International Standard

ISO 19880-8

Gaseous hydrogen — Fuelling stations —

Part 8: Fuel quality control

Hydrogène gazeux — Stations de remplissage —
Partie 8: Contrôle qualité du carburant

Second edition
2024-12

Reference number
ISO 19880-8:2024(en)

© ISO 2024



COPYRIGHT PROTECTED DOCUMENT

© ISO 2024
All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

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

Contents

Page

Foreword ... **iv**
Introduction ... **v**
1 Scope ... **1**
2 Normative references ... **1**
3 Terms and definitions ... **1**
4 Abbreviated terms ... **3**
5 Hydrogen specifications ... **4**
6 Quality control approaches ... **4**
6.1 General ... 4
6.2 Sampling ... 4
6.3 Monitoring ... 4
7 Potential sources of impurities ... **4**
8 Hydrogen quality assurance methodology ... **4**
8.1 General ... 4
8.2 Prescriptive methodology ... 5
8.3 Risk assessment methodology ... 5
8.4 Impact of impurities on fuel cell powertrain ... 7
9 Routine quality control ... **8**
10 Non-routine quality control ... **8**
11 Remedial measures and reporting ... **9**
Annex A (informative) **Example of risk assessment** ... **10**
Annex B (informative) **Example of Japanese hydrogen quality guidelines** ... **20**
Annex C (informative) **Typical hydrogen fuelling station supply chain** ... **30**
Annex D (informative) **Routine hydrogen quality analysis** ... **34**
Bibliography ... **36**

© ISO 2024 – All rights reserved

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 TC 197, *Hydrogen technologies*.

This second edition cancels and replaces the first edition (ISO 19880-8:2019), which has been technically revised. It also incorporates the Amendment ISO 19880-8:2019/AMD 1:2021.

The main changes are as follows:

— aligned with the revision of ISO 14687, in particular the change in the specifications of Grade D, the indicators required for risk assessment have been mainly changed;

— due to the change in the document structure of ISO 14687, the rationale for each of the ISO 14687, Grade D specifications has been moved to ISO 14687.

A list of all parts in the ISO 19880 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.

© ISO 2024 – All rights reserved

Introduction

This document was developed to specify how the quality of gaseous hydrogen fuel for road vehicles which use proton exchange membrane (PEM) fuel cells can be assured to meet the impurity levels in Grade D of ISO 14687. The document discusses hydrogen quality control approaches for routine and non-routine conditions, as well as quality assurance plans. It is based upon best practices and experience from the gaseous fuels and automotive industry. ISO 21087 describes the requirements for analytical methods to measure the level of contaminants in ISO 14687, Grade D.[1] ISO 19880-9 outlines requirements for sampling from hydrogen refuelling stations for samples taken at the dispenser.

© ISO 2024 – All rights reserved

Gaseous hydrogen — Fuelling stations —

Part 8:
Fuel quality control

1 Scope

This document specifies the protocol for ensuring the quality of the gaseous hydrogen at hydrogen distribution facilities and hydrogen fuelling stations for proton exchange membrane (PEM) fuel cells for road vehicles.

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 19880-9, *Gaseous hydrogen — Fuelling stations — Part 9: Sampling for fuel quality analysis*

ISO 14687, *Hydrogen fuel quality — Product specification*

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:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
constituent
component (or compound) found within a hydrogen fuel mixture

3.2
contaminant
impurity (3.7) that adversely affects the components within the *fuel cell powertrain* (3.4) or the hydrogen storage system

Note 1 to entry: An adverse effect can be reversible or irreversible.

3.3
filter
equipment to remove undesired *particulates* (3.14) from the hydrogen

3.4
fuel cell powertrain
power system used for the generation of electricity on a *fuel cell vehicle* (3.5)

Note 1 to entry: The fuel cell powertrain typically contains the following subsystems: fuel cell stack, air processing, fuel processing, thermal management, and water management

© ISO 2024 – All rights reserved