

Code for Facilities, Technology,
Inspection and Safety Diagnosis of
Pipelines outside Manufacturing Plants
and Supply Stations for Wholesale Gas
Business

Gas Technical Standards Committee

Byung-Hak Choi, Professor of Gangneung-Wonju

National University

Vice-Chairman Gi-hyun Jang, Professor of Inha University

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

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 Hyeong-Hwan Ann, Professor of Korea National

Gas 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

Korea Gas Safety Code

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.

History of Establishment and Revision of KGS Code			
Code Number	KGS FS451 ²⁰²²		
Code Title	Code for Facilities, Technology, Inspection and Safety Diagnosis of Pipelines outside Manufacturing Plants and Supply Stations for Wholesale Gas Business		

Date of	Description
Establishment/Revision	
December 31, 2008	Established (Notification of the Ministry of Knowledge Economy No. 2008-381)
May 15, 2009	Revised (Notification of the Ministry of Knowledge Economy No. 2009- 193)
September 25, 2009	Revised (Notification of the Ministry of Knowledge Economy No. 2009-357)
December 2, 2009	Revised (Notification of the Ministry of Knowledge Economy No. 2009-454)
June 25, 2010	Revised (Notification of the Ministry of Knowledge Economy No. 2010-260)
January 3, 2011	Revised (Notification of the Ministry of Knowledge Economy No. 2010-489)
October 10, 2011	Revised (Notification of the Ministry of Knowledge Economy No. 2011-500)
January 5, 2012	Revised (Notification of the Ministry of Knowledge Economy No. 2012-635)
June 26, 2012	Revised (Notification of the Ministry of Knowledge Economy No. 2012-313)
May 20, 2013	Revised (Notification of the Ministry of Knowledge Economy No. 2013-087)
October 14, 2013	Revised (Notification of the Ministry of Trade, Industry & EnergyNo. 2013-279)
November 17, 2014	Revised (Notification of the Ministry of Trade, Industry & EnergyNo. 2014-589)
February 27, 2015	Revised (Notification of the Ministry of Trade, Industry & EnergyNo. 2015-139)
April 14, 2015	Revised (Notification of the Ministry of Trade, Industry & EnergyNo. 2015-223)
July 3, 2015	Revised (Notification of the Ministry of Trade, Industry & Energy No. 2015-372)

August 7, 2015	Revised (Notification of the Ministry of Trade, Industry & Energy No. 2015-436)
November 4, 2015	Revised (Notification of the Ministry of Trade, Industry & Energy No. 2015-578)
January 8, 2016	Revised (Notification of the Ministry of Trade, Industry & Energy No 2016-006)
January 9, 2017	Revised(Notification of Ministry of Trade, Industry & Energy, No. 2017-3)
March 8, 2017	Revised(Notification of Ministry of Trade, Industry & Energy, No. 2017-116)
May 17, 2017	Revised(Notification of Ministry of Trade, Industry & Energy, No. 2017-265)
June 2, 2017	Revised(Notification of Ministry of Trade, Industry & Energy, No. 2017-298)
September 29, 2017	Revised(Notification of Ministry of Trade, Industry & Energy, No. 2017-475)
August 10, 2018	Revised(Notification of Ministry of Trade, Industry & Energy, No. 2018-419)
October 16, 2018	Revised(Notification of Ministry of Trade, Industry & Energy, No. 2018-512)
March 18, 2020	Revised(Notification of Ministry of Trade, Industry & Energy, No. 2020-168)
September 4, 2020	Revised(Notification of Ministry of Trade, Industry & Energy, No. 2020-525)
January 12, 2021	Revised(Notification of Ministry of Trade, Industry & Energy, No. 2021-012)
January 12, 2021	Revised(Notification of Ministry of Trade, Industry & Energy, No. 2021-014)
January 10, 2022	Revised(Notification of Ministry of Trade, Industry & Energy, No. 2022-012)

Table of Contents

1 General	1
1.1 Scope	1
1.2 Validity of Code	1
1.3 Definitions	1
1.4 Application of Other Codes	7
1.5 Interim Measures	7
1.5.1 Interim measures for line mark installation	7
1.5.2 Interim measures for installation and protection of pipelines	9
1.5.3 Interim measures for emergency shutoff system and contents removal system	9
1.5.4 Interim measures for pipeline materials	10
1.5.5 Interim measures for preparation of pipeline drawings	11
1.5.6 Interim measures for facility standard and technical standard	11
1.5.7 Application example of socket fusion < Newly established on November 4, 2015:	> . 11
1.6 Restriction to the Use of Materials	12
1.7 Restriction to Pipeline Pressure (currently not used)	12
1.8 Restriction to Pipeline Installation	12
1.8.1 Restriction to pipeline installation under the foundation of building < Newly establi	shed
on May 20, 2013>	12
1.9 Restriction to Installation of Polyethylene Gas Pipes	12
2. Facility Standard	13
2.1 Layout Standard (currently not used)	13
2.2 Foundation Standard (currently not used)	13
2.3 Storage Facility Standard (currently not used)	13
2.4 Gas Facility Standard (currently not used)	13
2.5 Pipeline Facility Standard	13
2.5.1 Preparation of pipeline facility drawings	13
2.5.2 Materials of pipeline facility	16
2.5.3 Configuration of pipeline facility	17
2.5.4 Pipeline thickness	17
2.5.5 Joints of pipeline	20
2.5.6 Expansion and contraction absorption measures for pipeline	29
2.5.7 Insulating measures for pipeline	32

2.5.8 Installation of pipelines	33
2.5.9 Performance of pipeline	49
2.6 Governor Station Standard (currently not used)	49
2.7 Accident Prevention Facility Standard	49
2.7.1 Installation of overpressure prevention device (currently not used)	49
2.7.2 Installation of gas leak alarm and automatic shutoff system	49
2.7.3 Installation of explosion-proof electrical facility (currently not used)	52
2.7.4 Installation of ventilation system (currently not used)	52
2.7.5 Installation of hazard monitoring and control system	52
2.7.6 Installation of corrosion prevention system	53
2.7.7 Measures for prevention of damage to pipelines due to excavation works	53
2.7.8 Installation of static eliminators (currently not used)	61
2.7.9 Installation of overturning prevention devices (currently not used)	61
2.7.10 Installation of water and impurities traps (currently not used)	61
2.7.11 Anti-freezing measures (currently not used)	61
2.7.12 Installation of safety grounding devices	61
2.7.13 Installation of lightning arrestors	61
2.8 Damage Control Facility Standard	61
2.8.1 Installation of dikes (currently not used)	61
2.8.2 Installation of protective walls (currently not used)	61
2.8.3 Installation of water sprays (currently not used)	61
2.8.4 Installation of detoxification units (currently not used)	61
2.8.5 Installation of neutralization and transfer facilities (currently not used)	61
2.8.6 Installation of emergency shutoff devices	61
2.8.7 Installation of gas supply shutoff devices	64
2.9 Associated Facilities Standard	65
2.9.1 Installation of metering system (currently not used)	65
2.9.2 Installation of emergency power system	65
2.9.3 Installation of pressure recorders (currently not used)	65
2.9.4 Installation of communication system (currently not used)	65
2.9.5 Installation of operation facilities	65
2.9.6 Installation of stable supply facilities	65
2.9.7 Installation of vent stacks	65
2.9.8 Installation of water traps	66
2.10 Marking Standard	67
2.10.1 Marking of boundary (currently not used)	67
2.10.2 Boundary fence (currently not used)	67

2.10.3 Marking of pipeline	67
3.Technical Standard	73
3.1 Safety Maintenance Standard	73
3.1.1 Maintenance of foundations (currently not used)	73
3.1.2 Maintenance of storage facilities (not applicable)	73
3.1.3 Maintenance of gas facilities (currently not used)	73
3.1.4 Maintenance of pipeline facilities	73
3.1.5 Maintenance of accident prevention facilities (currently not used)	76
3.1.6 Maintenance of damage control facilities (currently not used)	76
3.1.7 Maintenance of utilities (currently not used)	76
3.1.8 Maintenance of excavation works	76
3.2 Transfer and Filling Standard (not applicable)	79
3.3 Inspection Standard	79
3.3.1 Inspection of overall installations (currently not used)	79
3.3.2 Inspection of foundations (currently not used)	79
3.3.3 Inspection of storage facilities (currently not used)	79
3.3.4 Inspection of gas facilities (currently not used)	79
3.3.5 Inspection of pipeline facilities (currently not used)	79
3.3.6 Overhaul of governors (currently not used)	79
3.3.7 Inspection of accident prevention facilities	79
3.3.8 Inspection of damage control facilities (currently not used)	79
3.3.9 Inspection of utilities (currently not used)	80
3.3.10 Inspection of excavation works	80
4.Inspection Standard	80
4.1 Inspection Items	80
4.1.1 Intermediate inspection (not applicable)	80
4.1.2 Construction supervision	80
4.1.3 Regular inspection	80
4.1.4 Occasional inspection	81
4.1.5 Detailed safety diagnosis	81
4.2 Inspection Methods	82
4.2.1 Intermediate inspection (not applicable)	82
4.2.2 Construction supervision and regular inspection	82
4.2.3 Occasional inspection	91
4.2.4 Other inspection methods	91
4.2.5 Construction supervision for overall process (currently not used)	91
4.2.6 Detailed safety diagnosis	91

Appendix A. Standard for Ultrasonic	Test of Electrofusion	Joints of Polyethylene F	Pipelines for Gaseous
Fuels			94

Code for Facilities, Technology, Inspection and Safety Diagnosis of Pipelines outside Manufacturing Plants and Supply Stations for Wholesale Gas Business

1 General

1.1 Scope

This code applies to the installation, operation, inspection, supervision and diagnosis of pipelines outside gas manufacturing plants and supply stations among the gas supply facilities of wholesale gas operators [inclusive of gas supply facility contractors other than urban gas operators conforming to the Urban Gas Business Act (hereinafter referred to as "the Act"), Article 39-2, Clause 1] conforming to the Act, Article 2-2 and -5.

1.2 Validity of Code

- **1.2.1** This Code has passed the deliberation and resolution by the Gas Technical Standards Committee (Bill No. 2021-9, November 19, 2021) in conformity to the High Pressure Gas Safety Control Act, Article 33-2, in accordance with the Act, Article 17, Clause 5-2, has been approved by the Minister of Trade, Industry & Energy(Notification No. 2022-12 of the Ministry of Trade, Industry & Energy, January 10, 2022), and is valid and effective as the detailed standard in conformity to the Act, Article 17, Clause 5-1
- **1.2.2** Conformity to this Code is deemed to conform to Table 5-3 of the Enforcement Regulation of the Act (hereinafter referred to as "Enforcement Regulation") in accordance with the Act, Article 17, Clause 5-4. <Revised on August 7, 2015 & August 10, 2018>

1.3 Definitions