INTERNATIONAL STANDARD

ISO 14951-1

First edition
1999-10-01

Space systems — Fluid characteristics —

Part 1: Oxygen

Systèmes spatiaux — Caractéristiques des fluides —

Partie 1: Oxygène

Reference number
ISO 14951-1:1999(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 14951-1 was prepared by Technical Committee ISO/TC 20, *Aircraft and space vehicles*, Subcommittee SC 14, *Space systems and operations*.

ISO 14951 consists of the following parts, under the general title *Space systems — Fluid characteristics*:

— *Part 1: Oxygen*

— *Part 2: Hydrogen propellant*

— *Part 3: Nitrogen*

— *Part 4: Helium*

— *Part 5: Nitrogen tetroxide propellant*

— *Part 6: Monomethylhydrazine propellant*

— *Part 7: Hydrazine propellant*

— *Part 8: Kerosene propellant*

— *Part 9: Argon*

— *Part 10: Water*

— *Part 11: Ammonia*

— *Part 12: Carbon dioxide*

— *Part 13: Breathing air*

International Organization for Standardization
Case postale 56 • CH-1211 Genève 20 • Switzerland
Internet iso@iso.ch

Printed in Switzerland

Space systems — Fluid characteristics —

Part 1:
Oxygen

1 Scope

This part of ISO 14951 specifies limits for the composition of oxygen and test methods for verification of oxygen composition. This part of ISO 14951 is applicable to oxygen of the following types and grades, intended for use as an oxidizer and for purging and pressurization of propellant systems of space systems:

— type I: gaseous
  — grade A: standard, purging/pressurization;
  — grade CB: crew breathing;
  — grade F: fuel-cell;
— type II: liquid
  — grade A: oxidizer, 99,6 % pure;
  — grade B: oxidizer, 99,5 % pure;
  — grade F: fuel-cell.

This part of ISO 14951 is applicable to oxygen used in both flight hardware and ground facilities, systems, and equipment. It is applicable to influents only to the extent specified herein.

2 Term and definition

For the purposes of this part of ISO 14951, the following term and definition apply.

2.1
particulate
undissolved solids retained on a filter paper with a 10 µm absolute rating

3 Composition

The composition of oxygen delivered to the flight vehicle interface shall be in accordance with the limits given in Table 1 when tested in accordance with the applicable test methods.

4 Test methods

4.1 Sampling

Oxygen should be selected in accordance with a sampling plan that will produce results with sensitivities and accuracies equivalent to or better than those required to meet the programme or project requirements.

4.2 Composition tests

The composition of the oxygen shall be tested by such methods, apparatus, or analyzers as may be required to produce results with the sensitivities and accuracies necessary to meet programme or project requirements.

Table 1 — Composition limits

Composition			Limits					
			Type I (gaseous)			Type II (liquid)		
			Grade A	Grade CB	Grade F	Grade A	Grade B	Grade F
Purity	Oxygen (O_2)	volume fraction, %, min.	99,6	99,5	99,989	99,2	99,5	99,989
Impurities	Total hydrocarbons, as methane	µl/l, max.	50	50	23	75	67,7	23
	Alkynes, as acetylene	µl/l, max.	—	—	0,05	1,55	0,5	0,05
	Moisture	µl/l, max.	8	10	3	26,3	26,3	3
	Particulate	mg/l, max.	—	—	—	—	1,0	—
	Methane	µl/l, max.	—	—	16	—	—	16
	Ethane	µl/l, max.	—	—	2	—	—	2
	Propane and higher hydrocarbons, as propane	µl/l, max.	—	—	1	—	—	1
	Nitrous oxide	µl/l, max.	—	4	1	—	—	1
	Halogenated hydrocarbons	µl/l, max.	—	2	1	—	—	1
	Chlorinated hydrocarbons	µl/l, max.	—	0,2	0,01	—	—	0,01
	Odour		—	None	None	—	—	None
	Carbon monoxide (CO) and carbon dioxide (CO_2)	µl/l, max.	—	a	1	b	b	1
	Other [nitrogen (N_2), argon (Ar), krypton (Kr), etc.]	µl/l, max.	—	c	75	—	—	75

a 10 for CO and 10 for CO_2.

b 0,1 for CO and 3 for CO_2 when required to meet hardware needs.

c Other discernible impurities shall be identified, measured, and recorded.