



**Economic and Social
Council**

Distr.
GENERAL
TRANS/WP.11/2002/11
23 August 2002

ENGLISH
Original: ENGLISH and FRENCH

**ECONOMIC COMMISSION FOR EUROPE
INLAND TRANSPORT COMMITTEE
Working Party on the Transport of
Perishable Foodstuffs
(Fifty-eighth session,
11-14 November 2002)**

**AGREEMENT ON THE INTERNATIONAL CARRIAGE OF
PERISHABLE FOODSTUFFS AND ON THE SPECIAL
EQUIPMENT TO BE USED (ATP)**

DRAFT ATP HANDBOOK

Prepared by the secretariat

1. The secretariat was invited to prepare the draft ATP Handbook on the basis of the revised version of annexes to ATP.
2. The present document is based on the draft version of Annex 1 prepared by Mr. C. Bowyer (TRANS/WP.11/ 2002/12) and on the draft handbook prepared for the last session (TRANS/WP.11/ 2001/3). It takes also into account the report of the Working Group on the ATP Handbook (TRANS/WP.11/ 2002/10).
3. Comments are placed with the provisions of the Agreement to which they refer.
4. Comments do not modify the provisions of the Agreement or of its Annexes but merely make their contents, meaning and scope more precise.
5. Comments provide a means of applying the provisions of the Agreement and of its Annexes so as to take into account the development of technology and economic requirements. They could also describe certain recommended practices.
6. Comments contained in the ATP Handbook are not legally binding for Contracting Parties of the ATP. They are, however, important for the interpretation, harmonization and application of the Agreement as they reflect the opinion of the Working Party on the transport of Perishable Foodstuffs of the United Nations Economic Commission for Europe (UNECE).

7. New texts are between brackets.

**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.

Comments:

The issuing of a certificate of compliance by the competent authorities on the basis of test reports, is referred to in Annex 1, Appendix 1, paragraph 4, but there is no indication that such reports had to be issued by a testing station in the country of registration of the equipment.

The test reports in accordance with Annex 1, Appendix 2 are not certificates. To avoid duplication of the test, each Contracting Party should recognize test stations from any Contracting Party, approved by the competent authority of the country concerned.

Contracting Parties may recognise the test reports, issued by testing stations in countries of non-contracting parties and approved by the competent authority of those countries.
(TRANS/WP.11/2002/10)

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.

Comments:

0.3-1 Except in the case of the sea crossings referred to in article 3, paragraph 2, land/sea/land transport, with or without reloading of the goods at the end of the sea crossing(s) should not be subject to the provisions of the Agreement if the land transport operations in question are not in themselves of an international nature. (TRANS/348 - TRANS/WP.11/174, para.13).

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 zooprophylaxis 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 classified as thermal maritime 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.

Comment:

0.5-1 Land transport by container, preceded or followed by one or more sea crossings, other than those referred to in article 3, paragraph 2, should not be subject to the provisions of the 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.

Comments:

0.9-1 Signature Subject to Ratification, Acceptance or Approval

Where the signature is subject to ratification, acceptance or approval, the signature does not establish the consent to be bound. However, it is a means of authentication and expresses the willingness of the signatory state to continue the treaty-making process. The signature qualifies the signatory state to proceed to ratification, acceptance or approval. It also creates an obligation to refrain, in good faith, from acts that would defeat the object and the purpose of the treaty.

[Arts.10 and 18, Vienna Convention on the Law of Treaties 1969]

0.9-2 Ratification

Ratification defines the international act whereby a state indicates its consent to be bound to a treaty if the parties intended to show their consent by such an act. In the case of bilateral treaties, ratification is usually accomplished by exchanging the requisite instruments, while in the case of multilateral treaties the usual procedure is for the depositary to collect the ratifications of all states, keeping all parties informed of the situation. The institution of ratification grants states the necessary time-frame to seek the required approval for the treaty on the domestic level and to enact the necessary legislation to give domestic effect to that treaty.

[Arts.2 (1) (b), 14 (1) and 16, Vienna Convention on the Law of Treaties 1969]

0.9-3 Accession

"Accession" is the act whereby a state accepts the offer or the opportunity to become a party to a treaty already negotiated and signed by other states. It has the same legal effect as ratification. Accession usually occurs after the treaty has entered into force.

[Arts.2 (1) (b) and 15, Vienna Convention on the Law of Treaties 1969]

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. New Contracting Parties acceding to ATP as from 30 April 1999 and applying paragraph 1 of this article shall not be entitled to enter any objection to draft amendments in accordance with the procedure provided for in article 18, paragraph 2.

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.

Comments:

0.10-1 Notification

The term "notification" refers to a formality through which a state or an international organisation communicates certain facts or events of legal importance. Notification is increasingly resorted to as a means of expressing final consent. Instead of opting for the exchange of documents or deposit, states may be content to notify their consent to the other party or to the depository. However, all other acts and instruments relating to the life of a treaty may also call for notifications.

[Arts.16 (c), 78 etc., Vienna Convention on the Law of Treaties 1969]

0.10-2 Declarations

Sometimes states make "declarations" as to their understanding of some matter or as to the interpretation of a particular provision. Unlike reservations, declarations merely clarify the state's position and do not purport to exclude or modify the legal effect of a treaty. Usually, declarations are made at the time of the deposit of the corresponding instrument or at the time of signature.

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.

Comment:

0.16-1 Reservation

A reservation is a declaration made by a State by which it purports to exclude or alter the legal effect of certain provisions of the treaty in their application to that state. A reservation enables a State to accept a multilateral treaty as a whole by giving it the possibility not to apply certain provisions with which it does not want to comply. Reservations can be made when the treaty is signed, ratified, accepted, approved or acceded to. Reservations must not be incompatible with the object and the purpose of the treaty. Furthermore, a treaty might prohibit reservations or only allow for certain reservations to be made.

[Arts.2 (1) (d) and 19-23, Vienna Convention of the Law of Treaties 1969]

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.

Comments:

0.17-1 Revision

Revision has basically the same meaning as amendment. However, some treaties provide for a revision additional to an amendment (i.e., Article 109 of the Charter of the United Nations). In that case, the term "revision" refers to an overriding adoption of the treaty to changed circumstances, whereas the term "amendment" refers only to a change of singular provisions.

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.

The Secretary-General may also propose amendments to this Agreement or to its Annexes which have been transmitted to him by the Working Party on the Transport of Perishable Foodstuffs of the Inland Transport Committee of the Economic Commission for Europe.

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.

Comments:

0.18-1 Amendment

The term "amendment" refers to the formal alteration of treaty provisions affecting all the parties to the particular agreement. Such alterations must be effected with the same formalities that attended the original formation of the treaty. Many multilateral treaties lay down specific requirements to be satisfied for amendments to be adopted. In the absence of such provisions, amendments require the consent of all the parties.

[Art.40, Vienna Convention of the Law of Treaties 1969]

0.18-2 Correction of Errors

If, after the authentication of a text, the signatory and Contracting States are agreed that it contains an error, it can be corrected by initialling the corrected treaty text, by executing or exchanging an instrument containing the correction or by executing the corrected text of the whole treaty by the same procedure as in the case of the original text. If there is a depository, the depository must communicate the proposed corrections to all signatory and contracting states. In the UN practice, the Secretary-General, in his function as depository, informs all Parties to a treaty of the errors and the proposal to correct it. If, on the expiry of an appropriate time-limit, no objections are raised by

the signatory and Contracting States, the depository circulates a process-verbal of rectification and causes the corrections to be effected in the authentic text(s).

[Art.79, Vienna Convention on the Law of Treaties 1969]

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.

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Annex 1

**DEFINITIONS OF AND STANDARDS FOR SPECIAL
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- 3. Mechanically refrigerated equipment**
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Annex I

DEFINITIONS OF AND STANDARDS FOR SPECIAL EQUIPMENT ^{1/} FOR THE CARRIAGE OF PERISHABLE FOODSTUFFS

1. **Insulated equipment.** Equipment of which the body ^{2/} 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-** [specified] ~~characterized~~ by a K coefficient equal to or less than $0.70 \text{ W/m}^2 \cdot \text{K}$

I_R = **Heavily insulated equipment**
[specified] ~~characterized~~ by :

- a K coefficient equal to or less than $0.40 \text{ W/m}^2 \cdot \text{K}$ [and by]
- [side-]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 ^{3/} 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:

^{1/} [These provisions shall apply to vehicles of categories N and O as defined in annex 7 of the Consolidated Resolution on construction of vehicles (RE3)] Wagons, ~~lorries~~, trailers, semi-trailers, containers, [swap-bodies] and ~~other~~ similar equipment.

^{2/} In the case of tank equipment, the term "body" means under this definition, the tank itself.

^{3/} ~~The date of entry into force of this amendment is: 15 May 1991.~~

At + 7 °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.~~ [If] Such equipment shall comprise [includes] 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~~ [3.1.3].

The K coefficient of [refrigerated] equipment of classes B and C shall in every case be equal to or less than 0.40 W/m².K.

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, ([fitted with either a]mechanical compressor ~~unit~~, [or an] "absorption" [device] ~~unit, etc.~~). The appliance shall be capable, with a mean outside temperature of + 30 °C, of lowering the temperature [T_i] 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 [inside temperature T_i] ~~value~~ ~~it~~ 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] ~~it~~ may be chosen between + 12 °C and 0 °C inclusive.

Class B. Mechanically refrigerated equipment fitted with a refrigerating appliance such that [T_i] ~~it~~ may be chosen between + 12 °C and - 10 °C inclusive.

Class C. Mechanically refrigerated equipment fitted with a refrigerating appliance such that [T_i] ~~it~~ may be chosen between + 12 °C and - 20 °C inclusive.

In the case of classes D, E and F a fixed practically constant [inside temperature T_i] ~~value~~ ~~it~~ 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] ~~it~~ is equal to or less than 0 °C.

Class E. Mechanically refrigerated equipment fitted with a refrigerating appliance such that [T_i] ~~it~~ 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 $-20\text{ }^\circ\text{C}$.

The K coefficient of equipment of classes B, C, E and F shall in every case be equal to or less than $0.40\text{ W/m}^2\cdot\text{K}$.

4. **Heated equipment.** Insulated equipment fitted with a heat-producing appliance[,] which is capable of raising the ~~temperature~~ inside [temperature of] 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 $+12\text{ }^\circ\text{C}$ when the mean outside temperature of the body is that [, as] indicated below for the two classes [is]:

[$-10\text{ }^\circ\text{C}$ in the case of class A heated equipment;

$-20\text{ }^\circ\text{C}$ in the case of class B heated equipment;]

~~Class A. Heated equipment for use when the mean outside temperature is $-10\text{ }^\circ\text{C}$;~~
and

~~Class B. Heated equipment for use when the mean outside temperature is $-20\text{ }^\circ\text{C}$.~~

[Heat producing appliances shall have a capacity in conformity with the provisions of annex 1, appendix 2, paragraphs 3.3.1 to 3.3.5.]

The K coefficient of equipment of class B shall in every case be equal to or less than $0.40\text{ W/m}^2\cdot\text{K}$.

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 II, 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:

~~$0.90\text{ W/m}^2\cdot\text{K}$ in the case of insulated equipment in category IN, refrigerated equipment in class A, all mechanically refrigerated equipment, and heated equipment in class A; and~~

~~$0.60\text{ W/m}^2\cdot\text{K}$ 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 $0.70\text{ W/m}^2\cdot\text{K}$.

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. Checks for conformity with the standards prescribed in this annex shall be made:

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

Except in the cases provided for in appendix 2, paragraphs ~~29 and 49~~ [5 to 5.3 and 6 to 6.4], to this annex, the checks shall be made at a testing station designated or approved by the competent authority of the country in which the equipment is registered or recorded, unless, in the case of the check referred to in (a) above, a check has already been made on the equipment itself or on its prototype in a testing station designated or approved by the competent authority of the country in which the equipment was manufactured.

~~[2.]~~ Paragraph 2 is moved to the end of the appendix becoming paragraph 6.]

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

~~[3.]~~ **4.** A certificate of compliance with the standards shall be issued by the competent authority of the country in which the equipment is to be registered and recorded on a form conforming to the model reproduced in appendix 3 to this annex.

In the case of equipment transferred to another country which is a Contracting Party to ATP it shall be accompanied by the following documents so that the competent authority of the country in which the equipment is to be registered or recorded shall issue an ATP certificate:

- (a) in all cases, the test report - of the equipment itself or, in the case of serially produced equipment, of the reference equipment;
- (b) in all cases, the ATP certificate issued by the competent authority of the country of manufacture or, for equipment in service, the competent authority of the country of registration. This certificate will be treated as a provisional certificate valid, if necessary, for three months;
- (c) in the case of serially produced equipment, the technical specification of the equipment to be certified-[] this specification ~~shall~~ [must] cover the same items as the descriptive pages concerning the equipment which appears in the test report []].

In the case of equipment transferred after it has been in use, the equipment may be subject to a visual inspection to confirm its identity before the competent authority of the country

in which it is to be registered or recorded issues a certificate of compliance. 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~~ [a] certification plate [, as] reproduced in appendix 3 to this annex [,] is fixed to the equipment, the ~~said~~ [ATP] plate shall be recognised as equivalent to an ATP certificate. ~~The said [ATP] certification plate[s] shall be removed as soon as the equipment ceased 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.~~

Comments to paragraph 3 (c):

While the model ATP certificate is clearly defined in this paragraph, the applications for approval differ from one country to another. It would therefore be useful for a single format to be proposed for all Contracting Parties.

The test report could be drawn up in the national language of the country, issuing the document, which should also be drawn up in at least one of the three official languages of ATP. (TRANS/WP.11/2002/10)

[4.]5. [Classification] D[d]istinguishing 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.

[5.] 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.

[6.]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~~ [meets]class [specification]to which it is presumed to belong, the [resulting] test report shall be regarded as a Type Approval Certificate. This certificate shall expire at the end of a period of six years.

Comments to paragraph 6 (a):

A test report is valid for six years as from the date of the finalisation of the test.

The limit of validity of reports may be given in months and years (TRANS/WP.11/2000/10 and TRANS/WP.11/2001/2).

- (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~~ [circulating fans] 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~~ [minus its mechanical] refrigeration unit [which will be fitted at a later date] ~~removed and the~~ [. The resulting] aperture [will be] 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 [3.2.6].
- (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.**

Comments to paragraph 6 (d):

When determining the percentage of units (bodies) to be tested the competent authority may take into account the manufacturers procedures and quality assurance systems.
(TRANS/WP.11/2002/10)

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**

[1.] A. DEFINITIONS AND GENERAL PRINCIPLES

[1.1] ~~1-~~ **K coefficient.** The overall [heat transfer coefficient (K coefficient) of the special equipment] ~~coefficient of heat transfer (K coefficient) which represents the insulating capacity of the equipment,~~ is defined by the following formula:

$$K = \frac{W}{S \cdot \Delta T}$$
 where W is ~~the thermal capacity required in a body of mean surface area S~~ ~~to maintain the absolute difference ΔT~~ [either the heating power or the cooling capacity, as the case may be, required to maintain a constant absolute temperature difference ΔT] between the mean inside temperature T_i [T_i] and the mean outside temperature T_e [T_e] during continuous operation, when the mean outside temperature T_e [T_e] is constant, [for a body of mean surface area S].

[1.2] ~~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 [chamfers] ~~round-offs~~, wheel-arches and [similar features] ~~the like~~, shall be taken into account and shall be noted under the appropriate heading in the test report[s] ~~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.

[Temperature measuring points]

[1.3] ~~3-~~ In the case of parallelepipedic bodies, **the mean inside temperature of the body** (T_i [T_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.

[1.4] ~~4-~~ In the case of parallelepipedic bodies, **the mean outside temperature of the body** (T_e [T_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; [and]
- (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.

[1.5] ~~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:

$$\frac{T_e + T_i}{2}$$

[1.6] ~~4.~~ Temperature measuring instruments protected against radiation shall be placed inside and outside the body at the points specified in paragraphs [1.3] ~~3~~ and [1.4] ~~4~~ of this appendix.

[Steady state period and duration of test.]

[1.7] ~~6.~~ The mean outside temperatures and the mean inside temperatures of the body, taken over a steady period of not less than 12 hours, shall not vary by more than ~~3.0~~ 3.0°C [K], and these temperatures shall not vary by more than ~~2.0~~ 2.0°C [K] during the preceding 6 hours.

The difference between the [heating power or cooling capacity] ~~thermal capacity~~ measured over two periods of not less than 3 hours at the start and at the end of the steady state period, and separated by at least 6 hours, shall be less than 3 %.

The mean values of the temperatures and thermal capacity over at least the last 6 hours of the steady state period will be used in K coefficient calculation.

The mean [inside and outside] ~~internal and external~~ temperatures at the beginning and the end of the calculation period of at least 6 hours shall not differ by more than ~~0.2~~ 0.2°C [K].

[2.] ~~B.~~ INSULATING CAPACITY OF EQUIPMENT

Procedures for measuring the K coefficient

[2.1] ~~(a)~~ Equipment other than liquid-foodstuffs tanks

[2.1.1] ~~7.~~ ~~Insulating capacity~~ [K coefficient] 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.

[Test Method]

[2.1.2] ~~10.~~ Where the internal cooling method is [used] ~~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 °C when continuous operation has been established. Where the internal heating method is [used] ~~applied~~, electrical heating appliances (resistors [etc.] ~~and the like~~) shall be used. The heat exchangers or electrical heating appliances shall be fitted with [fans] ~~an air-blower~~ having a delivery rate sufficient to obtain 40 to 70 air charges per hour related to the empty volume of the tested body, and the air distribution around all [inside] ~~internal~~ surfaces of the tested body shall be sufficient to ensure that the maximum difference between the temperatures of any 2 of the 12 points specified in paragraph [1.3] ~~3~~ of this appendix does not exceed [2 K] ~~3 °C~~ when continuous operation has been established.

[2.1.3] ~~54~~(e) Heat quantity: The heat dissipated by the [electrical resistance] ~~internal~~ fan heaters ~~fitted with electrical resistances~~ shall not exceed a flow of 1W/cm² and the heater units shall be protected by a casing of low emissivity.

[Test Procedure]

[2.1.4] ~~8~~: Whatever the method employed, the mean temperature of the insulated chamber shall throughout the test be kept uniform, and constant [in compliance with paragraph 1.7 of this appendix,] to within ~~30.5~~ °C, at a level such that the temperature difference between the inside of the [body] ~~equipment~~ and the insulated chamber is 25 °C ~~2 °C~~ [K], the ~~mean~~ [average] temperature of the walls of the body being maintained at + 20 °C ~~30.5 °C~~ [K].

~~For a period of one year after this amendment comes into force ^{*/}, the officially recognized testing stations may correct with the calculation the measured value of the K coefficient and make it to refer to an average wall temperature of + 20 °C.~~

[2.1.5] ~~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 °C ~~2 °C~~. During the test, whether by the internal cooling method or by the internal heating method, the atmosphere of [the mass of air in] the chamber shall be made to circulate continuously so that the [its] speed of movement of the air 10 cm from the walls is maintained at between 1 and 2 metres/second.~~

[~~10~~. Para.10 becomes para.2.1.2.]

[~~11~~. Para.11 becomes para.1.6.]

[2.1.6] ~~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. Electrical cable losses between the heat input measuring instrument and the tested body shall be established by a measurement or calculation and subtracted from the total heat input measured.

[2.1.7] ~~13~~. When continuous operation has been established, the maximum difference between

^{*/} To prevent frosting.

^{*/} This date of entry into force is on 22 February 1996.

the temperatures at the warmest and at the coldest points on the outside of the body shall not exceed 2°C [K].

[2.1.8] ~~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.~~

[2.2] ~~(b)~~ Liquid-foodstuffs tanks

[2.2.1] ~~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.

[2.2.2] ~~17.~~ [K coefficients] ~~Insulating capacity~~ shall be [measured] ~~tested~~ in continuous operation by internal heating of the empty tank in an insulated chamber.

~~18.~~ *Para. 18 becomes para. 2.2.5 and is sub-headed "test procedure". The last sentence is deleted]*

~~19.~~ *Para. 19 becomes para. 2.2.6]*

[Test method]

[2.2.3] ~~20.~~ [An electrical heating appliance (resistors etc.)] ~~A heat-exchanger~~ shall be placed inside the tank. If the tank has several compartments, [an electrical heating appliance] ~~a heat-exchanger~~ shall be placed in each compartment. The [electrical heating appliances] ~~exchangers~~ shall be fitted with ~~electrical resistors and a fan~~ [fans] 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 [2] $^{\circ}\text{C}$ [K] 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 [K], the temperatures being measured as specified in paragraph ~~21~~ [2.2.4] of this appendix.

[2.2.4] ~~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.

[Test procedure]

- [2.2.5] ~~18.~~ Throughout the test, the ~~average~~ [mean] temperature of the insulated chamber ~~must~~ [shall] be kept uniform, and constant [in compliance with paragraph 1.7 of this appendix] ~~to within 0.5 °C~~, at a level such that the difference in temperature between the inside of the ~~equipment~~ [tank] and [that of] the insulated chamber is not less than 25 °C ~~2 °C~~ [K], with the average temperature of the [tank] ~~body~~ walls being kept [maintained] at + 20 °C ~~30.5 °C~~ [K].

~~For a period of one year after this amendment comes into force ^{*/}, the officially recognized testing stations may correct with the calculation the measured value of the K coefficient, and make it refer to an average wall temperature of + 20 °C.~~

- [2.2.6] ~~19.~~ The [mass of air in] ~~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.
- [2.2.7] ~~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.
- [2.2.8] ~~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 [K].

~~*/~~—The date of its entry into force is on 22 February 1996.

[2.2.9] ~~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.~~

[2.3] (e) Provisions common to all types of insulated equipment

[2.3.1] (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~~ [2.1.1. to 2.2.9.] of this appendix may be stopped as soon as the measurements made show that the K coefficient meets the requirements.

Comment:

2.3.1 makes a reference to 2.1.1 to 2.2.9, where 2.1.4 defines the duration and makes a reference to 1.7.

1.7 defines the steady state period of at least 12 hours. It is understood that the test, described in 2.3.1 may be interrupted when the steady state is reached. (TRANS/WP.11/2002/10)

[2.3.2] (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 10% when using the method of internal cooling and 5% when using the method of internal heating.

Comments:

1. Examples for the errors which are normally taken into account by the test stations are temperature, power and the surface area of the body.

The method of calculating the error, which is usually applied, is the total admissible error

$$e_m = \sqrt{\left(\frac{\Delta S}{S}\right)^2 + \left(\frac{\Delta W}{W}\right)^2 + 2 \frac{\Delta T}{T_e - T_i}}$$

or the absolute error e_m :

$$e_m = \frac{\Delta S}{S} + \frac{\Delta W}{W} + 2 \frac{\Delta T}{T_e - T_i}$$

where:

S is the mean surface area of the vehicle body (geometric mean of the internal and external surfaces)

W is the power dissipated inside the vehicle body in the steady state T_e and T_i are in the respective external and internal temperatures of the vehicle body under test.

2. Under normal test conditions, S can be measured to 1 %. However, there are cases where it is impossible to measure with this precision.

The error of W does not exceed 1 %, although certain test stations use equipment giving a greater error.

Temperature is measured with an absolute accuracy of 0.1K. The measurement of a temperature difference ($T_e - T_i$) of the order of 20K therefore gives an error of twice 0.5 %, i.e. 1%.

The total error is therefore $\sqrt{0.0003} = 0.017$ i.e. 1.7 %. The maximum admissible error is $e_m = 3\%$.

3. Other errors which have not been taken into consideration can have an effect on the exact value of the K coefficient. These errors are as follows:

(a) Latent errors due to admissible variations in the internal and external temperatures, which are a function of the thermal inertia of the walls of the equipment, the temperature and time.

(b) Errors due to the variation of air velocity at the boundary layer and its effect on the thermal resistance.

[If the internal and external air velocities are of equal value, the possible error will be about 2.5 % as between 1 to 2 m/s for a mean K coefficient of 0.40 W/m²K. For a K coefficient of 0.70 W/m²K, this error will be nearly 5%.] If there are significant thermal bridges, the influence of the speed and direction of the air will be greater.

4. Finally, because of the error in the estimation of the surface area of the body, an error which in practice is difficult to calculate when dealing with non standard equipment, (this estimation involving factors of a subjective nature), one could envisage the determination of the error in the measurement of the overall heat transfer per degree temperature difference:

$$\frac{W}{T_e - T_i} \approx K.S$$

(see TRANS/GE.11/R.122/Add.1)

~~(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.~~ *The 1st two sentences of para.29 become the introduction under heading 5. Sub-heading 5.1 , "general examination of equipment was para.29 (a). Sub-heading 5.2 , "Examination for air-tightness was para.29 (b).
Sub-heading 5.3, "Decisions" was para.29 (c)]*

(d) — Test reports

A test report consisting of

**Part 1 conforming to Model No. 1 A 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.~~

[3] ~~C~~. [EFFECTIVENESS] 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.~~

[3.1] Refrigerated equipment

[3.1.1] ~~32.~~ The empty equipment shall be placed in an insulated chamber whose mean temperature shall be kept uniform, and constant to within 0.5°C [K], at $+30^{\circ}\text{C}$. The atmosphere of [mass of air in] the chamber, ~~which shall be kept humid by regulating the dew point to $+25^{\circ}\text{C}$ \pm 2°C ,~~ shall be made to circulate as described in paragraph 9 [2.1.5] of this appendix.

[3.1.2] ~~33.~~ Temperature measuring instruments protected against radiation shall be placed inside and outside the body at the points specified in paragraphs ~~3 and 4~~ [1.3 and 1.4] of this appendix.

[Test procedure]

[3.1.3] ~~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.

[Provisions common to all types of refrigerated equipment]

[3.1.4] ~~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.

[3.1.5] ~~36., 1st sentence~~ 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.

[Criterion of satisfaction]

[3.1.6] ~~36., 2nd sentence~~ 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.

[3.2] Mechanically refrigerated equipment

[Test method]

[3.2.1] ~~37.~~ The test shall be carried out in the conditions described in paragraphs ~~32 and 33~~ [3.1.1 and 3.1.2.] of this appendix.

[Test procedure]

[3.2.2] ~~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.

[3.2.3] ~~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.

[3.2.4] ~~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 be long 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.~~

[Criterion of satisfaction]

[3.2.5] ~~40. last sentence~~ 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~~ [with any] automatic defrosting of the refrigerating unit not being taken into account.

[3.2.6] ~~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 re frigerating 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.

Comment:

[The proposed provision concerning the use of a multiplier factor of 1.75 when determining the refrigerating capacity of the appliance to be installed on a body, is to be applicable whether or not the body was fitted with an appliance when the K coefficient was measured. If during the insulation test the body was not equipped with an appliance, it would be advisable to ensure that the K coefficient of that body when equipped with an appliance does not exceed the class limits, in order to allow for the variations that might occur with equipment of differing lengths or types.]

(see TRANS/GE.11/R.103 and TRANS/WP.11/2001/2)

- [3.2.7] 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~~ [3.1.1. to 3.1.4.]; 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~~ [3.2.6].

[3.3] Heated equipment

[Test method]

- [3.3.1] 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~~ [2.1.5.] of this appendix.
- [3.3.2] 44. Temperature measuring instruments protected against radiation shall be placed inside and outside the body at the points specified in paragraphs ~~3 and 4~~ [1.3 and 1.4] of this appendix.

[Test procedure]

- [3.3.3] 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.
- [3.3.4] 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.
- [3.3.5] 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.~~ [In the case of new equipment, the above temperature difference must be increased by 35 per cent.]

[Criterion of satisfaction]

- [3.3.6] ~~47., last sentence~~ 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. 1 A or 1 B below; if this has not already been prepared for a test report under paragraph 28; and~~

~~Part 3 conforming to Model No. 4 A, 4 B, 4 C, 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. *The first sentence of para. 49 becomes the introduction under heading 6. Sub-heading 6.1 was para. 49 (a). Sub-heading 6.2 was para. 49 (b). Sub-heading 6.3 was para. 49 (c). Sub-heading 6.4 was para.49 (d).]*

~~(c) Test reports~~

~~A test report consisting of:~~

~~Part 1 conforming to Model No. 1 A 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.~~

[4] D. PROCEDURE FOR MEASURING THE EFFECTIVE REFRIGERATING CAPACITY W_0 OF A UNIT WHEN THE EVAPORATOR IS FREE FROM FROST

[4.1] [General principles]

[4.1.1] 51. ~~At each equilibrium temperature, this capacity is equal to the sum of the heat flow $U \cdot \Delta T$ 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:~~

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

[When attached to either a calorimeter box or the insulated body of a unit of transport equipment, and operating continuously, this capacity is:

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

where U is the heat leakage of the calorimeter box or insulated body, Watts/°C.

ΔT is the difference between the mean inside temperature T_i and the mean outside temperature T_e of the calorimeter or insulated body (°C),

W_j is the heat dissipated by the fan heater unit to maintain each temperature difference in equilibrium.]

[4.2] [Test method]

[4.2.1] 52. The refrigeration unit is [either] fitted to ~~either~~ a calorimeter box, or [the insulated body of] a unit of transport equipment.

In each case, the [heat leakage] ~~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~~ [1.1 to 2.1.8] above; however, it is sufficient to measure U ~~directly~~ [the heat leakage only], the value of this coefficient being defined by the following relationship:

$$U = \frac{W}{\Delta T_m} \quad \text{where:}$$

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

ΔT_m is the difference between the mean internal temperature T_i and the mean external temperature T_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, $U \cdot \Delta T$ should be not more than 35% of the total heat flow W_o . The calorimeter box or unit of transport equipment shall be heavily insulated.

~~53.~~ Para.53 is moved to be part of the test procedure under para.4.3.2.]

Comments to 4.2.1:

*The U factor of a calorimeter box is usually measured without the refrigeration unit fitted to the aperture. In the case of a unit of transport equipment, measurement of U may be made with or without the refrigeration unit fitted to the insulated body, in the absence of a refrigeration unit an insulated panel is fitted to the aperture.
(see TRANS/GE.11/R.127)*

[4.2.2] 54. Instrumentation

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

The instrumentation of the calorimeter box or [the insulated body of] unit of transport equipment shall conform to paragraphs 3 and 4 [1.3 and 1.4] 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 $1\text{W}/\text{cm}^2$ and the heater units shall be protected by a casing of low emissivity.

[4.2.3] 55: Test conditions

- (i) **Outside the calorimeter box or [the insulated body of a] unit of transport equipment:** the air temperature at the inlet to the condenser shall be maintained at $30\text{ }^\circ\text{C} \pm 0.5\text{ }^\circ\text{C}$ [K].
- (ii) **Inside the calorimeter box or [the insulated body of a] unit of transport equipment (at the air inlet to the evaporator):** there shall be three levels of temperature between $-25\text{ }^\circ\text{C}$ and $+12\text{ }^\circ\text{C}$ 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 $\pm 0.5\text{ }^\circ\text{C}$ [K].

The mean inside temperature shall be maintained within a tolerance of $0.5\text{ }^\circ\text{C}$ [K]. 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 $\pm 1\%$.

When presenting a refrigeration unit for testing, the manufacturer must supply:

- Documents describing the unit to be tested;
- A technical document outlining the parameters that are most important to the functioning of the unit and specify the allowable range;
- The characteristics of the equipment series tested; and
- A statement as to which form(s) of energy shall be used during testing.

[4.3] 56: Test procedure

[4.3.1] 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 $\pm 3\text{ }^\circ\text{C}$ [K] of the prescribed ambient temperature. It shall then be lowered to $-25\text{ }^\circ\text{C}$ (or to the minimum class temperature) [5 K below the lower limit 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, [capacity, with] the heating power of the internal heater producing an equilibrium condition at each temperature level as prescribed in paragraph 55 [4.2.3.].

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 [accordingly] ~~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.~~

[4.3.2] 53. [The same procedure shall be followed for the enthalpy method described in paragraph 53 [below], but in this case the heat power dissipated by the evaporator fans at each temperature level must also be measured.] [*last sentence of para. 56.*]

~~The following~~ [This] method may, ~~if necessary~~ [alternatively], be used ~~both for~~ [to test] 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_o) 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~~ [heat generated by the evaporator] fans (W_f) is deducted. It is difficult to measure W_f if the ~~air circulating~~ [evaporator] 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 3% [, with refrigerant flow measurement being accurate to $\pm 5\%$].

The heat balance is given by the formula:

$$W_o = (h_o - h_i) m - W_f.$$

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.

[4.3.3] 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 [tune the capacity of the refrigeration unit to motor output] ~~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.

[4.3.4] 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.

If the [air circulation of a refrigeration unit's evaporator fans are] ~~air flow of a refrigeration unit is~~ to be measured, methods capable of measuring the total flow [delivery volume] must be used. Use of one of the relevant existing standards, i.e. BS 848, ISO 5801, AMCA 210-85, DIN 24163, NFE 36101, NF X10.102, DIN 4796 is recommended;

- (iii) the refrigerant used for tests is that specified by the manufacturer.

[4.4 Test result]

[4.4.1] 59. The refrigeration capacity for ATP purposed is that relating to the mean internal temperature as determined by the temperature measuring instruments described in paragraph 3-[1.3] above, and not that determined by the thermometers placed at the inlet or outlet of the evaporator.

60. Test Reports

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

[5 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~~ [2.1.1 to 2.3.2] 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 [information as indicated below:] ~~the criteria set forth hereunder:~~

[5.1] (a) General examination of the equipment

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

- (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 [effective] 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.

Comment:

Changes in the K-coefficient during the service life of insulated bodies depend on the following factors:

- (a) Nature of the insulating material;
 - (b) Nature of the covering layers (glass-fibre reinforced plastics or metal);
 - (c) Construction of the body;
 - (d) Number of doors and hatches permitted in the approval tests;
 - (e) Conditions of use (carriage of fresh produce or frozen or quick (deep) - frozen products).
- (See TRANS/GE.11/R.117/Add.2)

[5.2] (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.

[5.3] (e) **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~~ [not acceptable], the equipment may be kept in service only [following a satisfactory measurement of K coefficient according to the procedure described in paragraphs 2.1.1 to 2.3.2] ~~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 ye ars.

(ii) If the equipment consists of units of serially-produced equipment of a particular type satisfying the requirements of appendix 1, paragraph 2-[6], 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 [involved,] may be measured in conformity with the provisions of paragraphs ~~7 to 27~~ [2.1.1 to 2.3.2] of this appendix. If the results of the examinations and measurements are [acceptable] ~~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.

Comments:

Some countries consider 0.40 to be the maximum K-value for classes B, C, E and F also by re-approval, and others are of the opinion that re-approval is done by fulfilling Sections 5 and 6.

Re-approval can be carried out either by a test station ensuring the maximum K-value for classes B, C, E and F is less than 0.40 W/m² and 0.70 W/m² for classes A and D or by fulfilling Sections 5 and 6.

(TRANS/WP.11/2002/10)

[6] **VERIFYING THE ~~EFFICIENCY~~ [EFFECTIVENESS] 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~~ [effectiveness] 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~~ [3.1.1 to 3.3.6] of this appendix;
or

Appoint experts to apply the following provisions:

[6.1] ~~49.(a)~~ **Refrigerated equipment other than equipment with fixed eutectic accumulators**

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 [time] period t such that $t \geq \frac{12\theta T}{\theta T'}$ in which

θ [T] is the difference between + 30 °C and the said limit temperature, and $\theta T'$ is the difference between the mean outside temperature during the test and the [class] ~~aforsaid~~ limit temperature, the outside temperature being not lower than + 15 °C. If the results are [acceptable] ~~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.

[6.2] ~~(b)~~ **Mechanically refrigerated equipment**

[Checks shall be made to ensure that] ~~It shall be verified that~~, when the outside temperature is not lower than + 15 °C, the inside temperature of the empty equipment, which has been previously ~~brought to the outside temperature~~ [equalized to that outside], can be ~~brought~~ [reduced to the required class temperature] within a maximum period of 6 hours:

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~~ [acceptable], 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.

[6.3] ~~(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 [K] in the case of class A and of 32 °C [K] in

the case of class B) can be achieved and be maintained for not less than 12 hours. If the results are ~~favourable~~ [acceptable], the equipment may be kept in service as heated equipment of its initial class for a further period of not more than three years.

[6.4] ~~(d)~~ Provisions common to refrigerated, mechanically refrigerated and heated equipment

(i) If the results are ~~unfavourable~~ [not acceptable], 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~~ [3.1.1 to 3.3.6] 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 I, paragraph 2 [6], 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~~ [effectiveness] 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~~ [3.1.1 to 3.3.6] of this appendix. If the results of the examinations and of the determination of ~~efficiency are favourable~~ [effectiveness are acceptable], all the equipment in question may be kept in service in its initial class for a further period of six years.

[7. TEST REPORTS]

[A test report of the type appropriate to the equipment tested shall be drawn up for each test in conformity with one or other of the models 1 to 6 hereunder.] [from old para. 60].

[Note from the secretariat: The models of test reports are replaced with those in the document TRANS/WP.11/2001/4 , with small editorial changes as follows:]

TEST REPORT MODEL No. 1

[Measurement of the overall heat transfer coefficient]

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.

Approved testing station: Name
Address

Equipment: Type⁽¹⁾ Body built by
Body Number Chassis number
Date of construction Date of entry into service
Owned or operated by
Submitted by
Tare Weight⁽²⁾ kg Carrying capacity⁽²⁾ kg

Principal dimensions) Outside: length m Inside: length m
of body) width/major axis m width/major axis m
height/minor axis m height/minor axis m

Total usable internal volume of body m³
Internal volume of each compartment m³ m³ m³

Total floor area of body (except tanks) m²
Total inside surface area S_i of body/tank walls m²
Inside surface area of each compartment S_{i1} S_{i2} m²
Total outside surface area S_e of body/tank walls m²
Mean surface area m²

Specifications of body/tank walls⁽³⁾

Thicknesses	Top	Bottom	Side walls	Front wall
Outside skin				
Insulation				
Inside skin				

Structural peculiarities of the body/tank⁽⁴⁾

Body (non-tank)		Tank	
Rear doors		Description of manholes	
Side doors		Manhole covers	
Vents		Description of discharge piping	
Ice-loading apertures			

Accessories⁽⁵⁾

Testing Method: inside cooling/inside heating⁽⁶⁾

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.):⁽⁶⁾

Total duration of test h Duration of continuous operation h

(a) Mean outside temperature of body: $T_e = \dots\dots\dots ?C \pm \dots\dots\dots K$

(b) Mean inside temperature of body: $T_i = \dots\dots\dots ?C \pm \dots\dots\dots K$

(c) Mean temperature difference achieved: $? T = \dots\dots\dots K$

Maximum temperature spread:

Outside body K

Inside body K

Mean temperature of walls of body $\frac{t_e + t_i}{2}$?C

Power consumed in exchangers: $W_1 \dots\dots\dots W$;

Power absorbed by fans: $W_2 \dots\dots\dots W$;

Overall coefficient of heat transfer calculated by the formula:

Inside-cooling test ; $K ? \frac{W_1 ? W_2}{S ? t}$ Inside-heating test $K ? \frac{W_1 ? W_2}{S ? t}$

Maximum error of measurement with test used %

Remarks:⁽⁷⁾

(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 class distinguishing mark IN/IR.⁽⁶⁾

However, this report shall be valid as a certificate of type approval within the meaning of ATP

annex 1, appendix 1, paragraph 2 (a) for a period of not more than six years, that is until

Done at:

on:

.....

Testing Officer:

-
- (1) **Wagon, lorry, trailer, semi-trailer, container, swap body, tank, etc.**
 - (2) **State source of information.**
 - (3) **Nature and thickness of materials used for body/tank walls, method of construction, etc.**
 - (4) **If there are structural irregularities, show how S_i and S_e were determined.**
 - (5) **Meat rails, etc.**
 - (6) **Delete as appropriate.**
 - (7) **If the body is not parallelepipedic, specify the points at which outside and inside temperatures were measured.**

TEST REPORT MODEL No. 2

[Determination of the effectiveness of cooling appliances of refrigerated equipment]

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.

Description of cooling appliance

Manufacturer
.....

Type Serial number Year of manufacture

Nature and nominal filling quantity of refrigerant/eutectic solution⁽¹⁾ kg

Actual filling of refrigerant used for test kg

Filling device (description, where situated; attach drawing if necessary)
.....

Ducts and screens/tank for liquefied gases;⁽¹⁾ description and dimensions
.....

Drive independent/dependent/mains-operated; cooling appliance removable/not removable⁽¹⁾

?Mechanical refrigeration unit: Make Type No.

Eutectic ?Make Latent heat at freezing temperature kJ/kg at °C

Plates:⁽¹⁾ ?Type Total cold reserve at freezing temperature kJ

?Number and dimensions

Inside fans: Description

Fan power; Delivery rate m³/h

Automatic Devices:

Accessories

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

Power of heat added during test W

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

Record of mean inside temperature T_i and mean outside temperature T_e of body with time
.....

Time hrs	0	1	2	3	4	5	6	7	8	9	10	11	12
T _i													
T _e													

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 class 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) for a period of not more than six years, that is until
.....

Done at:

on:

.....
Testing Officer:

⁽¹⁾ Delete as appropriate.

TEST REPORT MODEL No. 3

**?Determination of the effectiveness of cooling appliances of
mechanically refrigerated equipment?**

**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.

**Manufacturer
Type Serial number Year of manufacture**

**Drive: independent/dependent/mains-operated; refrigeration unit removable/not removable⁽¹⁾
Refrigerant and weight of charge kg**

**Refrigeration capacity stated by manufacturer for an outside temperature T_e of +30° C and an
inside temperature T_i of : 0° C; -10° C; -20° C**

	Compressor	Condenser fan	Evaporator fan
Make			
Type			
Number			
Drive			
Power			
RPM			
Delivery volume			

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

K coefficient of insulated body W/m²K

Power of heat added during test W

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

**Pull-down time from beginning of test to attainment of prescribed mean inside
temperature h**

Record of mean inside temperature T_i and mean outside temperature T_e of body with time

Time hrs	0	1	2	3	4	5	6	7	8	9	10	11	12
T_i													
T_e													

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 class 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), for a period of not more than six years, that is until

Done at:

on:

.....

Testing Officer:

⁽¹⁾ Delete as appropriate.

TEST REPORT MODEL No. 4

[Determination of the effectiveness of heating appliances of heated equipment]

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.

Manufacturer
 Type Serial number Year of manufacture
 Location Overall area of heat exchange surfaces
 Effective power rating as specified by manufacturer

Drive: independent/dependent/mains operated; heating appliance removable/not removable ⁽¹⁾

Inside fans: Description
 Power of electric fans W Delivery volume m³/h

Dimensions of ducts: cross-section m²; length m

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

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

Pull-down time from beginning of test to attainment of prescribed mean inside temperature h

Record of mean inside temperature T_i and mean outside temperature T_e of body with time:

Time hrs	0	1	2	3	4	5	6	7	8	9	10	11	12
T_i													
T_e													

Note: In the case of new equipment, the mean inside temperature prescribed must be increased from +12° C to +20° C for heated class A equipment, and from +12° C to +24° C in the case of heated class B equipment.

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 class 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 [6] (a), for a period of not more than six years, that is until

Done at:

on:

.....

Testing Officer:

⁽¹⁾ **Delete as applicable.**

TEST REPORT MODEL No. 5

[Determination of the effective refrigeration capacity of a mechanical refrigeration unit]

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.

Test Report No.

Approved testing station

Refrigeration unit presented by

Manufacturer

(a) Technical specifications of the unit: Date of manufacture: Type:

Serial No. Category:⁽¹⁾ Self-contained/not self-contained

Removable/not removable Single unit/assembled components

Description:

Compressor: Make: Type:

Number of cylinders: Cubic capacity:

Nominal speed of rotation: rpm

Methods of drive:⁽¹⁾ electric motor, separate internal combustion engine, vehicle engine, vehicle motion

Compressor drive motor: (See footnotes⁽¹⁾ and ⁽²⁾)

Electrical: Make: Type:

Power: kW at rpm Supply voltage and frequency V Hz

Internal combustion engine: Make: Type:

Number of cylinders: Cubic capacity:

Power: kW at rpm; Fuel:

Hydraulic motor:

Make: Type: Method of drive:

Alternator: Make: Type:

Speed of rotation (nominal speed given by the manufacturer): rpm

Minimum speed (given by the manufacturer): rpm

Refrigerant fluid:

Expansion valve: Make: Model Adjustable/Not adjustable⁽¹⁾

Defrost Device:

Automatic Device:

Heat exchangers		Condenser	Evaporator
Make			
Type			
Number of circuits			
Number of rows			
Number of tubes			
Fin pitch (mm) ⁽²⁾			
Tube: nature and diameter (mm) ⁽²⁾			
Total exchange surface area (m ²) ⁽²⁾			
Frontal surface area (m ²)			
F A N S	Type		
	Number		
	Number of blades per fan		
	Diameter (mm)		
	Nominal power (W) ^(2,3)		
	Nominal speed (rpm)		
	Total nominal delivery volume at a pressure of ... Pa (m ³ /h) ⁽²⁾		
Method of drive			

Security devices:

.....

.....

.....

.....

Results of measurements and effective refrigeration capacity

(Mean temperature of the air inlet to the condenser ... ?C)

Speed of rotation				Power of internal fan heater	Refrigerant mass flow rate	Refrigerant enthalpy at evaporator inlet	Refrigerant enthalpy at evaporator outlet	Power absorbed by the unit cooler fan	Fuel or electrical power consumption	Mean temperature around the body	Mean temp. air inlet to evaporator	Effective refrigerating capacity
	Fans	Alternator	Compresso									
	rpm	rpm	rpm	W	kg/sec	J/kg	J/kg	W	W or l/hr	?C	?C	W
Diesel												
Electric												

Results of measurements and effective refrigeration capacity (using the heat balance method)

(Mean temperature of the air inlet to the condenser ± °C)

N (1) rpm	W_j (2) Watts	C (3) litres/hr	P_m (4) watts	P_c abs (5) bar	P_o abs (6) bar	T_M ext (7) °C	T_m inlet to evap. (8) °C	W_o (9) Watts
--------------------------	--	--------------------------------	--	--	--	---	--	--

Diesel engine drive:

Electric motor drive:

- (1) Compressor speed
- (2) Balance electrical power input of heaters and fans
- (3) Fuel consumption
- (4) Electric power consumption
- (5) Condensing pressure
- (6) Compressor suction
- (7) Mean temperature outside calorimeter
- (8) Mean temperature air inlet to evaporator
- (9) Effective refrigeration capacity

Maximum error of measurement:

- U-coefficient of calorimeter
- Effective refrigeration capacity
- Pressure measurements
- Evaporator air delivery volume
- Fuel consumption
- Compressor speed
- Temperatures

(b) Test method and results:

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

In a calorimeter:

U-coefficient of calorimeter when fitted with the tested refrigeration unit: W/m²·°C[K], at a mean wall temperature of °C.

In an item of transport equipment:

K-coefficient of an item of transport equipment fitted with a refrigeration unit W/m²·°C[K], 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:

(c) Checks

Temperature regulator: Setting °C Differential °C

Functioning of the defrosting device:⁽¹⁾ satisfactory/unsatisfactory

Air delivery volume leaving the evaporator at a pressure of Pa

Internal combustion engine m³/hr Electric motor m³/hr

Existence of a means of supplying heat to the evaporator for setting the thermostat at between 0 and +12° C:⁽¹⁾ yes/no

(d) Remarks
.....

Done at:

on:

.....
Testing Officer:

⁽¹⁾ Delete as appropriate.

⁽²⁾ Value indicated by the manufacturer.

⁽³⁾ Where applicable.

TEST REPORT MODEL No. 6

[Expert field check of the insulation and the cooling/heating appliances of equipment in service]

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.

Test Report No.

The equipment was originally ATP certified based on test reports Nos. dated issued by approved testing station (name and address)

K-coefficient W/m²K

Manufacturer of insulated body Serial number

Condition of insulated body when checked:

Top Side walls

End walls Bottom

Doors and openings Seals

Cleaning drainholes Air tightness

Dimensions: Have dimensions changed since new?

Remarks:

Cooling/heating⁽¹⁾ appliance. Manufacturer

Type Serial number Year of manufacture

Description

Refrigeration capacity stated in ATP test report above for an outside temperature of +30° C and an inside temperature of: 0° C; -10° C; -20° C

Refrigerant and weight of charge kg

Fans: Description

Power W Delivery volume m³/hr

Dimensions of ducts:

Condition of appliance when checked

Temperatures at beginning of test: Inside°C Outside°C

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

Pull-down time from beginning of test to attainment of prescribed mean inside temperature h

Record of mean inside temperature T_i and mean outside temperature T_e of body with time:

Hrs													
T_i													
T_e													

**Defrost mechanism;⁽²⁾ correct operation: yes/no;⁽¹⁾ correct termination: yes/no⁽¹⁾
Thermostat check. At 0° C**

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 class distinguishing mark

Done at:

on:

.....

Testing Officer:

⁽¹⁾ Delete as appropriate.

⁽²⁾ If applicable.

Annex 1, Appendix 3

~~A. Model form of certificate of compliance of the equipment, as prescribed in annex 1, appendix 1, paragraph 4~~

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

1/

<u>6/</u>

EQUIPMENT				<u>5/</u>
INSULATED	REFRIGERATED	MECHANICALLY REFRIGERATED	HEATED	

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. Equipment 3/
3. Identification number.....allotted by.....
4. Owner or operated by
5. Submitted by.....
6. Is approved as 4/
 - 6.1. with one or more thermal appliances which (is) (are):
 - 6.1.1. independent;)
 - 6.1.2. not independent;)
 - 6.1.3. removable;) 5/
 - 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;)
- 7.1.2. conformity with a reference item of equipment;)
- 7.1.3. a periodic inspection;) ~~1~~[5/]
- 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 ~~2~~ [7/]
- 7.2.3. the number(s) of the report(s)
- 7.2.4. the K coefficient
- 7.2.5. the effective refrigerating capacity ~~3~~[8/]
 at an outside temperature of 30 °C
 and an inside temperature ofN C W
 " " "N C W
 " " "N C W

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.
- ~~2/~~7/ For example: insulating capacity or efficiency of thermal appliances.
- ~~3/~~8/ Where measured in conformity with the provisions of appendix 2, paragraph ~~42~~ [3.2.7], to this annex.

Comment to Item 8.1.2:

The replacement of components of the thermal appliance does not constitute a material alteration, in as much as replacement components do not reduce the quality of the appliance performance.

**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",

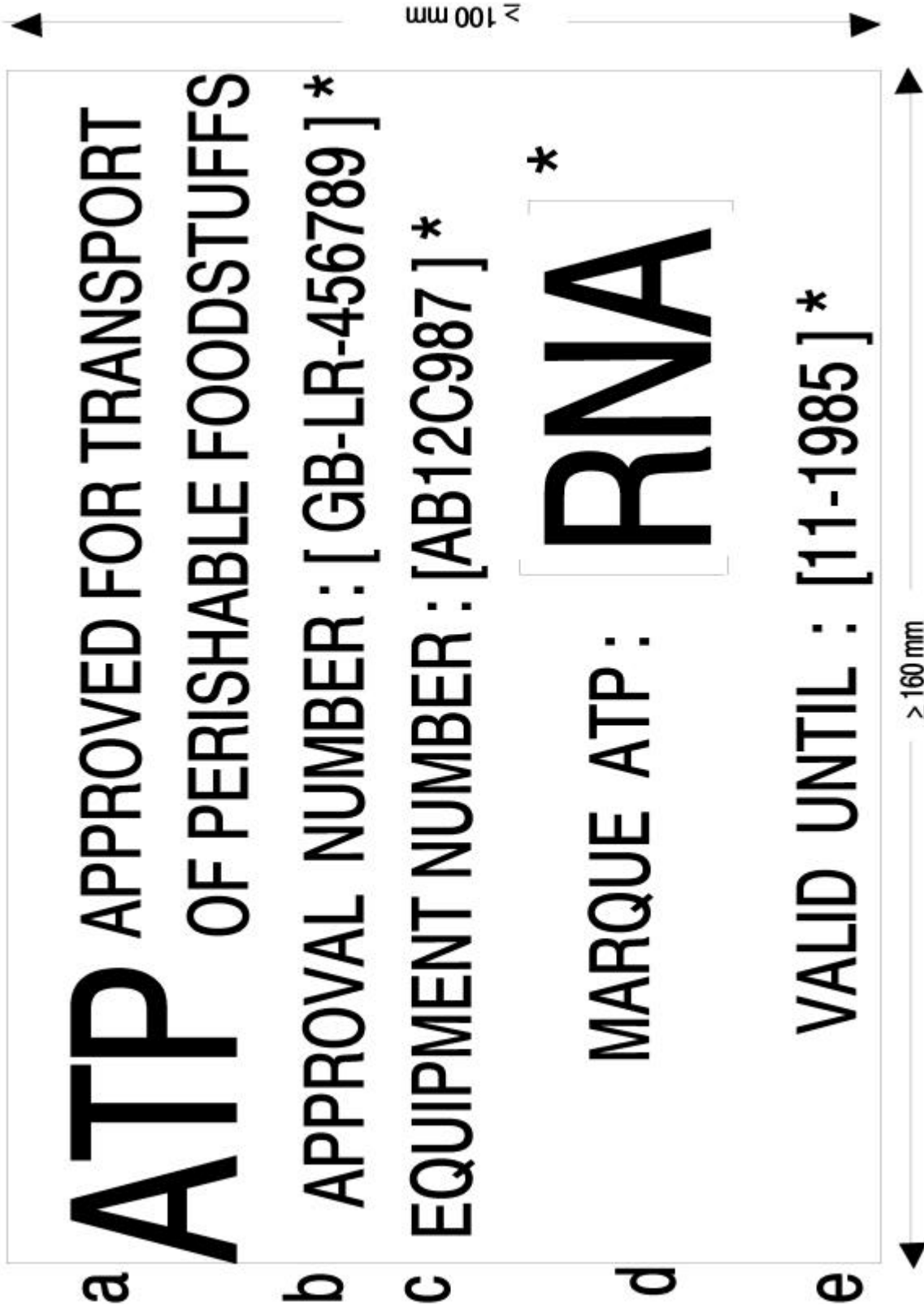
(b) "APPROVAL NUMBER" followed by the distinguishing sign (in international road traffic) of the State in which the approval was granted and the number (figures, letters, etc.) of the approval reference,

(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 I, Appendix 4

DISTINGUISHING MARKS TO BE AFFIXED TO SPECIAL EQUIPMENT

The distinguishing marks prescribed in Appendix 1, paragraph 5 [4] 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 for the classification marks and at least 50 mm for the expiry dates.

The classification and expiry marks shall at least be affixed externally on both sides in the upper corners near the front.

The marks shall be as follows:

<u>Equipment</u>	<u>Distinguishing mark</u>
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 <u>1/</u>
Class B mechanically refrigerated equipment with heavy insulation	FRB

1/ — See transitional provisions in paragraph 5 of this annex.

<u>Equipment</u>	<u>Distinguishing mark</u>
Class C mechanically refrigerated equipment with heavy insulation	FRC
Class C mechanically refrigerated equipment with normal insulation	FNC 1/
Class D mechanically refrigerated equipment with normal insulation	FND
Class D mechanically refrigerated equipment with heavy insulation	FRD
Class E mechanically refrigerated equipment with normal insulation	FNE 1/
Class E mechanically refrigerated equipment with heavy insulation	FRE
Class F mechanically refrigerated equipment with normal insulation	FNF 1/
Class F mechanically refrigerated equipment with heavy insulation	FRF
Class A heated equipment with normal insulation	CNA
Class A heated equipment with heavy insulation	CRA
Class B heated equipment with heavy insulation	CRB

If the equipment is fitted with a removable or non independent thermal appliance and if special conditions exist for the use of the thermal appliance, the distinguishing mark or marks shall be supplemented by the letter X in the following cases.

1. FOR REFRIGERATED EQUIPMENT:

Where the eutectic plates have to be placed in another chamber for freezing.

2. FOR MECHANICALLY REFRIGERATED EQUIPMENT

2.1 Where the compressor is powered by the vehicle engine,

2.2 Where the refrigeration unit itself or a part is removable, which would prevent its

functioning.

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:

<p>RNA 5 - 1974</p>

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

1/ — See transitional provisions in paragraph 5 of this annex.

Annex 2

SELECTION OF EQUIPMENT AND TEMPERATURE CONDITIONS TO BE OBSERVED FOR THE CARRIAGE OF QUICK (DEEP)-FROZEN AND FROZEN FOODSTUFFS

1. 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.
2. 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.
3. 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.
4. 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 as indicated in the transport contract. This temperature should not be higher than the maximum temperature authorised for the same foodstuff when refrigerated as prescribed 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 the use of a thermal appliance to increase the temperature of the foodstuffs.

Annex 2, Appendix 1

**MONITORING OF AIR TEMPERATURES FOR THE TRANSPORT OF PERISHABLE
FOODSTUFFS WHICH ARE QUICK-FROZEN.**

- (1) The transport equipment must be fitted with a suitable recording instrument to monitor, at frequent and regular intervals, the air temperatures to which quick-frozen foodstuffs intended for human consumption are subjected.**
- (2) The measuring instruments must be approved by the competent authorities of the country in which the special transport equipment is registered or recorded.**
- (3) Temperature recordings obtained in this manner must be dated and stored by the operator for at least one year, according to the nature of the food.**

Comments to Annex 2, Appendix 1:

1. *The reason for monitoring is to enable the operator to know that the refrigeration and air distribution system are functioning correctly, and to act as the first step in an enforcement of inspection process. Thus, temperature monitoring and presentation of the data produced by such devices, would facilitate inspection taking place at the end of, or even during a journey. It enhances control of temperature and could be used as part of any defence during trade or legal disputes which might arise.*

2. *The recording of the data may be mechanical (chart recorder) or electronic, providing a continuously recorded trace or an intermittent record from time of loading to that of unloading. The interval between each temperature measurement depends on the length of the journey. Thus for journeys of more than 8 hours to less than 5 days, a maximum interval of 1 hour could be used. Clear identification of separate loads and deliveries should also be indicated on the record.*
(see TRANS/WP.11/R.21)

Annex 2, Appendix 2

**PROCEDURE FOR THE SAMPLING AND MEASUREMENT OF TEMPERATURE
FOR CARRIAGE OF CHILLED, FROZEN AND QUICK FROZEN PERISHABLE
FOODSTUFFS**

A. GENERAL CONSIDERATIONS

1. **Inspection and measurement of temperatures stipulated in Annexes 2 and 3 should be carried out so that the foodstuffs are not exposed to conditions detrimental to the safety or quality of the foodstuffs. Measuring of food temperatures should be carried out in a cooled environment, and with the minimum delays and minimum disruption of transport operations.**
2. **Inspection and measurement procedures, as referred to in paragraph 1, shall preferably be carried out at the point of loading or unloading. These procedures should not normally be carried out during transport, unless serious doubt exists about the conformity of the temperatures of the foodstuffs stipulated in Annexes 2 and 3.**
3. **Where possible, the inspection should take account of information provided by temperature monitoring devices during the journey before selecting those loads of perishable foodstuffs for sampling and measurement procedures. Progression to temperature measurement of the food should only be undertaken where there is reasonable doubt of the temperature control during carriage.**
4. **Where loads have been selected, a non-destructive measurement (between-case or between-pack) should at first be used. Only where the results of the non-destructive measurement do not conform with the temperatures laid down in Annexes 2 or 3 (taking into account allowable tolerances) are destructive measurements to be carried out. Where consignments or cases have been opened for inspection, but no further action has been taken, they should be resealed giving the time, date, place of inspection, and the official stamp of the inspection authority.**

B. SAMPLING

5. **The types of package selected for temperature measurement shall be such that their temperature is representative of the warmest point of the consignment.**
6. **Where it is necessary to select samples during transport whilst the consignment is loaded, two samples should be taken from the top and bottom of the consignment adjacent to the opening edge of each door or pair of doors.**
7. **Where samples taken during unloading of the consignment, four samples should be chosen from any of the following locations:-**
 - **top and bottom of the consignment adjacent to the opening edge of the doors;**
 - **top rear corners of the consignment (i.e. furthest away from the refrigeration unit);**

- centre of the consignment;
 - centre of the front surface of the consignment (i.e. closest to the refrigeration unit);
 - top or bottom corners of the front surface of the consignment (i.e. closest to the return air intake of the refrigeration unit).
8. In the case of chilled foods in Annex 3, samples should also be taken from the coldest location to ensure that freezing has not occurred during transportation.

C. TEMPERATURE MEASUREMENT OF PERISHABLE FOODSTUFFS

9. The temperature measuring probe should be precooled to as close to the product temperature as possible before measurement.

(I) Chilled Foods

10. **Non-destructive measurement.** Measurement between-case or between-pack should be made with a probe with a flat head, which gives a good surface contact, low thermal mass and high thermal conductivity. When placing the probe between the cases or food packs, there should be sufficient pressure to give a good thermal contact, and sufficient length of probe inserted to minimise conductivity errors.
11. **Destructive measurement.** A probe with a rigid, robust stem and sharpened point should be used, made from a material which is easy to clean and disinfect. The probe should be inserted into the centre of the food pack, and the temperature noted when a steady reading is reached.

(II) Frozen and quick-frozen foods

12. **Non-destructive measurement.** Same as paragraph 10.
13. **Destructive measurement.** Temperature probes are not designed to penetrate frozen foods. Therefore it is necessary to make a hole in the product in which to insert the probe. The hole is made by a precooled product penetration instrument, which is a sharp pointed metallic instrument such as an ice punch, hand drill or an auger. The diameter of the hole should provide a close fit to that of the probe. The depth to which the probe is inserted will depend on the type of product:
- (i) Where product dimensions allow, insert the probe to a depth of 2.5 cm from the surface of the product;
 - (ii) Where (i) is not possible because of the size of the product, the probe should be inserted to a minimum depth from the surface of 3 to 4 times the diameter of the probe;
 - (iii) It is not possible or practical to make a hole in certain foods because of their size or composition e.g. diced vegetables. In these cases, the internal temperature of the food package should be determined by insertion of a suitable sharp-stemmed probe to the centre of the pack to measure the temperature in contact with the food.

After inserting the probe, the temperature should be read when it has reached a steady value.

D. GENERAL SPECIFICATIONS FOR THE MEASURING SYSTEM

14. The measuring system (probe and read-out) used in determining temperature shall meet the following specifications;
- (i) The response time should achieve 90% of the difference between the initial and final reading within three minutes.
 - (ii) The system must have an accuracy of $\pm 0.5\text{K}$ within the measurement range -20°C to $+30^{\circ}\text{C}$.⁽¹⁾
 - (iii) The measuring accuracy must not change by more than 0.3K during operation in the ambient temperature range -20°C to $+30^{\circ}\text{C}$.⁽ⁱ⁾
 - (iv) The display resolution of the instrument should be 0.1K
 - (v) The accuracy of the system should be checked at regular intervals.⁽¹⁾
 - (vi) The system should have a current certificate of calibration from an approved institution.
 - (vii) The electric components of the system should be protected against undesirable effects due to condensation of moisture.
 - (viii) The system should be robust and shock proof.

E. ALLOWABLE TOLERANCES IN THE MEASUREMENT OF TEMPERATURE

15. Certain tolerances should be allowed in the interpretation of temperature measurements:
- (i) operational – in the case of frozen and quick-frozen foods, a brief rise of up to 3K on the temperature permitted in Annex 2 is allowed for the surface temperature of the food.
 - (ii) methodology – non-destructive measurement can give up to a maximum of 2K difference in the reading compared to the true product temperature measurement, especially with the thickness of cardboard in case packaging. This tolerance does not apply to the destructive measurement of temperature.

(1) [~~The procedure will be defined~~]

[see the following European Standards:

- EN 13485: Thermometer for measuring the air and product temperature for transport, storage and distribution of chilled, frozen, quick frozen foods and ice cream – tests, performance and suitability; and
- EN 13486: Temperature recorders and thermometers for transport, storage etc. – periodic verification.] (TRANS/WP.11/2002/10)

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 ⁽¹⁾

Butter + 6 °C

Game + 4 °C

Milk (raw or pasteurized) in tanks, for immediate consumption + 4 °C ⁽¹⁾

Industrial milk + 6 °C ⁽¹⁾

Dairy products (yoghurt, kefir, cream, and fresh cheese) + 4 °C ⁽¹⁾⁽²⁾

Fish, molluscs and crustaceans ⁽³⁾ must always be carried in melting ice

Meat products ⁽⁴⁾ + 6 °C

Meat (other than red offal) + 7 °C

Poultry and rabbits + 4 °C

If however it is necessary to proceed to the verification of the temperature of the foodstuff, procedures are laid down in Annex 2, Appendix 2 to this Agreement.

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- (1) In principle, the duration of carriage should not exceed 48 hours.
 - (2) "Fresh cheese" means a non-ripened (non-matured) cheese which is ready for consumption shortly after manufacturing and which has a limited conservation period.
 - (3) Other than smoked, salted, dried or live fish, live molluscs and live crustaceans
 - (4) Except for products stabilised by salting, smoking, drying or sterilisation.