
Aerospace fluid systems — O-rings, inch series: Inside diameters and cross sections, tolerances and size-identification codes —

**Part 1:
Close tolerances for hydraulic systems**

Systèmes aérospatiaux de fluides — Joints toriques, série en inches: diamètres intérieurs et sections, tolérances et codes d'identification dimensionnelle —

Partie 1: Tolérances serrées pour systèmes hydrauliques



Reference number
ISO 16031-1:2002(E)

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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 part of ISO 16031 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 16031-1 was prepared by Technical Committee ISO/TC 20, *Aircraft and space vehicles*, Subcommittee SC 10, *Aerospace fluid systems and components*.

ISO 16031 consists of the following parts, under the general title *Aerospace fluid systems — O-rings, inch series: Inside diameters and cross sections, tolerances and size-identification codes*:

- *Part 1: Close tolerances for hydraulic systems*
- *Part 2: Standard tolerances (for non-hydraulic systems)*

Introduction

In fluid power systems, power is transmitted through a fluid (liquid or gas) under pressure within an enclosed circuit. Components are designed to meet these requirements under varying conditions. Testing of components to meet performance requirements provides users with a basis of assurance for determining design applications and for checking component compliance with their stated requirements.

Aerospace fluid systems — O-rings, inch series: Inside diameters and cross sections, tolerances and size-identification codes —

Part 1: Close tolerances for hydraulic systems

1 Scope

This part of ISO 16031 specifies the inside diameters, cross-sections, tolerances and size identification codes for inch O-rings used in aerospace fluid systems.

The dimensions and high precision tolerances specified in this part of ISO 16031 are suitable for nitrile and ethylene propylene materials intended for use in high pressure hydraulic fluid systems provided that suitable tooling be available.

2 Normative reference

The following normative document contains provisions which, through reference in this text, constitute provisions of this part of ISO 16031. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However parties to agreements based on this part of ISO 16031 are encouraged to investigate the possibility of applying the most recent edition of the normative document indicated below. For undated references, the latest edition of the document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 5598:1985, *Fluid power systems and components — Vocabulary*

3 Terms and definitions

For the purposes of this part of ISO 16031 the terms and definitions given in ISO 5598 apply.

NOTE Throughout ISO 16031, the term “O-ring” has been adopted although the correct technical term is “toroidal sealing ring”.

4 Configuration

The shape of the O-ring shall be toroidal as shown in Figure 1.

5 Inside diameters, cross-sections and tolerances

The combinations of inside diameters, d_1 , cross-sections, d_2 , and O-ring tolerances shall be chosen from Tables 1 and 2. For each of these combinations there is a corresponding size identification code.

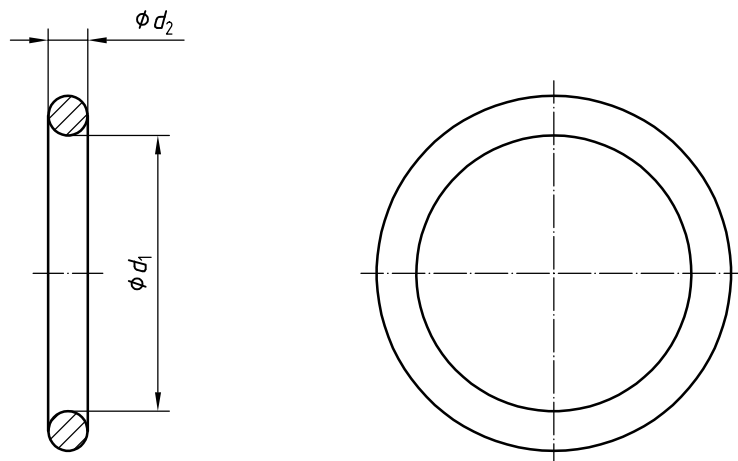


Figure 1 — Typical O-ring configuration

6 Size identification code

6.1 Table 1 lists the dimensions of O-rings and their corresponding size identification code from -001 to -475. The size identification codes are divided into groups of one hundred and within each group are sequential and not significant. Each group of one hundred identifies the cross-section size of the O-rings within the group (except for sizes -001 to -003 which have unique cross-section sizes).

EXAMPLE

- 0 2 5 O-ring size identification code
 | | |
 | | └── Reference number allocated to an O-ring internal diameter size
 | └──
 └── Signifies that the O-ring has a cross-section of 0,070 in (1,78 mm)

Reference to Table 1 establishes that -025 represents an O-ring with a cross-section of 0,070 in (1,78 mm) and an internal diameter of 1,170 in to 1,182 in (29,72 mm to 30,02 mm).

6.2 Table 2, lists the dimensions of O-rings and their corresponding size identification code for the 900 series, which includes all of the currently standardized O-rings for sealing straight thread tube fitting bosses. This series utilizes a significant dash numbering system, where the dash number designates the tube size in 1/16ths in, with the exception of the -901, which is intended for a 0.093 8 in (2.38 mm) nominal outside diameter tube.

EXAMPLE

- 9 1 8 O-ring size identification code

└─ Signifies that the O-ring is for an 18/16ths, i.e. 1,125 in (28,58 mm) tube size

└─ Signifies that the O-ring is for a straight thread tube fitting boss