
**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



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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 19013-1 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 1, *Hoses (rubber and plastics)*.

Together with Part 2 (see below), this part of ISO 19013 cancels and replaces ISO 4639-1:1987, ISO 4639-2:1995 and ISO 4639-3:1995, which have been technically revised.

ISO 19013 consists of the following parts, under the general title *Rubber hoses and tubing for fuel circuits for internal combustion engines — Specification*:

- *Part 1: Diesel fuels*
- *Part 2: Gasoline fuels*

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

Part 1: Diesel fuels

WARNING — Persons using this part of ISO 19013 should be familiar with normal laboratory practice. This part of ISO 19013 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 and to ensure compliance with any national regulatory conditions.

1 Scope

This part of ISO 19013 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. In addition, this specification may also be applied as a classification system to enable original equipment manufacturers (OEMs) to detail a “line call-out” of tests for specific applications where these are not covered by the main types specified (see example in Annex E). In this case, the hose or tubing would not carry any marking showing the number of this part of ISO 19013 but may detail the OEM's own identification markings as shown on their part drawings.

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 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 1746, *Rubber or plastics hoses and tubing — Bending tests*

ISO 1817, *Rubber, vulcanized — 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 dimensions*

ISO 4672:1997, *Rubber and plastics hoses — Sub-ambient temperature flexibility tests*

ISO 4926, *Road vehicles — Hydraulic brake systems — Non-petroleum base reference fluids*

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

ISO 7233:1991, *Rubber and plastics hoses and hose assemblies — Determination of suction resistance*

ISO 7326:1991, *Rubber and plastics hoses — Assessment of ozone resistance under static conditions*

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

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

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 J2044:2002, *Quick Connect Coupling Specification for Liquid Fuel and Vapor/Emissions Systems*

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

EN 14214, *Automotive fuels — Fatty acid methyl esters (FAME) for diesel engines — Requirements and test methods*

3 Classification

The product shall consist of extruded rubber materials with or without an integral reinforcement which may or may not be pre-formed before final vulcanization. The product may also have a rubber or thermoplastic barrier layer, either as an internal layer or forming the inner liner, to impart improved fluid resistance and/or reduced fuel vapour permeability.

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

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

4 Sizes

4.1 Tubing

When determined by the methods described in ISO 4671, internal 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.