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EUROPEAN STANDARD
NORME EUROPÉENNE
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EN ISO 7547

December 2004

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English version

**Ships and marine technology - Air-conditioning and ventilation of
accommodation spaces - Design conditions and basis of
calculations (ISO 7547:2002)**

Navires et technologie maritime - Conditionnement d'air et
ventilation des emménagements - Conditions de
conception et bases de calcul (ISO 7547:2002)

Schiffe und Meerestechnik - Klimatisierung und Lüftung
von Unterkunftsräumen auf Schiffen - Grundlagen für
Entwurf und Auslegung (ISO 7547:2002)

This European Standard was approved by CEN on 21 December 2004.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

EN ISO 7547:2004 (E)**Foreword**

The text of ISO 7547:2002 has been prepared by Technical Committee ISO/TC 8 "Ships and marine technology" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 7547:2004 by Technical Committee CEN/TC 300 "Sea-going vessels and marine technology", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2005, and conflicting national standards shall be withdrawn at the latest by June 2005.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Endorsement notice

The text of ISO 7547:2002 has been approved by CEN as EN ISO 7547:2004 without any modifications.

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INTERNATIONAL STANDARD

**ISO
7547**

Second edition
2002-09-01

Ships and marine technology — Air-conditioning and ventilation of accommodation spaces — Design conditions and basis of calculations

*Navires et technologie maritime — Conditionnement d'air et ventilation des
emménagements — Conditions de conception et bases de calcul*

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Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Design conditions	2
4.1 General	2
4.2 Summer temperatures and humidities	2
4.3 Winter temperatures	2
4.4 Outdoor air	2
4.5 Occupancy	3
5 Calculation of heat gains and losses	3
5.1 Applicability	3
5.2 Heat transmission	3
5.3 Solar heat gain	7
5.4 Heat gain from persons	7
5.5 Heat gain from lighting and other sources	8
6 Airflow calculation	8
6.1 Volume of space	8
6.2 Supply airflow	8
6.3 Temperature of supply airflow	9
6.4 Exhaust airflow	9
6.5 Air balance	9
Annex A (informative) Guidance and good practice in the design of ventilation and air-conditioning systems in ships	10
Annex B (informative) Thermal conductivities of commonly used construction materials	13

ISO 7547:2002(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.

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 International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 7547 was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 3, *Piping and machinery*.

This second edition cancels and replaces the first edition (ISO 7547:1985), which has been technically revised.

Annexes A and B of this International Standard are for information only.

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Ships and marine technology — Air-conditioning and ventilation of accommodation spaces — Design conditions and basis of calculations

1 Scope

This International Standard specifies design conditions and methods of calculation for air-conditioning and ventilation of accommodation spaces and the radio cabin on board seagoing merchant ships for all conditions except those encountered in extremely cold or hot climates (i.e. with lower or higher conditions than those stated in 4.2 and 4.3).

Annex A provides guidance and details of good practice in the design of ventilation and air-conditioning systems in ships.

Annex B gives the thermal conductivities of commonly used construction materials.

Users of this International Standard should note that, while observing the requirements of this International Standard, they should at the same time ensure compliance with statutory requirements, rules and regulations as may be applicable to the individual ship concerned.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 31-4:1992, *Quantities and units — Part 4: Heat*

ISO 3258:1976, *Air distribution and air diffusion — Vocabulary*

3 Terms and definitions

For the purposes of this International Standard, the definitions given in ISO 31-4, ISO 3258 and the following apply.

3.1

accommodation

space used as public rooms, cabins, offices, hospitals, cinemas, games and hobby rooms, hairdressing saloons and pantries without cooking appliances

3.2

air-conditioning

form of air treatment whereby temperature, humidity, ventilation and air cleanliness are all controlled within limits prescribed for the enclosure to be air-conditioned

ISO 7547:2002(E)**3.3****ventilation**

provision of air to an enclosed space, sufficient for the needs of the occupants or the process

3.4**relative humidity**

ratio, in humid air, expressed as a percentage, of the water vapour actual pressure to the saturated vapour pressure at the same dry bulb temperature

3.5**dry bulb temperature**

temperature indicated by a dry temperature-sensing element shielded from the effects of radiation

EXAMPLE The bulb of a mercury-in-glass thermometer is an example of a dry temperature-sensing element.

4 Design conditions**4.1 General**

The system shall be designed for the indoor air conditions specified in 4.2 and 4.3 in all accommodation spaces defined in 3.1 at the stated outdoor air conditions and the outdoor supply airflow, ventilation and air balance given in 6.2.1, 6.2.2 and 6.5 respectively.

NOTE All temperatures stated are dry bulb temperatures.

4.2 Summer temperatures and humidities

Summer temperatures and humidities are as follows:

- a) Outdoor air: + 35 °C and 70 % humidity;
- b) Indoor air: + 27 °C and 50 % humidity.

NOTE In practice, the indoor air conditions obtained, especially humidity, can be different from those stated.

4.3 Winter temperatures

Winter temperatures are as follows:

- a) Outdoor air: – 20 °C;
- b) Indoor air: + 22 °C.

NOTE This International Standard does not specify requirements for humidification in winter.

4.4 Outdoor air

The minimum quantity of outdoor air shall be not less than 40 % of the total air supplied to the spaces concerned.

4.5 Occupancy

The number of persons to be allowed for in the various accommodation spaces shall be as follows, unless otherwise stated by the purchaser.

- a) Cabins:
 - the maximum number of persons for which the cabin was designed;
- b) Public rooms such as saloons, mess- or dining-rooms and recreation rooms:
 - the number of persons who can be seated or, in the case where the purchaser does not specify:
 - i) one person per 2 m² floor area for saloons;
 - ii) one person per 1,5 m² floor area for mess- or dining-rooms;
 - iii) one person per 5 m² floor area for recreation-rooms;
- c) Captain's and chief engineer's day-room:
 - four persons;
- d) Other private day-rooms:
 - three persons;
- e) Hospital:
 - the number of beds plus two;
- f) Gymnasium, games-room:
 - four persons;
- g) First-aid-room:
 - two persons;
- h) Offices:
 - two persons.

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5 Calculation of heat gains and losses

5.1 Applicability

For the calculation of summer conditions, 5.2 to 5.5 inclusive shall apply.

For the calculation of winter conditions, 5.2 only shall apply.

5.2 Heat transmission

5.2.1 Method of calculation

The following formula shall be used for calculating the transmission losses or gains, in watts, for each separate surface:

$$\Phi = \Delta T (k_v A_v) + (k_g A_g)$$