

Agreement on the International Carriage of Perishable Foodstuffs and on the Special Equipment to be Used for Such Carriage (ATP)

The Contracting Parties,

Desirous of improving the conditions of preservation of the quality of perishable foodstuffs during their carriage, particularly in international trade,

Considering that the improvement of those conditions is likely to promote the expansion of trade in perishable foodstuffs,

Have agreed as follows:

Chapter I SPECIAL TRANSPORT EQUIPMENT

Article 1

For the international carriage of perishable foodstuffs, equipment shall not be designated as "insulated", "refrigerated", "mechanically refrigerated", or "heated" equipment unless it complies with the definitions and standards set forth in annex 1 to this Agreement.

Article 2

The Contracting Parties shall take the measures necessary to ensure that the equipment referred to in article 1 of this Agreement is inspected and tested for compliance with the said standards in conformity with the provisions of annex 1, appendices 1, 2, 3 and 4, to this Agreement. Each Contracting Party shall recognize the validity of certificates of compliance issued in conformity with annex 1, appendix 1, paragraph 4 to this Agreement by the competent authority of another Contracting Party. Each Contracting Party may recognize the validity of certificates of compliance issued in conformity with the requirements of annex 1, appendices 1 and 2, to this Agreement by the competent authority of a State not a Contracting Party.

Chapter II USE OF SPECIAL TRANSPORT EQUIPMENT FOR THE INTERNATIONAL CARRIAGE OF CERTAIN PERISHABLE FOODSTUFFS

Article 3

1. The provisions of article 4 of this Agreement shall apply to all carriage, whether for hire or reward or for own account, carried out exclusively subject to the provisions of paragraph 2 of this article by rail, by road or by a combination of the two, of

quick (deep)-frozen and frozen foodstuffs, and of

foodstuffs referred to in annex 3 to this Agreement even if they are neither quick (deep)-frozen nor frozen,

if the point at which the goods are, or the equipment containing them is, loaded on to a rail or road vehicle and the point at which the goods are, or the equipment containing them is, unloaded from that vehicle are in two different States and the point at which the goods are unloaded is situated in the territory of a Contracting Party.

In the case of carriage entailing one or more sea crossings other than sea crossings as referred to in paragraph 2 of this article, each land journey shall be considered separately.

2. The provisions of paragraph 1 of this article shall likewise apply to sea crossings of less than 150 km on condition that the goods are shipped in equipment used for the land journey or journeys without transloading of the goods and that such crossings precede or follow one or more land journeys as referred to in paragraph 1 of this article or take place between two such land journeys.

3. Notwithstanding the provisions of paragraphs 1 and 2 of this article, the Contracting Parties need not apply the provisions of article 4 of this Agreement to the carriage of foodstuffs not intended for human consumption.

Article 4

1. For the carriage of the perishable foodstuffs specified in annexes 2 and 3 to this Agreement, the equipment referred to in article 1 of this Agreement shall be used unless the temperatures to be anticipated throughout carriage render this requirement manifestly unnecessary for the purpose of maintaining the temperature conditions specified in annexes 2 and 3 to this Agreement. The equipment shall be so selected and used that the temperature conditions prescribed in the said annexes can be complied with throughout carriage. Furthermore, all appropriate measures shall be taken, more particularly as regards the temperature of the foodstuffs at the time of loading

and as regards icing or re-icing during the journey or other necessary operations. Nevertheless, the provisions of this paragraph shall apply only in so far as they are not incompatible with international undertakings in the matter of international carriage arising for the Contracting Parties by virtue of conventions in force at the time of the entry into force of this Agreement or by virtue of conventions substituted for them.

2. If during carriage under this Agreement the provisions of paragraph 1 of this article have not been complied with,

(a) the foodstuffs may not be disposed of in the territory of a Contracting Party after completion of carriage unless the competent authorities of that Contracting Party deem it compatible with the requirements of public health to authorize such disposal and unless such conditions as the authorities may attach to the authorization when granting it are fulfilled; and

(b) every Contracting Party may, by reason of the requirements of public health or zooprophyllaxis and in so far as it is not incompatible with the other international undertakings referred to in the last sentence of paragraph 1 of this article, prohibit the entry of the foodstuffs into its territory or make their entry subject to such conditions as it may determine.

3. Compliance with the provisions of paragraph 1 of this article shall be required of carriers for hire or reward only in so far as they have undertaken to procure or provide services intended to ensure such compliance and if such compliance depends on the performance of those services. If other persons, whether individuals or corporate bodies, have undertaken to procure or provide services intended to ensure compliance with the provisions of this Agreement, they shall be required to ensure such compliance in so far as it depends on performance of the services they have undertaken to procure or provide.

4. During carriage which is subject to the provisions of this Agreement and for which the loading point is situated in the territory of a Contracting Party, responsibility for compliance with the requirements of paragraph 1 of this article shall rest, subject to the provisions of paragraph 3 of this article,

in the case of transport for hire or reward, with the person, whether an individual or a corporate body, who is the consignor according to the transport document or, in the absence of a transport document, with the person, whether an individual or a corporate body, who has entered into the contract of carriage with the carrier;

in other cases with the person, whether an individual or a corporate body, who performs carriage.

Chapter III MISCELLANEOUS PROVISIONS

Article 5

The provisions of this Agreement shall not apply to carriage in containers by land without transloading of the goods where such carriage is preceded or followed by a sea crossing other than a sea crossing as referred to in article 3, paragraph 2, of this Agreement.

Article 6

1. Each Contracting Party shall take all appropriate measures to ensure observance of the provisions of this Agreement. The competent administrations of the Contracting Parties shall keep one another informed of the general measures taken for this purpose.

2. If a Contracting Party discovers a breach committed by a person residing in the territory of another Contracting Party, or imposes a penalty upon such a person, the administration of the first Party shall inform the administration of the other Party of the breach discovered and of the penalty imposed.

Article 7

The Contracting Parties reserve the right to enter into bilateral or multilateral agreements to the effect that provisions applicable to special equipment and provisions applicable to the temperatures at which certain foodstuffs are required to be maintained during carriage may, more particularly by reason of special climatic conditions, be more stringent than those prescribed in this Agreement. Such provisions shall apply only to international carriage between Contracting Parties which have concluded bilateral or multilateral agreements as referred to in this article. Such agreements shall be transmitted to the Secretary-General of the United Nations, who shall communicate them to Contracting Parties to this Agreement which are not signatories of the said agreements.

Article 8

Failure to observe the provisions of this Agreement shall not affect either the existence or the validity of contracts entered into for the performance of carriage.

Chapter IV FINAL PROVISIONS

Article 9

1. States members of the Economic Commission for Europe and States admitted to the Commission in a consultative capacity under paragraph 8 of the Commission's terms of reference may become Contracting Parties to this Agreement

(a) by signing it;

(b) by ratifying it after signing it subject to ratification; or

(c) by acceding to it.

2. States which may participate in certain activities of the Economic Commission for Europe under paragraph 11 of the Commission's terms of reference may become Contracting Parties to this Agreement by acceding thereto after its entry into force.

3. This Agreement shall be open for signature until 31 May 1971 inclusive. Thereafter, it shall be open for accession.

4. Ratification or accession shall be effected by the deposit of an instrument with the Secretary-General of the United Nations.

Article 10

1. Any State may at the time of signing this Agreement without reservation as to ratification or of depositing its instrument of ratification or accession or at any time thereafter declare by notification addressed to the Secretary-General of the United Nations that the Agreement does not apply to carriage performed in any or in a particular one of its territories situated outside Europe. If notification as aforesaid is made after the entry into force of the Agreement in respect of the notifying State the Agreement shall, ninety days after the date on which the Secretary-General has received the notification, cease to apply to carriage in the territory or territories named in that notification.

2. Any State which has made a declaration under paragraph 1 of this article may at any time thereafter declare by notification addressed to the Secretary-General of the United Nations that the Agreement will be applicable to carriage performed in a territory named in the notification made under paragraph 1 of this article and the Agreement shall become applicable to carriage in that territory one hundred and eighty days after the date on which the Secretary-General has received that notification.

Article 11

1. This Agreement shall come into force one year after five of the States referred to in its article 9, paragraph 1, have signed it without reservation as to ratification or have deposited their instruments of ratification or accession.

2. With respect to any State which ratifies, or accedes to, this Agreement after five States have signed it without reservation as to ratification or have deposited their instruments of ratification or accession, this Agreement shall enter into force one year after the said State has deposited its instrument of ratification or accession.

Article 12

1. Any Contracting Party may denounce this Agreement by giving notice of denunciation to the Secretary-General of the United Nations.

2. The denunciation shall take effect fifteen months after the date on which the Secretary-General received the notice of denunciation.

Article 13

This Agreement shall cease to have effect if the number of Contracting Parties is less than five throughout any period of twelve consecutive months after its entry into force.

Article 14

1. Any State may at the time of signing this Agreement without reservation as to ratification or of depositing its instrument of ratification or accession or at any time thereafter declare by notification addressed to the Secretary-General of the United Nations that this Agreement will be applicable to all or any of the territories for the international relations of which that State is responsible. This Agreement shall be applicable to the territory or territories named in the notification as from the ninetieth day after receipt of the notice by the Secretary-General or, if on that day the Agreement has not yet entered into force, as from its entry into force.

2. Any State which has made a declaration under paragraph 1 of this article making this Agreement applicable to a territory for whose international relations it is responsible may denounce the Agreement separately in respect of that territory in conformity with article 12

hereof.

Article 15

1. Any dispute between two or more Contracting Parties concerning the interpretation or application of this Agreement shall so far as possible be settled by negotiation between them.
2. Any dispute which is not settled by negotiation shall be submitted to arbitration if any one of the Contracting Parties concerned in the dispute so requests and shall be referred accordingly to one or more arbitrators selected by agreement between those Parties. If within three months from the date of the request for arbitration, the Parties concerned in the dispute are unable to agree on the selection of an arbitrator or arbitrators, any of those Parties may request the Secretary-General of the United Nations to designate a single arbitrator to whom the dispute shall be referred for decision.
3. The decision of the arbitrator or arbitrators designated under the preceding paragraph shall be binding on the Contracting Parties concerned in the dispute.

Article 16

1. Any State may, at the time of signing, ratifying, or acceding to, this Agreement, declare that it does not consider itself bound by article 15, paragraphs 2 and 3 of this Agreement. The other Contracting Parties shall not be bound by these paragraphs with respect to any Contracting Party which has entered such a reservation.
2. Any Contracting Party which has entered a reservation under paragraph 1 of this article may at any time withdraw the reservation by notification addressed to the Secretary-General of the United Nations.
3. With the exception of the reservation provided for in paragraph 1 of this article, no reservation to this Agreement shall be permitted.

Article 17

1. After this Agreement has been in force for three years, any Contracting Party may, by notification addressed to the Secretary-General of the United Nations, request that a conference be convened for the purpose of revising this Agreement. The Secretary-General shall notify all Contracting Parties of the request and a revision conference shall be convened by the Secretary-General if, within a period of four months from the date of the notification sent by the Secretary-General, not less than one third of the Contracting Parties signify their assent to the request.
2. If a conference is convened in pursuance of paragraph 1 of this article, the Secretary-General shall so advise all the Contracting Parties and invite them to submit within a period of three months, the proposals which they wish the conference to consider. The Secretary-General shall circulate the provisional agenda for the conference, together with the text of such proposals, to all Contracting Parties not less than three months before the date on which the conference is to open.
3. The Secretary-General shall invite to any conference convened in pursuance of this article all the countries referred to in article 9 paragraph 1, of this Agreement, and also the countries which have become Contracting Parties under the said article 9, paragraph 2.

Article 18

1. Any Contracting Party may propose one or more amendments to this Agreement. The text of any proposed amendment shall be communicated to the Secretary-General of the United Nations, who shall communicate it to all Contracting Parties and bring it to the notice of all the other States referred to in article 9, paragraph 1, of this Agreement.
2. Within a period of six months following the date on which the proposed amendment is communicated by the Secretary-General, any Contracting Party may inform the Secretary-General
 - (a) that it has an objection to the amendment proposed, or
 - (b) that, although it intends to accept the proposal, the conditions necessary for such acceptance are not yet fulfilled in its country.
3. If a Contracting Party sends the Secretary-General a communication as provided for in paragraph 2(b) of this article, it may, so long as it has not notified the Secretary-General of its acceptance, submit an objection to the proposed amendment within a period of nine months following the expiry of the period of six months prescribed in respect of the initial communication.
4. If an objection to the proposed amendment is stated in accordance with the terms of paragraphs 2 and 3 of this article, the amendment shall be deemed not to have been accepted and shall be of no effect.
5. If no objection to the proposed amendment has been stated in accordance with paragraphs 2 and 3 of this article, the amendment shall

be deemed to have been accepted on the date specified below:

(a) if no Contracting Party has sent a communication to the Secretary-General in accordance with paragraph 2(b) of this article, on the expiry of the period of six months referred to in paragraph 2 of this article;

(b) if at least one Contracting Party has sent a communication to the Secretary-General in accordance with paragraph 2(b) of this article, on the earlier of the following two dates:

the date by which all the Contracting Parties which sent such communications have notified the Secretary-General of their acceptance of the proposed amendment, subject however to the proviso that if all the acceptances were notified before the expiry of the period of six months referred to in paragraph 2 of this article the date shall be the date of expiry of that period;

the date of expiry of the period of nine months referred to in paragraph 3 of this article.

6. Any amendment deemed to be accepted shall enter into force six months after the date on which it was deemed to be accepted.

7. The Secretary-General shall as soon as possible inform all Contracting Parties whether an objection to the proposed amendment has been stated in accordance with paragraph 2(a) of this article and whether one or more Contracting Parties have sent him a communication in accordance with paragraph 2(b) of this article. If one or more Contracting Parties have sent him such a communication, he shall subsequently inform all the Contracting Parties whether the Contracting Party or Parties which have sent such a communication raise an objection to the proposed amendment or accept it.

8. Independently of the amendment procedure laid down in paragraphs 1 to 6 of this article, the annexes and appendices to this Agreement may be modified by agreement between the competent administrations of all the Contracting Parties. If the administration of a Contracting Party has stated that under its national law its agreement is contingent on special authorization or on the approval of a legislative body, the consent of the Contracting Party concerned to the modification of an annex shall not be deemed to have been given until the Contracting Party has notified the Secretary-General that the necessary authorization or approval has been obtained. The agreement between the competent administrations may provide that, during a transitional period, the old annexes shall remain in force, wholly or in part, concurrently with the new annexes. The Secretary-General shall specify the date of the entry into force of the new texts resulting from such modifications.

Article 19

In addition to communicating to them the notifications provided for in articles 17 and 18 of this Agreement, the Secretary-General of the United Nations shall notify the States referred to in article 9, paragraph 1, of this Agreement and the States which have become Contracting Parties under article 9, paragraph 2, of:

- (a) signatures, ratifications and accessions under article 9;
- (b) the dates of entry into force of this Agreement pursuant to article 11;
- (c) denunciations under article 12;
- (d) the termination of this Agreement under article 13;
- (e) notifications received under articles 10 and 14;
- (f) declarations and notifications received under article 16, paragraphs 1 and 2;
- (g) the entry into force of any amendment pursuant to article 18.

Article 20

After 31 May 1971, the original of this Agreement shall be deposited with the Secretary-General of the United Nations, who shall transmit certified true copies to each of the States mentioned in article 9, paragraphs 1 and 2, of this Agreement.

In witness whereof, the undersigned, being duly authorized thereto, have signed this Agreement.

Done at Geneva, this first day of September, one thousand nine hundred and seventy, in a single copy, in the English, French and Russian languages, the three texts being equally authentic.

Definitions of and Standards for Special Equipment* for the Carriage of Perishable Foodstuffs

1. *Insulated equipment.* Equipment of which the body** is built with insulating walls, doors, floor and roof, by which heat exchanges between the inside and outside of the body can be so limited that the overall coefficient of heat transfer (K coefficient), is such that the equipment is assignable to one or other of the following two categories:

I_N = Normally insulated equipment	characterized by a K coefficient equal to or less than $0.7 \text{ W/m}^2 \text{ }^\circ\text{C}$
I_R = Heavily insulated equipment characterized by	a K coefficient equal to or less than $0.4 \text{ W/m}^2 \text{ }^\circ\text{C}$ walls with a thickness of at least 45 mm for transport equipment of a width greater than 2.50 m.

This second condition is, however, not required for transport equipment designed prior to the date of entry into force of this amendment*** and built before that date or during a period of three years following that date.

The definition of the K coefficient and a description of the method to be used in measuring it, are given in appendix 2 to this annex.

2. *Refrigerated equipment.* Insulated equipment which, using a source of cold (natural ice, with or without the addition of salt; eutectic plates; dry ice, with or without sublimation control; liquefied gases, with or without evaporation control, etc.) other than a mechanical or "absorption" unit, is capable, with a mean outside temperature of $+30 \text{ }^\circ\text{C}$, of lowering the temperature inside the empty body to, and thereafter maintaining it:

At $+7^\circ \text{C}$ maximum in the case of class A;

At -10°C maximum in the case of class B;

At -20°C maximum in the case of class C; and

At 0°C maximum in the case of class D,

with the aid of appropriate refrigerants and fittings. Such equipment shall comprise one or more compartments, receptacles or tanks for the refrigerant. The said compartments, receptacles or tanks shall:

Be capable of being filled or refilled from the outside; and

Have a capacity in conformity with the provisions of annex 1, appendix 2, paragraph 34.

The K coefficient of equipment of classes B and C shall in every case be equal to or less than $0.4 \text{ W/m}^2 \text{ }^\circ\text{C}$.

3. *Mechanically refrigerated equipment.* Insulated equipment either fitted with its own refrigerating appliance, or served jointly with other units of transport equipment by such an appliance, (mechanical compressor unit, "absorption" unit, etc.). The appliance shall be capable, with a mean outside temperature of $+30^\circ \text{C}$, of lowering the temperature inside the empty body to, and thereafter maintaining it continuously in the following manner at:

In the case of classes A, B and C, any desired practically constant value t_i in conformity with the standards defined below for the three classes:

Class A. Mechanically refrigerated equipment fitted with a refrigerating appliance such that t_i may be chosen between $+12^\circ \text{C}$ and 0°C inclusive.

Class B. Mechanically refrigerated equipment fitted with a refrigerating appliance such that t_i may be chosen between $+12^\circ \text{C}$ and -10°C inclusive.

Class C. Mechanically refrigerated equipment fitted with a refrigerating appliance such that t_i may be chosen between $+12^\circ \text{C}$ and -20°C inclusive.

In the case of classes D, E and F a fixed practically constant value t_i in conformity with the standards defined below for the three classes:

Class D. Mechanically refrigerated equipment fitted with a refrigerating appliance such that t_i is equal to or less than 0° C.

Class E. Mechanically refrigerated equipment fitted with a refrigerating appliance such that t_i is equal to or less than -10° C.

Class F. Mechanically refrigerated equipment fitted with a refrigerating appliance such that t_i is equal to or less than -20° C.

The K coefficient of equipment of classes B, C, E and F shall in every case be equal to or less than 0.4 W/m^{20} C.

4. *Heated equipment.* Insulated equipment fitted with a heat-producing appliance which is capable of raising the temperature inside the empty body to, and thereafter maintaining it for not less than 12 hours without renewal of supply at, a practically constant value of not less than $+12^{\circ}$ C when the mean outside temperature of the body is that indicated below for the two classes:

Class A. Heated equipment for use when the mean outside temperature is -10° C; and

Class B. Heated equipment for use when the mean outside temperature is -20° C.

The K coefficient of equipment of class B shall in every case be equal to or less than 0.4 W/m^{20} C.

5. *Transitional provisions.* For a period of three years following the date of entry into force of this Agreement in conformity with the provisions of article 11, paragraph 1 thereof, the overall coefficient of heat transfer (K coefficient) may, in the case of equipment already in service at that date, be equal to or less than:

0.9 W/m^{20} C in the case of insulated equipment in category I_N , refrigerated equipment in class A, all mechanically refrigerated equipment, and heated equipment in class A; and

0.6 W/m^{20} C in the case of refrigerated equipment in classes B and C and heated equipment in class B.

Moreover, after the period of three years referred to in the first subparagraph of this paragraph and until the equipment is finally withdrawn from service, the K coefficient of the mechanically refrigerated equipment in question of classes B, C, E and F may be equal to or less than 0.7 W/m^{20} C.

These transitional provisions shall not, however, preclude the application of any stricter regulations enacted by certain States for equipment registered in their own territory.

Annex 1
Appendix 1

Provisions Relating to the Checking of Insulated, Refrigerated, Mechanically Refrigerated or Heated Equipment for Compliance with the Standards

1. Except in the cases provided for in appendix 2, paragraphs 29 and 49, to this annex, checks for compliance with the standards prescribed in this annex shall be made at the testing stations designated or approved by the competent authority of the country in which the equipment is registered or recorded. They shall be made:

- (a) before the equipment is put into service;
- (b) periodically, at least once every six years; and
- (c) whenever required by the competent authority.

2. (a) New equipment of a specific type serially produced may be approved by testing one unit of that type. If the unit tested fulfils the requirements prescribed for the class to which it is presumed to belong, the test report shall be regarded as a Type Approval Certificate. This certificate shall expire at the end of a period of six years.

(b) The competent authority shall take steps to verify that production of other units is in conformity with the approved type. For this purpose it may check by testing sample units drawn at random from the production series.

(c) A unit shall not be regarded as being of the same type as the unit tested unless it satisfies the following minimum conditions:

(i) If it is insulated equipment, in which case the reference equipment may be insulated, refrigerated, mechanically refrigerated or heated equipment,

the construction shall be comparable and, in particular, the insulating material and the method of insulation shall be identical;

the thickness of the insulating material shall be not less than that of the reference equipment;

the interior fittings shall be identical or simplified;

the number of doors and the number of hatches or other openings shall be the same or less; and

the inside surface area of the body shall not be as much as 20% greater or smaller;

(ii) If it is refrigerated equipment, in which case the reference equipment shall be refrigerated equipment,

the conditions set out under (i) above shall be satisfied;

inside ventilation appliances shall be comparable;

the source of cold shall be identical; and

the reserve of cold per unit of inside surface area shall be greater or equal;

(iii) If it is mechanically refrigerated equipment, in which case the reference equipment shall be either:

(a) mechanically refrigerated equipment

the conditions set out in (i) above shall be satisfied;

and the effective refrigerating capacity of the mechanical refrigeration appliance per unit of inside surface area, under the same temperature conditions, shall be greater or equal;

or (b) insulated equipment to which it is intended to have fitted, at a later date, a mechanical refrigeration unit and which is complete in every detail but with the refrigeration unit removed and the aperture filled, during the measurement of the K coefficient, with close fitting panels of the same overall thickness and type of insulation as is fitted to the front wall. In which case:

the conditions set out in (i) above shall be satisfied;

and the effective refrigerating capacity of the mechanical refrigeration unit fitted to insulated reference equipment shall be as defined in annex 1, appendix 2, paragraph 41.

(iv) If it is heated equipment, in which case the reference equipment may be insulated or heated equipment,

the conditions set out under (i) above shall be satisfied;

the source of heat shall be identical; and the capacity of the heating appliance per unit of inside surface area shall be greater or equal.

(d) If, in the course of the six year period, the production series exceeds 100 units, the competent authority shall determine the percentage of units to be tested.

3. The methods and procedures to be used in checking for compliance with the standards are described in appendix 2 to this annex.

4. A certificate of compliance with the standards shall be issued by the competent authority on a form corresponding to the model reproduced in appendix 3 to this annex. The certificate or a certified true photographic copy thereof shall be carried on the equipment during carriage and be produced whenever so required by the control authorities. However, if the certification plate reproduced in appendix 3 to this annex is affixed to the equipment, the said plate shall be recognized as equivalent to an ATP certificate. The said certification plate shall be removed as soon as the equipment ceases to conform to the standards laid down in this annex. If equipment cannot be designated as belonging to a category or class except by virtue of the transitional provisions contained in paragraph 5 of this annex, the validity of the certificate issued for such equipment shall be limited to the period laid down in the said transitional provisions.

5. Distinguishing marks and particulars shall be affixed to the equipment in conformity with the provisions of appendix 4 to this annex. They shall be removed as soon as the equipment ceases to conform to the standards laid down in this annex.

6. The insulated bodies of "insulated", "refrigerated", "mechanically refrigerated" or "heated" transport equipment and their thermal

appliances shall each bear permanent distinguishing marks affixed by the manufacturer and including at least the following particulars:

Country of manufacture or letters used in international road traffic;

Name of manufacturer or company;

Model (figures and/or letters);

Serial number;

Month and year of manufacture.

Annex 1
Appendix 2

Methods and Procedures for Measuring and Checking the Insulating Capacity and the Efficiency of the Cooling or Heating Appliances of Special Equipment for the Carriage of Perishable Foodstuffs

A. Definitions and General Principles

1. *K coefficient*. The overall coefficient of heat transfer (K coefficient) which represents the insulating capacity of the equipment, is defined by the following formula:

$$K = \frac{W}{S \cdot \Delta \Theta}$$

where W is the thermal capacity required in a body of mean surface area S to maintain the absolute difference $\Delta \Theta$ between the mean inside temperature Θ_i and the mean outside temperature Θ_e , during continuous operation, when the mean outside temperature Θ_e is constant.

2. *The mean surface area S of the body* is the geometric mean of the inside surface area S_i and the outside surface area S_e of the body:

$$S = \sqrt{S_i \cdot S_e}$$

In determining the two surface areas S_i and S_e , structural peculiarities and surface irregularities of the body, such as round-offs, wheel-arches and the like, shall be taken into account and shall be noted under the appropriate heading in the test report prescribed hereunder; however, if the body is covered with corrugated sheet metal the area considered shall be that of the plane surface occupied thereby, not that of the developed corrugated surface.

3. In the case of parallelepipedic bodies, *the mean inside temperature of the body* (Θ_i) is the arithmetic mean of the temperatures measured 10 cm from the walls at the following 12 points:

- (a) the eight inside corners of the body; and
- (b) the centres of the four inside faces having the largest area.

If the body is not parallelepipedic, the 12 points of measurements shall be distributed as satisfactorily as possible having regard to the shape of the body.

4. In the case of parallelepipedic bodies, *the mean outside temperature of the body* (Θ_e) is the arithmetic mean of the temperatures measured 10 cm from the walls at the following 12 points:

- (a) the eight outside corners of the body;
- (b) the centres of the four outside faces having the largest area.

If the body is not parallelepipedic, the 12 points of measurement shall be distributed as satisfactorily as possible having regard to the shape of the body.

5. *The mean temperature of the walls of the body* is the arithmetic mean of the mean outside temperature of the body and the mean inside temperature of the body:

$$\frac{\Theta_e + \Theta_i}{2}$$

6. *Continuous operation.* Operation shall be considered to be continuous if both the following conditions are satisfied:

The mean outside temperature and the mean inside temperature of the body, taken over a period of not less than 12 hours, shall not vary by more than $\pm 0.5^\circ \text{C}$; and

The difference between the mean thermal capacities measured over a period of not less than 3 hours, before and after the aforesaid period of not less than 12 hours, shall be less than 3%.

B. Insulating Capacity of Equipment

Procedures for measuring the K coefficient

(a) *Equipment other than liquid-foodstuffs tanks*

7. Insulating capacity shall be measured in continuous operation either by the internal cooling method or by the internal heating method. In either case, the empty body shall be placed in an insulated chamber.

8. Whatever the method employed, the mean temperature of the insulated chamber shall throughout the test be kept uniform, and constant to within $\pm 0.5^\circ \text{C}$, at a level such that the temperature difference between the inside of the equipment and the insulated chamber is not less than 20°C , the mean temperature of the walls of the body being maintained at about $+20^\circ \text{C}$.

9. When the overall coefficient of heat transfer (K coefficient) is being determined by the internal cooling method, the dew point in the atmosphere of the insulated chamber shall be maintained at $+25^\circ \text{C} \pm 2^\circ \text{C}$. During the test, whether by the internal cooling method or by the internal heating method, the atmosphere of the chamber shall be made to circulate continuously so that the speed of movement of the air 10 cm from the walls is maintained at between 1 and 2 metres/second.

10. Where the internal cooling method is applied, one or more heat exchangers shall be placed inside the body. The surface area of these exchangers shall be such that, if a fluid at a temperature not lower than 0°C **** passes through them, the mean inside temperature of the body remains below $+10^\circ \text{C}$ when continuous operation has been established. Where the internal heating method is applied, electrical heating appliances (resistors and the like) shall be used. The heat exchangers or electrical heating appliances shall be fitted with an air blower having a delivery rate sufficient to ensure that the maximum difference between the temperatures of any 2 of the 12 points specified in paragraph 3 of this appendix does not exceed 3°C when continuous operation has been established.

11. Temperature measuring instruments protected against radiation shall be placed inside and outside the body at the points specified in paragraphs 3 and 4 of this appendix.

12. The appliances for generating and distributing cold or heat and for measuring the quantity of cold or heat exchanged and the heat equivalent of the air-circulating fans shall be started up.

13. When continuous operation has been established, the maximum difference between the temperatures at the warmest and at the coldest points on the outside of the body shall not exceed 2°C .

14. The mean outside temperature and the mean inside temperature of the body shall each be read not less than four times per hour.

15. The test shall be continued as long as is necessary to ensure that operation is continuous (see para. 6 of this appendix). If not all measurements are automatic and recorded, the test shall be continued for a period of eight consecutive hours in order to make sure that

operation is continuous and to take the definitive readings.

(b) *Liquid-foodstuffs tanks*

16. The method described below applies only to single-compartment or multiple-compartment tank equipment intended solely for the carriage of liquid foodstuffs such as milk. Each compartment of such tanks shall have at least one manhole and one discharge-pipe connecting socket; where there are several compartments they shall be separated from one another by non-insulated vertical partitions.

17. Insulating capacity shall be tested in continuous operation by internal heating of the empty tank in an insulated chamber.

18. Throughout the test, the mean temperature of the insulated chamber shall be kept uniform, and constant to within $\pm 0.5^{\circ}\text{C}$, at a level between $+15^{\circ}\text{C}$ and $+20^{\circ}\text{C}$; the mean temperature inside the tank shall be kept at between $+45^{\circ}\text{C}$ and $+50^{\circ}\text{C}$ in continuous operation, the mean temperature of the tank walls being between $+30^{\circ}\text{C}$ and $+35^{\circ}\text{C}$.

19. The atmosphere of the chamber shall be made to circulate continuously so that the speed of movement of the air 10 cm from the walls is maintained at between 1 and 2 metres/second.

20. A heat exchanger shall be placed inside the tank. If the tank has several compartments, a heat exchanger shall be placed in each compartment. The exchangers shall be fitted with electrical resistors and a fan with a delivery rate sufficient to ensure that the difference between the maximum temperature and the minimum temperature inside each compartment does not exceed 3°C when continuous operation has been established. If the tank comprises several compartments, the difference between the mean temperature in the coldest compartment and the mean temperature in the warmest compartment shall not exceed 2°C , the temperatures being measured as specified in paragraph 21 of this appendix.

21. Temperature measuring instruments protected against radiation shall be placed inside and outside the tank 10 cm from the walls, as follows:

(a) If the tank has only one compartment, measurements shall be made at a minimum of 12 points positioned as follows:

The four extremities of two diameters at right angles to one another, one horizontal and the other vertical, near each of the two ends of the tank;

The four extremities of two diameters at right angles to one another, inclined at an angle of 45° to the horizontal, in the axial plane of the tank.

(b) If the tank has several compartments, the points of measurement shall be as follows:

for each of the two end compartments, at least the following:

The extremities of a horizontal diameter near the end and the extremities of a vertical diameter near the partition;

and for each of the other compartments, at least the following:

The extremities of a diameter inclined at an angle of 45° to the horizontal near one of the partitions and the extremities of a diameter perpendicular to the first and near the other partition.

The mean inside temperature and the mean outside temperature of the tank shall respectively be the arithmetic mean of all the measurements taken inside and all the measurements taken outside the tank. In the case of a tank having several compartments, the mean inside temperature of each compartment shall be the arithmetic mean of the measurements, numbering not less than four, relating to that compartment.

22. The appliances for heating and circulating the air and for measuring the quantity of heat exchanged and the heat equivalent of the air-circulating fans shall be started up.

23. When continuous operation has been established, the maximum difference between the temperatures at the warmest and at the coldest points on the outside of the tank shall not exceed 2°C .

24. The mean outside temperature and the mean inside temperature of the tank shall each be read not less than four times per hour.

25. The test shall be continued as long as is necessary to ensure that operation is continuous (see para. 6 of this appendix). If not all measurements are automatic and recorded, the test shall be continued for a period of eight consecutive hours in order to make sure that operation is continuous and to take the definitive readings.

(c) *Provisions common to all types of insulated equipment*

(i) Verification of the K coefficient

26. Where the purpose of the tests is not to determine the K coefficient but simply to verify that it is below a certain limit, the tests carried out as described in paragraphs 7 to 25 of this appendix may be stopped as soon as the measurements made show that the K coefficient meets the requirements.

(ii) Accuracy of measurements of the K coefficient

27. Testing stations shall be provided with the equipment and instruments necessary to ensure that the K coefficient is determined with a maximum margin of error of $\pm 10\%$.

(iii) Test reports

28. A test report consisting of

Part 1 conforming to Model No. 1 A or 1 B below; and

Part 2 conforming to Model No. 2 A or 2 B below

shall be drawn up for each test of an item of equipment.

Checking the insulating capacity of equipment in service

29. For the purpose of checking the insulating capacity of each piece of equipment in service as prescribed in appendix 1, paragraphs 1(b) and 1(c), to this annex, the competent authorities may:

Apply the methods described in paragraphs 7 to 27 of this appendix; or

Appoint experts to assess the fitness of the equipment for retention in one or other of the categories of insulated equipment. These experts shall take the following particulars into account and shall base their conclusions on the criteria set forth hereunder:

(a) *General examination of the equipment*

This examination shall take the form of an inspection of the equipment to determine the following in the following order:

(i) the general design of the insulating sheathing;

(ii) the method of application of insulation;

(iii) the nature and condition of the walls;

(iv) the condition of the insulated compartment;

(v) the thickness of the walls;

and to make all appropriate observations concerning the insulating capacity of the equipment. For this purpose the experts may cause parts of the equipment to be dismantled and require all documents they may need to consult (plans, test reports, specifications, invoices, etc.) to be placed at their disposal.

(b) *Examination for air-tightness (not applicable to tank equipment)*

The inspection shall be made by an observer stationed inside the equipment, which shall be placed in a brightly-illuminated area. Any method yielding more accurate results may be used.

(c) *Decisions*

(i) If the conclusions regarding the general condition of the body are favourable, the equipment may be kept in service as insulated equipment of its initial class for a further period of not more than three years. If the conclusions of the expert or experts are unfavourable, the equipment may be kept in service only if it passes at a testing station the tests described in paragraphs 7 to 27 of this appendix; it may then be kept in service for a further period of six years.

(ii) If the equipment consists of units of serially-produced equipment of a particular type satisfying the requirements of appendix 1,

paragraph 2, to this annex and belonging to one owner, then in addition to an inspection of each unit of equipment the K coefficient of not less than 1% of the number of units may be measured in conformity with the provisions of paragraphs 7 to 27 of this appendix. If the results of the examinations and measurements are favourable, all the equipment in question may be kept in service as insulating equipment of its initial class for a further period of six years.

(d) Test reports

A test report consisting of

Part 1 conforming to Model No. 1A below; and

Part 2 conforming to Model No. 3 below

shall be drawn up for each test of an item of equipment by an expert.

Transitional provisions applicable to new equipment

30. For four years from the date of the entry into force of this Agreement in conformity with the provisions of article 11, paragraph 1 thereof, if, owing to lack of testing stations the K coefficient of equipment cannot be measured by the procedures described in paragraphs 7 to 27 of this appendix, the compliance of new insulated equipment with the standards prescribed in this annex may be verified by applying the provisions of paragraph 29 and, in addition, evaluating the insulating capacity in the light of the following consideration:

The insulating material of the main components (side walls, floor, roof, hatches, doors, etc.) of the equipment shall be of a substantially uniform thickness exceeding in metre-length terms the figure obtained by dividing the coefficient of thermal conductivity of the material in a humid environment by the K coefficient required for the category in which inclusion of the equipment is requested.

C. Efficiency of Thermal Appliances of Equipment

Procedures for determining the efficiency of thermal appliances of equipment

31. The efficiency of the thermal appliances of equipment shall be determined by the methods described in paragraphs 32 to 47 of this appendix.

Refrigerated equipment

32. The empty equipment shall be placed in an insulated chamber whose mean temperature shall be kept uniform, and constant to within $\pm 0.5^{\circ}\text{C}$, at $+30^{\circ}\text{C}$. The atmosphere of the chamber, which shall be kept humid by regulating the dew point to $+25^{\circ}\text{C} \pm 2^{\circ}\text{C}$, shall be made to circulate as described in paragraph 9 of this appendix.

33. Temperature measuring instruments protected against radiation shall be placed inside and outside the body at the points specified in paragraphs 3 and 4 of this appendix.

34. (a) In the case of equipment other than equipment with fixed eutectic plates, and equipment fitted with liquefied gas systems, the maximum weight of refrigerant specified by the manufacturer or which can normally be accommodated shall be loaded into the spaces provided when the mean inside temperature of the body has reached the mean outside temperature of the body ($+30^{\circ}\text{C}$). Doors, hatches and other openings shall be closed and the inside ventilation appliances (if any) of the equipment shall be started up at maximum capacity. In addition, in the case of new equipment, a heating appliance with a heating capacity equal to 35% of the heat exchanged through the walls in continuous operation shall be started up inside the body when the temperature prescribed for the class to which the equipment is presumed to belong has been reached. No additional refrigerant shall be loaded during the test.

(b) In the case of equipment with fixed eutectic plates, the test shall comprise a preliminary phase of freezing of the eutectic solution. For this purpose, when the mean inside temperature of the body and the temperature of the plates have reached the mean outside temperature ($+30^{\circ}\text{C}$), the plate-cooling appliance shall be put into operation for 18 consecutive hours after closure of the doors and hatches. If the plate-cooling appliance includes a cyclically-operating mechanism, the total duration of operation of the appliance shall be 24 hours. In the case of new equipment, as soon as the cooling appliance is stopped, a heating appliance with a heating capacity equal to 35% of the heat exchanged through the walls in continuous operation shall be started up inside the body when the temperature prescribed for the class to which the equipment is presumed to belong has been reached. The solution shall not be subjected to any re-freezing operation during the test.

(c) In the case of equipment fitted with liquefied gas systems, the following test procedure shall be used: when the mean inside temperature of the body has reached the mean outside temperature ($+30^{\circ}\text{C}$), the receptacles for the liquefied gas shall be filled to the level prescribed by the manufacturer. Then the doors, hatches and other openings shall be closed as in normal operation and the inside

ventilation appliances (if any) of the equipment shall be started up at maximum capacity. The thermostat shall be set at a temperature not more than 2 degrees below the limit temperature of the presumed class of the equipment. Cooling of the body then shall be commenced. During the cooling of the body the refrigerant consumed is simultaneously replaced. This replacement shall be effected:

Either for a time corresponding to the interval between the commencement of cooling and the moment when the temperature prescribed for the class to which the equipment is presumed to belong is reached for the first time;

or for a duration of three hours counting from the commencement of cooling, whichever is shorter.

Beyond this period, no additional refrigerant shall be loaded during the test.

In the case of new equipment, a heating appliance with a heating capacity equal to 35% of the heat exchanged through the walls in continuous operation shall be started up inside the body when the class temperature has been reached.

35. The mean outside temperature and the mean inside temperature of the body shall each be read not less often than once every 30 minutes.

36. The test shall be continued for 12 hours after the mean inside temperature of the body has reached the lower limit prescribed for the class to which the equipment is presumed to belong (A = +7° C; B = -10° C; C = -20° C; D = 0° C) or, in the case of equipment with fixed eutectic plates, after stoppage of the cooling appliance. The test shall be deemed satisfactory if the mean inside temperature of the body does not exceed the aforesaid lower limit during the aforesaid period of 12 hours.

Mechanically refrigerated equipment

37. The test shall be carried out in the conditions described in paragraphs 32 and 33 of this appendix.

38. When the mean inside temperature of the body reaches the outside temperature (+30° C), the doors, hatches and other openings shall be closed and the refrigerating appliance and the inside ventilating appliances (if any) shall be started up at maximum capacity. In addition, in the case of new equipment, a heating appliance with a heating capacity equal to 35% of the heat exchanged through the walls in continuous operation shall be started up inside the body when the temperature prescribed for the class to which the equipment is presumed to belong has been reached.

39. The mean outside temperature and the mean inside temperature of the body shall each be read not less often than once every 30 minutes.

40. The test shall be continued for 12 hours after the mean inside temperature of the body has reached:

Either the lower limit prescribed for the class to which the equipment is presumed to belong in the case of classes A, B and C (A = 0° C; B = -10° C; C = -20° C); or

A level not lower than the upper limit prescribed for the class to which the equipment is presumed to belong in the case of classes D, E, and F (D = 0° C; E = -10° C; F = -20° C). The test shall be deemed satisfactory if the refrigerating appliance is able to maintain the prescribed temperature conditions during the said 12-hour periods, (if any) of automatic defrosting of the refrigerating unit not being taken into account.

41. If the refrigerating appliance with all its accessories has undergone separately, to the satisfaction of the competent authority, a test to determine its effective refrigerating capacity at the prescribed reference temperatures, the transport equipment may be accepted as mechanically refrigerated equipment without undergoing an efficiency test if the effective refrigerating capacity of the appliance in continuous operation exceeds the heat loss through the walls for the class under consideration, multiplied by the factor 1.75.

42. If the mechanically refrigerating unit is replaced by a unit of a different type, the competent authority may:

(a) require the equipment to undergo the determinations and verifications prescribed in paragraphs 37 to 40; or

(b) satisfy itself that the effective refrigerating capacity of the new mechanically refrigerating unit is, at the temperature prescribed for equipment of the class concerned, at least equal to that of the unit replaced; or

(c) satisfy itself that the effective refrigerating capacity of the new mechanically refrigerating unit meets the requirements of paragraph 41.

Heated equipment

43. The empty equipment shall be placed in an insulated chamber whose temperature shall be kept uniform and constant at as low a

level as possible. The atmosphere of the chamber shall be made to circulate as described in paragraph 9 of this appendix.

44. Temperature measuring instruments protected against radiation shall be placed inside and outside the body at the points specified in paragraphs 3 and 4 of this appendix.

45. Doors, hatches and other openings shall be closed and the heating equipment and the inside ventilating appliances (if any) shall be started up at maximum capacity.

46. The mean outside temperature and the mean inside temperature of the body shall each be read not less often than once every 30 minutes.

47. The test shall be continued for 12 hours after the difference between the mean inside temperature and the mean outside temperature of the body has reached the level corresponding to the conditions prescribed for the class to which the equipment is presumed to belong, increased by 35 per cent in the case of new equipment. The test shall be deemed satisfactory if the heating appliance is able to maintain the prescribed temperature difference during the 12 hours aforesaid.

Test reports

48. A test report consisting of

Part 1 conforming to Model No. 1A or 1B below; if this has not already been prepared for a test report under paragraph 28; and

Part 3 conforming to Model No. 4A, 4B, 4C, 5 or 6 below shall be drawn up for each test of an item of equipment.

Verifying the efficiency of thermal appliances of equipment in service

49. To verify as prescribed in appendix 1, paragraphs 1(b) and 1(c), to this annex the efficiency of the thermal appliance of each item of refrigerated, mechanically refrigerated or heated equipment in service, the competent authorities may:

Apply the methods described in paragraphs 32 to 47 of this appendix; or

Appoint experts to apply the following provisions:

(a) *Refrigerated equipment*

It shall be verified that the inside temperature of the empty equipment, previously brought to the outside temperature, can be brought to the limit temperature of the class to which the equipment belongs, as prescribed in this annex, and maintained below the said limit

temperature for a period t such that $t \geq \frac{12 \cdot \Delta_{\ominus}}{\Delta_{\ominus}'}$ in which Δ_{\ominus} is the difference between +30° C and the said limit temperature, and

Δ_{\ominus}' is the difference between the mean outside temperature during the test and the aforesaid limit temperature, the outside

temperature being not lower than +15° C. If the results are favourable, the equipment may be kept in service as refrigerated equipment of its initial class for a further period of not more than three years.

(b) *Mechanically refrigerated equipment*

It shall be verified that, when the outside temperature is not lower than +15° C, the inside temperature of the empty equipment can be brought:

In the case of equipment in classes A, B or C, to the minimum temperature, as prescribed in this annex;

In the case of equipment in classes D, E or F, to the limit temperature, as prescribed in this annex.

If the results are favourable, the equipment may be kept in service as mechanically refrigerated equipment of its initial class for a further period of not more than three years.

(c) *Heated equipment*

It shall be verified that the difference between the inside temperature of the equipment and the outside temperature which governs the class to which the equipment belongs as prescribed in this annex (a difference of 22° C in the case of class A and of 32° C in the case of class B) can be achieved and be maintained for not less than 12 hours. If the results are favourable, the equipment may be kept in

service as heated equipment of its initial class for a further period of not more than three years.

(d) *Provisions common to refrigerated, mechanically refrigerated and heated equipment*

(i) If the results are unfavourable, refrigerated, mechanically refrigerated or heated equipment may be kept in service in its initial class only if it passes at a testing station the tests described in paragraphs 32 to 47 of this appendix; it may then be kept in service in its initial class for a further period of six years.

(ii) If the equipment consists of units of serially-produced refrigerated, mechanically refrigerated or heated equipment of a particular type satisfying the requirements of appendix 1, paragraph 2, to this annex and belonging to one owner, then in addition to an inspection of the thermal appliances to ensure that their general condition appears to be satisfactory, the efficiency of the cooling or heating appliances of not less than 1% of the number of units may be determined at a testing station in conformity with the provisions of paragraphs 32 to 47 of this appendix. If the results of the examinations and of the determination of efficiency are favourable, all the equipment in question may be kept in service in its initial class for a further period of six years.

(e) *Test reports*

A test report consisting of

Part 1 conforming to Model No. 1A below, if this has not already been prepared for a test report under paragraph 29(d); and

Part 3 conforming to Model No. 7, 8 or 9 below shall be drawn up for each test of an item of equipment by an expert.

Transitional provisions applicable to new equipment

50. For four years from the date of the entry into force of this Agreement in conformity with the provisions of article 11, paragraph 1 thereof, if owing to lack of testing stations the efficiency of the thermal appliances of equipment cannot be determined by the procedures described in paragraphs 32 to 47 of this appendix, the compliance with the standards of new refrigerated, mechanically refrigerated or heated equipment may be verified by applying the provisions of paragraph 49 of this appendix.

D. Procedure for Measuring the Effective Refrigerating Capacity W_0 of a Unit when the Evaporator is Free From Frost

51. At each equilibrium temperature, this capacity is equal to the sum of the heat flow $U \cdot \Delta \Theta$ flowing through the walls of the calorimeter box or unit of transport equipment to which the refrigeration unit is attached and the heating power W_j which is dissipated in the interior of the body by the fan heater unit:

$$W_0 = W_j + U \cdot \Delta \Theta$$

52. The refrigeration unit is fitted to either a calorimeter box, or a unit of transport equipment.

In each case, the overall heat transfer is measured at a single mean wall temperature prior to the capacity test. An arithmetical correction factor, based upon the experience of the testing station, is made to take into account the average temperature of the walls at each thermal equilibrium during the determination of the effective refrigerating capacity.

It is preferable to use a calibrated calorimeter box to obtain maximum accuracy.

Measurements and procedure shall be as described in paragraphs 1 to 15 above; however, it is sufficient to measure U directly, the value of this coefficient being defined by the following relationship:

$$U = \frac{W}{\Delta \Theta_m}$$

where:

W is the heating power (in watts) dissipated by the internal heater and fans;

$\Delta \Theta_m$ is the difference between the mean internal temperature Θ_i and the mean external temperature Θ_e ;

U is the heat flow per degree of difference between the air temperature inside and outside the calorimeter box or unit of transport equipment measured with the refrigeration unit fitted.

The calorimeter box or unit of transport equipment is placed in a test chamber. If a calorimeter box is used, $U \cdot \Delta \Theta$ should be not more than 35% of the total heat flow W_0 .

53. The following method may, if necessary, be used both for reference equipment and for tests on series manufactured equipment. In this case, the effective refrigerating capacity is measured by multiplying the mass flow (m) of the refrigerant liquid by the difference in enthalpy between the refrigerant vapour leaving the unit (h_0) and the liquid at the inlet to the unit (h_i).

To obtain the effective refrigerating capacity, the heating power produced by the air circulating fans (W_f) is deducted. It is difficult to measure W_f if the air circulating fans are driven by an external motor, in this particular case the enthalpy method is not recommended. When the fans are driven by internal electric motors, the electrical power is measured by appropriate instruments with an accuracy of $\pm 3\%$.

The heat balance is given by the formula:

$$W_0 = (h_0 - h_i) \cdot m - W_f .$$

Appropriate methods are described in standards ISO 971, BS 3122, DIN, NEN, etc. An electric heater is placed inside the equipment in order to obtain the thermal equilibrium.

54. Instrumentation

Test stations shall be equipped with instruments to measure the U value to an accuracy of $\pm 5\%$. Heat transfer through air leakage should not exceed 5% of the total heat transfer through the calorimeter box or through the unit of transport equipment. The refrigerant flow measurement shall be accurate to $\pm 5\%$. The refrigerating capacity shall be determined with an accuracy of $\pm 10\%$.

The instrumentation of the calorimeter box or unit of transport equipment shall conform to paragraphs 3 and 4 above. The following are to be measured:

(a) Air temperatures:

At least four thermometers uniformly distributed at the inlet to the evaporator;

At least four thermometers uniformly distributed at the outlet to the evaporator;

At least four thermometers uniformly distributed at the inlet to the condenser;

The thermometers shall be protected against radiation.

(b) energy consumption:

Instruments shall be provided to measure the electrical energy or fuel consumption of the refrigeration unit.

(c) speed of rotation:

Instruments shall be provided to measure the speed of rotation of the compressors and circulating fans or to allow these speeds to be calculated where direct measurement is impractical.

(d) pressure:

High precision pressure gauges (accurate to $\pm 1\%$) shall be fitted to the condenser and evaporator and to the compressor inlet when the evaporator is fitted with a pressure regulator.

(e) heat quantity:

The heat dissipated by the internal fan heaters fitted with electrical resistances shall not exceed a flow of 1 W/cm^2 and the heater units shall be protected by a casing of low emissivity.

55. Test conditions

- (i) Outside the calorimeter box or unit of transport equipment: the air temperature at the inlet to the condenser shall be maintained at $30^{\circ} \pm 0.5^{\circ} \text{ C}$.
- (ii) Inside the calorimeter box or unit of transport equipment (at the air inlet to the evaporator): there shall be three levels of temperature between -25° C and $+12^{\circ} \text{ C}$ depending on the characteristics of the unit, one temperature level being at the minimum prescribed for the class requested by the manufacturer with a tolerance of $\pm 1^{\circ} \text{ C}$.

The mean inside temperature shall be maintained within a tolerance of $\pm 0.5^{\circ} \text{ C}$. During the measurement of refrigerating capacity, the heat dissipated within the calorimeter box or unit of transport equipment shall be maintained at a constant level with a tolerance of $\pm 1\%$.

56. Test procedure

The test shall be divided into two major parts, the cooling phase and the measurement of the effective refrigerating capacity at three increasing temperature levels.

- (a) Cooling phase; the initial temperature of the calorimeter box or transport equipment shall be within $\pm 3^{\circ} \text{ C}$ of the prescribed ambient temperature. It shall then be lowered to -25° C (or to the minimum class temperature).
- (b) Measurement of effective refrigerating capacity, at each internal temperature level.

A first test to be carried out, for at least four hours at each level of temperature, under control of the thermostat (of the refrigeration unit) to stabilize the heat transfer between the interior and exterior of the calorimeter box or unit of transport equipment.

A second test shall be carried out without the thermostat in operation in order to determine the maximum refrigerating power output, the heating power of the internal heater producing an equilibrium condition at each temperature level as prescribed in paragraph 55.

The duration of the second test shall be not less than four hours.

Before changing from one temperature level to another, the box or unit shall be manually defrosted.

If the refrigeration unit can be operated by more than one form of energy, the tests shall be repeated for each.

If the compressor is driven by the vehicle engine, the test shall be carried out at both the minimum speed and at the nominal speed of rotation of the compressor as specified by the manufacturer.

If the compressor is driven by the vehicle motion, the test shall be carried out at the nominal speed of rotation of the compressor as specified by the manufacturer.

The same procedure shall be followed for the enthalpy method described in paragraph 53, but in this case the heat power dissipated by the evaporator fans at each temperature level must also be measured.

57. Precautions

As the tests for effective refrigerating capacity are carried out with the thermostat of the refrigeration unit disconnected, the following precautions must be observed:

if the equipment has a hot gas injection system, it must be inoperative during the test;

with automatic controls of the refrigeration unit which unload individual cylinders (to adapt the refrigeration power of the unit to the power available from the motor) the test must be carried out with the number of cylinders appropriate for the temperature.

58. Checks

The following should be verified and the methods used indicated on the test report:

- (i) the defrosting system and the thermostat are functioning correctly;
- (ii) the rate of air circulation is that specified by the manufacturer;
- (iii) the refrigerant used for tests is that specified by the manufacturer.

A test report of the appropriate type shall be drawn up in accordance with model number 10 below.

Model No. 1A

Test Report

Prepared in conformity with the provisions of the Agreement on the International Carriage of Perishable Foodstuffs and on the Special Equipment to be Used for such Carriage (ATP)

Test report No

Section 1

Specifications of the equipment (equipment other than tanks for the carriage of liquid foodstuffs)

Approved testing station/expert:¹
 Name
 Address

Type of equipment:²
 Make Number of registration Serial number
 Date of first entry into service

Tare³ kg Carrying capacity⁴ kg

Body:
 Make and type Identification number
 Built by
 Owned or operated by
 Submitted by
 Date of construction

Principal dimensions:
 Outside: length m, width m, height m
 Inside: length m, width m, height m
 Total floor area of body m²
 Usable internal volume of body m³
 Total inside surface area S_i of body m²
 Total outside surface area S_e of body m²

Mean surface area: $S = \sqrt{S_i \cdot S_e}$ m²

Specifications of the body walls:⁵
 Top
 Bottom
 Sides

Structural peculiarities of body:⁶
 Number,) of doors
 positions) of vents
 and dimensions) of ice-loading apertures

Accessories⁶

K coefficient W/m²K

¹ Delete as necessary (experts only in the case of tests carried out under ATP annex 1, appendix 2, paras. 29 or 49).

² Wagon, lorry, trailer, semi-trailer, container, etc.

³ State source of information.

⁴ Nature and thickness of materials constituting the body walls, from the interior to the exterior, mode of construction, etc.

⁵ If there are surface irregularities, show how S_i and S_e were determined.

⁶ Meat bars, flettner fans, etc.

Test Report

prepared in conformity with the provisions of the Agreement on the International
Carriage of Perishable Foodstuffs and on the Special Equipment to be Used for such

Carriage (ATP)

Test report No .

Section 1

Specifications of tanks for the carriage of liquid foodstuffs

Approved testing station/expert:¹

Name

Address

Type of tank:²

Make Number of registration Serial number

Date of first entry into service

Tare³ kg Carrying capacity⁴ kg

Tank:

Make and type Identification number

Built by

Owned or operated by

Submitted by

Date of construction

Principal dimensions:

Outside: length of cylinder . m, major axis m, minor axis m

Inside: length of cylinder . m, major axis m, minor axis m

Usable internal volume m³

Internal volume of each compartment m³

Total inside surface area S_i of tank m²

Inside surface area of each compartment S_{i1}, ..., S_{in} m²

Total outside surface area S_e of tank m²

Mean surface area of tank: $S = \sqrt{S_i \cdot S_e}$ m²

Specifications of the tank walls:⁵

Structural peculiarities of the tank:²

Number, dimensions and description of manholes

Description of manhole covers

Number, dimensions and description of discharge piping

Accessories

¹ Delete as necessary (experts only in the case of tests carried out under ATP annex 1, appendix 2, paras. 29 or 49).

² Wagon, lorry, trailer, semi-trailer, container, etc.

³ State source of information.

⁴ Nature and thickness of materials constituting the tank walls, from the interior to the exterior, mode of construction, etc.

⁵ If there are surface irregularities, show how S_i and S_e were determined.

Section 2

Measurement in accordance with ATP, annex 1, appendix 2, paragraphs 7 to 15, of the overall coefficient of heat transfer of equipment other than tanks for liquid foodstuffs

Testing method: inside cooling/inside heating¹
 Date and time of closure of equipment's doors and other openings:
 Averages obtained for hours of continuous operation
 (from a.m./p.m. to a.m./p.m.):
 (a) Mean outside temperature of body: $\Theta_e =$ °C ± K
 (b) Mean inside temperature of body: $\Theta_i =$ °C ± K
 (c) Mean temperature difference achieved $\Delta\Theta =$ K
 Maximum temperature spread:
 Outside body K
 Inside body K
 Mean temperature of walls of body $\frac{\Theta_e + \Theta_i}{2}$ °C
 Operating temperature of heat exchanger² °C
 Dew point of atmosphere outside body during continuous operation³ °C ± K
 Total duration of test h
 Duration of continuous operation h
 Power consumed in exchangers: W_1 W
 Power absorbed by fans: W_2 W
 Overall coefficient of heat transfer calculated by the formula:
 Inside-cooling test¹ $K = \frac{W_1 - W_2}{S \cdot \Delta\Theta}$
 Inside-heating test¹ $K = \frac{W_1 + W_2}{S \cdot \Delta\Theta}$
 K = W/m²K
 Maximum error of measurement with test used %
 Remarks:¹

(To be completed only if the equipment does not have thermal appliances:)
 According to the above test results, the equipment may be recognized by means of a certificate in accordance with ATP annex 1, appendix 3, valid for a period of not more than six years, with the distinguishing mark INMR¹.
 However, this report shall be valid as a certificate of type approval within the meaning of ATP annex 1, appendix 1, paragraph 2(a) only for a period of not more than three years, that is until

Done at:
 on: Testing Officer

¹ Delete as necessary.
² For inside-cooling test only.
³ If the body is not parallelepipedic, specify the points at which the outside and inside temperatures were measured.

Section 2

Measurement, in accordance with ATP annex 1, appendix 2, paragraphs 16 to 25, of the overall coefficient of heat transfer of tanks for liquid foodstuffs

Testing method: inside heating
 Date and time of closure of equipment's openings
 Mean values obtained for hours of continuous operation
 (from a.m./p.m. to a.m./p.m.):

(a) Mean outside temperature of tank: $\Theta_e = \dots\dots\dots^\circ\text{C} \pm \dots\dots\dots\text{K}$

(b) Mean inside temperature of tank:

$$\Theta_i = \frac{\sum S_{in} \cdot \Theta_{in}}{\sum S_{in}} \dots\dots\dots^\circ\text{C} \pm \dots\dots\dots\text{K}$$

(c) Mean temperature difference achieved: $\Delta\Theta \dots\dots\dots\text{K}$

Maximum temperature spread:

Inside tank K

Inside each compartment K

Outside tank K

Mean temperature of tank walls $^\circ\text{C}$

Total duration of test h

Duration of continuous operation h

Power consumed in exchangers: $W^1 \dots\dots\dots\text{W}$

Power absorbed by fans: $W^2 \dots\dots\dots\text{W}$

Overall coefficient of heat transfer calculated by the formula:

$$K = \frac{W_1 + W_2}{S \cdot \Delta\Theta}$$

$K = \dots\dots\dots\text{W/m}^2\text{K}$

Maximum error of measurement with test used %

Remarks: ¹

(To be completed only if the equipment does not have thermal appliances:)

According to the above test results, the equipment may be recognized by means of a certificate in accordance with ATP annex 1, appendix 3, valid for a period of not more than six years, with the distinguishing mark INAR.²

However, this report shall be valid as a certificate of type approval within the meaning of ATP annex 1, appendix 1, paragraph 2(a) only for a period of not more than three years, that is until

Done at:

on: Testing Officer

¹ If the tank is not parallelepipedic, specify the points at which the outside and inside temperatures were measured.

² Delete as necessary.

Section 2

Field check of the insulating capacity of equipment in service conducted by experts in accordance with ATP annex 1, appendix 2, paragraph 29.

The check was based on test report No. dated
 issued by approved testing station (name and address)
 Condition when checked:
 Top
 Side walls
 End walls
 Bottom
 Doors and openings
 Seals
 Cleaning drainholes
 Air tightness
 K coefficient of the equipment when new (as shown in the previous test report) ...
 W/m²K
 Remarks:

According to the above test results the equipment may be recognized by means of a certificate in accordance with ATP annex 1, appendix 3, valid for not more than three years, with the distinguishing mark IN/IR.¹

Done at:
 on: Testing Officer

¹Delete as necessary.

Model No. 4A

Section 3

Determination of the efficiency of cooling appliances of refrigerated equipment using ice or dry ice by an approved testing station in accordance with ATP annex 1, appendix 2, paragraphs 32 to 36 except 34(b) and 34(c)

Cooling appliance:
 Description of cooling appliance
 Nature of refrigerant
 Nominal refrigerant filling capacity specified by manufacturer kg
 Actual filling of refrigerant used for test kg
 Drive independent/dependent/mains-operated¹
 Cooling appliance removable/hot removable¹
 Manufacturer
 Type, series/number
 Year of manufacture
 Filling device (description, where situated;
 attach drawing if necessary)
 Inside ventilation appliances:
 Description (number of appliances, etc.)
 Power of electric fans W
 Delivery rate m³/h
 Dimensions of ducts: cross-section m², length m
 Air intake screen, description¹
 Automatic devices
 Mean temperatures at beginning of test:
 Inside °C ± K
 Outside °C ± K
 Dew point in test chamber °C ± K
 Power of internal heating system W
 Date and time of closure of equipment's
 doors and other openings
 Record of mean inside and outside temperatures of body and/or curve
 showing variation of these temperatures with time
 Remarks:

According to the above test results, the equipment may be recognized by means of a certificate in accordance with ATP annex 1, appendix 3, valid for a period of not more than six years, with the distinguishing mark
 However, this report shall be valid as a certificate of type approval within the meaning of ATP annex 1, appendix 1, paragraph 2(a) only for a period of not more than three years, that is until

Done at:
 on: Testing Officer

¹Delete if not applicable.

Section 3

Determination of the efficiency of cooling appliances of refrigerated equipment with eutectic plates by an approved testing station in accordance with ATP annex 1, appendix 2, paragraphs 32 to 36, except 34(a) and 34(c)

Cooling appliance:

Description

Nature of eutectic solution

Nominal eutectic solution filling capacity specified
by manufacturer kg

Latent heat at freezing temperature stated by manufacturer ° C

Cooling appliance removable/not removable¹
Drive independent/dependent/mains-operated¹

Manufacturer

Type, series/number

Year of manufacture

Eutectic plates: Make Type

Dimensions and number of plates, where situated;
distance from walls (attach drawing)

Total cold reserve stated by manufacturer for freezing
temperature of ° C W

Inside ventilation appliances (if any):
Description

Automatic devices

Mechanical refrigerator (if any):
Make Type No.

Where situated

Compressor: Make Type

Type of drive

Nature of refrigerant

Condenser

Refrigerating capacity stated by the manufacturer for the specified freezing temperature
and an outside temperature of +30° C W

Automatic devices:
Defrosting (if any)

Thermostat

LP pressostat

HP pressostat

Relief valve

Others

Accessory devices:
Electrical heating devices of the door joint:
Capacity by linear metre of the resistor W/m

Linear length of the resistor m

Mean temperatures at beginning of test:
Inside ° C ± K

Outside ° C ± K

Dew point in test chamber ° C ± K

Power of internal heating system W

Date and time of closure of equipment's
doors and openings

Period of accumulation of cold h

Record of mean inside and outside temperatures of body and/or curve
showing variation of these temperatures with time

Remarks:

According to the above test results, the equipment may be recognized by means of a certificate in accordance with ATP annex 1, appendix 3, valid for a period of not more than six years, with the distinguishing mark

However, this report shall be valid as a certificate of type approval within the meaning of ATP annex 1, appendix 1, paragraph 2(a) only for a period of not more than three years, that is until

Done at:
on: Testing Officer

¹ Delete if not applicable.

Section 3

Test of the efficiency of cooling appliances of refrigerated equipment using liquefied gases by an approved testing station in accordance with ATP annex 1, appendix 2, paragraphs 32 to 36, except 34(a) and 34(b)

Cooling appliance:

Description

Drive independent/dependent/mains-operated¹

Cooling appliance removable/not removable¹

Manufacturer

Type, series/number

Year of manufacture

Nature of refrigerant

Nominal refrigerant filling capacity specified
by manufacturer kg

Actual filling of refrigerant used for test kg

Description of tank

Filling device (description, where situated)

Inside ventilation appliances:

Description (number, etc.)

Power of electric fans W

Delivery rate m³/h

Dimensions of ducts: cross-section m², length m

Automatic devices

Mean temperature at beginning of test:

Inside °C ± K

Outside °C ± K

Dew point in test chamber °C ± K

Power of internal heating system W

Date and time of closure of equipment's
doors and openings

Record of mean inside and outside temperatures of body and/or curve
showing variation of these temperatures with time

Remarks:

According to the above test results, the equipment may be recognized by means of a certificate in accordance with ATP annex 1, appendix 3, valid for a period of not more than six years, with the distinguishing mark

However, this report shall be valid as a certificate of type approval within the meaning of ATP annex 1, appendix 1, paragraph 2(a), only for a period of not more than three years, that is until

Done at:
on: Testing Officer

¹ Delete if not applicable.

Section 3

Test of the efficiency of cooling appliances of mechanically refrigerated equipment by an approved testing station in accordance with ATP annex 1, appendix 2, paragraphs 37 to 40

Mechanical refrigerating appliance:

Drive independent/dependent/mains-operated¹

Mechanical refrigerating appliances removable/not removable¹

Manufacturer

Type, series/number

Year of manufacture

Nature of refrigerant and filling capacity

Effective refrigerating capacity stated by manufacturer for an outside temperature of +30° C and an inside temperature of:

0° C W

-10° C W

-20° C W

Compressor:

Make Type

Drive: electric/thermal/hydraulic¹

Description

Make type power kW at rpm

Condenser and evaporator

Motor element of fan(s): make type number

power kW at rpm.

Inside ventilation appliances:

Description (number of appliances, etc.)

Power of electric fans W

Delivery rate m³/h

Dimensions of ducts: cross-section m², length m

Automatic devices:

Defrosting (if any)

Thermostat

LP pressostat

HP pressostat

Release valve

Others

Mean temperatures at beginning of test:

Inside temperature ° C ± K

Outside temperature ° C ± K

Dew point in test chamber ° C ± K

Power of internal heating system W

Date and time of closure of equipment's

doors and other openings

Record of mean inside and outside temperatures of body and/or curve

showing variation of these temperatures with time

.....

Time between beginning of test and attainment of prescribed

mean inside temperature of body h

According to the above test results, the equipment may be recognized by means of a certificate in accordance with ATP annex 1, appendix 3, valid for a period of not more than six years, with the distinguishing mark

However, this report shall be valid as a certificate of type approval within the meaning of ATP annex 1, appendix 1, paragraph 2(a), only for a period of not more than three years, that is until

Done at:

on: Testing Officer

¹ Delete if not applicable.

Section 3

Test of the efficiency of heating appliances of heated equipment by an approved testing station in accordance with ATP annex 1, appendix 2, paragraphs 43 to 41

Heating appliance:

Description

Drive independent/dependent/mains-operated¹

Heating appliance removable/hot removable¹

Manufacturer

Type, series/number

Year of manufacture

Where situated

Overall area of heat exchange surfaces m²

Effective power rating as specified by manufacturer kW

Inside ventilation appliances:

Description (number of appliances, etc.)

Power of electric fans W

Delivery rate m³/h

Dimensions of ducts: cross-section ... m², length m

Mean temperatures at beginning of test:

Inside temperature °C ± K

Outside temperature °C ± K

Date and time of closure of equipment's doors and other openings

Record of mean inside and outside temperatures of body and/or curve showing variation of these temperatures with time

Time between beginning of test and attainment of prescribed mean inside temperature of body h

Where applicable, mean heating output during test to maintain prescribed temperature difference² between inside and outside of body W

Remarks:

According to the above test results, the equipment may be recognized by means of a certificate in accordance with ATP annex 1, appendix 3, valid for a period of not more than six years, with the distinguishing mark

However, this report shall be valid as a certificate of type approval within the meaning of ATP annex 1, appendix 1, paragraph 2(a), only for a period of not more than three years, that is until

Done at:
 on: Testing Officer

¹Delete if not applicable.
²Increased by 35% for new equipment.

Section 3

Expert field check of the efficiency of cooling appliances of refrigerated equipment in service in accordance with ATP annex 1, appendix 2, paragraph 49(a)

The check was conducted on the basis of report No. dated
 issued by approved testing station/expert (name, address)

Cooling appliance:

Description
 Manufacturer
 Type, series/number
 Year of manufacture
 Nature of refrigerant
 Nominal refrigerant filling capacity specified by manufacturer kg
 Actual filling of refrigerant used for test kg
 Filling device (description, where situated)

Inside ventilation appliances:

Description (number of appliances, etc.)
 Power of electric fans W
 Delivery rate m³/h
 Dimensions of ducts: cross-section ... m², length m
 Condition of cooling appliance and ventilation appliances

Inside temperature attained °C
 At an outside temperature of °C

Inside temperature of the equipment before the refrigerating appliance is put into service °C
 Total running time of the refrigerating unit h
 Time between beginning of test and attainment of prescribed mean inside temperature of bod h
 Check on operation of thermostat

For refrigerated equipment with eutectic plates:

Period of operation of the cooling appliance for freezing of the eutectic solution h
 Period over which inside air temperature is maintained after the appliance is switched off h

Remarks:

According to the above test results, the equipment may be recognized by means of a certificate in accordance with ATP annex 1, appendix 3, valid for a period of not more than three years, with the distinguishing mark

Done at:
 on: Testing Officer

Section 3

Expert field check of the efficiency of cooling appliances of mechanically refrigerated equipment in service in accordance with ATP annex 1, appendix 2, paragraph 49(b)

The check was conducted on the basis of report No. dated
issued by approved testing station/expert (name, address)

Mechanical refrigerating appliances:

Type
Manufacturer
Type, series/number
Year of manufacture
Description
Refrigerating capacity specified by manufacturer for an outside temperature of +30° C
and an inside temperature of
0° C W
-10° C W
-20° C W
Nature of refrigerant and filling capacity kg

Inside ventilation appliances:

Description (number of appliances, etc.)
Power of electric fans W
Delivery rate m³/h
Dimensions of ducts: cross-section ... m², length m
Condition of mechanical refrigerating appliance and inside ventilation appliances

Inside temperature attained ° C
At an outside temperature of ° C
and with a relative running time of %
Running time h

Check on operation of thermostat

Remarks:

According to the above test results, the equipment may be recognized by means of a certificate in accordance with ATP annex 1, appendix 3 valid for a period of not more than three years, with the distinguishing mark

Done at:
on: Testing Officer

Section 3

Expert field check of the efficiency of heating appliances of heated equipment in service
in accordance with ATP annex 1, appendix 2, paragraph 49(c)

The check was conducted on the basis of report No. . . . dated
issued by approved testing station/expert (name, address)

Mode of heating:

Description
 Manufacturer
 Type, series/number
 Year of manufacture
 Where situated
 Overall area of heat exchange surfaces m²
 Effective power rating as specified by manufacturer kW

Inside ventilation appliances:

Description (number of appliances, etc.)
 Power of electric fans W
 Delivery rate m³/h

Dimensions of ducts: cross-section m², length m

Condition of heating appliance and inside ventilation appliances

Inside temperature attained ° C

At an outside temperature of ° C
 and with a relative running time of %
 Running time h

Check on operation of thermostat

Remarks:

According to the above test results, the equipment may be recognized by means of a
certificate in accordance with ATP annex 1, appendix 3, valid for a period of not more than
three years, with the distinguishing mark

Done at:
 on: Testing Officer

Test Report

prepared in conformity with the provisions of the Agreement on the International Carriage of Perishable Foodstuffs and on the Special Equipment to be used for such Carriage (ATP)

Test Report No.

Determination of the effective refrigerating capacity of a refrigeration unit in accordance with paragraphs 51–59 of ATP annex 1, appendix 2

Approved testing station

Name:

Address:

Refrigeration unit presented by:

(a) *Technical specifications of the unit*

Date of manufacture: Make:

Type: Serial No:

Category¹⁾

Self-contained/not self-contained

Removable/not removable

Single unit/assembled components

Description:

.....

Compressor – Make: Type:

Number of cylinders: Cubic capacity: cm³

Nominal speed of rotation: rpm

Methods of drive²⁾: electric motor, separate internal combustion engine, vehicle engine, vehicle motion

Compressor drive motor: (See notes 1 and 2)

Electrical: Make: Type:

Power: kW at rpm Supply voltage V

Supply frequency Hz

Internal combustion engine:

Make: Type:

Number of cylinders: Cubic capacity: cm³

Power: kW at rpm Fuel:

Hydraulic motor:

Make: Type:

Method of drive:

Alternator:

Make: Type:

Speed of rotation: (nominal speed given by the manufacture:

(..... rpm

(minimum speed: rpm

Refrigerant fluid:

Heat exchangers		Condenser	Evaporator
Make-type			
Number of tubes			
Fan pitch (mm) ²¹			
Tube: nature and diameter (mm) ²¹			
Exchange surface area (m ²) ²¹			
Frontal area (m ²)			
FANS	Number		
	Number of blades per fan		
	Diameter (mm)		
	Nominal power (W) ²¹¹		
	Total nominal output at a pressure of Pa ² (m ³ /h) ²¹		
	Method of drive		

Expansion valve:

Make: Model:
Adjustable:"1" Not adjustable:"1"

Defrosting device:

Automatic device:

Results of measurements and refrigerating performance (Mean temperature of the air to the condenser ... ° C)

Speed of rotation				Power of internal fan heater	Refrigerant mass flow rate (4)	Refrigerant enthalpy at evaporator or inlet (4)	Refrigerant enthalpy at evaporator or outlet (4)	Power absorbed by the unit cooler fan (4)	Fuel or electrical power consumption	Mean temperature around the body	Internal temperature		Effective refrigerating capacity
Fans	Alternator	Compressor (3)	Mean								Inlet to evaporator		
min ⁻¹	min ⁻¹	min ⁻¹	W	kg/s	J/kg	J/kg	W	W or l/h	°C	°C	°C	W	
Nominal													
Minimal													

(b) *Test method and results:*

Test method⁽¹⁾: heat balance method/enthalpy difference method

In a calorimeter box of mean surface area = m²

measured value of the U-coefficient of a box fitted with a refrigeration unit: W/m²°C,

at a mean wall temperature of °C.

In an item of transport equipment:

measured value of the U-coefficient of an item of transport equipment fitted with a

refrigeration unit: W/m² °C,

at a mean wall temperature of °C.

Method employed for the correction of the U-coefficient of the body as a function of the mean wall temperature of the body:

.....

.....

Maximum errors of determination of:

U-coefficient of the body

refrigerating capacity of the unit

(c) *Checks*

Temperature regulator: Setting Differential °C

Functioning of the defrosting device⁽²⁾: satisfactory/ unsatisfactory

Air flow volume leaving the evaporator: value measured m³/h

at a pressure of Pa

Existence of a means of supplying heat to the evaporator for setting the thermostat between 0 and 12° C⁽³⁾: yes/no

(d) Remarks

.....

.....

.....

Done at:

on: Testing Officer

(1) Delete where applicable.

(2) Value indicated by the manufacturer.

(3) Where applicable.

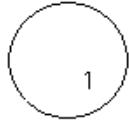
(4) Enthalpy difference method only.

Annex 1
Appendix 3

A. Model form of certificate of compliance of the equipment.

as described in annex 1, appendix 1, paragraph 4

FORM OF CERTIFICATE FOR INSULATED, REFRIGERATED,
MECHANICALLY REFRIGERATED OR HEATED EQUIPMENT USED FOR THE
INTERNATIONAL CARRIAGE OF PERISHABLE FOODSTUFFS BY LAND



EQUIPMENT

INSULATED ⁵	REFRIGERATED ⁵	MECHANICALLY REFRIGERATED ⁵	HEATED ⁵
------------------------	---------------------------	---	---------------------

CERTIFICATE ²

issued pursuant to the Agreement on the International Carriage of Perishable
Foodstuffs and on the Special Equipment to be Used for such Carriage (ATP)

1. Issuing authority
2. Equipment¹
3. Identification number allotted by
4. Owner or operated by
5. Submitted by
6. Is approved as³
 - 6.1. with one or more thermal appliances which (is) (are):

6.1.1. independent;) ⁴
6.1.2. not independent;)
6.1.3. removable;)
6.1.4. not removable.)
7. Basis of issue of certificate
 - 7.1. This certificate is issued on the basis of:

7.1.1. tests of the equipment;) ⁴
7.1.2. conformity with a reference item of equipment;)
7.1.3. a periodic inspection;)
7.1.4. transitional provisions.)
 - 7.2. If the certificate is issued on the basis of a test or by reference to an item of equipment of the same type which has been tested, specify:

7.2.1. the testing station
7.2.2. the nature of the tests ⁷
7.2.3. the number(s) of the report(s)
7.2.4. the K coefficient
7.2.5. the effective refrigerating capacity ⁸
at an outside temperature of 30° C
and an inside temperature of
° C
° C
° C
8. This certificate is valid until
 - 8.1. provided that:
 - 8.1.1. the insulated body (and, where applicable the thermal appliance) is maintained in good condition;
 - 8.1.2. no material alteration is made to the thermal appliances; and
 - 8.1.3. if the thermal appliance is replaced, it is replaced by an appliance of equal or greater refrigerating capacity.
9. Done at:
10. on:
(The competent authority)

¹ Distinguishing sign of the country, as used in international road traffic.
² The blank certificate shall be printed in the language of the issuing country and in English, French or Russian; the various items shall be numbered as in the above model.
³ State type (wagon, lorry, trailer, semi-trailer, container, etc.); in the case of tank equipment for the carriage of liquid foodstuffs, add the word "tank".
⁴ Enter here one or more of the descriptions listed in appendix 4 of this annex, together with the corresponding distinguishing mark or marks.
⁵ Strike out what does not apply.
⁶ The number (figures, letters, etc.) indicating the authority issuing the certificate and the approval reference.
⁷ For example: insulating capacity or efficiency of thermal appliances.
⁸ Where measured in conformity with the provisions of appendix 2, paragraph 42, to this annex.

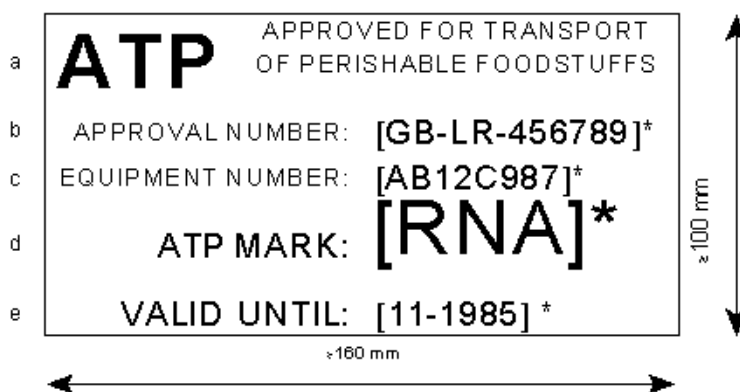
B. Certification plate of compliance of the equipment, as provided for in annex 1, appendix 1, paragraph 4

1. The certification plate shall be affixed to the equipment permanently and in a clearly visible place adjacent to any other approval plate issued for official purposes. The plate, conforming to the model reproduced below, shall take the form of a rectangular, corrosion-resistant and fire-resistant plate measuring at least 160 mm by 100 mm. The following particulars shall be indicated legibly and indelibly

on the plate in at least the English or French or Russian language:

- (a) the Latin letters "ATP" followed by the words "APPROVED FOR TRANSPORT OF PERISHABLE FOODSTUFFS",
- (b) "APPROVAL NUMBER" followed by the distinguishing sign (in international road traffic) of the State in which the approval was granted and the number (figures, letters, etc.) of the approval reference,
- (c) "EQUIPMENT NUMBER" followed by the individual number assigned to identify the particular item of equipment (which may be the manufacturer's number),
- (d) "ATP MARK" followed by the distinguishing mark prescribed in annex 1, appendix 4, corresponding to the class and the category of the equipment,
- (e) "VALID UNTIL" followed by the date (month and year) when the approval of the unit of equipment expires. If the approval is renewed following a test or inspection, the subsequent date of expiry may be added on the same line.

2. The letters "ATP" and the letters of the distinguishing mark should be approximately 20 mm high. Other letters and figures should not be less than 5 mm high.



* The particulars in square brackets are given by way of example.

Annex 1
Appendix 4

Distinguishing Marks to be Affixed to Special Equipment

The distinguishing marks prescribed in appendix 1, paragraph 5 to this annex shall consist of capital Latin letters in dark blue on a white ground; the height of the letters shall be at least 100 mm. The marks shall be as follows:

Equipment

Distinguishing mark

Normally insulated equipment	IN
Heavily insulated equipment	IR
Class A refrigerated equipment with normal insulation	RNA
Class A refrigerated equipment with heavy insulation	RRA
Class B refrigerated equipment with heavy insulation	RRB
Class C refrigerated equipment with heavy insulation	RRC
Class D refrigerated equipment with normal insulation	RND
Class D refrigerated equipment with heavy insulation	RRD
Class A mechanically refrigerated equipment with normal insulation	FNA
Class A mechanically refrigerated equipment with heavy insulation	FRA
Class B mechanically refrigerated equipment with normal insulation	FNB ¹
Class B mechanically refrigerated equipment with heavy insulation	FRB
Class C mechanically refrigerated equipment with normal insulation	

Class C mechanically refrigerated equipment with heavy insulation	FNC
Class D mechanically refrigerated equipment with normal insulation	FRC
Class D mechanically refrigerated equipment with heavy insulation	FND
Class E mechanically refrigerated equipment with normal insulation	FRD
Class E mechanically refrigerated equipment with heavy insulation	FNE ¹
Class F mechanically refrigerated equipment with normal insulation	FRE
Class F mechanically refrigerated equipment with heavy insulation	FNF ¹
Class A heated equipment with normal insulation	FRF
Class A heated equipment with heavy insulation	CNA
Class B heated equipment with heavy insulation	CRA
	CRB

If the equipment is fitted with removable or non-independent thermal appliances, the distinguishing mark or marks shall be supplemented by the letter X.

The date (month, year) entered under section A, item 8 in appendix 3 of this annex as the date of expiry of the certificate issued in respect of the equipment shall be quoted under the distinguishing mark or marks aforesaid.

Model:

RNA
5 - 1974

 5 = month (May) of expiry of the
1974 = year) certificate

¹ See transitional provisions in paragraph 5 of this annex.

Selection of Equipment and Temperature Conditions to be Observed for the Carriage of Quick (Deep)-Frozen and Frozen Foodstuffs

- For the carriage of the following quick (deep)-frozen and frozen foodstuffs, the transport equipment has to be selected and used in such a way that during carriage the highest temperature of the foodstuffs at any point of the load does not exceed the indicated temperature.
- Accordingly, the temperature of the foodstuffs at any point in the load must be at or below the indicated value on loading, during carriage and on unloading.
- Where it is necessary to open the equipment, e.g. to carry out inspections, it is essential to ensure that the foodstuffs are not exposed to procedures or conditions contrary to the objectives of this annex and those of the International Convention on the Harmonization of Frontier Controls of Goods.
- During certain operations, such as defrosting the evaporator of mechanically refrigerated equipment, a brief rise of the temperature of the surface of the foodstuffs of not more than 3° C in a part of the load, e.g. near the evaporator, above the appropriate temperature may be permitted.

Ice cream	-20° C
Frozen or quick (deep)-frozen fish, fish products, molluscs and crustaceans and all other quick (deep)-frozen foodstuffs	-18° C
All frozen foodstuffs (except butter)	-12° C
Butter	-10° C

Deep-frozen and frozen foodstuffs mentioned below to be immediately further processed at destination:¹

Butter

Concentrated fruit juice.

¹ The deep-frozen and frozen foodstuffs listed, when intended for immediate further processing at destination, may be permitted gradually to rise in temperature during carriage so as to arrive at their destination at temperatures no higher than those specified by the sender and indicated in the transport contract. This temperature should not be higher than the maximum temperature authorized for the same foodstuff when refrigerated as mentioned in annex 3. The transport document shall state the name of the foodstuff, whether it is deep-frozen or frozen and that it is immediately to be further processed at destination. This carriage shall be undertaken with ATP-approved equipment without use of a thermal appliance to increase the temperature of the foodstuffs.

Annex 3

**Temperature Conditions for the Carriage of Certain Foodstuffs
Which are Neither Quick (Deep)-Frozen nor Frozen**

During carriage, the temperatures of the foodstuffs in question shall not be higher than those indicated below:

Red offal	+3° C ³
Butter	+6° C
Game	+4° C
Milk (raw or pasteurized) in tanks, for immediate consumption	+4° C ³
Industrial milk	+6° C ³
Dairy products (yoghurt, kefir, cream, and fresh cheese)	+4° C ^{3, 4}
Fish, molluscs and crustaceans ¹	must always be carried in melting ice
Meat products ²	+6° C
Meat (other than red offal)	+7° C
Poultry and rabbits	+4° C

¹ Other than smoked, salted, dried or live fish, live molluscs and live crustaceans.

² Except for products stabilized by salting, smoking, drying or sterilization.

³ In principle, the duration of carriage should not exceed 48 hours.

⁴ "Fresh cheese" means a non-ripened (non-matured) cheese which is ready for consumption shortly after manufacturing and which has a limited conservation period.

* Wagons, lorries, trailers, semi-trailers, containers and other similar equipment.

** In the case of tank equipment, the term "body" means under this definition, the tank itself.

*** The date of entry into force of this amendment is: 15 May 1991.

**** To prevent frosting