INTERNATIONAL STANDARD

ISO 8575

First edition
1990-11-15

Aerospace — Fluid systems — Hydraulic system tubing

Aéronautique et espace — Systèmes de fluides — Tubes pour systèmes hydrauliques

Reference number
ISO 8575:1990(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 8575 was prepared by Technical Committee ISO/TC 20, *Aircraft and space vehicles*.

Annex A of this International Standard is for information only.

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Case Postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

Aerospace — Fluid systems — Hydraulic system tubing

1 Scope

This International Standard specifies the requirements relating to the sizes and material of tubing for use in aerospace hydraulic pressure and return systems. For pressure lines, the requirements apply to the pressure and temperature ranges covered by pressure classes D and E and temperature types II and III as specified in ISO 6771.

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 2964:1985, *Aerospace — Tubing — Outside diameters and thicknesses — Metric dimensions.*

ISO 6771:1987, *Aerospace — Fluid systems and components — Pressure and temperature classifications.*

ISO 8574:1990[1], *Aerospace — Hydraulic system tubing — Qualification test requirements.*

3 Requirements

3.1 Pressure lines

3.1.1 Tubing material

Materials for tubing used in hydraulic system pressure lines shall be in accordance with table 1 and shall conform to the appropriate physical properties specified in table 1.

3.1.2 Tube sizes

The outside diameters, wall thicknesses and materials of tubing used in the manufacture of tube assemblies shall conform, where applicable, to the relevant requirements given in table 2.

Where no wall thickness is shown in table 2 for a particular combination of tube outside diameter and material and it is desired to use that combination, a suitable wall thickness shall be selected in accordance with ISO 2964 and shall be verified by testing in accordance with ISO 8574.

3.1.3 Qualification

Tubing having outside diameters, wall thicknesses and materials as specified in table 2 shall have been verified by testing in accordance with the requirements of ISO 8574.

3.2 Sunction and return lines

3.2.1 Tubing material

Materials for tubing used in hydraulic system suction and return lines may be as given in table 1 and verified in accordance with ISO 8574 or at the discretion of the aircraft designer.

3.2.2 Tube sizes

Unless otherwise specified, the outside diameters for tubing used in suction and return lines shall be selected from those specified in table 2 or in ISO 2964.

The corresponding wall thicknesses shall be selected from those specified in ISO 2964 according to each particular outside diameter that has been selected.

1) To be published.

Table 1 — Tubing materials

Material		Ultimate tensile strength	Proof stress of non-proportional elongation	Percentage elongation after fracture
Code No.	Description	R_m min. N/mm² [1]	$R_{p0,2}$ min. N/mm² [1]	$A_{min.}$ %
1	Cold-worked corrosion-resistant steel	725	515	20
2	High-strength corrosion-resistant steel	980	825	20
3	Cold-worked and stress-relieved titanium	860	720	10
4	Unalloyed titanium	350	250	28

NOTE — While waiting for the publication of International Standards for the materials described in table 1, national standards accepted by the corresponding country as conforming to the requirements specified in this table are given in the annex for information.

1) 1 N/mm² = 1 MPa

Table 2 — Outside diameters, wall thicknesses and materials for hydraulic tubing pressure lines

Dimensions in millimetres

Temperature (see ISO 6771)	Type II (–55 °C to 135 °C)						Type III (–55 °C to 200 °C)	
Pressure (see ISO 6771)	Classe D 21 000 kPa (210 bar)			Classe E 28 000 kPa (280 bar)			Classe D 21 000 kPa (210 bar)	Classe E 28 000 kPa (280 bar)
Tube material code (see table 1)	1	2	3	2	3	4	3	3
Tube outside diameter [1] (see ISO 2964)	Tube wall thickness (see ISO 2964)							
DN05	0,4	0,4	0,4	0,6	0,6	—	—	—
DN06	0,4	0,4	0,4	0,6	0,6	0,8	0,4	0,7
DN08	0,5	0,5	0,5	0,8	0,8	0,9	—	—
DN10	0,7	0,5	0,5	0,8	0,8	1,2	0,6	0,9
DN12	0,8	0,6	0,6	0,9	0,9	1,4	0,7	1
DN14	1	0,8	0,8	—	—	1,6	—	—
DN16	1	0,8	0,8	1,2	1,2	1,8	0,9	1,3
DN20	1,5	1	1	1,5	1,5	—	1,1	1,8
DN25	1,6	1,3	1,3	1,9	1,9	—	1,4	2,2
DN32	2,2	1,4	1,4	2,2	2,2	—	1,6	2,5
DN40	—	—	—	—	—	—	—	—

NOTE — A dash (—) in the columns for "Tube wall thickness" indicates that values have not been established as yet. They will be added when available.

1) **DN** = Nominal outside diameter of tube. For example: **DN05** = tube with outside diameter of 5 mm.

Annex A
(informative)

Aerospace hydraulic tubing materials

National standards for tubing material accepted by the corresponding countries as conforming to the requirements specified in table 1 are given in table A.1; the reference numbers for the corresponding future International Standards are also given for information.

Table A.1 — Corresponding national standards for tubing materials

Material (see table 1)		Reference number of future International Standard[1)]	Corresponding national standards			
Code No.	Description		China	France	United Kingdom	USA
1	Cold-worked corrosion-resistant steel	ISO 9522	YB678	—	As for USA	MIL-T-6845
2	High-strength corrosion-resistant steel	ISO 9540	—	AIR 9423		ANSI/SAE AMS 5561
3	Cold-worked and stress-relieved titanium	ISO 9630		—		ANSI/SAE AMS 4944
4	Unalloyed titanium	ISO 9620				ANSI/SAE AMS 4941 or ANSI/SAE AMS 4942

1) These International Standards are currently being developed.

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