

ISO 7396-1:2007-04 (E)

Medical gas pipeline systems - Part 1: Pipeline systems for compressed medical gases and vacuum

Contents		Page
Foreword		v
Introduction		vi
1	Scope	1
2	Normative references	2
3	Terms and definitions	2
4	General requirements	7
4.1	(* Safety	7
4.2	(* Alternative construction	7
4.3	Materials	8
4.4	System design	9
5	Supply systems	10
5.1	System components	10
5.2	General requirements	10
5.3	Supply systems with cylinders or cylinder bundles	12
5.4	Supply systems with mobile or stationary cryogenic or non-cryogenic vessels	13
5.5	Supply systems for air	13
5.6	Supply systems with oxygen concentrator(s)	17
5.7	Supply systems for vacuum	18
5.8	Location of supply systems	18
5.9	Location of cylinder manifolds	19
5.10	Location of stationary cryogenic vessels	19
6	Monitoring and alarm systems	19
6.1	General	19
6.2	Installation requirements	19
6.3	Monitoring and alarm signals	20
6.4	Provision of operating alarms	21
6.5	Provision of emergency clinical alarms	22
6.6	(* Provision of emergency operating alarms	22
7	Pipeline distribution systems	22
7.1	Mechanical resistance	22
7.2	Distribution pressure	22
7.3	Low-pressure hose assemblies and low-pressure flexible connections	23
7.4	Double-stage pipeline distribution systems	24
8	Shut-off valves	24
8.1	General	24
8.2	Service shut-off valves	25
8.3	Area shut-off valves	25
9	Terminal units, gas-specific connectors, medical supply units, pressure regulators and pressure gauges	26
10	Marking and colour coding	27

10.1	Marking	27
10.2	Colour coding	27
11	Pipeline installation	27
11.1	General	27
11.2	Pipeline supports	28
11.3	Pipeline joints	29
11.4	Extensions and modifications of existing pipeline systems	29
12	Testing, commissioning and certification	29
12.1	General	29
12.2	General requirements for tests	30
12.3	Inspections and checks before concealment	30
12.4	Tests, checks and procedures before use of the system	30
12.5	Requirements for inspections and checks before concealment	31
12.6	Requirements for tests, checks and procedures before use of the system	31
12.7	Certification of the systems	36
13	Information to be supplied by the manufacturer	37
13.1	General	37
13.2	Instructions for use	37
13.3	Operational management information	38
13.4	"As-installed" drawings	38
13.5	Electrical diagrams	38
Annex A	(informative) Schematic representations of typical supply systems and area distribution systems	39
Annex B	(informative) Guidelines for location of cylinder manifolds, cylinder storage areas and stationary vessels for cryogenic or non-cryogenic liquids	62
Annex C	(informative) Example of procedure for testing and commissioning	63
Annex D	(informative) Typical forms for certification of the medical gas pipeline system	75
Annex E	(informative) Temperature and pressure relationships	105
Annex F	(informative) Risk management checklist	107
Annex G	(informative) Operational management	120
Annex H	(informative) Rationale	138
Bibliography	140