

Economic and Social Council

Distr.: General 10 December 2020

Original: English

Economic Commission for Europe

Inland Transport Committee

Working Party on the Transport of Perishable Foodstuffs

Seventy-sixth session

Report of the Working Party on the Transport of Perishable Foodstuffs on its seventy-sixth session

held in Geneva from 13-16 October 2020



Contents

Ad	optio	n of the agenda (agenda item 1)				
Election of officers (agenda item 2)						
Activities of ECE bodies of interest to the Working Party (agenda item 3)						
A.	Inla	and Transport Committee				
	1.	Sustainable Development Goals and ITC strategy				
	2.	Pending issues from the report of the eighty-first session of the Inland Transport Committee (ITC), (19-22 February 2019) as reflected in paragraphs 99-104 of ECE/TRANS/288.				
B.	Wo	rking Party on Agricultural Quality Standards				
Activities of other international organizations dealing with issues of interest to the Working Party (agenda item 4)						
A.	Inte	ernational Institute of Refrigeration (IIR)				
B.	Tra	nsfrigoroute International				
C.	Sta	ndardization organizations				
Status and implementation of the Agreement on the International Carriage of Perishable Foodstuffs and on the Special Equipment to be Used for such Carriage (ATP) (agenda item 5)						
A.	Sta	tus of application of the Agreement				
B.	. Status of amendments					
C.	Test stations officially designated by the competent authorities of countries Parties to ATP.					
D	Exchange of information among Parties under Article 6 of ATP					
E	Exchange of good practices for better implementation of ATP					
F	Inte	erpretation of ATP				
	1.	Cool down test of the multitemperature and multicompartment (MTMC) equipment. Annex 1 Appendix 2 paragraph 6.2.1 (iii) of the ATP Agreement				
	2.	Clarifications regarding the authorization of test stations and the appointment of experts for monitoring the compliance of vehicles in use with ATP				
	3.	The explanations concerning the procedure of checking a refrigerated equipment in use manufactured after 2 January 2012				
	4.	Clarifications regarding filling the form of the ATP certificate issued to insulated equipment, refrigerated equipment, mechanically refrigerated equipment, heated equipment, mechanically refrigerated and heated equipment for carriage perishable foodstuffs				
	5.	Inclusion in the ATP Handbook of comments to article 3 of ATP on definition of the term "perishable foodstuffs" and comments to article 7 of ATP on the carriage of fresh fruit and vegetables. Amendments to annex 3 to ATP regarding temperature conditions to be observed for the carriage of chilled perishable foodstuffs and monitoring of air temperature for the carriage of chilled perishable foodstuffs				
Proposals of amendments to ATP (agenda item 6)						
A	Pen	ding proposals				
	1.	Definition of the independence of a unit taking into account mixed energy source technologies				

		2.	of annex 1, appendix 2, of ATP of 6 January 2018			
		3.	Amendments to the models of reports that define the specifications of equipment and tanks for the carriage of liquid foodstuffs resulting from the need to take into account technological developments brought about by the use of new insulating foams			
		4.	Amendment to Annex 1, Appendix 2 paragraph 3.2.6 and 4.3.4 (ii), Annex 1, Appendix 3 and the ATP Handbook			
		5.	Addition to the ATP of provisions for the competent authorities of Contracting Parties to publish on their websites lists of all ATP certificates issued			
		6.	Amendment to Annex 1, Appendix 2			
		7.	Proposal to amend Annex 1, Appendix 2, Model test report No. 12 after "(d) Remarks:" Validity of test reports for mechanical refrigeration units			
		8.	Degrees Celsius and Kelvin			
		9.	The role of measurement uncertainty in conformity assessment decisions in ATP			
	В	Nev	w proposals			
		1.	Possibility of voluntarily extending the scope of the bilateral and multilateral agreements resulting from the ATP Agreement to foodstuffs likely to become unfit for human consumption			
		2.	Amendment to Annex 1, Appendix 2 paragraph 2.2.1			
		3.	Proposals for amendment of the ATP by the informal working group on the improvement of the approval system of ATP equipment and thermal appliances			
VIII.	AT	P Har	ndbook (agenda item 7)			
	Amendment to Annex 1, Appendix 2 paragraph 3.2.6 and 4.3.4 (ii), Annex 1, Appendix 3 and the ATP Handbook					
IX.	Rep	orts o	of informal working groups (agenda item 8)			
	Report of the Informal Working group on the improvement of the approval system for ATP equipment and thermal appliances					
X.	Sco	pe of	ATP (agenda item 9)			
	The	e ATP	and the future			
XI.	Ene	ergy la	abelling, refrigerants and blowing agents (agenda item 10)			
XII.	Pro	gramı	me of work (agenda item 11)			
	Dat	es of	the seventy-seventh session			
XIII.	Oth	er bu	siness (agenda item 12)			
	1.	Dis	cussion on the feedback of Round table discussion October 2018			
	2.	Dra	ft revision of the ECE Road Map on Intelligent Transport Systems			
	3.	Trib	outes			
XIV.	Ado	option	n of the report (agenda item 13)			
Annexes						
I.	Pro	posed	I amendments to the ATP			
II.	Ado	dition	s to the ATP Handbook			

I. Attendance

- 1. The seventy-sixth session of Working Party on the Transport of Perishable Foodstuffs of the United Nations Economic Commission for Europe, initially scheduled from 7 to 9 April 2020, was postponed due to the COVID-19 pandemic and the measures implemented by the United Nations Economic Commission for Europe and ATP Contracting Parties to protect public health. The seventy-sixth session was held from 13-16 October 2020 with Mr. K. de Putter (Netherlands) as Chair and Mr. J.M. Bonnal (France) as Vice-Chair.
- 2. Representatives of the following countries took part in the session: Croatia, Czechia, Denmark, Finland, France, Germany, Italy, Latvia, Luxembourg, Netherlands, Poland, Russian Federation, Slovakia, Slovenia, Spain, Turkey, United Kingdom of Great Britain and Northern Ireland and United States of America.
- 3. The intergovernmental organization International Institute of Refrigeration (IIR) and the non-governmental organizations International Association of the Body and Trailer Building Industry (CLCCR) and Transfrigoroute International (TI) also took part in the session.

II. Adoption of the agenda (agenda item 1)

Documents: ECE/TRANS/WP.11/242/Rev.1

ECE/TRANS/WP.11/242/Add.1/Rev.1

Informal documents INF.1 and INF.6 (Secretariat)

4. The provisional agenda (ECE/TRANS/WP.11/242/Rev.1 and -/Add.1/Rev.1) were adopted as amended by informal document INF.1 to take account of informal documents INF.1 to INF.18.

III. Election of officers (agenda item 2)

5. The Working Party elected Mr. K. de Putter (Netherlands) as Chair, and Mr. J. M. Bonnal (France) as Vice-Chair for its session in 2021. The Working Party thanked the officers and the secretariat for their work, especially for the organization of the session under the restrictions imposed by the COVID-19 pandemic.

IV. Activities of ECE bodies of interest to the Working Party (agenda item 3)

A. Inland Transport Committee

- 6. The Working Party was informed about the results of the eighty-second session of the Inland Transport Committee (ITC), (25-28 February 2020) as reflected in its report (ECE/TRANS/294, paragraphs 87-90).
- 7. The ITC adopted the reports of its subsidiary bodies (ECE/TRANS/294, para. 131).

1. Sustainable Development Goals and ITC strategy

Document ECE/TRANS/WP.11/2020/16 (Vice-Chair of WP.11).

8. In 2019, the Chair of the Working Party transmitted to WP.11 participants, for their views and input, an explanatory note from the secretariat together with the draft recommendations of ITC on the implementation of its strategy until 2030 on sustainable transport and innovative technologies, including the carriage of perishable foodstuffs. In the explanatory note was stressed that the Working Party should take appropriate measures to align its work with the adopted ITC strategy.

- 9. The Working Party approved these draft recommendations and confirmed that its work and the ATP Agreement were fully in line with the ITC strategy, and that it would remain aligned as long as the ATP Agreement was kept relevant and up to date with technological progress.
- 10. The Working Party endorsed the recommendations made in document ECE/TRANS/WP.11/2020/16 as ways of alignment with the sustainable development goals and the ITC strategy. The recommendations were as follows:

SDG No. 2 - Zero hunger

The ATP enables the preservation and safe carriage of agricultural products and the quality of food available.

- 11. Although it can be argued that not all foodstuffs that may "perish" were included in the ATP Agreement, its provisions were focused on foodstuffs that are harmful for humans when consumed perished and in that way, regulatory pressure on transport was limited to where it is absolutely necessary. Foodstuffs such as fresh fruit and vegetables are easily recognizable when perished and therefore non harmful for humans. As there is a direct financial impact on consignees and carriers and no consequences for public health, regulating the carriage of these non-harmful foodstuffs may be left to the market.
- 12. The Working Party may consider developing guidance for the carriage of non-harmful foodstuffs to help reducing food waste. However, factors such as the type of foodstuff and the destination after carriage (storage of direct consumption) could make very difficult to give exact guidance on conditions of carriage. Using ATP certified equipment for national transport of perishable foodstuffs that may become unfit for human consumption would help reduce wastage and food loss.

SDG No. 8 - Decent work and economic growth

The ATP allows for resource efficiency in Global consumption.

13. The special equipment and thermal appliances used for the carriage of perishable foodstuffs, certified based on the requirements of the ATP, ensure a minimum level of performance and contribute to resource efficiency on a global scale, with special importance in countries with a lower level of regulatory development. Foodstuffs of animal origin, that are particularly hazardous when consumed "perished" and thus subject to the ATP, have a large environmental footprint and loss of these products have a larger environmental impact than loss of "plant" based foodstuffs.

SDG No. 12 – Responsible consumption and production

The ATP helps maintaining the cold chain and reducing wastage and food losses during transport.

14. As one link in the cold chain, the transport of perishable foodstuffs in accordance with the provisions of the ATP Agreement contributes to reduce wastage and food loses during their carriage, reducing also CO2 emissions as direct consequence of disposing of perished goods. Although not all foodstuffs are covered by the ATP, the availability of conditioned means of transport in line with the requirements of the ATP, would allowed for the use of these equipment for other foodstuffs as a first choice of consigners and carriers to deliver the foodstuffs in perfect condition.

SDG No. 14 - Life below water

The ATP contributes to sustainable fishing practices.

15. Generally, fish is not caught on the place where the main consumption takes place, and therefore such fish products need to be carried under controlled conditions to their destination. As fish falls under the scope of the ATP Agreement, loss of fish or fish products is prevented by the proper use of ATP equipment for carriage.

16. The work of WP.11 and the ATP Agreement also contribute to limit the environmental footprint of the carriage of perishable foodstuffs by using refrigerants with lower Global Warming Potential (GWP), more efficient refrigeration machines and by using multi modal carriage (as far this is possible) for inland transport.

Conclusion

17. Recognizing the importance of ensuring that the ATP Agreement was kept relevant and up to date with technological progress, the Working Party decided to create the informal working group on the future of the ATP under the chairmanship of France and vice-chairmanship of the Russian Federation, with the following mandate:

To explore the possibilities of modernizing the ATP Agreement and to contribute to the Sustainable Development Goals and the ITC strategy until 2030, on sustainable transport and innovative technologies, including the carriage of perishable foodstuffs.

18. An invitation to all WP.11 members will be sent by the Chair/Vice-Chair of the informal working group. France, Italy, the Russian Federation, Spain and Turkey manifested their interest in participating.

2. Pending issues from the report of the eighty-first session of the Inland Transport Committee (ITC), (19-22 February 2019) as reflected in paragraphs 99-104 of ECE/TRANS/288.

Document ECE/TRANS/WP.11/2020/15 (Vice-Chair of WP.11).

19. This document was discussed under agenda item 12, Other business.

B. Working Party on Agricultural Quality Standards

- 20. The activities of the Working Party on Agricultural Quality Standards (WP.7) of interest to WP.11 were:
 - Forty-seventh session of the Specialized Section on Standardization of Seed Potatoes (GE.6) 16 to 17 March 2020, Geneva, Switzerland;
 - Sixty-eighth session of the Specialized Section on Standardization of Fresh Fruit and Vegetables (GE.1) 06 to 08 May 2020 Geneva, Switzerland;
 - Sixty-seventh session of the Specialized Section on Standardization of Dry and Dried Produce (GE.2) 15 to 17 June 2020 Geneva, Switzerland;
 - Twenty-eighth session of the Specialized Section on Standardization of Meat (GE.11) 02 to 04 September 2020 Geneva, Switzerland;
 - Seventy-sixth session of the Working Party on Agricultural Quality Standards (WP.7) 16 to 17 November 2020 Geneva, Switzerland.

The latest UNECE tool to combat food loss and waste can be found at $\label{loss_equation} $$ http://www.unece.org/trade/agr/unece-foodlosschallenge.html$

For more information on these and other activities, please visit WP.7 website at http://www.unece.org/trade/agr/welcome.html.

V. Activities of other international organizations dealing with issues of interest to the Working Party (agenda item 4)

A. International Institute of Refrigeration (IIR)

21. The Working Party was informed about the results of the meeting of the IIR sub-commission on refrigerated transport held by video conference on 19 May 2020 (see informal document INF.3). The Sub-Commission had given its support for proposals to WP.11 including those on:

- Degrees Celsius and Kelvin (no technical objections to this proposal from Spain)
- Uncertainties of measurement (recommended with a slight modification)
- Tank manhole diameter (recommended with a slight modification)

B. Transfrigoroute International

- 22. The representative of Transfrigoroute International presented the recent activities of his organization as reflected in informal document INF.7.
- 23. WP.11 was informed of some changes in Transfrigoroute International, Mr. Joe Grealy was elected as president until the end of 2020 and Mr. Lionel Pourcheresse was elected president for the period of 2021-2023.

C. Standardization organizations

24. Delegations participating in the work of standardization organizations were invited to inform the Working Party about progress on the development of standards dealing with transport under controlled temperatures and what impact these standards were expected to have on the ATP. No updates were provided for this session.

VI. Status and implementation of the Agreement on the International Carriage of Perishable Foodstuffs and on the Special Equipment to be Used for such Carriage (ATP) (agenda item 5)

A. Status of application of the Agreement

25. There have been no new accessions to ATP since the last session and the number of Contracting Parties remains at 50.

B. Status of amendments

26. Proposed amendments to the ATP adopted by WP.11 at its seventy-third and seventy-fourth sessions held in Geneva from 10-13 October 2017 and 8-12 October 2018 respectively, are deemed accepted as of 6 January 2020 (depositary notification C.N.5.2020.TREATIES-XI.B.22), and entered into force on 6 July 2020.

C. Test stations officially designated by the competent authorities of countries Parties to ATP

27. The current list of officially designated test stations appears at the following web link: http://www.unece.org/trans/main/wp11/teststationsnew.html.

D Exchange of information among Parties under Article 6 of ATP

- 28. At the seventy-fifth session, the WP.11 thanked the 22 countries that had provided data in response to the questionnaire on the implementation of ATP in 2018 and stressed that it was mandatory to have information from all ATP contracting parties and that it was a means of harmonizing implementation of the agreement.
- 29. The information received for the year 2019 is presented in ECE/TRANS/WP.11/2020/17. Countries were also asked to respond to an additional question on how parcels and small containers used for the transport of perishable foodstuffs were regulated in each country, answers received by the secretariat are included in annex I to

document ECE/TRANS/WP.11/2020/17. Countries were also requested to send the secretariat information on additional measures taken to guarantee the transport of perishable goods across borders in response to the COVID-19 pandemic, answers received by the secretariat are included in annex II to said document. The Working Party decided to include these questions again in the questionnaire for 2020.

30. At the request of the Working Party at its seventy-third session, the secretariat sent a letter to all contracting parties requesting them to fulfil their obligation under article 6 of ATP of replying to the annual questionnaire and to update the contact information for competent authorities and test stations. All the information received by the secretariat is included in the list of competent authorities and officially designated test stations at http://www.unece.org/trans/main/wp11/teststationsnew.html.

E Exchange of good practices for better implementation of ATP

31. As no document had been submitted under this agenda sub-item, no discussion took place on this subject.

F Interpretation of ATP

1. Cool down test of the multitemperature and multicompartment (MTMC) equipment. Annex 1 Appendix 2 paragraph 6.2.1 (iii) of the ATP Agreement

Document: ECE/TRANS/WP.11/2020/9 (Finland)

32. Contracting Parties with experience on cool down test for multitemperature and multicompartment (MTMC) equipment were invited to reply to the question in the document and to share experiences and best practices in the WP.11 Workspace at the following link: https://wiki.unece.org/display/wp11/

2. Clarifications regarding the authorization of test stations and the appointment of experts for monitoring the compliance of vehicles in use with ATP

Document: Informal document INF.2 (Russian Federation)

- 33. Several delegations believed ensuring independence between any party that stands to gain from the outcome of a decision (i.e. manufacturers, sellers, service centres for maintenance or repair of thermal equipment, etc.) and the decision makers was of the utmost importance. This should be considered when authorizing test stations and appointing experts in charge of deciding if the special equipment can remain in the originally established class for an extended period of three years.
- 34. It was also confirmed that the competent authority should verify that applicants have all the necessary organizational and technical support, as well as the equipment necessary to carry out measures to check compliance of the special equipment with the ATP requirements.
- 35. Contracting Parties were invited to share experiences and best practices regarding these topics in the WP.11 Workspace at the following link: https://wiki.unece.org/display/wp11/

3. The explanations concerning the procedure of checking a refrigerated equipment in use manufactured after 2 January 2012

Document: Informal document INF.4 (Russian Federation)

36. Some representatives were of the opinion that testing a refrigerated equipment at temperatures above 30 $^{\circ}$ C, although possible, was not recommended. As the maximum period of time stipulated for the test was 6 hours, the outcome of tests performed at temperatures above 30 $^{\circ}$ C may be unreliable as equipment that would pass the test at 30 $^{\circ}$ C may not pass it at higher temperatures.

4. Clarifications regarding filling the form of the ATP certificate issued to insulated equipment, refrigerated equipment, mechanically refrigerated equipment, heated equipment, mechanically refrigerated and heated equipment for carriage perishable foodstuffs

Document: Informal document INF.5 (Russian Federation)

- 37. From the delegations that took the floor on the subject, it was clear that, when filling the ATP certificates, there was not uniform criteria to cross out "Insulated" as type of equipment that was not applicable. It was suggested to submit this document for consideration at the next meeting of the IIR sub-commission on refrigerated transport (CERTE Meeting).
- 38. Contracting Parties were invited to share experiences and best practices regarding this topic in the WP.11 Workspace at the following link: https://wiki.unece.org/display/wp11/
- 5. Inclusion in the ATP Handbook of comments to article 3 of ATP on definition of the term "perishable foodstuffs" and comments to article 7 of ATP on the carriage of fresh fruit and vegetables. Amendments to annex 3 to ATP regarding temperature conditions to be observed for the carriage of chilled perishable foodstuffs and monitoring of air temperature for the carriage of chilled perishable foodstuffs

Documents: Informal document INF.8 (Russian Federation)

Informal document INF.9 (Russian Federation) Informal document INF.10 (Russian Federation)

- 39. Documents, as well as the comments made during the session, were submitted for consideration by the informal working group on the future of the ATP.
- 40. The outcome of discussions in the informal working group will be presented at the seventy-seventh session of WP.11.

VII. Proposals of amendments to ATP (agenda item 6)

A Pending proposals

1. Definition of the independence of a unit taking into account mixed energy source technologies

Documents: ECE/TRANS/WP.11/2020/1/Rev.1 (France).

Informal document INF.12 (Netherlands)
Informal document INF.16 (France)

- 41. Several delegations expressed support in principle for the proposal, but it was agreed that more work was needed to make the proposal broader and future oriented. To that end, it was suggested to create an informal working group involving also representatives from industry. It was also suggested to submit this document for consideration at the next meeting of the IIR sub-commission on refrigerated transport (CERTE Meeting).
- 42. The French delegation stressed that there was some urgency on trying to introduce a clear definition for autonomous or electrical equipment as these technologies were already in use without a clear definition, compromising fair competition and enforcement. A revised proposal was submitted in informal document INF.16.
- 43. The revised proposal was submitted to the vote. It was rejected with one vote in favour (France) and four votes against (Denmark, Germany, Spain and United Kingdom).
- 44. The French delegation will present a revised proposal at the next session taking into account the comments made, as there were not objections in principle to the introduction of a definition for autonomous or electrical equipment in the ATP Agreement.

2. Amendment relating to the use of checks to be carried out under paragraph 4.3.4 of annex 1, appendix 2, of ATP of 6 January 2018

Document: ECE/TRANS/WP.11/2020/3/Rev.1 (France).

- 45. The French delegation clarified that the proposal was intended to revert to the status before 19 December 2016, where the information regarding airflow was specified by the manufacturer and that this was only necessary if the proposal in ECE/TRANS/WP.11/2020/5/Rev.1 was not adopted.
- 46. The proposal was submitted to the vote. It was rejected with three votes in favour (France, Italy and Spain) and two votes against (Germany and United Kingdom).
- 3. Amendments to the models of reports that define the specifications of equipment and tanks for the carriage of liquid foodstuffs resulting from the need to take into account technological developments brought about by the use of new insulating foams

Documents: ECE/TRANS/WP.11/2020/4/Rev.1 (France)

Informal document INF.17 (France)

- 47. Several delegations stated that more clarifications were necessary to understand the reasoning behind the proposal. Several problems were identified, such as:
 - (a) Not all test stations had the necessary information to conduct the tests;
 - (b) Confidentiality issues;
 - (c) New insulation materials coming to the marketplace.
- 48. The French delegation stressed the importance of testing stations being able of comparing the insulation of the equipment being tested with the prototype as a first step for certification. It was suggested that in order to alleviate confidentiality concerns, information about construction parameters and foam composition could be passed directly to test stations under confidentiality agreements and that it was not necessary to include this information in test reports, as it is already common practice in some ATP Contracting Parties.
- 49. The revised proposal in informal document INF.17 was submitted to the vote. It was rejected with six votes in favour (Czechia, Denmark, France, Italy, Luxembourg and United Kingdom) and one vote against (Germany).
- 4. Amendment to Annex 1, Appendix 2 paragraph 3.2.6 and 4.3.4 (ii), Annex 1, Appendix 3 and the ATP Handbook

Documents: ECE/TRANS/WP.11/2020/5/Rev.1 (United Kingdom)

Informal document INF.13 (Netherlands)

Informal document INF.14/Rev.1 (United Kingdom)

- 50. There was general agreement in principle, to the inclusion of provisions in the ATP regarding airflow circulation in the body of the equipment, but several delegations mentioned that more time was needed to consider the revised proposal in informal document INF.14/Rev.1. In particular, the Finnish delegation made the following comments:
- (a) It should be clear in the proposal that the amendment would apply only to equipment manufactured after the entry into the force of the amendment.
- (b) Sentence "For mechanically refrigerated equipment of Class F the airflow may be reduced with N>40 and where V exceeds $100~\text{m}^3$ VL may be limited to $5500~\text{m}^3$ per hour." should cover also Class C.
- (c) Air flow capacity of ventilators without cooling or heating should be taken into account when calculating the available airflow capacity.
- (d) Lorries having internal volume more than 60 $\mbox{m}^3,$ should have fixed requirement of 3300 $\mbox{m}^3/h.$
- (e) How air flow requirements in each compartment in MTMC equipment were dealt with?

- 51. It was also mentioned that rail transport also falls under the scope of ATP, therefore, dimensions of rail wagons should be taken into account in the proposal.
- 52. The United Kingdom delegation thanked the Working Party for the comments and progress made during the session and expressed its intention of submitting this document for consideration at the next meeting of the IIR sub-commission on refrigerated transport (CERTE Meeting) with the objective of presenting a revised proposal at the next session.

5. Addition to the ATP of provisions for the competent authorities of Contracting Parties to publish on their websites lists of all ATP certificates issued

Documents: ECE/TRANS/WP.11/2020/6 (Russian Federation)
Informal document INF.18 (Russian Federation)

- 53. Some delegations expressed their support to the proposal and were of the view that a database sharing certificate information would improve checking of compliance by the police and other enforcement bodies. On the other hand, it was mentioned that considering the time and costs associated with the establishment and updating in real time, national databases regarding ATP certificates issued, the proposal should include other ways of verifying the validity and authenticity of ATP certificates, such as electronic signatures on certificates or including in the certificate a web link with a secure code, among others.
- 54. The Russian Federation agreed with the comments and submitted a revised proposal in informal document INF.18. The revised proposal was submitted to the vote. It was rejected with five votes in favour (France, Finland, Italy, Russian Federation and Spain) and four votes against (Czechia, Germany, Turkey and United Kingdom)

6. Amendment to Annex 1, Appendix 2

Document: ECE/TRANS/WP.11/2020/7 (United Kingdom).

55. The proposal was adopted (see Annex I)

7. Proposal to amend Annex 1, Appendix 2, Model test report No. 12 after "(d) Remarks:" Validity of test reports for mechanical refrigeration units

Document: ECE/TRANS/WP.11/2020/10 (Germany).

- 56. Some delegations considered that a separate chapter for cooling and heating appliances should be established, including the definitions, clearly distinguishing mass produced units from those manufactured in small numbers, if detailed rules for specifically designed refrigeration units manufactured in small numbers and mass produced units are to be incorporated into the ATP. Until that distinction is not achieved, given that most refrigeration units do not remain identical in design for more than a few years, the reference to Annex 1, Appendix 1, paragraph 6 (a) in model No. 12 should not be deleted.
- 57. It was also proposed to consider the proposal made by Germany in ECE/TRANS/WP.11/2019/4, but it was mentioned that a clear definition of the expression "no modification to major components" was still missing, making it difficult for competent authorities to decide on whether the extension of the validity of the type approval certificate was warranted.
- 58. Germany decided to present a revised proposal at a future session considering all the comments made.

8. Degrees Celsius and Kelvin

Document: ECE/TRANS/WP.11/2020/11 (Spain).

59. After a few clarifications, the proposals were adopted (see Annex I)

9. The role of measurement uncertainty in conformity assessment decisions in ATP

Document: ECE/TRANS/WP.11/2020/12 (Slovenia).

60. The proposal was adopted (see Annex II)

B New proposals

1. Possibility of voluntarily extending the scope of the bilateral and multilateral agreements resulting from the ATP Agreement to foodstuffs likely to become unfit for human consumption

Document: ECE/TRANS/WP.11/2020/2 (France).

- 61. Some delegations were of the opinion that expanding the scope of application of ATP, in the context of bilateral or multilateral agreements, to perishable foodstuffs that may become unfit for human consumption would help reduce wastage and food loss. It was also pointed out that the proposal was in line with the EU Food Safety regulations (Regulation CE / 178/2002, art 14), emphasizing the importance of transporting perishable foodstuffs under controlled conditions.
- 62. For other delegations, the proposal was unnecessary as in their legal opinion, there was no need for stating in any agreement that bilateral or multilateral agreements on matters not covered by that very agreement may be established. Any sovereign state may enter into any bilateral or multilateral agreement it so wishes without the permission of the Contracting Parties of another agreement.
- 63. The proposal was submitted to the vote. It was rejected with four votes in favour (France, Italy, Russian Federation and Spain) and one vote against (Denmark).

2. Amendment to Annex 1, Appendix 2 paragraph 2.2.1

Document: ECE/TRANS/WP.11/2020/13 (Spain).

- 64. Some delegations pointed out that the ATP Agreement was not the place to regulate construction requirements. There were several standards applied across Europe for the construction requirement of tanks and including in the ATP provisions regulating the size of the tank manhole would bring some problems to Contracting Parties using different standards.
- 65. In general, the Working Party was favourable to set the minimum size of the tank manhole between 40-50 cm, but there were still doubts on whether the ATP Agreement was the right place to include this requirement.
- 66. The delegation of Spain is going to present a revised proposal at a future session taking into consideration all the comments made.
- 3. Proposals for amendment of the ATP by the informal working group on the improvement of the approval system of ATP equipment and thermal appliances

Document: ECE/TRANS/WP.11/2020/14 (Netherlands on behalf of the informal working group).

- 67. Proposals 1, 2 and 3 were adopted (see Annex I).
- 68. Regarding Proposal 4, after it was clarified that competent authorities had the tools to calculate all the necessary parameters for the declaration of conformity and that the only thing missing was a template for the declaration, proposals in paragraphs 9 and 10 were adopted as amended (see Annex I). Proposals in paragraphs 12 and Annex I were also adopted (see Annex I).
- 69. Proposal in paragraph 11 was not adopted.
- 70. WP.11 requested the secretariat to send the proposed amendments it had adopted at its seventy-fifth and seventy-sixth sessions which were contained in annex II of ECE/TRANS/WP.11/241 and in annex I of the present report, respectively, to the United Nations Treaty Section for official notification to ATP Contracting Parties.

VIII. ATP Handbook (agenda item 7)

Amendment to Annex 1, Appendix 2 paragraph 3.2.6 and 4.3.4 (ii), Annex 1, Appendix 3 and the ATP Handbook

Document: ECE/TRANS/WP.11/2020/5/Rev.1 (United Kingdom).

- 71. As the related proposal for amending the ATP was not adopted, this consequential amendment to the ATP Handbook was rejected.
- 72. The latest version of the ATP Handbook appears on the Transport Division website in English, French and Russian at the following link: http://www.unece.org/trans/main/wp11/atp_handbook.html.

IX. Reports of informal working groups (agenda item 8)

Report of the Informal Working group on the improvement of the approval system for ATP equipment and thermal appliances

Document: Informal document INF.11 (Netherlands on behalf of the working group).

- 73. The Working Party took note of the report of the informal working group on the improvement of the approval system for ATP equipment and thermal appliances.
- 74. The Working Party agreed in principle with the drafting of a guidance document on the issue of the declaration of conformity (Annex 1, Appendix 2 paragraph 7.3.6) and the dimensioning of Multi-Compartment, Multi-Temperature equipment (MTMC). It was decided to post the draft guidance in informal document INF.11, for comments and suggestions, in the WP.11 Workspace at the following link: https://wiki.unece.org/display/wp11/
- 75. WP.11 thanked the informal working group for the excellent work done as it facilitates discussions in plenary and extended the mandate of the informal working group on the improvement of the approval system for ATP equipment and thermal appliances to 2021.

X. Scope of ATP (agenda item 9)

The ATP and the future

Document: ECE/TRANS/WP.11/2020/8 (Vice-Chair of WP.11).

- 76. The Working Party thanked the Vice-chair for the important work done in the document and for the suggestions on how to prepare the ATP Agreement for the challenges of the future. The main topics were:
- (a) New emission laws limiting pollution and emissions of carbon dioxide of internal combustion engines;
 - 77. Some delegations pointed out that as software was playing an increasing role in evaluating the performance of refrigeration machines, it was important find a way to account for differences among software versions and different configurations tested. The certifying authority should be informed of the version of the software used as well as configuration tested.
 - 78. France also proposed to separate Test reports from Model type certificates. Model type certificates need only to include the information required for certification, to ensure the same capacity and performance of the unit. Some delegations saw merit in the proposal and agreed to explore the issue further.

- (b) Using more than one system of refrigeration and heating;
- (c) Use of better insulated equipment
- (d) Changes in climate and accession of new Contracting Parties in new climatic zones;
 - 79 Denmark pointed out that a careful approach should be taken when developing regulations in this sense. If the use of special equipment should be limited to the climatic conditions for which they were certified, controls on the road might become very difficult to perform.
- (e) Use of maritime Reefer containers for inland transport;
 - 80. It was pointed out that maritime Reefer containers did not have ATP approval at the moment. It was also mentioned that there might be some issues arising when trying to approve these containers under the scope of ATP, issues such as:
 - Differences in size and weight from containers used in inland transport;
 - Jurisdiction problems as maritime containers are considered part of the vessel and vessels might not be registered in an ATP Contracting Party;
 - Construction and materials might be different from containers that are ATP certified;
 - Maritime containers do not have an independent source of power.
- (f) Developments in supply of foods production and supply systems;
- (g) International post order deliveries and packaging used in that transport;
 - 81. WP.11 agreed on the importance of clarifying if the transport of perishable foodstuffs in parcels and small containers was under the scope of the ATP. As more and more parcels and small containers are used in the market, answers to the questionnaire on the implementation of ATP for 2019 should be used as starting point for discussions.
 - 82. In conclusion, the Working Party decided to submit the document, as well as the comments made during the discussion, for consideration by the informal working group on the future of the ATP.
 - 83. The road map for accession to and implementation of the ATP prepared by the EuroMed road, rail and urban transport project with inputs from the secretariat and the chairs of WP.11 has been published and can be found at the UNECE website: http://www.unece.org/trans/areas-of-work/transport-of-perishable-foodstuffs/road-map-for-accession-and-implementation-of-atp.html.

XI. Energy labelling, refrigerants and blowing agents (agenda item 10)

84. As no document had been submitted under this agenda item, no discussion took place on this subject.

XII. Programme of work (agenda item 11)

Dates of the seventy-seventh session

85. The dates of 26-29 October 2021 (Tuesday to Friday) have been reserved for the seventy-seventh session of WP.11. The deadline for submission of documents is 30 July 2021.

XIII. Other business (agenda item 12)

1. Discussion on the feedback of Round table discussion October 2018

Document: ECE/TRANS/WP.11/2020/15 (Vice-Chair of WP.11).

- 86. The Working Party took note of the pending points identified by the informal working group for the improvement of methods of work of WP.11 as presented in document ECE/TRANS/WP.11/2020/15. Awaiting the outcome of future discussions, progress had been made on the following points:
- (a) Frequency of meetings
 - 87. The number of sessions was extended to 3 sessions per biennium, subject to a revision at the eighty-third ITC session in 2021. Unfortunately, due to the COVID-19 outbreak, the April 2020 session had to be postponed, resulting in only one session for the year 2020. The Working Party requested the ITC to extend the deadline for revision of this decision to its session in 2023.
- (b) Fixed period for acceptance of proposals
- (c) Fixed dates for entry into force of new proposals
 - 88. The Working Party agreed that it would be desirable to have the entry into force of new amendments at a fixed date, i.e. 1 January or 1 July. A member of the secretariat noted that due to the uncertainty introduced by paragraph 2 (b) of Article 18 of the ATP, fixing the date of entry into force of amendments would mean that amendments would not enter into force as soon as Contracting Parties using paragraph 2 (b) of Article 18 notify the Secretary of their acceptance, but on the fixed date. The Working Party will consider again this topic at a future session.
- (d) Informal working groups
- (e) Reference to standards and dedicated standards working group
 - 89. It was stressed that the Working Party should expedite the creation of the informal working group on standardization, as it was agreed at the seventy-fourth session, in order to deal with these topics in a more efficient way, albeit the difficulties in finding experts that can work on the subject on a permanent basis.
- (f) Use of documents
 - 90. Points identified under "Other topics" could be discussed at a future WP.11 session.

2. Draft revision of the ECE Road Map on Intelligent Transport Systems

Document: Informal document INF.15 (Secretariat).

- 91. Following decision No. 18 of the Inland Transport Committee, at its eighty-second session in February 2020, the secretariat was requested to, in cooperation with ITC subsidiary working parties, initiate activities to prepare a revision of the ECE Road Map on Intelligent Transport Systems.
- 92. As a first step, the secretariat to the World Forum on Harmonization of Vehicle Regulations (WP.29) held a meeting with the Co-chairs of the Informal Working Group on Intelligent Transport Systems, which operates under the World Forum, to define the necessary actions to implement decision No. 18 of the ITC. The Co-Chairs provided input for a first draft revision of the ITS Road Map after which consultations among ITC working parties and subsidiary bodies were launched. Namely, the document and revision process are being presented to all ITC working parties and subsidiary bodies as they hold their sessions during summer and autumn of 2020.
- 93. The proposed system for updating the ITS Roadmap was to use an online platform, Google docs, through which interested parties could access the document and work on it in

a collaborative manner. All interested stakeholders were invited to provide their contributions to the revision process with the aim of having a draft revised ITS Roadmap ready for presentation to the November 2020 session of the ITC bureau, as a leadup to tabling it at the ITC session in February 2021.

94. The draft document, contained in informal document INF.15 as updated on 14 October 2020, can be accessed live through the following link:

https://docs.google.com/document/d/1-tIgg7XLAaax0t-WuiMrdU8WFxH3eOO6/edit

3. Tributes

- 95. The Working Party was informed that Mr. Grealy (Transfrigoroute International) was retiring in December 2020. WP.11 thanked Mr. Grealy for his long-lasting contributions to the carriage of perishable foodstuffs and to the work of the Working Party and wished him a long and happy retirement.
- 96. WP.11 was informed that Mr. Rui Telmo Nobre (Portugal), its Chairman for many years, had passed away on November 2019 after a period of health problems. Mr. Nobre contributed tirelessly and selflessly to the ATP and WP.11 and his expertise and dedication will be sorely missed. The Working Party sent its sympathies and condolences to his wife and family.

XIV. Adoption of the report (agenda item 13)

97. The WP.11 adopted the report on its seventy-sixth session based on a draft prepared by the secretariat.

Annex I

Proposed amendments to the ATP

1. Annex 1, section 1. Insulated equipment

Replace degrees "K" by " $^{\circ}$ C" under I_N and I_R (twice).

(Reference document: ECE/TRANS/WP.11/2020/11)

2. Annex 1, section 2. Refrigerated equipment

In the last paragraph, replace degrees "K" by "°C".

(Reference document: ECE/TRANS/WP.11/2020/11)

3. Annex 1, section 3. Mechanically refrigerated equipment

Under Class F, replace degrees "K" by "°C".

(Reference document: ECE/TRANS/WP.11/2020/11)

4. Annex 1, section 4. Heated equipment

In the last paragraph, replace degrees "K" by "°C".

(Reference document: ECE/TRANS/WP.11/2020/11)

5. Annex 1, section 5. Mechanically refrigerated and heated equipment

In the second to last paragraph, replace degrees "K" by "°C".

(Reference document: ECE/TRANS/WP.11/2020/11)

6. Annex 1

Insert a new section 7 to read as follows:

"7. Definitions

Equipment means an assembly of parts forming an insulated body and its supportive structure needed for carriage on road and rail. Thermal appliances may be part of the assembly.

Heating appliance means a thermal appliance that generates thermal energy to increase(heat) the temperature inside.

Mechanically heated and refrigerated appliance means a mechanical refrigerating appliance that is able to decrease (cool) or increase (heat) the temperature inside the equipment that is tested to certify both the capacity to cool and to heat.

Mechanically refrigerating appliance means a thermal appliance that generates thermal energy to decrease (cool) the temperature inside the equipment by a mechanical drive system.

Refrigerating appliance means a thermal appliance that generates thermal energy to decrease (cool) the temperature inside the equipment by melting, evaporation or sublimation of for example natural ice, brine (eutectic) liquefied gas or dry ice.

Thermal appliance means a device to generate thermal energy, to decrease (cool) or increase (heat) the temperature inside the equipment.".

(Reference document: ECE/TRANS/WP.11/2020/14 as amended)

7. Annex 1, appendix 1, paragraph 3(b)

Add a new last sentence to read as follows: "For Multi Temperature, Multi Compartment equipment also the declaration of conformity (see 7.3.6 of annex I, appendix 2) shall be provided.".

(Reference document: ECE/TRANS/WP.11/2020/14 as amended)

8. Annex 1, appendix 1, paragraph 3(c)

Add a new last sentence to read as follows: "For Multi Temperature, Multi Compartment equipment also a calculation sheet (see 7.3.6 of annex I, appendix 2) based on the iterative method shall be provided.".

(Reference document: ECE/TRANS/WP.11/2020/14 as amended)

9. Annex 1, appendix 2, section 1.2

Under Method C, replace degrees "K" by "°C".

(Reference document: ECE/TRANS/WP.11/2020/11)

10. Annex 1, appendix 2, section 1.7

In the first paragraph, replace degrees "K" by "°C" (twice).

(Reference document: ECE/TRANS/WP.11/2020/11)

11. Annex 1, appendix 2, section 1.7

In the fourth paragraph, replace degrees "K" by "°C".

(Reference document: ECE/TRANS/WP.11/2020/11)

12. Annex 1, appendix 2, section 2.1.2

In the first paragraph, replace degrees "K" by "°C".

(Reference document: ECE/TRANS/WP.11/2020/11)

13. Annex 1, appendix 2, section 2.1.7

Replace degrees "K" by "°C".

(Reference document: ECE/TRANS/WP.11/2020/11)

14. Annex 1, appendix 2, section 2.2.3

Replace degrees "K" by "°C" (twice).

(Reference document: ECE/TRANS/WP.11/2020/11)

15. Annex 1, appendix 2, section 2.2.8

Replace degrees "K" by "°C".

(Reference document: ECE/TRANS/WP.11/2020/11)

16. Annex 1, appendix 2, section 4.1.1

Replace degrees "K" by "°C".

(Reference document: ECE/TRANS/WP.11/2020/11)

17. Annex 1, appendix 2, section 4.2.2, paragraph a)

In the last paragraph, replace degrees "K" by "°C".

(Reference document: ECE/TRANS/WP.11/2020/11)

18. Annex 1, appendix 2, section 4.2.3, paragraph a)

In the second paragraph, replace degrees "K" by "°C".

(Reference document: ECE/TRANS/WP.11/2020/11)

19. Annex 1, appendix 2, section 4.2.3, paragraph b)

Replace degrees "K" by "°C".

(Reference document: ECE/TRANS/WP.11/2020/11)

20. Annex 1, appendix 2, section 4.2.3

In the paragraph after (b), replace degrees "K" by "°C".

(Reference document: ECE/TRANS/WP.11/2020/11)

21. Annex 1, appendix 2, section 6.3

Replace degrees "K" by "°C" (four times).

(Reference document: ECE/TRANS/WP.11/2020/11)

22. Annex 1, appendix 2, section 6.4, (ii)

Replace degrees "K" by "°C" (four times).

(Reference document: ECE/TRANS/WP.11/2020/11)

23. Annex 1, appendix 2, section 7.3.1

In the second paragraph, replace degrees "K" by "°C".

(Reference document: ECE/TRANS/WP.11/2020/11)

24. Annex 1, appendix 2, section 7.3.2

In the first paragraph, replace degrees "K" by "°C".

(Reference document: ECE/TRANS/WP.11/2020/11)

25. Annex 1, appendix 2, section 7.3.6, third paragraph

Insert a new last sentence to read as follows: "The declaration shall conform to the layout given in Model No. 14 of this appendix"

(Reference document: ECE/TRANS/WP.11/2020/14)

26. Annex 1, appendix 2, section 7.3.7

In the table heading, replace degrees "K" by "°C".

(Reference document: ECE/TRANS/WP.11/2020/11)

27. Annex 1, appendix 2, section 8, MODELS No. 1A and 1B

Replace "Date of construction" by "Date of construction (month/year)".

(Reference document: ECE/TRANS/WP.11/2020/14)

28. Annex 1, appendix 2, section 8, MODEL No. 1 A

In the last line, replace degrees "K" by "°C".

(Reference document: ECE/TRANS/WP.11/2020/11)

29. Annex 1, appendix 2, section 8, MODEL No. 2 A

Replace degrees "K" by "°C" everywhere it appears (seven times).

(Reference document: ECE/TRANS/WP.11/2020/11)

30. Annex 1, appendix 2, section 8, MODEL No. 2 B

Replace degrees "K" by "°C" everywhere it appears (seven times).

(Reference document: ECE/TRANS/WP.11/2020/11)

31. Annex 1, appendix 2, section 8, MODEL No. 3

Replace degrees "K" by "°C".

(Reference document: ECE/TRANS/WP.11/2020/11)

32. Annex 1, appendix 2, section 8, MODEL No. 4 A

Replace degrees "K" by "°C" everywhere it appears (three times).

(Reference document: ECE/TRANS/WP.11/2020/11)

33. Annex 1, appendix 2, section 8, MODELS No. 4A, 4B, 4C, 5, 6, 7, 8, 9, 10, 11

Replace "Year of manufacture" by "Date of manufacture (month/year)".

(Reference document: ECE/TRANS/WP.11/2020/14)

34. Annex 1, appendix 2, section 8, MODEL No. 4 B

Replace degrees "K" by "oC" everywhere it appears (three times).

(Reference document: ECE/TRANS/WP.11/2020/11)

35. Annex 1, appendix 2, section 8, MODEL No. 4 C

Replace degrees "K" by "°C" everywhere it appears (three times).

(Reference document: ECE/TRANS/WP.11/2020/11)

36. Annex 1, appendix 2, section 8, MODEL No. 5

Replace degrees "K" by "°C" everywhere it appears (three times).

(Reference document: ECE/TRANS/WP.11/2020/11)

37. Annex 1, appendix 2, section 8, MODEL No. 6

Replace degrees "K" by "°C" everywhere it appears (twice).

(Reference document: ECE/TRANS/WP.11/2020/11)

38. Annex 1, appendix 2, section 8, MODEL No. 7

Replace degrees "K" by "°C" everywhere it appears (twice).

(Reference document: ECE/TRANS/WP.11/2020/11)

39. Annex 1, appendix 2, section 8, MODEL No. 12

Replace "Date of manufacture" by "Date of manufacture month/year)".

(Reference document: ECE/TRANS/WP.11/2020/14)

40. Annex 1, appendix 2, section 8, MODEL No. 12

Replace "Self-contained/not self-contained" by "Drive independent/dependent".

(Reference document: ECE/TRANS/WP.11/2020/14)

41. Annex 1, appendix 2, section 8, MODEL No. 12

At the beginning, delete the following text:

"Refrigerant charge

Refrigerant fluid: (ISO/ASHRAE designation) a)	
Nominal mass of refrigerant	
a) If existing".	
(Reference document: ECE/TRANS/WP.11/2020/7)	
42. Annex 1, appendix 2, section 8, MODEL No. 12	
Replace "Refrigerant fluid" b	Ŋ
"Refrigerant charge	
Refrigerant fluid: (ISO/ASHRAE designation) a)	
Nominal mass of refrigerant	
a) If existing".	

(Reference document: ECE/TRANS/WP.11/2020/7)

43. Annex 1, appendix 2, section 8

Insert a new Model No. 14 to read as follows:

Model No. 14

Declaration of conformity for Multi Temperature - Multi compartment equipment

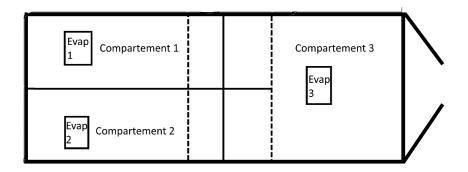
Supplementary document to the Certificate of Compliance as per Annex 1, appendix 2 paragraph 7.3.6

Top view sketch of the lay-out of the equipment:

Indicating:

- -front and rear, numbering of compartments
- -lay-out of the compartments with fixed and movable bulkheads and the following dimensions in centimeters: inside dimensions of the body, thickness and lengths of the bulkheads.
- -most extreme position of movable dividing walls
- Position of the host unit(s) and evaporators
- -material of the floor.

(Example of top view sketch)



Insulated body:

ATP test report number:

Make: Serial number:								
Host unit: ATP Test report number: Make: Serial Number:								
Evaporators: ATP test report number: Make: Type:								
Remarks: (for example, limitations in compartment temperatures or dimensions, use of particular accessories as curtains etc.)								
Authentication								
Name of competent authority: Address: Telephone number: E-mail address:								
Date and Place of signature Stamps signature, and name signing officer.".								
(Reference document: ECE/TRANS/WP.11/2020/14)								

Annex II

Additions to the ATP Handbook

1. At the end of Annex I, Appendix 2, add the following comment:

"CONFORMITY ACCEPTANCE

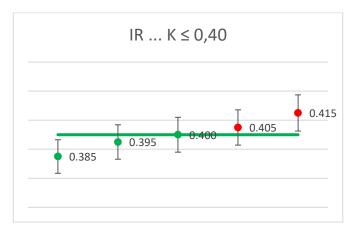
Measurement results in all sections of Annex I, Appendix 2 should include estimation of measurement uncertainty. To achieve demanded level of measurement uncertainty Test stations should follow definition of procedures as defined by test procedure in each section of Annex I, Appendix 2.

Conformity acceptance in all sections of Annex I, Appendix 2 should be done without taking measurement uncertainty into account, using *binary decision*¹ or *shared risk*^{1,2,3,4} decision rule.

Examples of conformity acceptance decisions for insulation box classification:

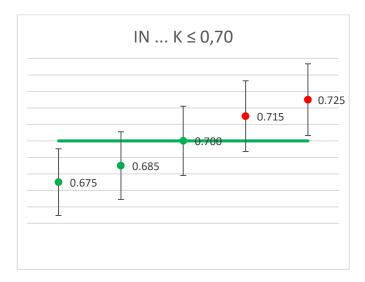
Case 1 – insulation box to be classified as IR:

All results for K factor which are smaller or equal to 0,40 conform with IR class (green points). All results for K factor which are greater than 0,40 do not conform with IR class (red points).



Case 2 – insulation box to be classified as IN:

All results for K factor which are smaller or equal to 0,70 conform with IN class (green points). All results for K factor which are greater than 0,70 do not conform with IN class (red points).



References:

¹ ILAC- ILAC- Guidelines on the Reporting of Compliance with Specification G8:09/2019, - 2.7

² JCGM 106:2012 Evaluation of measurement data – The role of measurement uncertainty in conformity assessment - 8.2

(Reference document: ECE/TRANS/WP.11/2020/12)

- 2. Add to the French and Russian versions of the Handbook the following comment to paragraph 4.2.2 (b):
- "1. This procedure describes the measurement method for determining the fuel consumption of vehicle powered refrigeration units, or in other words the increase in diesel engine fuel consumption when the refrigeration unit is on.
- 2. Three standards have been introduced and used to determine the increase in fuel consumption as a result of the operation of the refrigeration unit:
- Standard diesel engine with standard specific fuel consumption: cs = 165 g/(kW. h).
- Standard vehicle alternator efficiency: $\varepsilon = 50 \%$.
- Standard diesel fuel specific density: $\rho = 836$ g/l.
- 3. The most frequent arrangement is assumed: the refrigeration compressor or a special electric generator supplying the refrigeration unit is driven from the vehicle engine crankshaft (usually by a belt drive). Using a suitable design of power pack in the test station, the torque τ [N.m] and operating rotational speed n [s-1] are measured and the input power P1 [W] on the shaft of the compressor or generator is calculated.

P1 [W] =
$$2\pi n\tau$$
 ... where $\pi = 3.141593$

4. There are also vehicle-powered units taking in addition electric current from the standard (or auxiliary) vehicle alternator, or from vehicle batteries, usually to drive electric fans and blowers. Regarding the shaft power P2 [W] of a standard or auxiliary alternator determined from electric measurement, the efficiency of such vehicle alternators has to be considered (usually 24 V dc, 100 A to 150 A). Alternator efficiency ϵ for these calculations is postulated at 50 % (see the second of the three standards mentioned above). Accordingly, if Pfans is the total electric input needed to drive the fans, the alternator shaft input is:

$$P2 = 2 x Pfans$$

5. In this case the total input power P [W] that the vehicle engine has to deliver to the refrigeration unit consists of the compressor input P1 and of the alternator input P2 for the fans:

$$P = P1 + P2$$

6. If P [W] is the total refrigeration unit input power at specific operating conditions, then the fuel consumption by weight Cfw [g/h] of the tested refrigeration unit can be calculated as:

Cfw
$$[g/h] = P x cs = 0.165 x P$$
.

7. The consumption by weight (measured in g/h) can be converted to consumption by volume (measured in l/h) if the specific density ρ of the diesel fuel is known. This density varies from 830 kg/m³ (winter) to 842 kg/m³ (summer). The standard (mean) value of the specific density $\rho = 836$ kg/m³ = 836 g/l has been used for the purposes of this procedure (see the third of the standards mentioned above).

8. It is beneficial to introduce specific fuel consumption; it is the quantity which can be used to compare the economy of units with different refrigeration capacities. Specific fuel

³ Welmec 4.2-1 / 2006 – 6

⁴ OIML G 19 /2017 - 5.3.3. 5.3.4".

consumption cfvol (consumption by	volume reduced to	1 kW (of refrigeration	capacity	Q) is
defined in this way:					

cfvol [l/(h. kW)] =1000 Cfvol /Q".