INTERNATIONAL STANDARD

ISO
12573

Aircraft — Tubing tolerances — Inch series

Aéronefs — Tolérances de tuyauterie — Série en inches

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ISO 12573:2010
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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 12573 was prepared by Technical Committee ISO/TC 20, *Aircraft and space vehicles*, Subcommittee SC 10, *Aerospace fluid systems and components*.

Introduction

The purpose of this International Standard is to harmonize the dimensional tolerances used in the preparation of aerospace tubing. It is intended that future aerospace tubing standards refer to this International Standard for the purpose of defining dimensional tolerances.

International Standards use the International System of units (SI); however, large segments of the aerospace industry make use of other measurement systems as a matter of common working practice. The title of this International Standard ("Inch series") reflects the fact that nominal sizes (see definition 3.1), which are in common use in the aerospace industry, were originally defined in terms of fractional inches.

Although tube sizes were originally defined (and are frequently cited) using non-SI units, all dimensions used in this International Standard are given in SI units, with inch units also indicated for the convenience of the user.

The decimal sign used in International Standards is the comma (","); however, the comma is not used in common working practice for inch dimensions. Therefore, in common with many other aerospace standards, the decimal point is used in this International Standard when providing dimensions in inches.

NOTE   The use of non-SI units and the decimal point in this International Standard does not constitute general acceptance of measurement systems other than SI within International Standards.

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Aircraft — Tubing tolerances — Inch series

1 Scope

This International Standard specifies the dimensional tolerances to be applied to round section inch series tubing used in aircraft.

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.

ISO 8575, *Aerospace — Fluid systems — Hydraulic system tubing*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
nominal size
dash number
d_N
non-dimensional characteristic which identifies the size of the parts of a fluid system

NOTE   For a tube, the nominal size corresponds to the nominal value of the outside diameter, expressed in sixteenths of an inch (1,59 mm).

EXAMPLE   −04 corresponds to 4/16 in = 0.250 in = 6,35 mm.

3.2
outside diameter
d_1
distance between any two points at 180° to each other around the outside of a single section across the tube

NOTE   Unless otherwise specified, the limits on the outside diameter therefore include all allowances for ovality (lack of circularity).

See Figure 1.

Key

d_1 outside diameter

d_2 inside diameter

t wall thickness

Figure 1 — Outside diameter, inside diameter and wall thickness

3.3
mean outside diameter
arithmetic mean of two measurements of the outside diameter, taken at right angles to each other around a single section across the tube

NOTE   Where a mean outside diameter is specified, a limitation on ovality is also specified.

See Figure 2.

Key

$d_{1,max}$ maximum outside diameter

$d_{1,min}$ minimum outside diameter

mean outside diameter: $\dfrac{d_{1,max} - d_{1,min}}{2}$

ovality: $d_{1,max} - d_{1,min}$

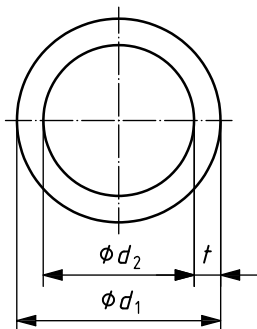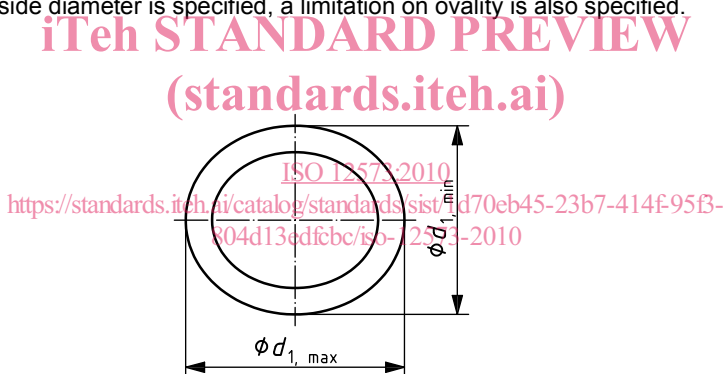**Figure 2 — Mean outside diameter and ovality**

3.4
inside diameter
d_2
distance between any two points at 180° to each other around the inside of a single section across the tube

NOTE   Unless otherwise specified, the limits on the inside diameter shall include all allowances for ovality (lack of circularity).

See Figure 1.

3.5
wall thickness
t
thickness measured at a right angle across the tube wall

See Figure 1.

3.6
ovality
difference between the larger and smaller measures of the outside diameter where these are taken at right angles to each other around a single section across the tube
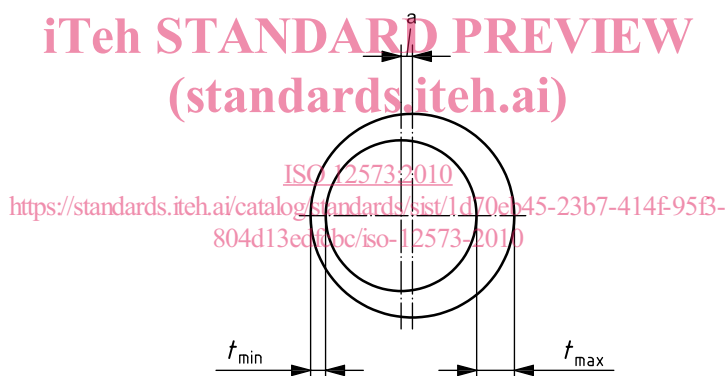
See Figure 2.

3.7
concentricity
lack of coaxiality
axis of the outside diameter being non-coincident with the axis of the inside diameter

NOTE   As the position of the axes is difficult to determine in practice, it is defined as half the variation in wall thickness at any two points at 180° to each other around a single section of the tube. Unless otherwise specified, the allowance for concentricity is contained with the permitted variation of wall thickness.

See Figure 3.

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Key

t_{max} maximum wall thickness

t_{min} minimum wall thickness

a   concentricity: $\frac{t_{max} - t_{min}}{2}$

Figure 3 — Concentricity

3.8
straightness
maximum curvature (depth of arc) permissible in a specified length

See Figure 4.