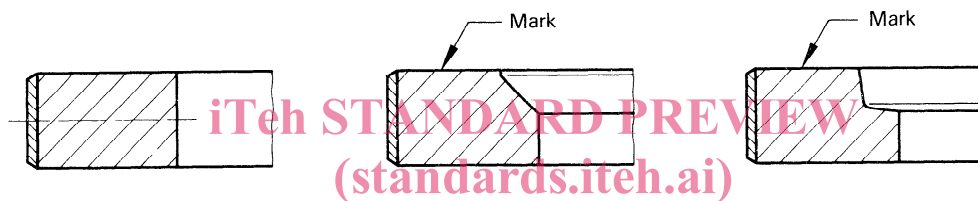


Figure 5 — Fully faced coated type R rings
[ISO/TR 6622-2:1988](https://standards.iteh.ai/catalog/standards/sist/8453467b-433f-4dfe-a063-7d3d3479c611/iso-tr-6622-2-1988)

<https://standards.iteh.ai/catalog/standards/sist/8453467b-433f-4dfe-a063-7d3d3479c611/iso-tr-6622-2-1988>

4.1.2.2 Semi-inlaid

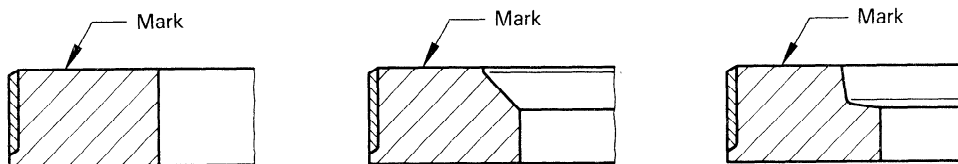


Figure 6 — Semi-inlaid coated type R rings

4.1.2.3 Inlaid

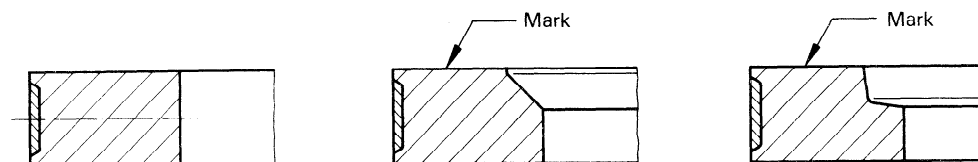


Figure 7 — Inlaid coated type R rings

4.2 Type B — Barrel-faced rectangular ring

4.2.1 Uncoated rings

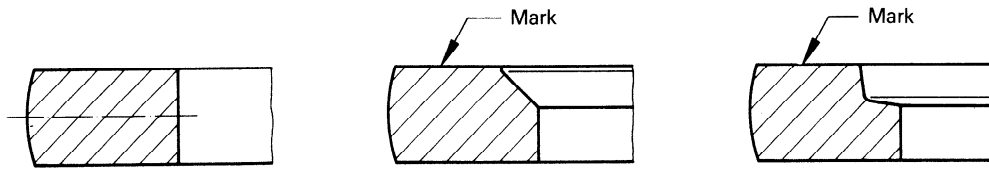


Figure 8 — Uncoated type B rings

4.2.2 Coated rings (chromium or molybdenum)

4.2.2.1 Fully faced

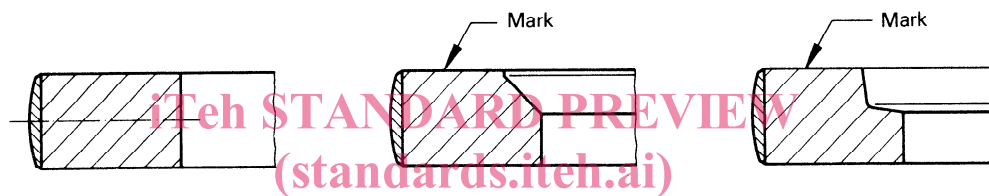


Figure 9 — Fully faced coated type B rings

<https://standards.iteh.ai/catalog/standards/sist/8453467b-433f-4dfe-a063-7d3d3479c611/iso-tr-6622-2-1988>

4.2.2.2 Semi-inlaid

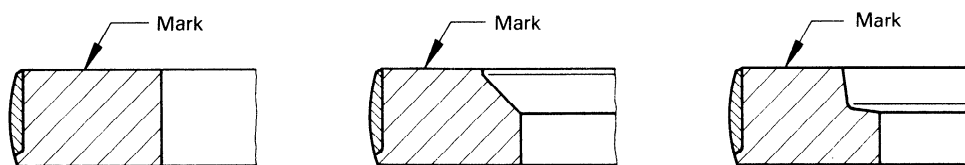


Figure 10 — Semi-inlaid coated type B rings

4.2.2.3 Inlaid

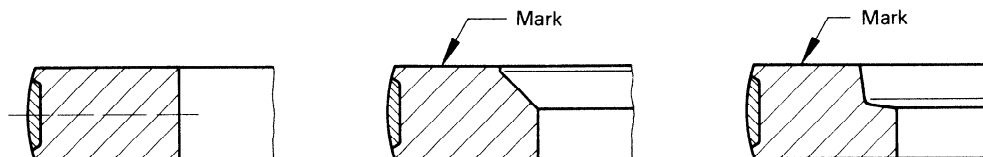


Figure 11 — Inlaid coated type B rings

4.3 Type M – Taper-faced rectangular ring

4.3.1 Uncoated rings

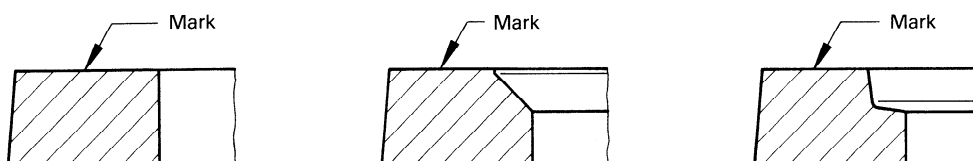


Figure 12 – Uncoated type M rings

4.3.2 Coated rings (chromium or molybdenum)

4.3.2.1 Fully faced

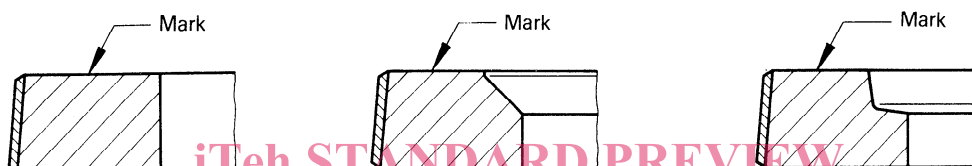


Figure 13 – Fully faced coated type M rings

ISO/TR 6622-2:1988
<https://standards.iteh.ai/catalog/standards/sist/8453467b-433f-4dfe-a063-7d3d3479c611/iso-tr-6622-2-1988>

4.3.2.2 Semi-inlaid

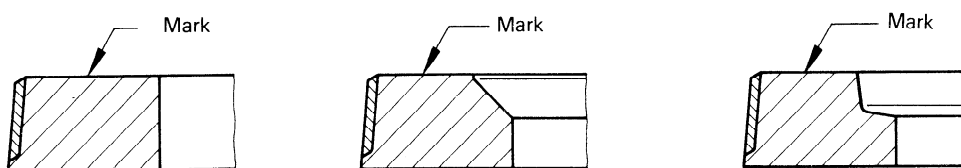


Figure 14 – Semi-inlaid coated type M rings

4.3.2.3 Inlaid

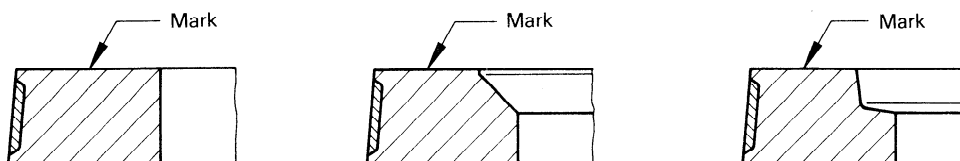


Figure 15 – Inlaid coated type M rings

4.4 R-, B- and M-rings (positive twist type) — Internal bevel (top side) or internal step (top side)

Dimensions in millimetres

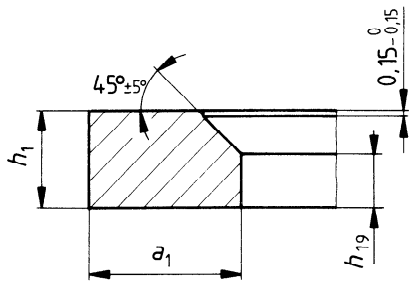


Figure 16 — Internal bevel (IF)

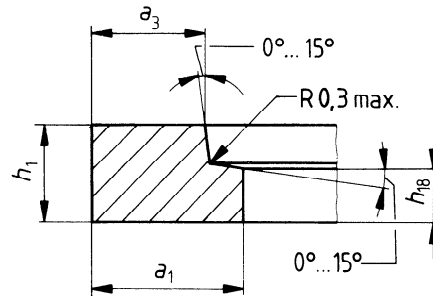


Figure 17 — Internal step (IW)

Table 3 — h_{18} , h_{19} and a_3 dimensions

Dimensions in millimetres

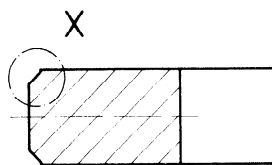
d_1	h_{18}, h_{19}		a_3	
		Tolerance		Tolerance
$30 \leq d_1 < 60$	$0,6 \times h_1$	$\begin{matrix} 0 \\ -0,25 \end{matrix}$	$0,85 \times a_1$	$\begin{matrix} 0 \\ -0,2 \end{matrix}$
$60 \leq d_1 \leq 100$	$0,6 \times h_1$	$\begin{matrix} 0 \\ -0,25 \end{matrix}$	$0,9 \times a_1$	$\begin{matrix} 0 \\ -0,3 \end{matrix}$

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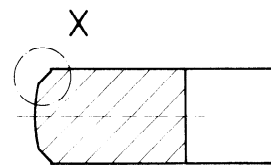
4.5 Chamfered edges (cast iron rings) [ISO/TR 6622-2:1988](https://standards.iteh.ai/catalog/standards/sist/8453467b-433f-4dfe-a063-713d34796ca1/iso-tr-6622-2-1988)

[https://standards.iteh.ai/catalog/standards/sist/8453467b-433f-4dfe-a063-](https://standards.iteh.ai/catalog/standards/sist/8453467b-433f-4dfe-a063-713d34796ca1/iso-tr-6622-2-1988)

4.5.1 R- and B-rings — Outside chamfered edges (KA)



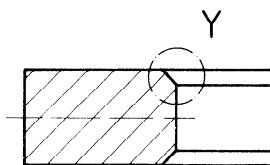
a) R-rings



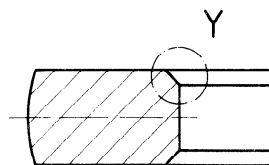
b) B-rings

Figure 18 — Outside chamfered edges (KA)

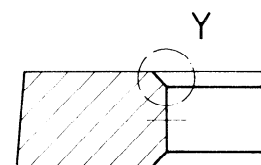
4.5.2 R-, B- and M-rings — Inside chamfered edges (KI)



a) R-rings



b) B-rings



c) M-rings

Figure 19 — Inside chamfered edges (KI)