
**Natural gas — Natural gas for use
as a compressed fuel for vehicles —**

Part 1:
Designation of the quality

*Gaz naturel — Gaz naturel pour usage comme carburant comprimé
pour véhicules —*

Partie 1: Désignation de la qualité



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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 15403-1 was prepared by Technical Committee ISO/TC 193, *Natural gas*.

This first edition of ISO 15403-1 cancels and replaces ISO 15403:2000, of which it constitutes a minor revision including the following changes:

- correction of the title to reflect that ISO 15403 is now formed of two parts;
- reformat the document in accordance with the ISO/IEC Directives, Part 2, Fifth edition, 2004;
- reformat the references cited in Clause 2 and in the Bibliography, in accordance with the ISO/IEC Directives, Part 2, Fifth edition, 2004.

ISO 15403 consists of the following parts, under the general title *Natural gas — Natural gas for use as a compressed fuel for vehicles*:

- *Part 1: Designation of the quality*
- *Part 2: Specification of the quality* (Technical Report)

Introduction

Natural gas has been used to some extent as a fuel for internal combustion engines in compressor stations, co-generation systems, and vehicles of various types for many years now. However, the prerequisites for growth, i.e. economic viability and fuel availability, were generally not satisfied. Now, with the natural gas industry well established, supplying 20 % of the world's primary energy, and the need for alternative, low-emission fuels, the situation has improved considerably. During the past decade, natural gas vehicles have become a viable option with some five millions units now in use around the world. Growth is continuing as many governments actively promote this clean-burning fuel with its environmental benefits. Many fleet operators are converting their vehicles, and vehicle manufacturers are developing and marketing dedicated natural gas equipment.

In the context of this International Standard, natural gas vehicles (NGVs) utilize compressed natural gas stored "on-board". The pressure of the gas stored in multiple containers is up to a maximum 25 000 kPa. Although the pressure has to be reduced before combustion, compression and storage gives NGVs an adequate range. While NGVs were initially equipped with converted gasoline or diesel engines, high-performance, dedicated natural gas engines are now being extensively developed and produced. Liquefied natural gas (LNG) may also be stored in the fuel tanks of natural gas vehicles. This, however, will be the subject of a separate International Standard.

This part of ISO 15403 for the quality designation of compressed natural gas is designed to stipulate the international requirements placed on the natural gas used as a motor fuel. Engine and vehicle manufacturers must know these requirements so they can develop high-performance equipment which runs on compressed natural gas.

A technical report giving detailed data on the gas compositions used in this part of ISO 15403 is being published as ISO/TR 15403-2.

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Natural gas — Natural gas for use as a compressed fuel for vehicles —

Part 1: Designation of the quality

1 Scope

The aim of this part of ISO 15403 is to provide manufacturers, vehicle operators, fuelling station operators and others involved in the compressed-natural-gas vehicle industry with information on the fuel quality for natural gas vehicles (NGVs) required to develop and operate compressed-natural-gas vehicle equipment successfully.

Fuel meeting the requirements of this part of ISO 15403 should

- a) provide for the safe operation of the vehicle and associated equipment needed for its fuelling and maintenance;
- b) protect the fuel system from the detrimental effects of corrosion, poisoning, and liquid or solid deposition;
- c) provide satisfactory vehicle performance under any and all conditions of climate and driving demands.

Some aspects of this part of ISO 15403 may also be applicable for the use of natural gas in stationary combustion engines.

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 6976:1995, *Natural gas — Calculation of calorific values, density, relative density and Wobbe index from composition*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply. Definitions were taken from ISO 14532 whenever possible.

3.1

natural gas

complex mixture of hydrocarbons, primarily methane, but generally also including ethane, propane and higher hydrocarbons in much smaller amounts and some non-combustible gases, such as nitrogen and carbon dioxide

NOTE 1 Natural gas generally also includes minor amounts of trace constituents.