



Facility/Technical/Inspection Code for Manufacture of Mobile Gas Fuel Cells(for Forklift)

Deliberation/Resolution by Gas Technical Standards Committee : October 21, 2022

Approval by the Ministry of Trade, Industry & Energy : November 4, 2022

Gas Technical Standards Committee

Chairman	Byung-Hak Choi, Professor of Gangneung-Wonju National University
Vice-Chairman	Gi-hyun Jang, Professor of Inha University
Ex Officio Member	Yoon-Gil Hwang, Manager of Energy Safety Department, Ministry of Trade, Industry & Energy Chae-Sik Kwak, Director of Technology and Safety, Korea Gas Safety Corporation
<hr/>	
High-Pressure Gas	Byung-Hak Choi, Professor of Gangneung-Wonju National University Seong-Jin Song, Vice president of SungKyunKwan University Beom-Seok Lee, Professor of KyungHee University Chun-Seok Yoon, CEO of Hanul E&R Yeong-Hoon Ann, Professor of HanYang University
Liquefied Petroleum Gas	Hyeong-Hwan Ann, Professor of Korea National University of Transportation Hyuk-Myun Kwon, Professor of YonSei University Jeong-Sik Cheon, Director of E1 CO., Ltd. kyung-Soo Kang, Senior Researcher of Korea Institute of Energy Research Yong-Kwon Lee, Vice-President of DaeYeon Co., Ltd.
Urban Gas	Dong-Il Shin, Professor of MyongJi University Jeong-Hoon Kim, Principal Researcher of Korea Institute of Machinery and Materials In-Cheol Jeong, Director of Yesco Co., Ltd. Gi-hyun Jang, Professor of Inha University
Hydrogen Gas	Kwang-Won Lee, Professor of HoSeo University Ho-young Jeong, Professor of ChonNam National University In-Yong Kang, CEO of H&Power Co., Ltd. Woon-Bong Baek, Senior Researcher of Korea Institute of Standards and Science

This code is the detailed standards established by the Gas Technical Standards Committee in accordance with Article 22-2 of "High-Pressure Gas Safety Control Act", Article 45 of "Safety Control and Business of Liquefied Petroleum Gas Act" and Article 17-5 of "Urban Gas Business Act", Article 48 of "Hydrogen Economy Promotion and Hydrogen Safety Management Act". Since conformity to this Code is deemed to conform to the laws and regulations above, this Code must be observed.

This English version of KGS Code is an informal translation from its Korean original version. Only the Korean version of the KGS Code is officially effective since it has been authorized by the Gas Technical Standards Committee (KGS Code Committee). The secretariat of the Committee reserves the right to revise the English version whenever translation errors are found.

Contents

1. General	1
1.1 Scope	1
1.2 Validity of the Code	1
1.3 Recognition of Other Standards	1
1.3.1 Inspection standards for new technology products	1
1.3.2 Manufacturing registration standards for foreign products	2
1.4 Definitions of Terms	2
1.5 Application of the Code <i>Mutatis Mutandis</i>	4
1.6 Transitional Measures	4
2. Manufacturing Facility Standards	4
2.1 Manufacturing Equipment	4
2.2 Inspection Equipment	5
3. Technical Standards for Manufacturing	6
3.1 Material	6
3.2 Structure and Dimensions	7
3.3 Devices	13
3.3.1 Safety devices	14
3.3.2 Other devices	14
3.4 Performance	18
3.4.1 Product performance	18
3.4.2 Material performance	20
3.4.3 Operating performance	20
3.5 Heat Treatment (N/A)	30
3.6 Labeling	30
3.6.1 Product label	30
3.6.2 Acceptance mark	30
3.6.3 Instructions	31
3.6.4 Gas safety rules	31
3.6.5 Piping and installation information signs	31
4. Inspection Standards	32
4.1 Types of Inspection	32
4.1.1 Manufacturing facility inspection	32
4.1.2 Product inspection	32
4.2 Auditing of the Object of In-Process Inspection	34
4.2.1 Audit application	34
4.2.2 Audit method	34
4.2.3 Judging committee	35
4.3 Inspection Items	36
4.3.1 Manufacturing facility inspection	36
4.3.2 Product inspection	36
4.4 Inspection method	39
4.4.1 Manufacturing facility inspection	40

4.4.2 Product inspection	40
4.5 Other Inspection Standards.....	44
4.5.1 Inspection of imported goods	44
4.5.2 Partial omissions of inspections	44
4.5.3 Method of scrapping nonconforming products (N/A)	44
4.5.4 Detailed inspection standards.....	44
Appendix A General Standards for the Operation of Quality Control System at Hydrogen Equipment Manufacturing Plants	45
Appendix B Testing Environment	52
Appendix C Method of Testing Fuel cells	54

Facility/Technical/Inspection Code for Manufacture of Mobile Gas Fuel Cells(for Forklift)

1. General

1.1 Scope

1.1.1 This Code is applicable to the facilities, technical matters, and inspections of fuel cells that fall under any one of the following among those falling under Article 2 (3) 1 (B) of the Enforcement Rule of the Hydrogen Economy Promotion and Hydrogen Safety Management Act that are installed in forklifts (excl. construction machinery falling under Article 2 subparagraph 1 of the Construction Machinery Management Act) to be used as a source of power and whose rated voltage output is no more than DC 150 V and their ancillary facilities (hereinafter collectively referred to as "fuel cells"):

- (1) direct methanol fuel cell (DMFC);
- (2) polymer electrolyte membrane fuel cell (PEMFC).

1.2 Validity of the Code

1.2.1 This Code has been approved by the Minister of Trade, Industry and Energy (MOTIE Notice No. 2022-793, November 4, 2022) following a review and resolution (Agenda No. 2022-8, October 21, 2022) by the KGS Code Committee pursuant to Article 33-2 of the High-Pressure Gas Safety Control Act (hereinafter referred to as the "High-Pressure Gas Act") in accordance with Article 48 (1) of the Hydrogen Economy Promotion and Hydrogen Safety Management Act (hereinafter referred to as the "Act") and is in effect as detailed standards under Article 48 (1) of the Act.

1.2.2 Compliance with this Code will be regarded as conformity to the matters set forth in attached Table 1 of the Enforcement Rule in accordance with Article 48 (4) of the Act.

1.3 Recognition of Other Standards

1.3.1 Inspection standards for new technology products

In accordance with subparagraph 4 item A of attached Table 1 of the Enforcement Rule, manufacturing and inspection methods for newly developed fuel cells that do not meet the facility, technical, and inspection standards under this Code but are not deemed to undermine the safety