

ISO/TS 20100:2008-12 (E)

Gaseous hydrogen - Fuelling stations

Contents		Page
Foreword		v
1	Scope	1
2	Normative references	2
3	Terms and definitions	3
4	General design requirements	7
5	Hydrogen delivery systems	8
5.1	General	8
5.2	Gaseous hydrogen supply by tube trailers and multi cylinder packs	8
5.3	Liquid hydrogen supply	9
5.4	Pipeline	13
6	On-site generation	13
6.1	Hydrogen generators using water electrolysis process	13
6.2	Hydrogen generators using fuel processing technologies	13
6.3	Shutdown control	13
7	Hydrogen compressors	14
7.1	General	14
7.2	Vibration and movement	14
7.3	Compressor enclosure ventilation	14
7.4	Attachment to other buildings	14
7.5	Enclosure access doors	14
7.6	Control and monitoring	14
8	Filters and separators	15
9	Hydrogen purifier	15
10	Gaseous hydrogen buffer storage tanks	16
11	Dispenser, fuelling assembly, and process control	16
11.1	Location and protection of dispensers	16
11.2	Fuelling position	16
11.3	Dispenser system design	17
11.4	Fuelling hose assembly	18
11.5	Hose breakaway device	20
11.6	Fuelling connector	21
11.7	Fuelling process control	22
11.8	Dispenser safety devices	22
11.9	Safety notices at fuelling point	24
12	Hydrogen fuel specifications	25
13	Layout	25
13.1	General	25
13.2	Safety distances	25
14	Fire and explosion hazard protection requirements	30
14.1	General requirements	30
14.2	Area classification	30
14.3	Protection requirements for equipment within classified areas	30

14.4	Prevention of the accumulation of ignitable mixtures indoors and in enclosures	30
14.5	Ventilation specification	31
14.6	Start-up purge	32
14.7	Areas adjacent to hazardous areas	32
14.8	Hydrogen detection systems	32
14.9	Safety of personnel	33
15	Hydrogen storage siting requirements	33
15.1	Ground storage	33
15.2	Below-ground vaults	33
15.3	Fuelling station canopy-top storage	34
15.4	Roof-top installation of gaseous hydrogen systems	35
16	General equipment requirements	36
16.1	Materials	36
16.2	Piping carrying gaseous hydrogen	37
16.3	Pressure relief devices for gaseous hydrogen systems	37
16.4	Protection from the accumulation of static charges	38
16.5	Equipment grounding and bonding	38
16.6	Valves for gaseous hydrogen	38
16.7	Instruments and cabinets	39
17	Gaseous hydrogen vent systems	39
18	Instrumentation control and safety systems	39
18.1	General	39
18.2	Master system	40
18.3	Alarms	40
18.4	Pneumatics	41
18.5	Safety systems	41
18.6	Instrumentation	41
18.7	Safety functions control	41
19	Electrical systems (electrical equipment and wiring)	42
19.1	General requirements	42
19.2	Power supply	42
19.3	Electromagnetic compatibility and interference (EMC)	42
20	Safety systems	42
20.1	Emergency principles and operations	42
20.2	Fire detection systems	43
20.3	Safety and emergency shut-off systems	43
20.4	Emergency release of gas from gaseous hydrogen buffer storage tanks	43
20.5	Fire-fighting systems	43
21	Protection from external effects	44
21.1	General principles	44
21.2	Lightning protection	44
21.3	Protection from environmental conditions	44
22	Tests	44
22.1	Pressure test	44
22.2	Leak test	45
22.3	Testing of electrotechnical control/safety/emergency systems and components	45
	Bibliography	46