

DRAFT INTERNATIONAL STANDARD

ISO/DIS 16496

ISO/TC 48

Secretariat: DIN

Voting begins on:
2013-10-31

Voting terminates on:
2014-03-31

Laboratory glassware — Vacuum-jacketed vessels for heat insulation

Verrerie de laboratoire — Appareillage à double enveloppe isolant sous vide

ICS: 71.040.20

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
<https://standards.iteh.ai/catalog/standards/sist/c29b3248-972a-44d1-9a04-cb8ad5eeb0c/iso-16496-2016>

ISO/CEN PARALLEL PROCESSING

This draft has been developed within the International Organization for Standardization (ISO), and processed under the **ISO lead** mode of collaboration as defined in the Vienna Agreement.

This draft is hereby submitted to the ISO member bodies and to the CEN member bodies for a parallel five month enquiry.

Should this draft be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month approval vote in ISO and formal vote in CEN.

To expedite distribution, this document is circulated as received from the committee secretariat. ISO Central Secretariat work of editing and text composition will be undertaken at publication stage.

THIS DOCUMENT IS A DRAFT CIRCULATED FOR COMMENT AND APPROVAL. IT IS THEREFORE SUBJECT TO CHANGE AND MAY NOT BE REFERRED TO AS AN INTERNATIONAL STANDARD UNTIL PUBLISHED AS SUCH.

IN ADDITION TO THEIR EVALUATION AS BEING ACCEPTABLE FOR INDUSTRIAL, TECHNOLOGICAL, COMMERCIAL AND USER PURPOSES, DRAFT INTERNATIONAL STANDARDS MAY ON OCCASION HAVE TO BE CONSIDERED IN THE LIGHT OF THEIR POTENTIAL TO BECOME STANDARDS TO WHICH REFERENCE MAY BE MADE IN NATIONAL REGULATIONS.

RECIPIENTS OF THIS DRAFT ARE INVITED TO SUBMIT, WITH THEIR COMMENTS, NOTIFICATION OF ANY RELEVANT PATENT RIGHTS OF WHICH THEY ARE AWARE AND TO PROVIDE SUPPORTING DOCUMENTATION.



Reference number
ISO/DIS 16496:2013(E)

© ISO 2013

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
<https://standards.iteh.ai/catalog/standards/sist/c29b3248-972a-44d1-9a04-cb8ad5eeb0c/iso-16496-2016>

Copyright notice

This ISO document is a Draft International Standard and is copyright-protected by ISO. Except as permitted under the applicable laws of the user's country, neither this ISO draft nor any extract from it may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, photocopying, recording or otherwise, without prior written permission being secured.

Requests for permission to reproduce should be addressed to either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Reproduction may be subject to royalty payments or a licensing agreement.

Violators may be prosecuted.

Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Dimensions	2
4.1 Dewar flasks	2
4.2 Reaction vessels	6
4.3 Columns	7
5 Materials	8
6 Construction	9
7 Safety requirements and testing	9
7.1 General	9
7.2 Dewar flasks	9
7.3 Reaction vessels	10
7.4 Columns	10
8 Use of vacuum vessels	10
8.1 Safety instructions	10
8.2 Functional requirements	10
9 User information	11
10 Marking	11
10.1 Dewar flasks	11
10.2 Reaction vessels and columns	11
Annex A (normative) Testing glass for residual strain (bifilar method)	13
Bibliography	14

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 16496 was prepared by Technical Committee ISO/TC 48, Laboratory equipment and by Technical Committee CEN/TC 332, Laboratory equipment in collaboration.

ITeH STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
<https://standards.iteh.ai/catalog/standards/sist/c9b3248-972a-44d1-9a04-cb8ad5eeb0c/iso-16496-2013>

Laboratory glassware — Vacuum-jacketed vessels for heat insulation

1 Scope

This International Standard recommends dimensions and specifies requirements and test methods for laboratory glassware manufactured from borosilicate glass 3.3 and provided with a vacuum jacket for thermal insulation. It covers Dewar vessels, vacuum-jacketed reaction vessels and vacuum-jacketed columns intended for laboratory use and laboratory related applications. Typical dimensions are given in Table 1 to Table 5.

This standard does not apply to large scale production equipment and equipment operated with pressures of more than 0,1 bar above atmospheric pressure.

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 4803, *Laboratory glassware — Borosilicate glass tubing*

ISO 383, *Laboratory glassware — Interchangeable conical ground joints*

ISO 641, *Laboratory glassware — Interchangeable spherical ground joints*

ISO 718, *Laboratory glassware — Thermal shock and thermal shock endurance — Test methods*

ISO 3585, *Borosilicate glass 3.3 — Properties*

ISO 4790, *Glass-to-glass sealings — Determination of stresses*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

Dewar flask

glass vessel with vacuum jacket for thermal insulation, designed for keeping substances at a controlled temperature within a range from -200 °C to +200 °C

NOTE See subclause 8.1 for restrictions on the use of Dewar flasks.

3.2

cryo vessel

vacuum jacketed vessel made of materials other than glass

3.3
column

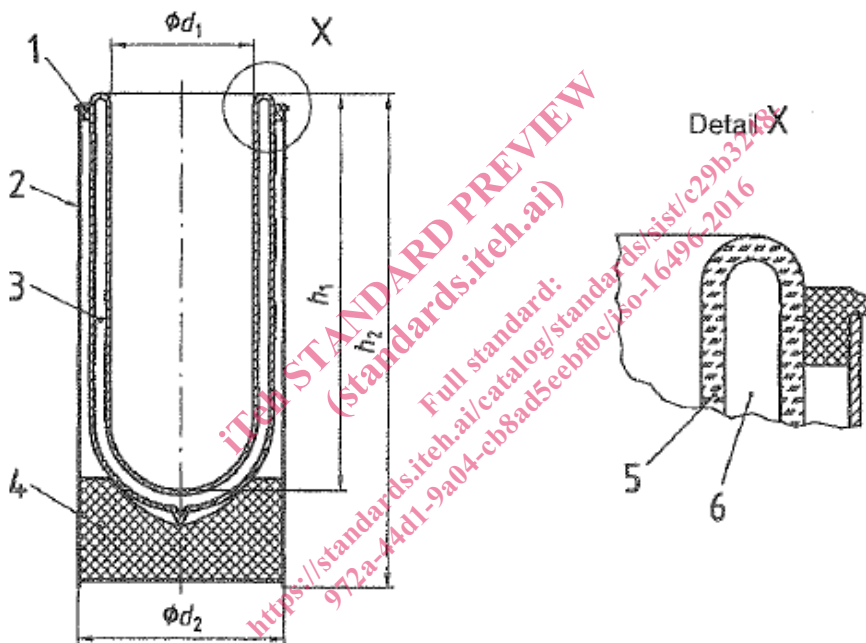
cylindrical vessel for the thermal separation of substances in a laboratory or pilot plant

4 Dimensions

The designs shown in Figure 1 to Figure 5 are for illustrative purposes only. The dimensions given in Table 1 to Table 5 are for guidance, other dimensions being permissible, provided the resulting capacities comply with the scope of this International Standard.

4.1 Dewar flasks

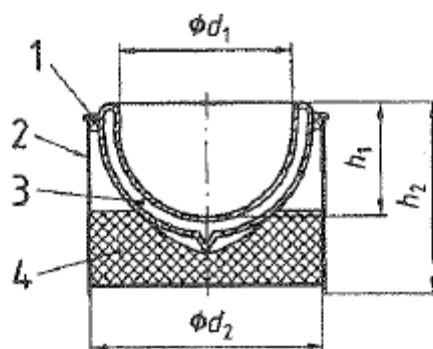
Dewar flasks may have a cylindrical, spherical or dished shape, as shown exemplarily in Figure 1 to Figure 3. Other flask designs are permitted, e.g. flasks with flat bottom or rolled-on or integral flange.



Key

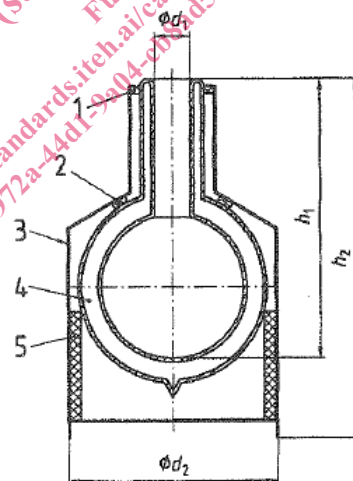
- 1 Soft rubber spacer
- 2 Protective housing
- 3 Dewar flask
- 4 Plastic foam cushion
- 5 Glass body
- 6 Evacuated space

Figure 1 — Cylindrical Dewar flask

**Key**

- 1 Soft rubber spacer
- 2 Protective housing
- 3 Dewar flask
- 4 Plastic foam cushion

Figure 2 — Dished Dewar flask

**Key**

- 1 Soft rubber spacer
- 2 Hard rubber spacer
- 3 Protective housing
- 4 Dewar flask
- 5 Plastic foam cushion

Figure 3 — Spherical Dewar flask

Table 1 — Dimensions of cylindrical Dewar flasks

Dimensions in millimetres

Nominal capacity ml	Internal diameter		Internal height		Housing diameter $d_2^{1)}$ ≈	Overall height $h_2^{1)}$ ≈
	Nominal size	Limit deviations	Nominal size	Limit deviations		
200	40	± 3	170	± 3	66	220
500	57		210		82	265
800	67		240		90	300
1 000	77		235		106	300
1 000	100		150		128	190
1 500	90		245		125	305
1 500	100		240		130	300
2 000	90		340		125	395
2 000	100		290		130	350
2 000	138		± 4		170	± 4
2 500	110	290		140	350	
3 000	138	230		170	285	
4 000	138	310		170	365	
7 000	200	± 5	270	± 5	240	375
10 000	200		360		240	465
14 000	200		500		240	600
21 000	250	± 6	480	± 6	295	580
28 000	250		625		295	720
40 000	290		650		340	745

¹⁾ Dimensions d_2 and h_2 are intended as guideline values.

Table 2 — Dimensions of dished Dewar flasks

Dimensions in millimetres

Nominal capacity	Internal diameter	Internal height	Housing diameter	Overall height
ml	d_1 ≈	h_1 ≈	d_2 ≈	h_2 ≈
260	100	65	130	110
390	110	70	138	115
680	138	80	170	125
1 280	170	110	215	145
4 400	200	140	250	190
8 300	250	170	300	220

All dimensions are intended as guideline values.

Table 3 — Dimensions of spherical Dewar flasks

Dimensions in millimetres

Nominal capacity	Internal neck diameter	Internal height	Housing diameter	Overall height
ml	d_1 ± 2	h_1 ± 4	d_2 ¹⁾ ≈	h_2 ¹⁾ ≈
1 000	30	230	175	295
3 000	60	305	225	375
5 000	60	350	260	425
10 000	65	380	330	475

¹⁾ Dimensions d_2 and h_2 are intended as guideline values.