INTERNATIONAL STANDARD

ISO 21029-1

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Cryogenic vessels — Transportable vacuum insulated vessels of not more than 1 000 litres volume —

Part 1: Design, fabrication, inspection and tests

Récipients cryogéniques — Récipients transportables, isolés sous vide, d'un volume n'excédant pas 1 000 litres —

Partie 1: Conception, fabrication, inspection et essais

Reference number
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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 2.

The main task of technical committees is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 21029-1 was prepared by Technical Committee ISO/TC 220, *Cryogenic vessels*.

ISO 21029 consists of the following parts, under the general title *Cryogenic vessels — Transportable vacuum insulated vessels of not more than 1 000 litres volume*:

— *Part 1: Design, fabrication, inspection and tests*

— *Part 2: Operational requirements*

Cryogenic vessels — Transportable vacuum insulated vessels of not more than 1 000 litres volume —

Part 1: Design, fabrication, inspection and tests

1 Scope

This part of ISO 21029 specifies requirements for the design, fabrication, inspection and testing of transportable vacuum-insulated cryogenic vessels of not more than 1 000 l volume designed to operate at a maximum permissible pressure greater than atmospheric.

This part of ISO 21029 applies to transportable vacuum-insulated cryogenic vessels for fluids as specified in 3.1 and Table 1 and does not apply to such vessels designed for toxic fluids.

NOTE This part of ISO 21029 does not cover specific requirements for refillable liquid hydrogen tanks that are primarily dedicated as fuel tanks in vehicles. For fuel tanks used in land vehicles, see ISO 13985.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 148-1, *Metallic materials — Charpy pendulum impact test — Part 1: Test method*

ISO 2244, *Packaging — Complete, filled transport packages and unitloads — Horizontal impact tests*

ISO 4126-2, *Safety devices for protection against excessive pressure — Part 2: Bursting disc safety devices*

ISO 4136, *Destructive tests on welds in metallic materials — Transverse tensile test*

ISO 5173, *Destructive tests on welds in metallic materials — Bend tests*

ISO 6520-1:1998, *Welding and allied processes — Classification of geometric imperfections in metallic materials – Part 1: Fusion welding*

ISO 9606-1, *Approval testing of welders — Fusion welding — Part 1: Steels*

ISO 9606-2, *Qualification test of welders — Fusion welding — Part 2: Aluminium and aluminium alloys*

ISO 9712, *Non-destructive testing — Qualification and certification of personnel*

ISO 10474:1991, *Steel and steel products — Inspection documents*

ISO 11117, *Gas cylinders — Valve protection caps and valve guards for industrial and medical gas cylinders — Design, construction and tests*

ISO 14732, *Welding personnel — Approval testing of welding operators for fusion welding and of resistance weld setters for fully mechanized and automatic welding of metallic materials*

ISO 15613, *Specification and qualification of welding procedures for metallic materials — Qualification based on pre-production welding test*

ISO 15614-1, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 1: Arc and gas welding of steels and arc welding of nickel and nickel alloys*

ISO 15614-2, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 2: Arc welding of aluminium and its alloys*

ISO 17636, *Non-destructive testing of welds — Radiographic testing of fusion-welded joints*

ISO 17637, *Non-destructive testing of welds — Visual testing of fusion-welded joints*

ISO 21010, *Cryogenic vessels – Gas/materials compatibility*

ISO 21011, *Cryogenic Vessels — Valves for cryogenic service*

ISO 21013-1, *Cryogenic vessels — Pressure relief accessories for cryogenic service — Part 1: Reclosable pressure relief valves*

ISO 21013-2, *Cryogenic vessels — Pressure relief accessories for cryogenic service — Part 2: Non-reclosable pressure relief devices*

ISO 21013-3, *Cryogenic vessels — Pressure relief accessories for cryogenic service — Part 3: Sizing and capacity determination*

ISO 21014, *Cryogenic vessels — Cryogenic insulation performance*

ISO 21028-1, *Cryogenic vessels — Toughness requirements for materials at cryogenic temperature — Part 1: Temperatures below − 80 °C*

ISO 21028-2, *Cryogenic vessels —Toughness requirements for materials at cryogenic temperature — Part 2: Temperatures between − 80 °C and − 20 °C*

ISO 21029-2, *Cryogenic vessels — Transportable vacuum insulated vessels of not more than 1 000 litres volume — Part 2: Operational requirements*

EN 288-1, *Specification and qualification of welding procedures for metallic materials — Part 1: General rules for fusion welding*

EN 12300, *Cryogenic vessels — Cleanliness for cryogenic service*

EN 13068-3, *Non-destructive testing — Radioscopic testing — Part 3: General principles of radioscopic testing of metallic materials by X- and gamma rays*