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## 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: Segments racleurs régulateurs d'huile mis en charge par ressort hélicoïdal*

ICS: 43.060.10

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## Contents

This template allows you to work with default MS Word functions and styles. You can use these if you want to maintain the Table Of Contents automatically and apply auto-numbering if this is your preference. Delete this Table of Contents if not required.

<b>Foreword</b>	<b>5</b>
<b>Introduction</b>	<b>5</b>
<b>1 Scope</b>	<b>6</b>
<b>1 Normative references</b>	<b>6</b>
<b>2 Overview</b>	<b>6</b>
<b>3 Piston ring types and designation</b>	<b>6</b>
<b>3.2 Type DSF-C — Coil spring loaded bevelled edge oil control ring, chromium plated and profile ground</b>	<b>7</b>
<b>3.2.1 General features and dimensions</b>	<b>7</b>
<b>3.2.2 Designation of a Type DSF-C piston ring in accordance with ISO 6626-1</b>	<b>8</b>
<b>3.3 Type DSF-CNP — Coil spring loaded bevelled edge oil control ring, chromium plated not profile ground</b>	<b>8</b>
<b>3.3.1 General features and dimensions</b>	<b>8</b>
<b>3.3.2 Designation of a Type DSF-CNP piston ring in accordance with ISO 6626-1</b>	<b>9</b>
<b>3.4 Type SSF — Coil spring loaded slotted oil control ring</b>	<b>10</b>
<b>3.4.1 General features and dimensions</b>	<b>10</b>
<b>3.4.2 Designation of a Type SSF piston ring in accordance with ISO 6626-1</b>	<b>10</b>
<b>3.5 Type GSF — Coil spring loaded double bevelled oil control ring</b>	<b>11</b>
<b>3.5.1 General features and dimensions</b>	<b>11</b>
<b>3.5.2 Designation of a Type GSF piston ring in accordance with ISO 6626-1</b>	<b>11</b>
<b>3.6 Type DSF — Coil spring loaded bevelled edge oil control ring</b>	<b>12</b>
<b>3.6.1 General features and dimensions</b>	<b>12</b>
<b>3.6.2 Designation of a Type DSF piston ring in accordance with ISO 6626-1</b>	<b>12</b>
<b>3.7 Type DSF-NG — Coil spring loaded bevelled edge oil control ring (face geometry similar to type DSF-C or type DSF-CNP)</b>	<b>13</b>
<b>3.7.1 General features and dimensions</b>	<b>13</b>
<b>3.7.2 Designation of a Type DSF-NG piston ring in accordance with ISO 6626-1</b>	<b>13</b>
<b>3.8 Type SSF-L — Coil spring loaded slotted oil control ring with 0,6 mm nominal land width</b>	<b>14</b>
<b>3.8.1 General features and dimensions</b>	<b>14</b>
<b>3.8.2 Designation of a Type SSF-L piston ring in accordance with ISO 6626-1</b>	<b>14</b>
<b>4 Common features</b>	<b>14</b>
<b>4.1 Oil drainage by slots or holes</b>	<b>15</b>
<b>4.1.1 Arrangement of slots</b>	<b>15</b>
<b>4.1.2 Slot length</b>	<b>16</b>
<b>4.1.3 Arrangement of holes</b>	<b>16</b>
<b>4.2 Plating thickness — DSF-C and DSF-CNP Coil spring loaded oil control rings</b>	<b>17</b>
<b>4.3 Peripheral edges at gap of chromium plated oil control rings</b>	<b>17</b>
<b>4.4 Spring groove offset and land offset</b>	<b>18</b>
<b>5 Coil springs</b>	<b>18</b>
<b>5.1 Types of coil spring</b>	<b>18</b>
<b>5.2 Coil spring excursion (extended gap)</b>	<b>20</b>
<b>5.3 Position of coil spring gap and fixing</b>	<b>20</b>
<b>5.4 Material</b>	<b>21</b>

6	Tangential force and nominal contact pressure .....	21
6.1	Tangential force, $F_t$ .....	21
6.1.1	Force factors.....	21
6.1.2	General tangential force, $F_t$ .....	21
6.1.3	Actual tangential force, $F_t$ , and tolerance .....	22
6.2	Nominal contact pressure, $p_0$ .....	22
8	Dimensions .....	24

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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. [www.iso.org/directives](http://www.iso.org/directives)

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](http://www.iso.org/foreword)

The committee responsible for this document is ISO/TC22/SC34.

This part 1 cancels and replaces the ISO 6626:1989, of which has been technically revised.

ISO 6626 consists of the following parts, under the general title Internal combustion engines — Piston rings:

- Part 1: Coil -spring- loaded oil control rings made of cast iron
- Part 2: Coil -spring- loaded oil control rings of narrow width made of cast iron
- Part 3: Coil -spring- loaded oil control rings made of steel

## Introduction

ISO 6626 is one of a series of International Standards dealing with piston rings for reciprocating internal combustion engines. Others are ISO 6621<sup>[1]</sup>, <sup>[2]</sup>, ISO 6622<sup>[3]</sup>, ISO 6623<sup>[4]</sup>, ISO 6624<sup>[5]</sup>, ISO 6625<sup>[6]</sup> ISO 6626<sup>[7]</sup> <sup>[8]</sup> and ISO 6627<sup>[9]</sup>.

# Internal combustion engines — Piston rings — Part 1: Coil spring loaded oil control rings made of cast iron

## 1 Scope

This part of ISO 6626 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.

## 1 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.

ISO 6621-3, *Internal combustion engines — Piston rings — Part 3: Material specifications*

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

ISO 6621-5, *Internal combustion engines — Piston rings — Part 5: Quality requirements*

## 2 Overview

The 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 13 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 to 8 mm inclusive) is driven into 0,5 or 1,0 mm steps. In Tables 14 to 19 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.

## 3 Piston ring types and designation

### 3.1 Types DSF-C, DSF-CNP, SSF, GSF, DSF, DSF-NG and SSF-L

#### 3.1.1 General features and dimensions

See Figure 1 and Tables 8 to 19

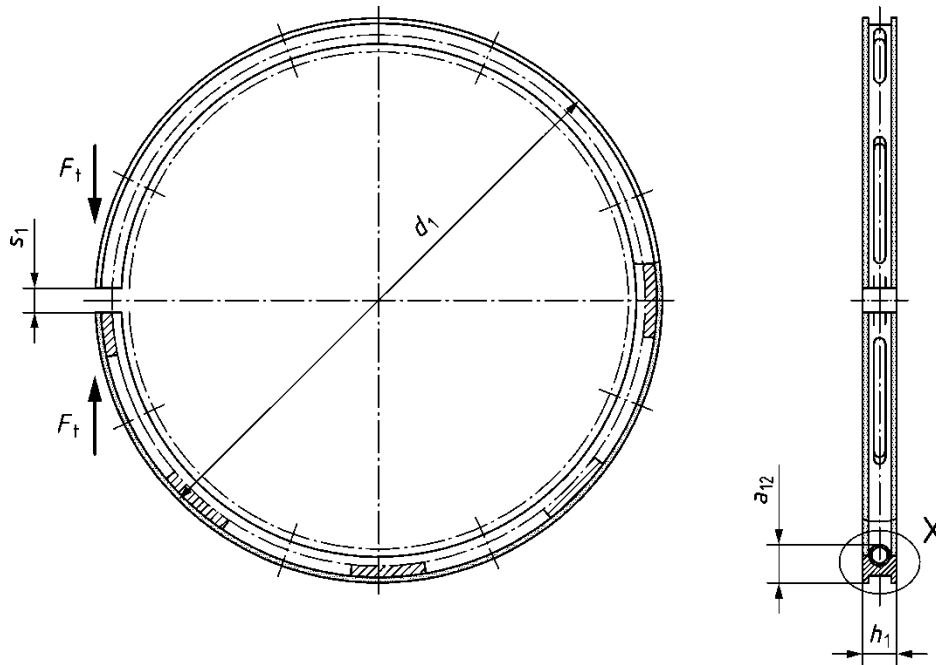


Figure 1 — Types DSF-C, DSF-CNP, SSF, GSF, DSF, DSF-NG and SSF-L

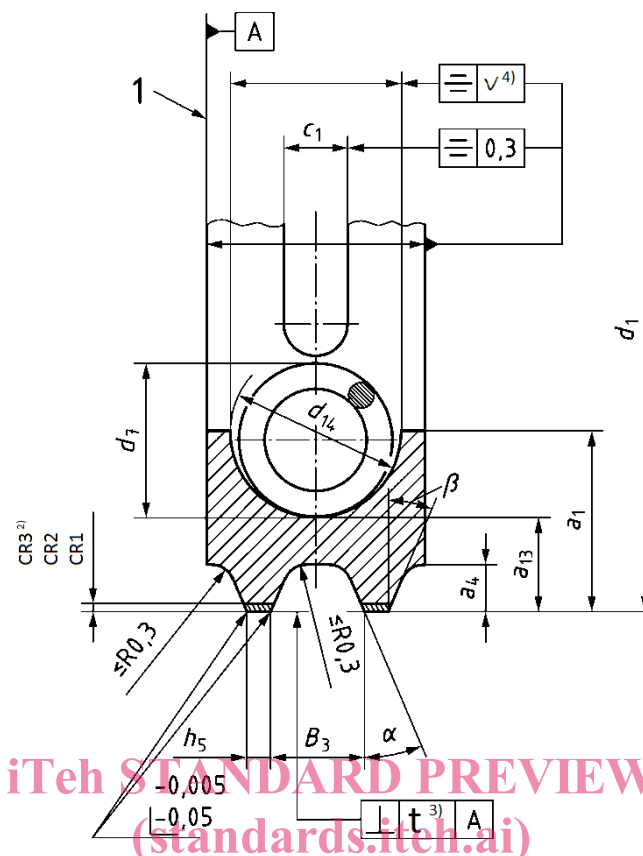
### 3.2 Type DSF-C— Coil spring loaded bevelled edge oil control ring, chromium plated and profile ground

#### 3.2.1 General features and dimensions

See Figure 2 and Tables 8 and 14.

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**Key**

- 1 reference plane
- 2 see table 3
- 3 see table 4
- 4 see table 5

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**Figure 2 — Type DSF-C****3.2.2 Designation of a Type DSF-C piston ring in accordance with ISO 6626-1**

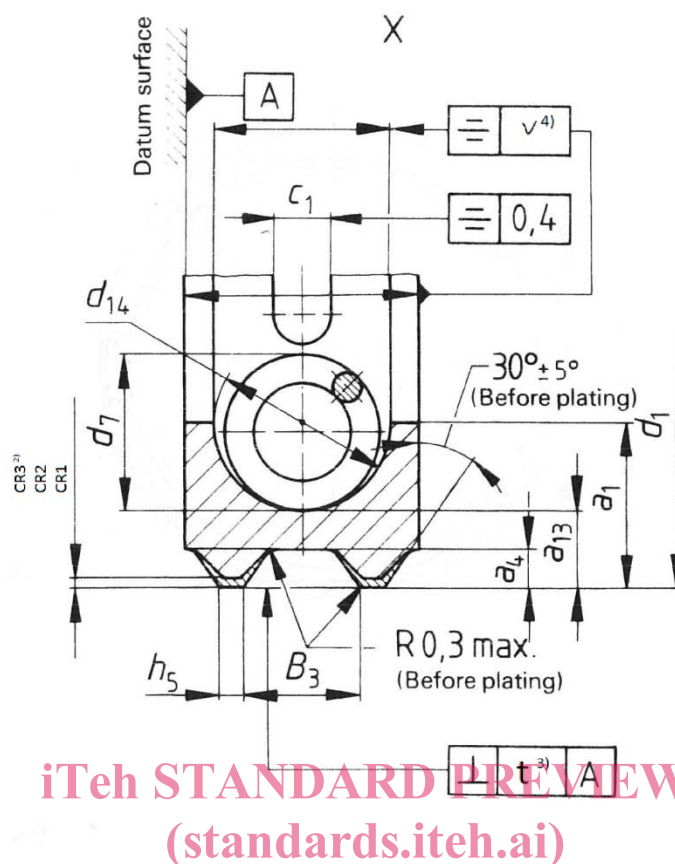
**EXAMPLE** Coil spring loaded bevelled edge oil control ring, chromium plated and profile ground (DSF-C), of nominal diameter  $d_1 = 125$  mm (125), nominal ring width  $h_1 = 3,5$  mm (3,5), a land width  $h_5 = 0,25$  mm (0,25), made of grey cast iron, non-heat treated, material subclass 11 (MC11), 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 1,5N/mm<sup>2</sup> (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 - 125 × 3,5 × 0,25 - MC11 / S020 CR3 PO WK WF CSE PN1,5 MM**

**3.3 Type DSF-CNP — Coil spring loaded bevelled edge oil control ring, chromium plated not profile ground****3.3.1 General features and dimensions**

See Figure 3 and Tables 9 and 15.



**Key**

- 1 reference plane
- 2 see table 3
- 3 see table 4
- 4 see table 5

ISO/DIS 6626-1

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**Figure 3 — Type DSF-CNP****3.3.2 Designation of a Type DSF-CNP piston ring in accordance with ISO 6626-1**

**EXAMPLE** Coil spring loaded slotted oil control ring (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  $1,0\text{N/mm}^2$  (PN1,0). Parameters in parenthesis are used in the ISO ring designation:

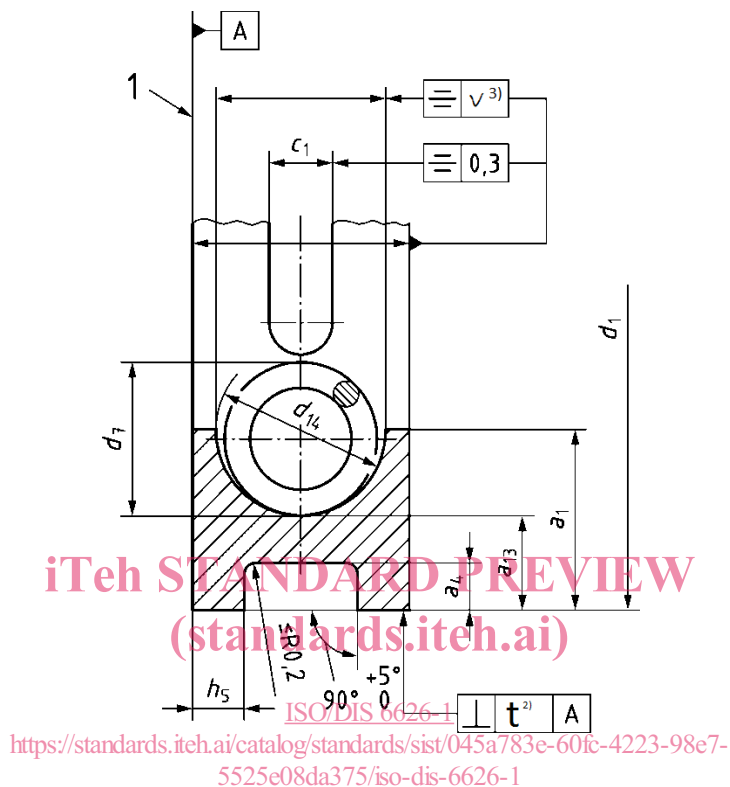
**Piston ring ISO 6626-1 SSF- 100 × 4 × 0,40 - MC12 / CSN PN1,0**

### 3.4 Type SSF — Coil spring loaded slotted oil control ring

#### 3.4.1 General features and dimensions

See Figure 4 and Table 10 and 16.

Dimensions in millimetres



#### Key

- 1 reference plane
- 2 see table 4
- 3 see table 5

Figure 4 — Type SSF

#### 3.4.2 Designation of a Type SSF piston ring in accordance with ISO 6626-1

**EXAMPLE** Coil spring loaded slotted oil control ring (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  $1,0\text{N/mm}^2$  (PN1,0). Parameters in parenthesis are used in the ISO ring designation:

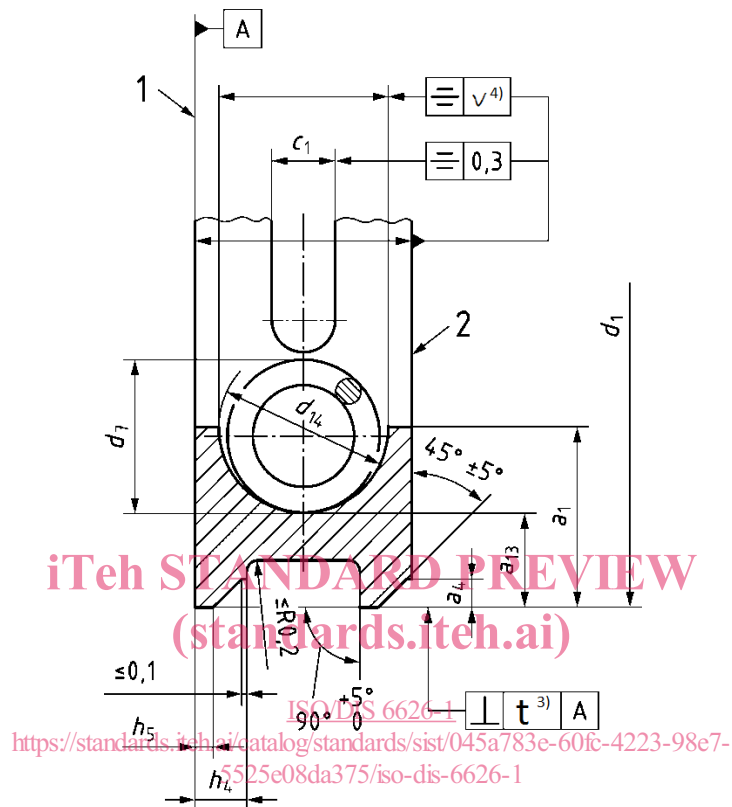
**Piston ring ISO 6626-1 SSF- 80 × 4,0 × 0,70 - MC12 / CSN PN1,0**

### 3.5 Type GSF — Coil spring loaded double bevelled oil control ring

#### 3.5.1 General features and dimensions

See Figure 5 and Table 11 and 17. Top-side marking is mandatory in accordance with ISO 6621-4.

Dimensions in millimetres



#### Key

- 1 reference plane
- 2 top side identification mark
- 3 see table 4
- 4 see table 5

Figure 5 — Type GSF

#### 3.5.2 Designation of a Type GSF piston ring in accordance with ISO 6626-1

**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  $1,0\text{N/mm}^2$  (PN1,0). Parameters in parenthesis are used in the ISO ring designation:

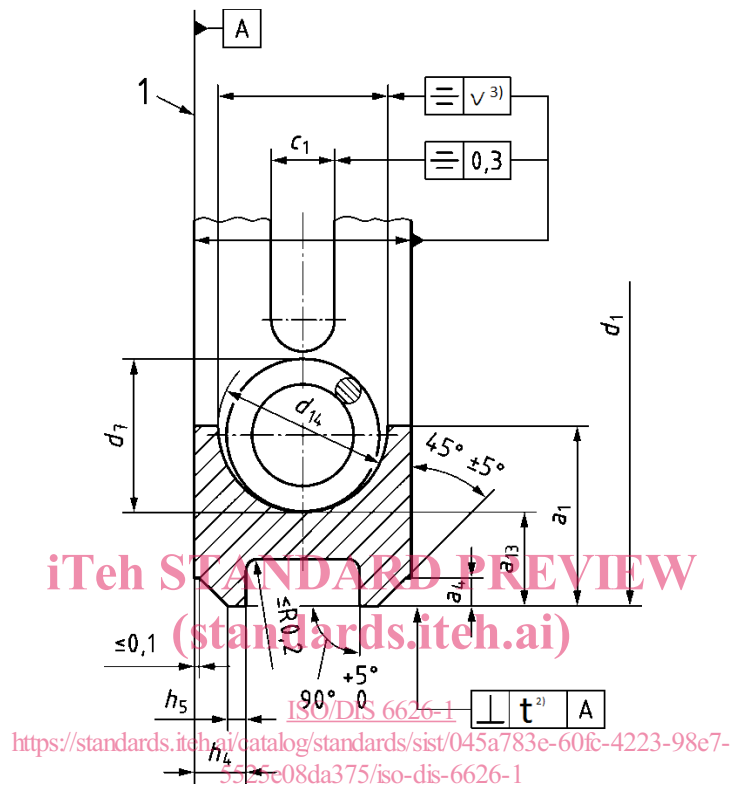
**Piston ring ISO 6626-1 GSF- 75 × 3,5 × 0,35 - MC12 / CSN PN1,0**

### 3.6 Type DSF — Coil spring loaded bevelled edge oil control ring

#### 3.6.1 General features and dimensions

See Figure 6 and Tables 11 and 17.

Dimensions in millimetres



#### Key

- 1 reference plane
- 2 see table 4
- 3 see table 5

Figure 6 — Type DSF

#### 3.6.2 Designation of a Type DSF piston ring in accordance with ISO 6626-1

**EXAMPLE** Coil spring loaded double bevelled 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  $1,0\text{N/mm}^2$  (PN1,0). Parameters in parenthesis are used in the ISO ring designation:

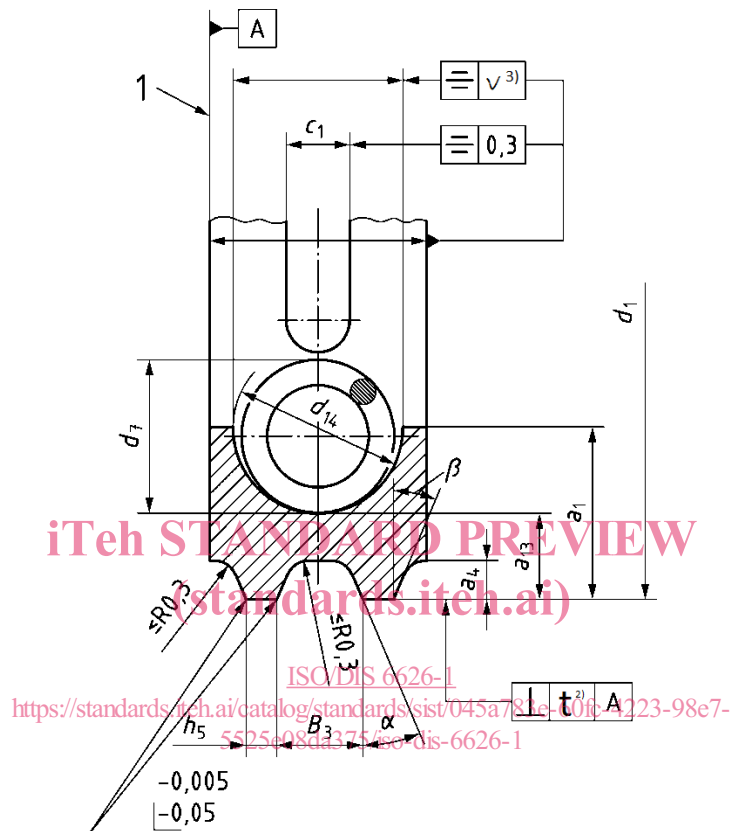
**Piston ring ISO 6626-1 DSF- 90 × 3,5 × 0,35 - MC12 / CSN PN1,0**

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

#### 3.7.1 General features and dimensions

See Figure 7 and Tables 12 and 18.

Dimensions in millimetres



#### Key

- 1 reference plane
- 2 see table 4
- 3 see table 5

Figure 7 — Type DSF-NG

#### 3.7.2 Designation of a Type DSF-NG piston ring in accordance with ISO 6626-1

**EXAMPLE** Coil spring loaded slotted oil control ring (DSF-NG) 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  $1,0$  N/mm<sup>2</sup> (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**

### 3.8 Type SSF-L — Coil spring loaded slotted oil control ring with 0,6 mm nominal land width

#### 3.8.1 General features and dimensions

See Figure 8 and Tables 13 and 19.

Dimensions in millimetres

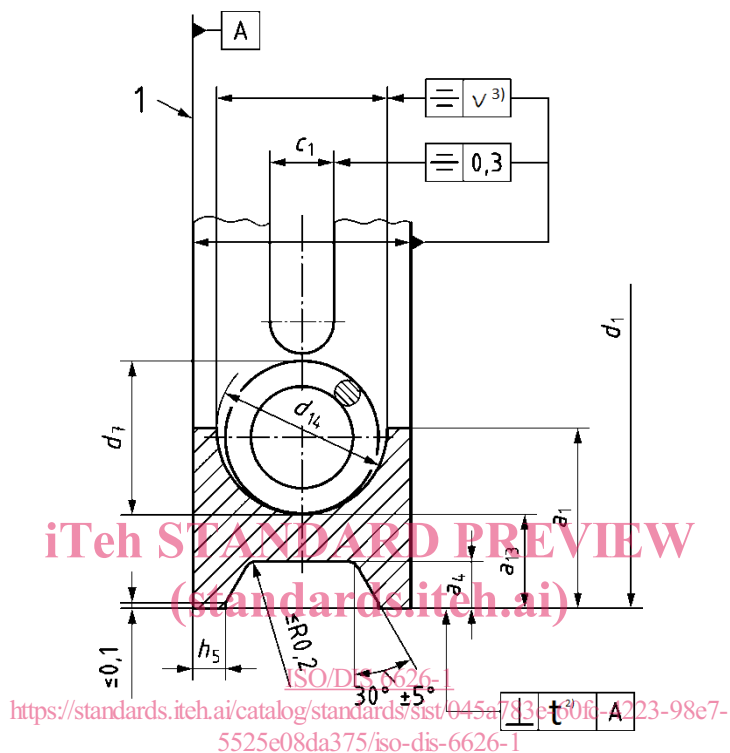


Figure 8 — Type SSF-L

#### 3.8.2 Designation of a Type SSF-L piston ring in accordance with ISO 6626-1

**EXAMPLE** Coil spring loaded slotted oil control ring (SSF-L) of nominal diameter  $d_1 = 80$  mm (80), nominal ring width  $h_1 = 3,0$  mm (3,0), 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  $1,0\text{N/mm}^2$  (PN1,0). Parameters in parenthesis are used in the ISO ring designation:

**Piston ring ISO 6626-1 SSF-L - 80 × 3,0 - MC12 / CSN PN1,0**

## 4 Common features

## 4.1 Oil drainage by slots or holes

### 4.1.1 Arrangement of slots

See Figure 9 and Table 1.

Dimensions in millimetres

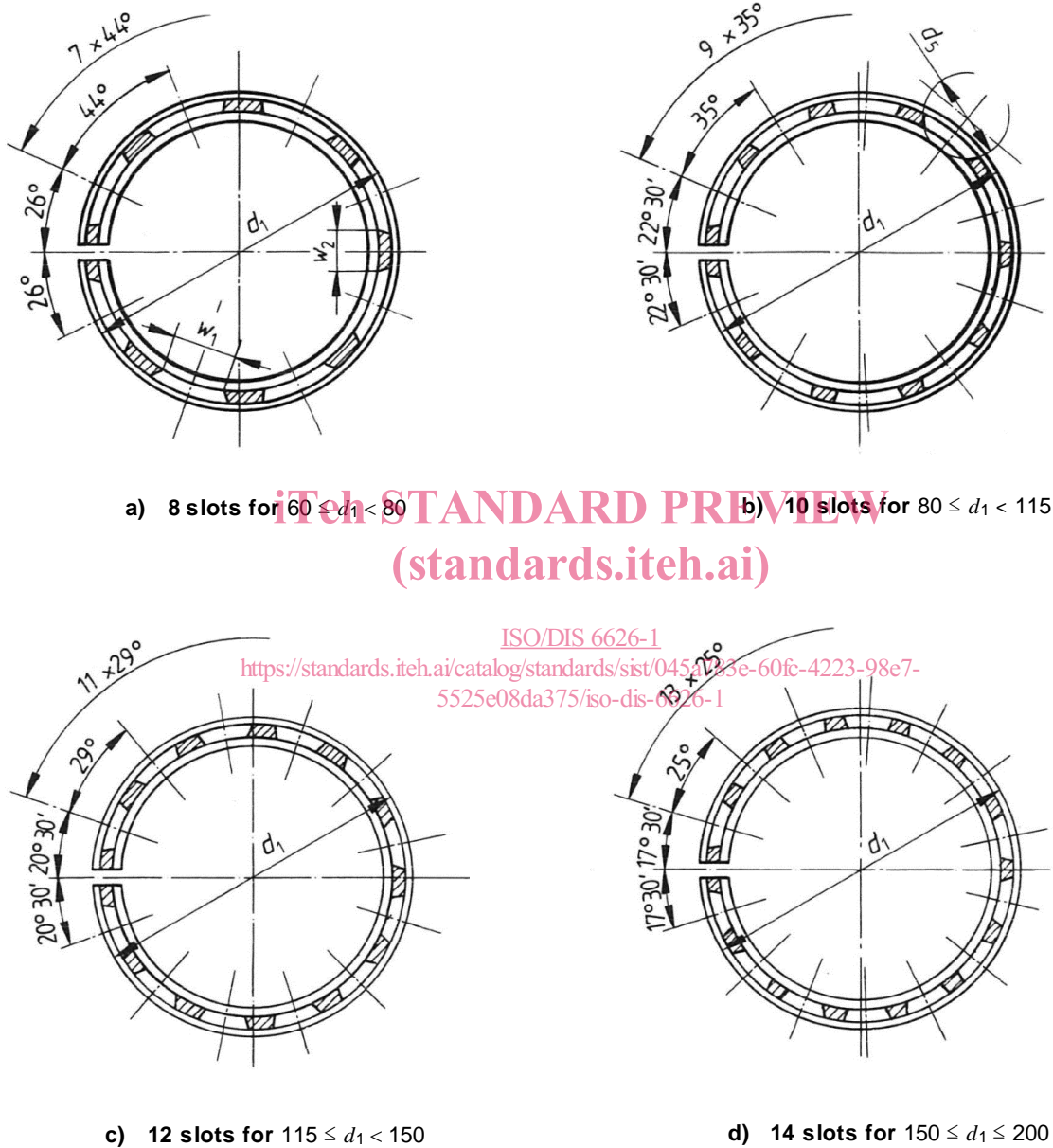


Figure 9 — Arrangement of slots