



**International
Standard**

ISO 24671

**Road vehicles — Qualification
and certification of technical
personnel dealing with natural
gas vehicles (NGVs)**

*Véhicules routiers — Qualification et certification du personnel
technique chargé des véhicules au gaz naturel*

**First edition
2024-06**

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

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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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 41, *Specific aspects of gaseous fuels*.

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

The use of natural gas (NG) as compressed natural gas (CNG) or liquified natural gas (LNG) is considered risky because of how the fuel is stored on board of vehicles (compressed at pressure higher than 200 bar or cryogenic at a temperature of $-160\text{ }^{\circ}\text{C}$). Furthermore, operations on systems subjected to very high pressure or very low temperature can seriously injure or cause the death of persons not competent in activities dealing with natural gas vehicles (NGVs). Also, users can be badly affected in the same manner as a consequence of activities conducted by not competent persons.

Since the effectiveness of any application depends upon the competence of the persons who perform or are responsible for the activities, a procedure has been developed to provide a means for qualifying the competence of personnel involved with different levels of liability in the NGVs operations as well as a certification scheme for those professional figures that are subjected to high risk activities.

Thus, this document, as well as other standards dealing with high risk activities associated with NGVs, also aim to provide to the certification bodies precise requirements for a certification scheme when certification is required to verify the competence of level 3 and 4 (see [5.3](#)). On this matter, methods and techniques that should be adopted for a standardized competence assessment of technicians involved with the operations on NGVs are provided. This is to avoid discrepancies and different criteria in competence assessment. A synthetic scheme on how this document shall be applied in conjunction with other standards covering training and qualification of technical personnel dealing with natural gas vehicles is provided in [Figure 1](#).

When certification of personnel working on NGVs is required in product standards, regulations, codes or specifications, it is important to certify the personnel in accordance with this document.

When there is no requirement by legislation, standards or in certification of NGVs personnel, it is upon employers of such personnel to decide how to assure themselves that they are competent to do the work assignments. Thus, they may employ people who are already certified or they may apply their own expertise so as to assure themselves that their employee has the necessary competence.

This document is mainly directed to:

- workshop personnel;
- CNG, LNG and L-CNG fuelling station owner/personnel; [24](#)
- first responders;
- inspectors;
- training course providers;
- certification bodies;
- original equipment manufacturer (OEM);
- system manufacturer;
- workshop owner/personnel;
- CNG and L-CNG fuelling station owner/personnel.

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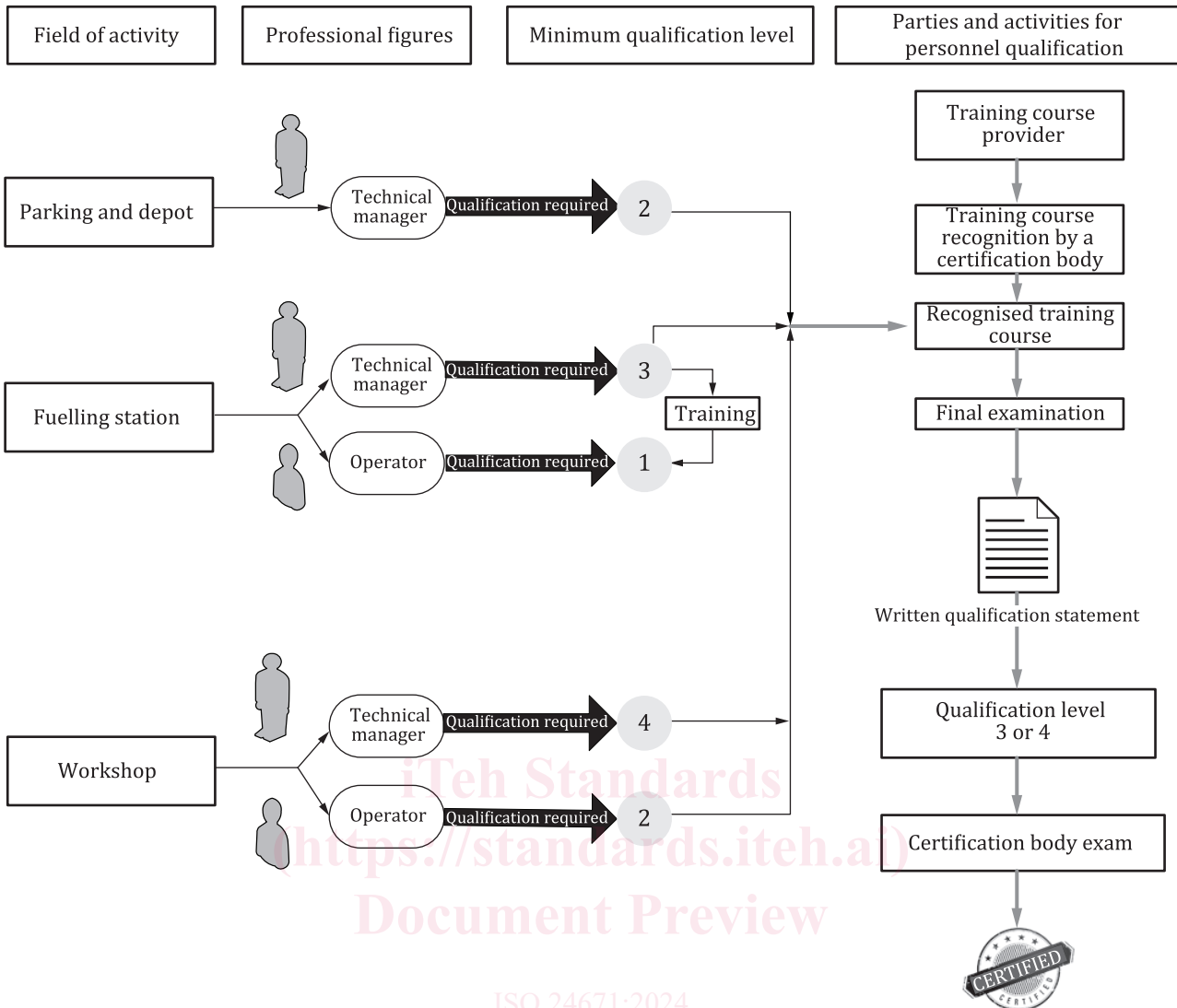


Figure 1 — Certification and qualification scheme of personnel dealing with NGVs activities

Road vehicles — Qualification and certification of technical personnel dealing with natural gas vehicles (NGVs)

1 Scope

This document specifies requirements for the qualification and certification of personnel who perform operations on NGVs, according to the level of safety required by the role and/or position.

NOTE 1 The certification is required for the level 3 and 4 of competence as defined in ISO 23684.

NOTE 2 This document specifies requirements for what are, in effect, third-party conformity assessment schemes. These requirements do not directly apply to conformity assessment by second or first parties, but relevant parts of this document can be referred to in such arrangements.

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/IEC 17024, *Conformity assessment — General requirements for bodies operating certification of persons*

ISO 23684:2023, *Road vehicles — Technical personnel dealing with natural gas vehicles (NGVs) — Training and qualification*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1

ability

capacity and human attribute to perform an activity

[SOURCE: ISO/IEC TS 17027:2014, 2.1]

3.2

applicant

person who has submitted an application to be admitted into the *certification process* (3.8)

[SOURCE: ISO/IEC 17024:2012, 3.13]

3.3

authorized qualification body

body, independent of the NGV workshop, authorized by the *certification body* (3.10) to prepare and administer qualification examinations

Note 1 to entry: Qualification examination is an activity administered by the *certification body* (3.10) or the authorized qualification body, which assesses the general, specific and practical knowledge and the *skill* (3.40) of the candidate.

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Note 2 to entry: The training course provider of a recognised training course can also operate as an authorized qualification body if the requirements of impartiality are not compromised as well as the reduction of the assessment and certification requirements.

[SOURCE: ISO 9712:2021, 3.2, modified — Note 1 to entry and Note 2 to entry have been added, and "employer" has been changed to "NGV workshop".]

3.4

candidate

applicant (3.2) who has fulfilled specified prerequisites and has been admitted to the *certification process* (3.8)

3.5

certificate

document in the form of a letter, card or other medium (e.g. digital certificate) issued by a *certification body* (3.10) under the provisions of this document, indicating that the named person has fulfilled the *certification requirements* (3.9)

3.6

certification

third-party attestation related to products, processes, systems, or persons

3.7

certification cycle

maximum period of time permitted from the date of certification to the date of *recertification* (3.36) inclusive of the *renewal* (3.37) period

3.8

certification process

activities by which a *certification body* (3.10) determines that a person fulfils *certification requirements* (3.9), including application, assessment, decision on certification, *renewal* (3.37), *recertification* (3.36) and use of *certificates* (3.5) and logos/marks

3.9

certification requirement

set of specified requirements, including requirements of the scheme to be fulfilled in order to establish or maintain *certification* (3.6)

3.10

certification body

CB

third-party conformity assessment body operating *certification schemes* (3.12)

Note 1 to entry: A certification body can be non-governmental or governmental (with or without regulatory authority).

Note 2 to entry: A conformity assessment body is a body that performs conformity assessment activities and that can be the object of accreditation.

Note 3 to entry: Third-party conformity assessment is the conformity assessment activity that is performed by a person or body that is independent of the person being certified.

[SOURCE: ISO/IEC 17065:2012, 3.12, modified — Note 2 to entry and Note 3 to entry have been added.]

3.11

certified person

person whose competence is attested as the outcome of an assessment and validation process by a *certification body* (3.10)

3.12

certification scheme

specific *certification requirements* (3.9) related to specified categories of persons to which the same particular standards and rules, and the same procedures apply

3.13

competence

ability (3.1) to apply knowledge and skills to achieve intended results

[SOURCE: ISO/IEC 17024:2012, 3.6]

3.14

compressed natural gas

CNG

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

[SOURCE: ISO 16923:2016, 3.12]

3.15

competence assessment

formal outcome of an evaluation process (e.g. examination) and validation by means of objective elements, obtained when a competent body states that the learning outcomes of a person meet given standards and safety regulations

3.16

competent person

person who has been assessed by means a *competence assessment* (3.15) and has been deemed to have the knowledge and skills for competent performance

3.17

CNG cylinder

any container used for the storage of compressed natural gas according to the following classifications:

- CNG-1: an all metal cylinder
- CNG-2: a hoop wrapped cylinder with a load sharing metal liner and composite reinforcement on the cylindrical part only
- CNG-3: a fully wrapped cylinder with a load sharing metal liner and composite reinforcement on both the cylindrical part and dome ends
- CNG-4: a fully wrapped cylinder with a non-load sharing non-metallic liner and composite reinforcement on both the cylindrical part and dome ends

3.18

employer

government, prime contractor, sub-contractor, supplier or outside agency employing or contracting the services of one or more individuals who perform activities on NGVs

Note 1 to entry: Self-employed individuals are included in this definition.

3.19

examination

mechanism that is part of the assessment which measures a *candidate's* (3.4) *competence* (3.13) by one or more means, such as written, oral, practical and observational, as defined in the *certification scheme* (3.12)

[SOURCE: ISO/IEC 17024:2012, 3.9]

3.20

examination centre

centre approved by the *certification body* (3.10) where *examinations* (3.19) are carried out

3.21

examination element

component of an *examination* (3.19)