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## Road vehicles — Liquefied natural gas (LNG) fuel system components —

### Part 1: General requirements and definitions

*Véhicules routiers — Équipements pour véhicules utilisant le gaz naturel liquéfié (GNL) comme combustible —*

*Partie 1: Exigences générales et définitions*

ICS 43.060.40

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# Contents

Page

Foreword.....	iv
1 Scope .....	1
2 Normative references .....	1
3 Terms and definitions .....	2
4 Construction and assembly.....	4
5 Electrical equipment and wiring.....	4
6 Instructions .....	5
7 Marking .....	5
Annex A (informative) Construction and assembly.....	6

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3

## 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.

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ISO 12614-1 was prepared by Technical Committee ISO/TC 22, *Road Vehicles*, Subcommittee SC 25, *Vehicles using gaseous fuels*.

ISO 12614 consists of the following parts, under the general title *Road vehicles — Liquefied natural gas (LNG) fuel system components*:

- *Part 1: General requirements and definitions*
- *Part 2: Performance and general test methods*
- *Part 3: Check valve*
- *Part 4: Manual valve*
- *Part 5: Tank pressure gauge*
- *Part 6: Overpressure regulator*
- *Part 7: Pressure relief valve*
- *Part 8: Excess flow valve*
- *Part 9: Gas-tight housing and ventilation hose*

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- Part 10: Rigid fuel line in stainless steel
- Part 11: Fittings
- Part 12: Rigid fuel line in copper and its alloys
- Part 13: Pressure control regulator
- Part 14: Differential pressure fuel content gauge
- Part 15: Capacitance fuel content gauge
- Part 16: Heat exchanger – vaporizer
- Part 17: Natural gas detector
- Part 18: Gas temperature sensor

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# Road vehicles — Liquefied natural gas (LNG) fuel system components — Part 1: General requirements and definitions

## 1 Scope

This part of ISO 12614 specifies general requirements and definitions of liquefied natural gas fuel system components, intended for use on the types of motor vehicles as defined in ISO 3833. This part of ISO 12614 is also applicable to other LNG fuelled motor vehicles (for example ships) as far as appropriate, until any specific norm would be worked out for such a type of vehicle. It also provides general design principles, and specifies requirements for instructions and marking.

This part of ISO 12614 is applicable to vehicles using natural gas in accordance with ISO 15403 (mono-fuel, bi-fuel or dual-fuel applications). It is not applicable to the following:

- a) fuel containers;
- b) stationary gas engines;
- c) container mounting hardware;
- d) electronic fuel management;
- e) fuelling receptacles.

NOTE 1 It is recognized that miscellaneous components not specifically covered herein can be examined to meet the criteria of this part of ISO 12614 and tested according to the appropriate functional tests

NOTE 2 All references to pressure in this part of ISO 12614 are to be considered gauge pressures unless otherwise specified.

NOTE 3 This part of ISO 12614 is based upon a maximum working pressure for natural gas as fuel of 1,6 MPa [16 bar<sup>1)</sup>]. Other working pressures can be accommodated by adjusting the pressure by the appropriate factor (ratio). For example, a 2 MPa (20 bar) working pressure system will require pressures to be multiplied by 1,25.

## 2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard

1) 1bar=0,1MPa=105Pa;1MPa=1N/mm2

are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 3833:1977, *Road vehicles — Types — Terms and definitions.*

ISO 6722-1:1996, *Road vehicles — Unscreened low-tension cables — Part 1: Test methods.*

ISO 6722-2:1996, *Road vehicles — Unscreened low-tension cables — Part 2: Requirements.*

ISO 6722-3:1993, *Road vehicles — Unscreened low-tension cables — Part 3: Conductor sizes and dimensions for thick-wall insulated cables.*

ISO 6722-4:1993, *Road vehicles — Unscreened low-tension cables — Part 4: Conductor sizes and dimensions for thin-wall insulated cables.*

### 3 Terms and definitions

For the purposes of this part of ISO 12614, the following terms and definitions apply.

#### 3.1 burst pressure

pressure which causes failure and consequential fluid loss through the component envelope

#### 3.2 electronic control unit (ECU)

device for control of the engine – it is not in the scope of ISO 12614

#### 3.3 filter

component that is intended to remove contaminants from the gas stream

#### 3.4 fitting

connector used in joining a piping, tubing, or hose system

#### 3.5 flexible fuel line

flexible tubing or hose through which natural gas flows

#### 3.6 fuel content gauge

shows the liquid fuel level in the fuel tank

- Differential pressure fuel content gauge
- Capacitance fuel content gauge

#### 3.7 gas-air mixer

device for mixing the gaseous fuel and intake air for the engine

#### 3.8 gas flow adjuster

gas flow restricting device, installed downstream of a pressure regulator, controlling gas flow to the engine

#### 3.9 gas injector

device for introducing gaseous fuel into the engine or associated intake system

#### 3.10 gas temperature sensor

device for gas temperature measurement, which is placed downstream to vaporizer



**3.11 gas tight housing**

device which vents gas leakage to outside the vehicle including the gas ventilation hose, the clear opening of which is at least 450 mm<sup>2</sup>

**3.12 heat exchanger - vaporizer**

device for vaporizing the cryogenic liquid fuel and deliver it as gas to the engine with gas temperature between -40°C and +85°C

**3.13 liquefied natural gas LNG**

natural gas which has been liquefied and stored for use as a vehicle fuel

**3.13.1 LNG vehicle**

vehicle, which is using liquefied natural gas (LNG) as a source of gaseous fuel for its engine

**3.14 natural gas detector**

device for natural gas detecting, which is placed at a place of expected accumulation of potentially leaking gas.

**3.15 natural gas vehicle NGV**

road vehicle powered by natural gas

**3.16 Overpressure regulator**

device used to control the delivery pressure of gaseous fuel to the engine

**3.17 pressure control regulator**

direct pressure regulator for control pressure in the fuel tank

**3.18 rigid fuel line**

tubing which has been designed not to flex in normal operation and through which natural gas flows

**3.19 tank pressure gauge**

pressurized device which indicates the pressure of the gas space in the fuel tank

**3.20 test pressure**

pressure to which a component is taken during acceptance testing

**3.21 valve**

device by which the flow of a fluid may be controlled

**3.21.1 manual valve**

valve which is operated manually

**3.21.2 automatic shut-off valve**

valve which is not operated manually used on vaporized gas only for emergency operation

**3.21.3 check valve**

automatic valve which allows gas to flow in only one direction

**3.21.4 excess flow valve**

valve which automatically shuts off, or limits, the gas flow when the flow exceeds a set design value

**3.21.5 pressure relief valve (PRV)**

device which prevents a pre-determined upstream pressure being exceeded

**3.21.6 service valve**

manual valve which is closed only when servicing the vehicle