
**Cryogenic vessels — Pressure-relief
accessories for cryogenic service —**

**Part 3:
Sizing and capacity determination**

*Réipients cryogéniques — Dispositifs de sécurité pour le service
cryogénique —*

Partie 3: Détermination de la taille et du volume

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 220, *Cryogenic vessels*.

This second edition cancels and replaces the first edition (ISO 21013-3:2006), which has been technically revised.

ISO 21013 consists of the following parts, under the general title *Cryogenic vessels — Pressure-relief accessories for cryogenic service*:

- *Part 1: Reclosable pressure-relief valves*
- *Part 2: Non-reclosable pressure-relief devices*
- *Part 3: Sizing and capacity determination*
- *Part 4: Pressure-relief accessories for cryogenic service*

Cryogenic vessels — Pressure-relief accessories for cryogenic service —

Part 3: Sizing and capacity determination

1 Scope

This part of ISO 21013 provides separate calculation methods for determining the required mass flow to be relieved for each of the following specified conditions:

- vacuum-insulated vessels with insulation system (outer jacket + insulating material) intact under normal vacuum, outer jacket at ambient temperature, inner vessel at temperature of the contents at the specified relieving pressure;
- vacuum-insulated vessels with insulation system (outer jacket + insulating material) intact under normal vacuum, outer jacket at ambient temperature, inner vessel at temperature of the contents at the specified relieving pressure, pressure regulator of the pressure build-up system functioning at full potential;
- vacuum or non-vacuum-insulated vessels with insulation system remaining in place, but with loss of vacuum in the case of vacuum-insulated vessels, outer jacket at ambient temperature, inner vessel at temperature of the contents at the specified relieving pressure or vacuum or non-vacuum-insulated vessels with insulation system remaining fully or partially in place, but with loss of vacuum in the case of vacuum-insulated vessels, fire engulfment, inner vessel at temperature of the contents at the specified relieving pressure;
- vacuum-insulated vessels containing fluids with saturation temperature below 75 K at 1 bar with insulation system remaining in place, but with loss of vacuum with air or nitrogen in the vacuum space;
- vacuum insulated vessels containing fluids with saturation temperature below 75 K at 1 bar with insulation system remaining in place, but with loss of vacuum with air or nitrogen in the vacuum space with fire engulfment;
- vessels with insulation system totally lost and fire engulfment.

Good engineering practice based on well-established theoretical physical science needs to be adopted to determine the required mass flow where an appropriate calculation method is not provided for an applicable condition.

Recommendations for pressure relief devices for cryostats are given in [Annex A](#).

2 Normative references

There are no normative references in this document.