FINAL DRAFT
International Standard

ISO/FDIS 8434-2

Metallic tube connections for fluid power and general use —

Part 2:
37 degree flared connectors

Raccordements de tubes métalliques pour transmissions hydrauliques et pneumatiques et applications générales —

Partie 2: Connecteurs évasés à 37 degrés

ISO/TC **131**/SC **4**

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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 document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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

This third edition cancels and replaces the second edition (ISO 8434-2:2007), which has been technically revised.

The main changes are as follows:

— Introduction and Clause 10, ISO 263 cross-references replaced with ISO 725.

— Clause 1 “Scope” updated to include tubes with outside diameters from 4 mm to 50,8 mm. Sizes 4, 5, and 22 mm have been added to all applicable tables.

— Clause 2 “Normative references” updated.

— Clause 3 “Terms and definitions” updated. Figure 1 added.

— 4.2, removed all references to connector bodies made from copper alloys.

— 5.3, removed pressure derating for connectors made from stainless steel.

— 6.7, added material and letter designations.

— Clause 7 “Requirements for tubes” rewritten to remove references to ISO 3304 and ISO 3305.

— 8.1, added forging size criteria.

— 9.4 “Wall Thickness” added.

— Clause 10 “Screw Threads” rewritten.

— 11.3 “Corrosion protection” rewritten.

— Clause 12 “Assembly Instructions” rewritten.

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— Clause 13 “Procurement information” seal material added.

— 15.1 “Performance requirements” rewritten.

— 15.1.5 “Repeated assembly test” added, “Re-use of test samples” removed.

— Clause 16 “Identification statement” rewritten.

— All figures have been renumbered and redrawn.

— Figure 5, tolerance added to R0,5 radius.

— Figure 7 and Table 8 were added for the recommended chamfer for single flares.

— Table 9, footnote “[a]” added.

— Figure 10, R0,26 ± 0,13 changed to R0,25 ± 0,15.

— Figure 11/Table 12, added “L_6” dimension and subsequent “L” dimensions were adjusted in following figures and tables.

— Table 13, removed Tube OD 50.

— Figure 18/Table 19 and Figure 19/Table 20, Optional dual angle seat design added.

— Figure 19/Table 20 added “L_{47}”.

— Table A.3 factor for 9/16-18 and 16 updated to -0,4.

— Bibliography updated.

A list of all parts in the ISO 8434 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

In fluid power systems, power is transmitted and controlled through a fluid (liquid or gas) under pressure within an enclosed circuit. In general applications, a fluid may be conveyed under pressure.

Components may be connected through their ports by connections (connectors), tubes and hoses. Tubes are rigid conductors; hoses are flexible conductors.

This document is based on the US standard SAE J514-1[1] and SAE J533[2]. The threads for the 37° flared connection are unified inch threads in accordance with ISO 725. The inch threads were not changed to metric threads according to ISO 261 to allow connectors complying with this document to be used in existing applications without requiring a change to tube or hose assemblies. Also, the thread-to-nut overtightening and seal performance have been extensively tested; to change to metric threads would require an extensive test program at considerable cost without providing any functional improvement. The threads are integral to themselves, connectors of this type match only to themselves and, other than having metric threads, no value in changing could be found. Major international companies that have used these connectors have adopted the design without noting any problems. All wrench flats specified in this document are dimensioned to be used with ISO standard metric wrenches.

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Metallic tube connections for fluid power and general use —

Part 2:
37 degree flared connectors

1 Scope

This document specifies the general and dimensional requirements for the design and performance of 37° flared connectors that are suitable for use with ferrous and non-ferrous tubes with outside diameters from 4 mm to 50,8 mm, inclusive. These connectors provide full-flow connections with metal-to-metal sealings. These connectors are for use in fluid power and general applications within the limits of pressure and temperature specified in this document.

They are intended for the connection of tubes and hose fittings to ports in accordance with ISO 6149-1, ISO 1179-1, ISO 9974-1 and ISO 11926-1. (See ISO 12151-5 for related hose fitting specification.)

NOTE 1 For new designs in hydraulic fluid power applications, see the requirements given in 9.7. Where the requirements of the application allow for the use of elastomeric seals, connector designs that conform to International Standards and incorporate elastomeric sealing are preferred.

NOTE 2 For use under conditions outside the limits for pressure or temperature, or both, see 5.4.

Both metric and inch tubing can be accommodated by changing the sleeve (see Figure 9). In the past, these connectors have been used predominantly with inch tubing. For new and future designs, the use of metric tubing is preferred.

This document also specifies performance and qualification tests for 37° flared connectors.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 725, *ISO inch screw threads — Basic dimensions*

ISO 1127, *Stainless steel tubes — Dimensions, tolerances and conventional masses per unit length*

ISO 1179-3, *Connections for general use and fluid power — Ports and stud ends with ISO 228-1 threads with elastomeric or metal-to-metal sealing — Part 3: Light-duty (L series) stud ends with sealing by O-ring with retaining ring (types G and H)*

ISO 4759-1, *Tolerances for fasteners — Part 1: Bolts, screws, studs and nuts — Product grades A, B and C*

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

ISO 6149-3, *Connections for hydraulic fluid power and general use — Ports and stud ends with ISO 261 metric threads and O-ring sealing — Part 3: Dimensions, design, test methods and requirements for light-duty (L series) stud ends*

ISO 9227, *Corrosion tests in artificial atmospheres — Salt spray tests*

ISO 9974-2, *Connections for general use and fluid power — Ports and stud ends with ISO 261 threads with elastomeric or metal-to-metal sealing — Part 2: Stud ends with elastomeric sealing (type E)*

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ISO 11926-3, *Connections for general use and fluid power — Ports and stud ends with ISO 725 threads and O-ring sealing — Part 3: Light-duty (L series) stud ends*

ISO 19879, *Metallic tube connections for fluid power and general use — Test methods for hydraulic fluid power connections*

ISO 21920-1, *Geometrical product specifications (GPS) — Surface texture: Profile — Part 1: Indication of surface texture*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5598 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
adjustable stud end
stud end connector that allows for connector orientation through final tightening of the locknut to complete the connection

Note 1 to entry: This type of stud end is typically used on shaped connectors (e.g. tees, crosses and elbows).

3.2
non-adjustable stud end
stud end connector that does not require specific orientation before final tightening of the connection because it is only used on straight connectors

3.3
run
two principal, axially aligned outlets of a tee connector or cross connector



Key

1	run
2	branch

Figure 1 — Run and branch illustration

3.4
branch
side outlet(s) of a tee connector or cross connector

3.5
chamfer
removal of a conical portion at the entrance of a thread to assist assembly and prevent damage to the start of the thread

3.6
assembly torque
torque required to achieve a satisfactory final connection

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3.7
qualification test torque
torque used to verify conformity of the connector to the requirements of this document

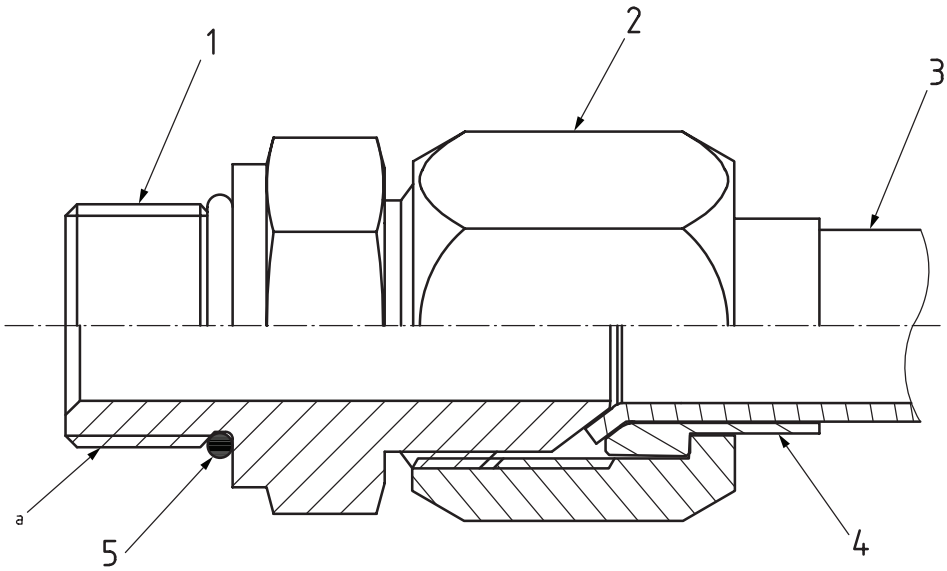
3.8
overtightening
torque that the nut withstands without deformation that renders it unusable

3.9
jump size connector
connector with dis-similar end connections, for example, –6 male flare with a –12 stud end

4 Materials

4.1 General

Figure 2 shows the cross-section and components of a typical 37° flared connector.



Key

1	straight stud connector body
2	tube nut
3	tube
4	sleeve
5	O-ring
a	Stud end in accordance with ISO 1179-3, ISO 6149-3, ISO 9974-2 or ISO 11926-3.

Figure 2 — Cross-section of typical 37° flared connection

4.2 Connector bodies

Bodies shall be manufactured from carbon steel or stainless steel, which will provide the minimum requirements for the pressure and temperature ratings specified in Clause 5 when tested in accordance with Clause 15. They shall have characteristics that make them suitable for use with the fluid to be conveyed and to provide an effective joint.

4.3 Nuts

Nuts to be used with carbon steel bodies shall be made of carbon steel and those for use with stainless steel bodies shall be made of stainless steel unless otherwise specified.

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