



International
Standard

ISO 19013-1

**Rubber hoses and tubing for fuel
circuits for internal combustion
engines — Specification —**

**Part 1:
Diesel fuels**

*Tuyaux de caoutchouc et flexibles pour les circuits de carburant
pour les moteurs à combustion interne — Spécifications —*

Partie 1: Carburants diesel

**Third edition
2026-08**

Sample Document

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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 45, *Rubber and rubber products*, Subcommittee SC 1, *Rubber and plastics hoses and hose assemblies*.

This third edition cancels and replaces the second edition (ISO 19013-1:2019), which has been technically revised.

The main changes are as follows:

- inclusion of requirements in Clauses 5 and 6;
- revision of Clause 7.

A list of all parts in the ISO 19013 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.

Rubber hoses and tubing for fuel circuits for internal combustion engines — Specification —

Part 1: Diesel fuels

WARNING — Persons using this document should be familiar with normal laboratory practice. This document does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices.

1 Scope

This document specifies the requirements for rubber tubing and hoses used in diesel fuel circuits for internal combustion engines. The diesel fuels covered include “bio-diesels” which consist of the methyl ester of rape seed oil at levels up to 20 % by volume in conventional diesel fuels.

NOTE See [Annex E](#) for a detailed description of the “line call-out” used in tests for specific original equipment manufacturer (OEM) applications.

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 188, *Rubber, vulcanized or thermoplastic — Accelerated ageing and heat resistance tests*

ISO 1402, *Rubber and plastics hoses and hose assemblies — Hydrostatic testing*

ISO 1629, *Rubber and latices — Nomenclature*

ISO 1817, *Rubber, vulcanized or thermoplastic — Determination of the effect of liquids*

ISO 3302-1, *Rubber — Tolerances for products — Part 1: Dimensional tolerances*

ISO 4671, *Rubber and plastics hoses and hose assemblies — Methods of measurement of the dimensions of hoses and the lengths of hose assemblies*

ISO 4926, *Road vehicles — Hydraulic braking systems — Non-petroleum-based reference fluid*

ISO 6133, *Rubber and plastics — Analysis of multi-peak traces obtained in determinations of tear strength and adhesion strength*

ISO 7233:2021, *Rubber and plastics hoses and hose assemblies — Determination of resistance to vacuum*

ISO 7326:2016, *Rubber and plastics hoses — Assessment of ozone resistance under static conditions*

ISO 8031, *Rubber and plastics hoses and hose assemblies — Determination of electrical resistance and conductivity*

ISO 8033, *Rubber and plastics hoses — Determination of adhesion between components*

ISO 10619-1:2017, *Rubber and plastics hoses and tubing — Measurement of flexibility and stiffness — Part 1: Bending tests at ambient temperature*

ISO 10619-2:2021, *Rubber and plastics hoses and tubing — Measurement of flexibility and stiffness — Part 2: Bending tests at sub-ambient temperatures*

ISO 23529, *Rubber — General procedures for preparing and conditioning test pieces for physical test methods*

SAE J2027, *Standard for Protective Covers for Gasoline Fuel Line Tubing*

SAE J2044:2009, *Quick Connect Coupling Specification for Liquid Fuel and Vapor/Emissions Systems*

SAE J2260, *Nonmetallic Fuel System Tubing with One or More Layers*

EN 14214, *Liquid petroleum products — Fatty acid methyl esters (FAME) for use in diesel engines and heating applications — Requirements and test methods*

3 Terms and definitions

No terms and definitions are listed in this document.

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/>

4 Classification

The product shall consist of extruded rubber materials with or without an integral reinforcement, which can be pre-formed or non-pre-formed before final vulcanization. The product can also have a rubber or thermoplastic barrier layer, either as an internal layer or forming the inner liner, to impart improved fluid resistance or reduced fuel vapour permeability, or both.

Seven hoses and tubings for specific applications are specified, as follows:

- Type 1:
 - Class A = Pressurized [0,7 MPa (7 bar) working pressure] feed and return lines from the fuel tank to the engine compartment (−40 °C to +80 °C continuous);
 - Class B = Pressurized [0,2 MPa (2 bar) working pressure] feed and return lines from the fuel tank to the engine compartment (−40 °C to +80 °C continuous);
- Type 2:
 - Class A = Pressurized [0,7 MPa (7 bar) working pressure] feed and return lines in the engine compartment (−40 °C to +100 °C continuous);
 - Class B = Pressurized [0,2 MPa (2 bar) working pressure] feed and return lines in the engine compartment (−40 °C to +100 °C continuous);
- Type 3:
 - Class A = Pressurized [0,7 MPa (7 bar) working pressure] feed and return lines in the engine compartment (−40 °C to +125 °C continuous);
 - Class B = Pressurized [0,2 MPa (2 bar) working pressure] feed and return lines in the engine compartment (−40 °C to +125 °C continuous);
- Type 4 Low pressure [0,12 MPa (1,2 bar) working pressure] fuel filler, vent and vapour handling (−40 °C to +80 °C continuous).

5 Sizes

5.1 Tubing

The test shall be carried out in accordance with ISO 4671. The inside diameters and wall thicknesses shall be as specified in [Table 1](#).

Tolerances shall be selected from the appropriate categories specified in ISO 3302-1: M3 for moulded hoses: E2 for extrusions.

The thickness of the barrier layer, where applicable, shall be included in the total nominal wall thickness shown in [Table 1](#).

Table 1 — Tubing inside diameters and wall thicknesses

Inside diameter mm	Wall thickness mm
3,5	3,5
4	3,5
5	4
7	4,5
9	4,5
11	4,5
13	4,5

NOTE The unions on which the tubing is fitted have the following diameters: 4 mm, 4,5 mm, 6 mm or 6,35 mm, 8 mm, 10 mm, 12 mm and 14 mm.

5.2 Hoses

The test shall be carried out in accordance with ISO 4671. The dimensions and concentricity of hoses shall be in accordance with [Tables 2](#) and [3](#).

Table 2 — Hose dimensions

Dimensions in millimetres

Inside diameter	Tolerance	Outside diameter	Tolerance
3,5	±0,3	9,5	±0,4
4	±0,3	10	±0,4
5	±0,3	11	±0,4
6	±0,3	12	±0,4
7	±0,3	13	±0,4
7,5	±0,3	13,5	±0,4
8	±0,3	14	±0,4
9	±0,3	15	±0,4
11	±0,3	18	±0,4
12	±0,3	19	±0,4
13	±0,4	20	±0,6
16	±0,4	24	±0,6
21	±0,4	29	±0,6
31,5	+0,5 -1	40	±1
40	+0,5 -1	50	±1