

INTERNATIONAL STANDARD

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Hydraulic fluid power — Plain-end, seamless and welded precision steel tubes — Dimensions and nominal working pressures

*Transmissions hydrauliques — Tubes de précision en acier, soudés ou
non, à extrémités lisses — Dimensions et pressions nominales de travail*



Reference number
ISO 10763:1994(E)

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.

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.

International Standard ISO 10763 was prepared by Technical Committee ISO/TC 131, *Fluid power systems*, Subcommittee SC 4, *Connectors and similar products and components*.

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Introduction

In hydraulic fluid power systems, power is transmitted and controlled through a liquid under pressure within an enclosed circuit.

Components may be connected through their ports by connections (fittings) and conduits. Tubes are rigid conduits.

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1 Scope

This International Standard specifies sizes and nominal working pressures for tubes with outside diameters in accordance with ISO 4397 and wall thicknesses or mechanical properties in accordance with ISO 3304 (seamless precision steel tubes) and ISO 3305 (welded precision steel tubes). The nominal working pressures included in this standard reflect a design factor ratio of 4 to 1 between the static burst and nominal working pressures.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 3304:1985, *Plain end seamless precision steel tubes — Technical conditions for delivery*.

ISO 3305:1985, *Plain end welded precision steel tubes — Technical conditions for delivery*.

ISO 4397:1993, *Fluid power systems and components — Connectors and associated components — Nominal outside diameters of tubes and nominal inside diameters of hoses*.

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

3 Definitions

For the purposes of this International Standard, the definitions given in ISO 5598 apply.

4 Requirements

Steel tubes shall have outside diameters selected from the range presented in ISO 4397 and shall have the mechanical properties of grade R37 in normalized conditions (NBK), as specified in ISO 3304 and ISO 3305.

5 Nominal working pressures

The nominal working pressures for selected tube outside diameters and wall thicknesses are given in table 1. The values are based on a design factor ratio of 4 to 1 between the static burst and working pressures and are derived from the following formulae:

$$p_b = R_{m,min} \left(\ln \frac{D}{d} \right) \quad \dots (1)$$

and

$$p_w = \frac{p_b}{4} \quad \dots (2)$$

where

p_b is the static burst pressure in megapascals;

p_w is the nominal working pressure^{1),2)} in megapascals;

$R_{m,min}$ is the minimum tensile strength; for table 1, 360 N/mm² is used for normalized condition (NBK, grade R37), in accordance with ISO 3304 and ISO 3305;

$\ln$ is the natural logarithm, also referred to as $\log_e$;

D is the tube outside diameter;

d is the tube inside diameter.

6 Identification statement (Reference to this International Standard)

It is recommended to manufacturers to use the following statement in test reports, catalogues and sales literature when electing to comply with this International Standard:

"Sizes and working pressures for seamless and welded precision steel tubes in accordance with ISO 10763:1994, *Hydraulic fluid power — Plain-end, seamless and welded precision steel tubes — Dimensions and nominal working pressures*."

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1) Nominal working pressure values are for dynamic conditions, and for essentially static conditions; a smaller design factor agreed upon between the manufacturer and user may be used.

2) These values are for tubes used at temperatures between -20 °C and $+120\text{ °C}$.