# DIN EN 17124:2019-07 (E)

## Hydrogen fuel - Product specification and quality assurance - Proton exchange membrane (PEM) fuel cell applications fo r road vehicles

## Contents

Page


European foreword ..... 4

1 Scope ..... 5

2 Normative references ..... 5

3 Terms and definitions ..... 5

4 Requirements ..... 6

5 Hydrogen Quality Control Approaches ..... 7
5.1 General requirements ..... 7
5.2 Sampling ..... 8
5.3 Monitoring ..... 8

6 Hydrogen Quality Assurance Methodology ..... 8
6.1 General Requirements - Potential sources of impurities ..... 8
6.2 Prescriptive Approach for Hydrogen Quality Assurance ..... 8
6.3 Risk Assessment for Hydrogen and Quality Assurance ..... 8

7 Routine Quality Control ..... 12

8 Non-routine Quality Control ..... 12

9 Non compliances ..... 13

Annex A (informative) Impact of impurities ..... 14

A.1 General ..... 14
A.2 Inert Gases: Argon, Nitrogen ..... 14
A.3 Oxygen ..... 14
A.4 Carbon Dioxide ..... 14
A.5 Carbon Monoxide ..... 14
A.6 Methane ..... 15
A.7 Water ..... 15
A.8 Total sulphur compounds ..... 15
A.9 Ammonia ..... 15
A.10 Total Hydrocarbons ..... 15
A.11 Formaldehyde ..... 16
A.12 Formic Acid ..... 16
A.13 Halogenated Compounds ..... 16
A.14 Helium ..... 16
A.15 Solid and liquid particulates (Aerosols) ..... 16

Annex B (informative) Example of Supply chain evaluation with regards to potential sources of impurities ..... 18

B.1 Potential Sources of Impurities ..... 18
B.2 Production ..... 18
B.2.1 General ..... 18
B.2.2 Reforming ..... 18

B.2.3 Alkaline Electrolysis ..... 19
B.2.4 Proton exchange membrane (PEM) electrolysis ..... 19
B.2.5 Byproducts ..... 19
B.2.6 New production methods ..... 19
B.3 Transportation ..... 20
B.3.1 General ..... 20
B.3.2 Pipeline ..... 20
B.3.3 Filling centre and tube trailer ..... 20
B.4 HRS ..... 21
B.5 Special operations: Commissioning, Maintenance ..... 21
B.6 Particles ..... 21

Annex C (informative) Example of Risk Assessment -- Centralized production, pipeline transportation ..... 22

Bibliography ..... 30