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AMENDMENT 1
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Series 1 freight containers — Specification and testing —

Part 2: Thermal containers

AMENDMENT 1

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Conteneurs de la série 1 — Spécifications et essais —

Partie 2: Conteneurs à caractéristiques thermiques

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Foreword

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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.

Amendment 1 to ISO 1496-2:1996 was prepared by Technical Committee ISO/TC 104, *Freight containers*, Subcommittee SC 2, *Specific purpose containers*.

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Page 1, Clause 2

Add the following at the end of the Normative references:

IEC 60947-1, *Low-voltage switchgear and controlgear — Part 1: General rules*

Page 16, Clause 9

Replace the existing text with the following:

9 Electrical aspects of thermal containers

9.1 General

The requirements that follow are only intended to govern those aspects of electrically-powered thermal containers which affect interchange or are the minimum needed to affect safety. They do not constitute a detailed electrical specification. Reference should be made to IEC 60947-1, IEC 60309-1:1999 and IEC 60309-2:1999 and appropriate national and international standards and regulations.

NOTE 1 See Annex M for information concerning electrical power supplies for thermal containers.

NOTE 2 Commonly available electric motors and control gear will not necessarily satisfy the requirements set out below, which include wider voltage tolerances than are necessary for stationary equipment.

9.2 General requirements for standard voltage equipment

9.2.1 Equipment shall be designed to operate from three-phase, three-wire a.c. supply sources when the nominal voltage measured between phases at the receptacle is as follows:

- a) 50 Hz: 360 V min., 460 V max.;
- b) 60 Hz: 400 V min., 500 V max.

The nominal frequencies of 50 Hz and 60 Hz shall have a tolerance of $\pm 2,5$ %.

NOTE Operation at the extremes of the voltage or frequency range specified, particularly both, will greatly shorten motor life.

9.2.2 Equipment shall have a maximum electrical loading, under rated operating conditions, not exceeding 18,75 kVA. The power consumption shall not exceed 15 kW.

9.2.3 Equipment shall operate in the proper direction of rotation when connected to a supply system having standard phase rotation through a plug and socket connector wired as shown in Annex K. Standard phase rotation shall be taken to mean a three-phase a.c. power system in which the line voltages attain their maximum positive values in the sequence A (or R), B (or S), C (or T).

9.2.4 Total starting current shall be as low as possible and shall not exceed 150 A. The total starting current shall be taken to mean the sum of the locked rotor (standstill) currents of all motors starting up at the instant of switch-on plus the current taken by non-rotating elements.

It is permissible for the total starting current of an item of equipment to be limited to the specified value by sequence controls permitting only one of the motors in the multimotor equipment to start at any one instant.

The starting current shall decay to 125 % of the normal full load operating current in not more than 1 s when tested on a mains supply.

9.2.5 Equipment shall be provided with means for protecting the temperature control apparatus against electrical overloads. Automatic reset devices may be used, provided component temperatures are not allowed to exceed safe levels.

9.2.6 A continuous equipment earthing conductor shall be provided at the plug and through the "powercord" to the equipment. Metallic parts of electrical fittings within the equipment which do not carry electric current shall be connected to this earthing conductor. All parts which are electrically live, at voltages in excess of 42 V, shall be shielded against accidental contact. The insulation resistance of the equipment shall be at least 1 M Ω .

9.2.7 A flexible power cable of adequate electrical capacity shall be permanently attached to the refrigeration and/or heating unit at one end and shall have a male plug at the other end. The cable shall have a minimum length of 18 m.

9.2.8 The equipment shall be provided with a 32 A four-pin (three poles plus earth) male plug with bayonet retaining ring as shown in Annex L.

The plug shall be sealed to the power cable by a suitable means so as to prevent the entry of water under service conditions.

9.2.9 The container or refrigeration equipment shall include a storage space large enough to securely stow the power cable. If a portion of the cable is intended to be stored in the compartment during operation, the storage space shall be ventilated.

9.2.10 Controls shall include an easily accessible and clearly marked ON/OFF switch on the outside of the equipment, which prevents operation of the unit when in the OFF position.

Whenever the unit's ON/OFF switch is in the ON position, the unit shall operate automatically on its own control system and an indicating light shall be illuminated. Indicating lights shall not interfere with on-board navigation lights.

9.2.11 All electrically live metal parts shall be protected from accidental contact.

9.2.12 All exposed non-current carrying metallic components in a plug assembly which are liable to be energized when in the mated position, and all receptacle box assemblies, shall be grounded.

9.2.13 Cable connections to plugs shall be provided with a cable anchorage (strain relief) such that the conductors are relieved from strain, including twisting, and that their covering is protected from abrasion. Cable anchorages shall be designed in such a way that the conductors cannot touch accessible metal parts.

9.2.14 Plug and receptacle shall be designed to conform with IEC 60947-1.

Safe working procedures shall be established for the use of power connectors. In some countries there may be a requirement for the equipment to operate from supplies fitted with a residual current device (rcd).

9.2.15 A wiring diagram shall be mounted on an easily accessible door of the appliance. All wires shall be identified by marking or colour coding to correspond with information on the wiring diagram.

9.2.16 The equipment nameplate details shall include the following data as a minimum requirement:

Volts: three-phase Hz;

Full load current: **A**;

Total starting current: **A**.

9.3 220 volt and dual voltage equipment

220 volt and dual voltage equipment, being built to older specifications, are not recommended for installation in new thermal containers. Requirements for these types of equipment are given in Annex N.

9.4 Remote condition monitoring

As an option, thermal containers can be equipped to monitor their condition remotely using power line transmission of data. Requirements for implementing this capability are set out in ISO 10368.

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Page 23

In Annex B, immediately following the title, delete the existing NOTE and replace with a new NOTE as follows:

<https://standards.iteh.ai/catalog/standards/sist/dcb4dace-d80d-45d3-b64e-1496-2:1996/Amd.1:2006>

NOTE For the convenience of users of this part of ISO 1496, the conversion of values expressed in SI units to values in non-SI units is given in Annex O.

Page 49

Replace the present Annex M (informative) with the following:

Annex M (informative)

Electrical power supplies for thermal containers (9.2)

M.1 This part of ISO 1496 has been drawn up, insofar as the electrical aspects (Clause 9) are concerned, on the assumption that the containers will be used in conjunction with electrical power supply installations which meet certain basic requirements. In order to ensure that containers built in accordance with this part of ISO 1496 can be relied upon to function safely and satisfactorily wherever they are required to operate, the desirable basic requirements for electrical supply installations are set out in Clauses M.1 to M.8.

M.2 Electrical power supply systems intended for use with thermal containers should be designed and constructed in accordance with appropriate national standards and/or legislation where such exist. Where no such national standards or legislation exist, design and construction should be in accordance with the relevant recommendations of the International Electrotechnical Commission.

M.3 Power supply systems should be provided with outlet sockets (receptacles) suitable for use with the plugs described in 9.2.8. These sockets are depicted in Annex L alongside the corresponding plug.

M.4 Where the voltage of the local electricity supply does not fall within the range covered by 9.2.1, suitable means of transformation should be employed to change the voltage to an acceptable value.

M.5 Each power supply outlet socket should be fitted with a suitable isolating switch or circuit breaker, preferably interlocked so that the plug cannot be inserted or withdrawn while the switch or circuit breaker is in the ON position.

M.6 Each power supply outlet socket should be provided with a linked three-phase circuit breaker of suitable rating, which will give protection against the effects of short circuit but which will not be caused to operate by the starting current of the container machinery, up to the limits specified in 9.2.4. Power supply circuit breakers should have the following characteristics:

Current	Tripping time
100 A	3 s min.
180 A	1,0 s max.
360 A	0,2 s max.

M.7 Each power supply outlet socket should be capable of individually supplying a current consistent with the requirements of 9.2.2. However, in assessing the load to be supplied by groups of outlet sockets, an appropriate diversity factor may be taken into account.

M.8 Three-phase power supply systems should be connected for standard phase rotation, as defined in 9.2.3. Outlet sockets should be connected as shown in Annex K.

M.9 It should be noted that in some countries there may be a requirement for the equipment to operate from supplies fitted with a residual current device (rcd).

Page 50

Change the existing Annex N to Annex O and insert a new Annex N as follows:

Annex N (normative)

General requirements for 220 volt and dual voltage equipment

N.1 220 volt equipment

N.1.1 220 volt equipment shall be designed to operate on any electrical power supply when the nominal voltage measured between phases at the receptacle is as follows:

- a) 50 Hz: 180 V min., 230 V max.;
- b) 60 Hz: 200 V min., 250 V max.

N.1.2 The equipment shall be provided with a 60 A four-pin (three poles plus earth) male plug with screwed retaining ring as shown in Figure L.1.

NOTE Figure L.2 illustrates the related socket.

N.2 Dual voltage equipment

N.2.1 Dual voltage equipment shall be designed to operate on both electrical power supplies in accordance with 9.2.1 and electrical power supplies in accordance with N.1 above.

N.2.2 Equipment shall be provided with two separate flexible power cables of adequate electrical capacity, one to be used when operating from electrical power supplies as per 9.2.1 and the other to be used for electrical power supplies as per N.1. The former shall be fitted with a male plug as described in Annex L.

N.2.3 Both power cables shall be permanently attached to the refrigeration and/or heating unit and both shall have a minimum length of 18 m.

N.2.4 Dual voltage equipment shall include storage space(s) large enough to securely stow both power cables. If portions of the cables are intended to be stored in a compartment during operation, the storage space(s) shall be ventilated.

N.2.5 The electrical circuit design shall be such that when the controls are set for one voltage range, the power cable for the other voltage range shall be electrically disconnected at the equipment.

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Re-reference the original Annex N as Annex O as follows:

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Annex O
 (informative)

Conversion of SI units to non-SI units

Page 51

Delete the existing Annex O and replace with a Bibliography as follows:

Bibliography

- [1] IEC 60309-1:1999, *Plugs, socket-outlets and couplers for industrial purposes — Part 1: General requirements*
- [2] IEC 60309-2:1999, *Plugs, socket-outlets and couplers for industrial purposes — Part 2: Dimensional interchangeability requirements for pin and contact-tube accessories*