

Official Journal of the European Union

L 176



English edition

Legislation

Volume 62

1 July 2019

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⁽¹⁾ Text with EEA relevance.

II

(Non-legislative acts)

INTERNATIONAL AGREEMENTS

Information on the date of entry into force of the Treaty establishing the Transport Community

The Treaty establishing the Transport Community ⁽¹⁾, signed by the European Union and six South East European partners between 12 July (Trieste) and 9 October 2017 (Brussels), has entered into force on 1 May 2019 in accordance with its Article 41(2). All parties have ratified or approved it.

⁽¹⁾ The treaty was published in OJ L 278, 27.10.2017, p. 3.

DECISIONS

POLITICAL AND SECURITY COMMITTEE DECISION (CFSP) 2019/1112

of 12 June 2019

on the appointment of the EU Force Commander for the European Union military operation in the Southern Central Mediterranean (EUNAVFOR MED operation SOPHIA) and repealing Decision (CFSP) 2018/1219 (EUNAVFOR MED/1/2019)

THE POLITICAL AND SECURITY COMMITTEE,

Having regard to the Treaty on European Union, and in particular Article 38 thereof,

Having regard to Council Decision (CFSP) 2015/778 of 18 May 2015 on a European Union military operation in the Southern Central Mediterranean (EUNAVFOR MED operation SOPHIA) ⁽¹⁾, and in particular Article 6 thereof,

Whereas:

- (1) Pursuant to Article 6(1) of Decision (CFSP) 2015/778, the Council authorised the Political and Security Committee (PSC) to take decisions on the appointment of the EU Force Commander for the EUNAVFOR MED operation SOPHIA ('EU Force Commander').
- (2) On 23 August 2018, the PSC adopted Decision (CFSP) 2018/1219 ⁽²⁾ appointing Rear Admiral (LH) Stefano TURCHETTO as EU Force Commander.
- (3) The EU Operation Commander of EUNAVFOR MED operation SOPHIA has recommended the appointment of Rear Admiral (LH) Ettore SOCCI to succeed Rear Admiral (LH) Stefano TURCHETTO as the new EU Force Commander as from 12 June 2019.
- (4) On 5 June 2019, the European Union Military Committee supported that recommendation.
- (5) Decision (CFSP) 2018/1219 should be repealed.
- (6) In accordance with Article 5 of Protocol No 22 on the position of Denmark, annexed to the Treaty on European Union and to the Treaty on the Functioning of the European Union, Denmark does not participate in the elaboration and the implementation of decisions and actions of the Union which have defence implications,

HAS ADOPTED THIS DECISION:

Article 1

Rear Admiral (LH) Ettore SOCCI is hereby appointed as EU Force Commander for the European Union military operation in the Southern Central Mediterranean (EUNAVFOR MED operation SOPHIA) as from 12 June 2019.

Article 2

Decision (CFSP) 2018/1219 is hereby repealed.

⁽¹⁾ OJ L 122, 19.5.2015, p. 31.

⁽²⁾ Political and Security Committee Decision (CFSP) 2018/1219 of 23 August 2018 on the appointment of the EU Force Commander for the European Union military operation in the Southern Central Mediterranean (EUNAVFOR MED operation SOPHIA) and repealing Decision (CFSP) 2017/2432 (EUNAVFOR MED/1/2018) (OJ L 226, 7.9.2018, p. 5).

Article 3

This Decision shall enter into force on 12 June 2019.

Done at Brussels, 12 June 2019.

For the Political and Security Committee
The Chairperson
S. FROM-EMMESBERGER

POLITICAL AND SECURITY COMMITTEE DECISION (CFSP) 2019/1113**of 19 June 2019****on the appointment of the EU Mission Force Commander of the European Union CSDP Military Training Mission in the Central African Republic (EUTM RCA) (EUTM RCA/1/2019)**

THE POLITICAL AND SECURITY COMMITTEE,

Having regard to the Treaty on European Union, and in particular Article 38 thereof,

Having regard to Council Decision (CFSP) 2016/610 of 19 April 2016 on a European Union CSDP Military Training Mission in the Central African Republic (EUTM RCA) ⁽¹⁾, and in particular Article 5(1) thereof,

Whereas:

- (1) By means of Decision (CFSP) 2016/610, the Council authorised the Political and Security Committee (PSC), in accordance with Article 38 of the Treaty on European Union, to take the relevant decisions concerning the political control and strategic direction of EUTM RCA, including decisions on the appointment of subsequent EU Mission Force Commanders.
- (2) On 19 December 2017, the PSC adopted Decision (CFSP) 2017/2439 ⁽²⁾, appointing Brigadier General Hermínio TEODORO MAIO as the EU Mission Force Commander of EUTM RCA.
- (3) On 15 May 2019, the European Union Military Committee recommended the approval of the nomination of Brigadier General Éric PELTIER to succeed Brigadier General Hermínio TEODORO MAIO as the EU Mission Force Commander of EUTM RCA as from 8 July 2019.
- (4) In accordance with Article 5 of Protocol No 22 on the position of Denmark, annexed to the Treaty on European Union and to the Treaty on the Functioning of the European Union, Denmark does not participate in the elaboration and the implementation of decisions and actions of the Union which have defence implications,

HAS ADOPTED THIS DECISION:

Article 1

Brigadier General Éric PELTIER is hereby appointed as the EU Mission Force Commander of the European Union CSDP Military Training Mission in the Central African Republic (EUTM RCA) as from 8 July 2019.

Article 2

This Decision shall enter into force on the date of its adoption.

Done at Brussels, 19 June 2019.

For the Political and Security Committee

The Chairperson

S. FROM-EMMERSBERGER

⁽¹⁾ OJ L 104, 20.4.2016, p. 21.

⁽²⁾ Political and Security Committee Decision (CFSP) 2017/2439 of 19 December 2017 on the appointment of the EU Mission Force Commander of the European Union CSDP Military Training Mission in the Central African Republic (EUTM RCA) (EUTM RCA/4/2017) (OJ L 344, 23.12.2017, p. 40).

COUNCIL DECISION (CFSP) 2019/1114**of 28 June 2019****amending Decision 2013/354/CFSP on the European Union Police Mission for the Palestinian Territories (EUPOL COPPS)**

THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty on European Union, and in particular Article 42(4) and Article 43(2) thereof,

Having regard to the proposal from the High Representative of the Union for Foreign Affairs and Security Policy,

Whereas:

- (1) On 3 July 2013, the Council adopted Decision 2013/354/CFSP ⁽¹⁾, which continued the European Union Police Mission for the Palestinian Territories (EUPOL COPPS) as from 1 July 2013.
- (2) On 29 June 2018, the Council adopted Decision (CFSP) 2018/942 ⁽²⁾, amending Decision 2013/354/CFSP and extending EUPOL COPPS from 1 July 2018 until 30 June 2019.
- (3) Following the Strategic Review of EUPOL COPPS, EUPOL COPPS should be extended for a further period of 12 months, until 30 June 2020.
- (4) Decision 2013/354/CFSP should therefore be amended accordingly.
- (5) EUPOL COPPS will be conducted in the context of a situation which may deteriorate and could impede the achievement of the objectives of the Union's external action as set out in Article 21 of the Treaty,

HAS ADOPTED THIS DECISION:

Article 1

Decision 2013/354/CFSP is amended as follows:

- (1) in Article 12(1), the following subparagraph is added:

‘The financial reference amount intended to cover the expenditure related to EUPOL COPPS for the period from 1 July 2019 until 30 June 2020 shall be EUR 12 430 000.’;

- (2) in Article 15, the third paragraph is replaced by the following:

‘It shall expire on 30 June 2020.’.

Article 2

This Decision shall enter into force on the date of its adoption.

It shall apply from 1 July 2019.

Done at Brussels, 28 June 2019.

For the Council

The President

G. CIAMBA

⁽¹⁾ Council Decision 2013/354/CFSP of 3 July 2013 on the European Union Police Mission for the Palestinian Territories (EUPOL COPPS) (OJ L 185, 4.7.2013, p. 12).

⁽²⁾ Council Decision (CFSP) 2018/942 of 29 June 2018 amending Decision 2013/354/CFSP on the European Union Police Mission for the Palestinian Territories (EUPOL COPPS) (OJ L 166, 3.7.2018, p. 17).

COUNCIL DECISION (CFSP) 2019/1115**of 28 June 2019****amending Joint Action 2005/889/CFSP on establishing a European Union Border Assistance Mission for the Rafah Crossing Point (EU BAM Rafah)**

THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty on European Union, and in particular Article 42(4) and Article 43(2) thereof,

Having regard to the proposal from the High Representative of the Union for Foreign Affairs and Security Policy,

Whereas:

- (1) On 25 November 2005, the Council adopted Joint Action 2005/889/CFSP ⁽¹⁾ establishing a European Union Border Assistance Mission for the Rafah Crossing Point (EU BAM Rafah).
- (2) On 29 June 2018, the Council adopted Decision (CFSP) 2018/943 ⁽²⁾ amending Joint Action 2005/889/CFSP and extending it until 30 June 2019.
- (3) Following the Strategic Review of EU BAM Rafah, EU BAM Rafah should be extended for a further period of 12 months, until 30 June 2020.
- (4) Joint Action 2005/889/CFSP should therefore be amended accordingly.
- (5) EU BAM Rafah will be conducted in the context of a situation which may deteriorate and could impede the achievement of the objectives of the Union's external action as set out in Article 21 of the Treaty,

HAS ADOPTED THIS DECISION:

Article 1

Joint Action 2005/889/CFSP is amended as follows:

- (1) in Article 13(1), the following subparagraph is added:

'The financial reference amount intended to cover the expenditure related to EU BAM Rafah for the period from 1 July 2019 to 30 June 2020 shall be EUR 2 150 000.';

- (2) in Article 16, the second paragraph is replaced by the following:

'It shall expire on 30 June 2020.'.

Article 2

This Decision shall enter into force on the date of its adoption.

It shall apply from 1 July 2019.

Done at Brussels, 28 June 2019.

*For the Council**The President*

G. CIAMBA

⁽¹⁾ Council Joint Action 2005/889/CFSP of 25 November 2005 on establishing a European Union Border Assistance Mission for the Rafah Crossing Point (EU BAM Rafah) (OJ L 327, 14.12.2005, p. 28).

⁽²⁾ Council Decision (CFSP) 2018/943 of 29 June 2018 amending Joint Action 2005/889/CFSP on establishing a European Union Border Assistance Mission for the Rafah Crossing Point (EU BAM Rafah) (OJ L 166, 3.7.2018, p. 19).

COMMISSION DECISION (EU) 2019/1116**of 19 December 2017****on State aid SA.33829 (2012/C) Maltese tonnage tax scheme and other State measures in favour of shipping companies and their shareholders***(notified under document C(2017) 8734)***(Only the English text is authentic)****(Text with EEA relevance)**

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union, and in particular the first subparagraph of Article 108(2) thereof,

Having regard to the Agreement on the European Economic Area, and in particular Article 62(1)(a) thereof,

Having called on interested parties to submit their comments pursuant to the provisions cited above ⁽¹⁾, and having regard to their comments,

Whereas:

1. PROCEDURE

- (1) Based on a complaint received by an interested party in October 2011 the Commission entered in discussion with the Maltese authorities on the Maltese tonnage tax scheme and further tax measures. Following written and oral discussions with the Maltese authorities between November 2011 and June 2012, the Commission informed Malta by letter dated 26 July 2012 that it had decided to initiate the procedure laid down in Article 108(2) of the Treaty on the Functioning of the European Union ("TFEU") on possible illegal aid measures applied by Malta in favour of shipping companies and their shareholders ('the opening decision') ⁽²⁾.
- (2) In the opening decision the Commission invited interested parties to submit their comments on the measures set out in the opening decision in recitals 3 to 30.
- (3) The Commission received comments from six interested parties: European Community Shipowners' Association; Malta Maritime Law Association; Norwegian Shipowners' Association; Malta Chamber of Commerce, Enterprise and Industry; Malta International Shipping Council; Super Yachts Industry Network — Malta. The Commission also received comments from a German shipping sector employee wishing to remain anonymous.
- (4) The comments were forwarded to Malta, which was given the opportunity to react; its comments were received by letter dated 15 December 2012.
- (5) Malta submitted further observations by letters of 15 October 2012, 21 December 2012, 27 February 2013, 31 October 2013, 25 March 2014 and 24 December 2015.
- (6) By letter dated 9 December 2016, Malta waived its right under Article 342 TFEU in conjunction with Article 3 of Regulation (EEC) No 1 determining the languages to be used by the European Economic Community ⁽³⁾ to have this Decision adopted in Maltese and agreed that this Decision be adopted in English.

2. DESCRIPTION OF THE MEASURES

- (7) This Decision relates to the following measures:
 - (a) the tonnage tax scheme and specifically:
 - (i) the vessels eligible for tonnage tax;

⁽¹⁾ OJ C 216, 21.7.2012, p. 45.

⁽²⁾ OJ C 289, 25.9.2012, p. 49.

⁽³⁾ OJ 17, 6.10.1958, p. 358.

- (ii) specific types of income and activities of tonnage tax ships ⁽⁴⁾ subject to tonnage tax, tonnage tax scheme, including the extension of the tonnage tax to non-core shipping activities;
- (iii) the level of tonnage tax;
- (iv) the flag link requirement;
- (v) ring-fencing measures;
- (b) the exemption from taxation of capital gains arising from the sale or transfer of ships;
- (c) the exemption from taxation of capital gains in relation to shares in shipping companies;
- (d) the exemption from taxation of dividends in relation to shares in shipping companies,
- (e) the exemption from taxation of interest or other income in relation to financing of shipping companies or tonnage tax ships,
- (f) the exemption from certain duties on documents and transfers.

2.1. The tonnage tax scheme

2.1.1. General principles — Eligible vessels, income and activities

- (8) Under the Merchant Shipping Act ⁽⁵⁾, as specifically supplemented and amended by the Merchant Shipping Taxation Regulations ⁽⁶⁾ (‘the Taxation Regulations’), income derived by a licensed shipping organisation from shipping activities may be exempted from income tax under the Income Tax Act ⁽⁷⁾, provided that all relevant registration fees and tonnage taxes ⁽⁸⁾ are duly paid. The option to pay tonnage tax relates to income arising from the operation of a tonnage tax ship ⁽⁹⁾.
- (9) A shipping organisation is defined, in the Merchant Shipping Act ⁽¹⁰⁾, as organisation having its principal objects as one or more of the following activities provided they are licensed to do so:
 - ‘(a) the ownership, operation (under charter or otherwise), administration and management of a ship or ships registered as a Maltese ship in terms of this Act and the carrying on of all ancillary financial, security and commercial activities in connection therewith;
 - (b) the ownership, operation (under charter or otherwise), administration and management of a ship or ships registered under the flag of another state and the carrying on of all ancillary financial, security and commercial activities in connection therewith;
 - (c) the holding of shares or other equity interests in entities, whether Maltese or otherwise, established for any of the purposes stated in this article and the carrying on of all ancillary financial, security and commercial activities in connection therewith;
 - (d) the raising of capital through loans, the issue of guarantees or the issue of securities by the company when the purpose of such activity is to achieve the objects stated in this article for the shipping organisation itself or for other shipping organisations within the same group; [...]
 - (e) the carrying on of such other activities within the maritime sector which the Minister may, on the advice of the Authority, from time to time prescribe by regulations as qualifying for the above purpose.’

⁽⁴⁾ ‘Tonnage tax ships’ under the Maltese legislation are ships whose activities make them eligible for the tonnage tax scheme, see section 4.2.1.1 of this Decision.

⁽⁵⁾ Chapter 234, the Merchant Shipping Act, Malta Government Gazette, Supplement of 6 April 1973, (‘Merchant Shipping Act’).

⁽⁶⁾ Chapter 234.43, the Merchant Shipping (Taxation and Other Matters relating to Shipping Organisations) Regulations, Malta Government Gazette nr. 17,574 of 30 April 2004.

⁽⁷⁾ Chapter 123, Income Tax Act, Malta Government Gazette, 1 January 1949 (‘Income Tax Act’).

⁽⁸⁾ ‘Tonnage taxes’ in the broader sense refer to duties any ship is liable to pay, in particular to the registration fee. It is important to note that, whilst all seagoing vessels registered in Malta pay tonnage tax as a registration fee, not all such vessels are then eligible for exemption from income tax. Vessels within the tonnage tax scheme which are eligible for tonnage taxation while being exempted from income tax are referred to by Malta as ‘tonnage tax ships’.

⁽⁹⁾ For the definition of ‘tonnage tax ship’ see footnote 4.

⁽¹⁰⁾ Article 84(Z)(1) of the Merchant Shipping Act.

- (10) The tonnage tax scheme covers the income arising from shipping activities ⁽¹¹⁾. The Taxation Regulations require account separation to be ensured in respect of shipping and non-shipping activities ⁽¹²⁾. 'Shipping Activities' are defined as 'the international carriage of goods or passengers by sea or the provision of other services to or by a ship as may be ancillary thereto or associated therewith including the ownership, chartering or any other operation of a ship engaged in all or any of the above activities or as otherwise may be prescribed' ⁽¹³⁾.
- (11) Article 85(1) of the Merchant Shipping Act sets out the requirements for a ship to qualify as 'tonnage tax ship' and hence to benefit from the tonnage tax scheme: 'Tonnage tax ship' means 'either a ship declared to be a tonnage tax ship by the Minister in terms of Article 85A of this Act or a Community ship of not less than 1 000 net tons which is owned entirely, chartered, managed, administered or operated by a shipping organisation'. Article 85A(1) of the Merchant Shipping Act allows for any ship, including those below 1 000 net tons ⁽¹⁴⁾, to be declared a 'tonnage tax ship', therefore eligible for the tonnage tax scheme. The current wording specifies that this may be done 'irrespective of operations or trade in which engaged', and on such conditions as the responsible Minister 'may deem appropriate'.
- (12) Income derived from shipping activities of a licensed shipping organisation is exempt from income tax under the Income Tax Act ⁽¹⁵⁾.
- (13) Summarized, vessels within the tonnage tax scheme ('tonnage tax ships') which are eligible for tonnage taxation while being exempted from income tax are vessels which are 'owned entirely, chartered, managed, administered or operated by a shipping organisation' ⁽¹⁶⁾ and which are engaged in shipping activities ⁽¹⁷⁾.
- (14) Furthermore, the following is exempt from taxation under the Income Tax Act: any income, profits or gains of a licensed shipping organisation derived from the sale or other transfer of a tonnage tax ship or from the disposal of any rights to acquire a ship which, when delivered or completed, would qualify as a tonnage tax ship ⁽¹⁸⁾.

2.1.2. *Specific types of income and activities eligible to tonnage tax*

2.1.2.1. Bareboat chartering out

- (15) Under the Maltese legislation all revenue from bareboat chartering out is eligible for tonnage taxation, without any limitations.

2.1.2.2. Time/voyage chartering

- (16) Because of the wide definition of 'shipping organisation' ⁽¹⁹⁾ in combination with the wide definition of 'shipping activities' ⁽²⁰⁾ in the Maltese legislation it may be interpreted that the profits of pure commercial managers of ships without any responsibility for crew or technical management (that is to say, companies which enter into transportation contracts and rely on other companies to deliver the service, through time or voyage chartering) are eligible for tonnage tax.
- (17) The use of time-chartered vessels is subject to the flag link requirements set out in recital 24. However, there is currently no explicit rule as to minimum EEA flagging requirement for new entrants into the tonnage tax scheme.

⁽¹¹⁾ Article 3(1)(a) of the Taxation Regulations.

⁽¹²⁾ Article 3(4) of the Taxation Regulations.

⁽¹³⁾ Article 85 of the Merchant Shipping Act.

⁽¹⁴⁾ See recital 7 of the opening decision.

⁽¹⁵⁾ Article 3(1)(a) of the Taxation Regulations.

⁽¹⁶⁾ Article 85(1) of the Merchant Shipping Act.

⁽¹⁷⁾ See recital 10.

⁽¹⁸⁾ Article 3(1)(b) of the Taxation Regulations.

⁽¹⁹⁾ See recital 9.

⁽²⁰⁾ See recital 10.

- (18) On 6 January 2012 the Registrar General of Shipping issued internal rules on the eligibility for the application of the Maltese tonnage tax scheme ('2012 Rules on Internal Procedure')⁽²¹⁾. Those include restrictions on time-chartering and similar activities as a percentage of the total tonnage of the fleet. The same internal procedure allows for derogations of up to three years:

'At the time of opting into the tonnage tax scheme, the total net tonnage of the ships chartered-in and included in the tonnage taxation scheme does not exceed 80 % of the total net tonnage of all ships chartered-in and operated by the qualifying charterer and any other organisation forming part of the same group. Chartered-in ship means a ship taken on a time charter or on a voyage charter or on a contract of affreightment basis. Ships operated means ships owned or bareboat chartered-in. This percentage can reach 90 % provided that every chartered-in ship flies a Community flag or is entirely managed (crew and technical) from the territory of the EU/EEA. Following the entry into the system, the charterer may increase the percentage net tonnage chartered-in from the above mentioned maximum, provided that this excess does not occur for more than three consecutive tax periods'.

2.1.2.3. Ancillary revenues

- (19) In relation to carriage of cargo and passengers, the 2012 Rules on Internal Procedure give some details as to which 'ancillary activities' would normally be considered by the Maltese authorities to be covered by the definition of 'shipping activities'. It is specified that in general 'All activities which are substantially connected to and form a normal part of the ship operating service being offered in the course of the operation of qualifying ships should qualify for the tonnage tax regime'. In particular, the following activities are in that regard specified:
- (a) In relation to the carriage of passengers by sea (cruise ships), all hotel, catering, entertainment and retailing activities on board a qualifying ship, provided that these services are performed as ancillary activities to the activity of carriage of passengers by sea by that ship and are all consumed or used on board that ship;
 - (b) the operation of office facilities in connection with shipping activities subject to tonnage tax;
 - (c) the operation of ticketing facilities and passenger terminals in connection with shipping activities subject to tonnage tax⁽²²⁾;
 - (d) the provision of excursions for passengers of a qualifying ship operated by the company, where any cabin for the passenger remains available for his exclusive use;
 - (e) any interest or similar return earned on working capital where such interest/return is used for the purposes of financing the licensed shipping organisation or its shipping activities and/or the acquisition and maintenance of a tonnage tax ship.
- (20) According to Malta, the activity described in point (a) of recital 19, and in particular consumption or use on board, is interpreted to cover all receipts from goods and services sold to the passengers still maintaining a cabin on board as long as the revenues of the ship mainly stem from the traditional shipping revenues.

2.1.3. The level of the tonnage tax

- (21) Malta charges an annual tonnage tax in the form of a lump sum⁽²³⁾:

Table 1

Ship of Net Tonnage (Net Tons)		Annual tonnage tax
0	2 500	EUR 1 000
2 500	8 000	EUR 1 000 plus 40 cents for every NT in excess of 2 500 NT
8 000	10 000	EUR 3 200 plus 19 cents for every NT in excess of 8 000 NT

⁽²¹⁾ Merchant Shipping Notice, Internal procedure, Transport Malta, Merchant Shipping Directorate, issued by the Registrar General of Shipping and Seamen on 6 January 2012.

⁽²²⁾ The revenues covered are the sale of tickets related to maritime transport or combined transport with a maritime part. The relevant costs covered by the tonnage tax are the costs of operating ticketing offices and ticketing at the terminal.

⁽²³⁾ See First schedule Part B of the Merchant Shipping Act.

Ship of Net Tonnage (Net Tons)		Annual tonnage tax
10 000	15 000	EUR 3 580 plus 14 cents for every NT in excess of 10 000 NT
15 000	20 000	EUR 4 280 plus 12 cents for every NT in excess of 15 000 NT
20 000	30 000	EUR 4 880 plus 9 cents for every NT in excess of 20 000 NT
30 000	50 000	EUR 5 780 plus 7 cents for every NT in excess of 30 000 NT
Exceeding 50 000		EUR 7 180 plus 5 cents for every NT in excess of 50 000 NT

(22) The standard rate is adjusted depending on the age of the ship. The standard rate is only applied to ships that are 10-15 years old. Ships older than 15 years are subject to a surcharge up to a maximum of 50 %. For ships aged 0-5 years a reduction of 30 % applies, for those aged 5-10 years the reduction is 15 % ⁽²⁴⁾.

(23) The First Schedule to the Merchant Shipping Act states that 'The Minister may, under such conditions as he may deem appropriate, exempt any ship or any class of ships from the payment of all or part of the fees payable in terms of these regulations.'

2.1.4. *The flag link requirement*

(24) Pursuant to Article 85A(2) of the Merchant Shipping Act, a non-Community flagged ship can be declared a 'tonnage tax ship' where ⁽²⁵⁾:

(a) the licensed shipping organisation owns, manages or operates at least 60 % of its total tonnage under a Community flag; or

(b) the percentage of the licensed shipping organisation's total tonnage which is Community-flagged immediately after the shipping organisation begins to operate the ship is not less than the percentage of the shipping organisation's total tonnage which was Community-flagged on the reference date ⁽²⁶⁾ or, in the case of ship managers, one year from the date the ship manager started his business (if this is later than the reference date); or

(c) the percentage of Community-flagged tonnage of the beneficiary company has not decreased over a period of three years or such lesser period in which the tonnage tax beneficiary was in existence.

(25) Where the requirements of points (b) or (c) are not fulfilled, the non-Community-flagged ship can still be entered into the tonnage tax scheme if the beneficiary commits to increasing or at least maintaining under the flag of one of the Member States the share of tonnage that was being operated under such flags on the reference date.

2.1.5. *Ring-fencing measures*

(26) The general anti-abuse provisions of Maltese tax law, which provide that schemes aimed at artificially lowering the tax amounts should be disregarded, apply also in respect of the tonnage tax scheme ⁽²⁷⁾.

(27) Switching between the tonnage taxation scheme and the general corporate income taxation system for the purposes of optimising the tax bill is limited by the fact that the decision to leave the tonnage taxation scheme is irrevocable ⁽²⁸⁾.

⁽²⁴⁾ The precise reductions and increases are set out in the First Schedule Part C of the Merchant Shipping Act.

⁽²⁵⁾ As clarified by Malta, the term 'Community flagged' in Maltese legislation covers both EU- and EEA-flagged vessels.

⁽²⁶⁾ As provided in Articles 2 and 3 of the Taxation Regulations, the reference dates are respectively 17 January 2004 for shipping organisations and 11 June 2009 for ship managers (in accordance with chapters 3 and 12 of the Community Guidelines on State aid to Maritime Transport (OJ C 13, 17.1.2004, p. 3), 'the Maritime Guidelines' and chapter 5 of the Commission Communication providing guidance on State aid to ship management companies (OJ C 132, 11.6.2009, p. 6)).

⁽²⁷⁾ Article 51 of the Income Tax Act.

⁽²⁸⁾ Regulation 6 of the Taxation Regulations.

- (28) In respect of any year for which tonnage tax is applied, separate accounts must be kept clearly distinguishing the payments and receipts by the shipping organisation concerned in respect of shipping activities and receipts in respect of any other business ⁽²⁹⁾.

2.1.6. *Exemption from taxation of capital gains arising from the sale or transfer of ships*

- (29) Capital gains arising from the sale or transfer of tonnage tax ships and similar operations are exempt from taxation ⁽³⁰⁾. There are no limitations on this exemption.

2.1.7. *Exemption from taxation of dividends in relation to shares in shipping companies*

- (30) Article 3(1)(a) of the Taxation Regulations stipulates that 'no further tax under the Income Tax Act shall be charged or payable on the income to the extent that such income is derived from shipping activities of a licensed shipping organisation', provided that all relevant fees and taxes have been duly paid by the shipping organisation. This tax exemption applies throughout the whole chain of ownership ⁽³¹⁾.

- (31) As regards the general system of income taxation, the treatment of dividends for shareholders is governed by Article 68 of the Income Tax Act, which provides:

'68. (1) (a) Any person who is not resident in Malta or any individual who is resident in Malta and who is in receipt of a dividend paid out of profits allocated to any of the taxed accounts other than the final tax account shall not be obliged to disclose the existence of such dividend in any return made pursuant to the provisions of the Income Tax Acts.

(b) No person shall be charged to further tax under this Act in respect of the income referred to in paragraph (a).

(c) Any dividends paid out of profits allocated to the final tax account shall not be charged to further tax and shall not form part of the chargeable income of any person and no person may claim a credit or refund in respect of any tax directly or indirectly paid on such profits ...'

- (32) The practical effect of Article 68 of the Income Tax Act is that profits when distributed as dividends are not subject to further tax at shareholder level. It is to be noted that there is also no obligation on recipients to disclose such dividends.

2.1.8. *Exemption from taxation of capital gains in relation to shares in shipping companies*

- (33) Organisations holding equity interests in shipping organisations and shareholders do not pay income tax on capital gains arising from the transfer of those equity interests, provided that the company in which the equity interest is held limits its activities to shipping activities ⁽³²⁾. That exemption applies throughout the whole chain of ownership ⁽³³⁾.

- (34) The Income Tax Act imposes tax on certain capital gains. These are exhaustively specified in Article 5(1) of the Income Tax Act and include in principle those arising from transactions in immoveable property, securities and partnerships. Taxable capital gains are aggregated with taxpayers' other income and are charged at a flat rate of 35 % for companies.

- (35) Article 12(1)(c)(ii) of the Income Tax Act provides a tax exemption for persons not resident in Malta. Specifically any gains or profits accruing to or derived by any person not resident in Malta on a transfer of any shares or securities in a company, which is not a property company, are exempt from the tax, provided that the beneficial owner of the gain is a person not resident in Malta and that person is not owned or controlled by an individual or individuals who are ordinarily resident in Malta.

⁽²⁹⁾ Article 3(4) of the Taxation Regulations.

⁽³⁰⁾ Article 3(1)(b) of the Taxation Regulations.

⁽³¹⁾ Article 3(1)(b) of the Taxation Regulations.

⁽³²⁾ Article 3(1)(c) of the Taxation Regulations.

⁽³³⁾ Article 3(3) of the Taxation Regulations.

2.1.9. *Exemption from taxation of interest or other income payable in relation to financing of shipping companies or tonnage tax ships*

- (36) The Merchant Shipping Act sets out that besides the ownership, operation, administration and management of a ship or ships registered in Malta or under the flag of another state and the carrying on of all ancillary financial, security and commercial activities in connection therewith⁽³⁴⁾ an organisation shall qualify as a shipping organisation if its principal object is — and provided a licence is obtained from the Director-General of Shipping — ‘the raising of capital through loans, the issue of guarantees or the issue of securities for the shipping organisation itself or for other shipping organisations within the same group’⁽³⁵⁾, or ‘for the carrying on of such other activities within the maritime sector which the Minister may, on the advice of the Authority, from time to time prescribe by regulations as qualifying for the above purpose’⁽³⁶⁾.
- (37) Article 3(2) of the Taxation Regulations sets out that no tax under the Income Tax Act shall be payable on interest or other income payable in relation to financing of the operations of licensed shipping organisations set out in Article 84Z(1) of the Merchant Shipping Act or the financing of a tonnage tax ship. According to that provision this exemption is applicable only to licensed banks, credit or financial institutions which are resident in Malta and is granted only upon explicit request to the competent authorities.
- (38) Loans and guarantees from financial institutions to shipowners as well as to operators, managers or administrators of ships might therefore potentially be exempted from income taxation under the Income Tax Act on the profits arising from the relevant activities⁽³⁷⁾.
- (39) The Maltese authorities have confirmed that since the accession of Malta to the European Union no licence was granted for any organisation other than those active in the ownership, operation (under charter or otherwise), administration and management of a ship or ships and that no bank, credit or financial institution within the meaning of Article 84Z(1) of the Merchant Shipping Act has availed itself of such a benefit.

2.1.10. *Exemption from duty on documents and transfers*

- (40) The Duty on Documents and Transfers Act⁽³⁸⁾ applies to transfers of marketable securities, immovable property, auction sales and insurance policies. Marketable securities are defined as ‘a holding of share capital in any company and documents representing the same company’⁽³⁹⁾.
- (41) The Taxation Regulations⁽⁴⁰⁾ express that no duty will be payable on (i) the registration of a tonnage tax ship under the Merchant Shipping Act; (ii) the issue or allotment of any security or interest of a licensed shipping organisation; (iii) the purchase, transfer, assignment of any security or interest of any licensed shipping organisation; (iv) the sale or transfer of a tonnage tax ship; (v) the registration, transfer or discharge of any mortgage or other charge over or in relation to any ship or shipping organisation; (vi) the assignment of any rights and interests, or assumption of obligations in respect of any ship.
- (42) The Duty on Documents and Transfers Act⁽⁴¹⁾ levies a duty on transactions on securities of two euros for every one hundred euros of the amount or value of the consideration or the real value of the marketable security, whichever is the higher.
- (43) However, no duty is applicable to transactions involving securities of a company in which more than half the ordinary share capital, voting rights and rights to profits are held by persons who are not resident in Malta and are not owned or controlled directly or indirectly by persons resident in Malta, provided the company has the majority of its business interests outside Malta⁽⁴²⁾.
- (44) Also exempt from charges generally are transfers made on an intra-group basis in the context of group restructuring exercises⁽⁴³⁾. There are a significant number of other exemptions mostly focused on various legal persons with significant international interests but also in other circumstances such as for collective investment entities.

⁽³⁴⁾ Article 84Z(1)(a) to (c) of the Merchant Shipping Act.

⁽³⁵⁾ Article 84Z(1)(d) of the Merchant Shipping Act.

⁽³⁶⁾ Article 84Z(1)(e) of the Merchant Shipping Act.

⁽³⁷⁾ Article 84Z(1)(d) of the Merchant Shipping Act and Article 3(2) of the Taxation Regulations.

⁽³⁸⁾ The Duty on Documents and Transfers Act, Chapter 364, Malta Government Gazette, 25 November 1992.

⁽³⁹⁾ Article 2 of the Duty on Documents and Transfers Act.

⁽⁴⁰⁾ Article 5 of the Taxation Regulations.

⁽⁴¹⁾ Article 42(1) of the Duty on Documents and Transfers Act

⁽⁴²⁾ Article 47(3) and 47(4) of the Duty on Documents and Transfers Act.

⁽⁴³⁾ Article 42(1)(b) of the Duty on Documents and Transfers Act.

3. GROUNDS FOR INITIATING THE FORMAL INVESTIGATION PROCEDURE

- (45) The opening decision raised doubts regarding the compatibility of the measures described in sections 2.1 to 2.8 with the internal market and in particular with the Maritime Guidelines ⁽⁴⁴⁾.
- (46) On the tonnage tax measures the Commission had the following doubts:
- (a) The Maritime Guidelines limit the application of tonnage tax to ships used for purposes of maritime transport, which is defined as 'the transport of goods and persons by sea' ⁽⁴⁵⁾. However, that definition did not seem to be reflected in the Merchant Shipping Act. Moreover, the Maltese scheme gives the Minister discretion to depart from the broad requirements set out in the Merchant Shipping Act. The Commission considered that profits from ships not involved in maritime transport activities should not be eligible for tonnage tax. In this context, the Commission considered that fishing vessels, pontoons, barges, yachts, cruise vessels, pontoons and oil rigs appeared to be eligible under the Maltese tonnage tax scheme but doubted that this was justifiable.
 - (b) The absence of clear provisions on service/support vessels, tugboats and dredgers gave rise to further doubts on the part of the Commission whether compliance with the rules set out in the Maritime Guidelines is ensured.
 - (c) Concerning capital gains from the sale of ships, the Commission has doubts as to whether exempt transactions were limited to ships bought and sold by shipping companies while under tonnage taxation.
 - (d) The Commission considered that the absence of clear limitations on the eligibility of ancillary activities may lead to the granting of incompatible aid, particularly in case of the sale of certain goods on board of cruise vessels.
 - (e) As to ships clearly involved in eligible activities, the Commission considered that tax benefits should not be extended to all market operators involved in some way with those ships. Ship lessors without any maritime transport activity of their own should not benefit from tonnage tax. Additionally, the Commission had doubts about the unrestricted eligibility of time charterers and similar companies to benefit from tonnage tax.
 - (f) The Commission expressed doubts as to whether, in all cases, the level of taxation was in line with what the Commission had accepted in the past for other Member States.
 - (g) The Commission expressed doubts as to whether the flag link requirements as well as ring-fencing measures were adequate.
 - (h) The Commission questioned the tax treatment of dividends from shares in shipping companies.
 - (i) The Commission also questioned the compatibility with the internal market of the exemption from taxation of capital gains relating to shares in shipping companies.
 - (j) The Commission questioned the compatibility with the internal market of the exemptions from the Duty on Documents and Transfers Act relating to ships. Those exemptions appear to potentially benefit economic operators which are not necessarily genuine shipping companies (notably shareholders).
 - (k) Finally, the Commission considered that exemption from income taxation of profits from the sales of ships and from financing shipping companies was not in line with the Maritime Guidelines.

4. OBSERVATIONS AND COMMITMENTS BY MALTA

4.1. Introduction

- (47) Malta stresses that it has always implemented the tonnage tax with the aim of respecting fair competition and the Maritime Guidelines.

⁽⁴⁴⁾ Commission Communication C(2004) 43 — Community Guidelines on State aid to maritime transport (OJ C 13, 17.1.2004, p. 3).

⁽⁴⁵⁾ The Maritime Guidelines explicitly refer to the definition of maritime transport in Council Regulation (EEC) No 4055/86 of 22 December 1986 applying the principle of freedom to provide services to maritime transport between Member States and between Member States and third countries (OJ L 378, 31.12.1986, p. 1) and Council Regulation (EEC) No 3577/92 of 7 December 1992 applying the principle of freedom to provide services to maritime transport within Member States (maritime cabotage) (OJ L 364, 12.12.1992, p. 7).

- (48) In practice, the Maltese scheme has always been limited to vessels recognised by the Commission as eligible for tonnage taxation (essentially, vessels engaged in the international carriage of goods and passengers). Ancillary services such as financing and brokerage have not benefitted from the tonnage tax.
- (49) At the end of December 2015, the registered gross tonnage under the Maltese flag was 66,2 million (over 3 000 vessels). The fleet flying the Maltese flag is a fundamental component of the maritime activity of Malta and has a vital bearing on the economic viability of its maritime industry as a whole, particularly when considering its position as a small island on the periphery of the Union and the multiplier effect it generates in the Maltese economy.
- (50) This should be compared with 462 ships under the Maltese tonnage tax scheme with a total tonnage of 10,4 million gross tons at the end of 2015.
- (51) Those ships that benefit from the Maltese tonnage tax scheme fly the Maltese flag except for two ships that fly the Norwegian flag. None of the ships in question are operated under bareboat chartering out to third parties or time/voyage-chartering arrangements.
- (52) Ships operated commercially within Maltese territorial waters do not benefit from the Maltese tonnage tax scheme. These are mainly engaged in port operations such as bunkering operations, conveyance and tourist cruises and employ many of the Maltese seafarers.
- (53) There is a distinction to be made between ships that are operated commercially in the transportation of tourists/cargo in Maltese territorial waters and ships engaged in the international trade. It is only the latter that are eligible under the Maltese tonnage tax scheme.

4.2. The tonnage tax scheme

4.2.1. Vessels eligible for tonnage taxation

4.2.1.1. General observations

- (54) According to the First Schedule to the Merchant Shipping Act, tonnage tax is payable in respect of all vessels registered in Malta, including fishing vessels and pleasure yachts.
- (55) However, Malta stresses that not all types of vessels are eligible as 'tonnage tax ships' which benefit from the tonnage tax scheme. This is the case, for example, of fishing vessels and pleasure yachts. Nor is the licensed shipping organisation that owns, operates or manages such vessels entitled to benefit from the tonnage tax scheme on profits that the said licensed shipping organisation derives from such vessels.
- (56) Vessels that are not engaged in shipping activities, such as fishing vessels and pleasure yachts, are required to pay income tax in Malta on their chargeable income in addition to registration fees and annual fees based on tonnage payable pursuant to the Merchant Shipping Act. The latter fees and taxes are also referred to in Malta as 'tonnage tax', however only what Malta has referred to in the past as 'tonnage tax ships' are required only to pay the tonnage tax under the tonnage tax scheme in lieu of income tax under the Income Tax Act.
- (57) The Taxation Regulations provide an exemption from income tax only in respect of income derived from 'shipping activities'. The 2012 Rules on Internal Procedure list a number of vessels which are not eligible for tonnage taxation in exemption of regular income taxation, since the income derived from those vessels does not qualify as income from 'shipping activities'. In particular fishing vessels, pleasure yachts, fixed offshore installations including oil rigs that are not used for maritime transport, non-ocean-going tugs, non-self-propelled floating cranes, and vessels the main purpose of which is to provide gambling and/or casinos do not benefit. Also mobile platforms and pontoons do not qualify for exemptions from regular income taxation. All those vessels simply pay a registration fee and an annual fee based on their tonnage, which is referred to as 'tonnage taxation' or 'tonnage tax' but which does not exempt them from regular income taxation.
- (58) Malta submits that in the future, the registration fee and the annual fee payable by fishing vessels and similar non-qualifying vessels will no longer be called 'tonnage tax' to avoid misunderstandings.

- (59) The discretion of the responsible Minister to accept ships below 1,000 net tons does not mean that vessels which are not involved in shipping activities could be covered by the tonnage tax. The discretion does not eliminate the need for the vessel to be involved in the international carriage of goods or passengers.
- (60) For the sake of clarity Article 85A(1) of the Merchant Shipping Act will be reformulated to read: 'The Minister may with the concurrence of the Minister responsible for finance and subject to such conditions as would be deemed appropriate in line with these Regulations, declare to be a tonnage tax ship, a ship of any net tonnage, which is engaged in shipping activities'.
- (61) Only the categories of ships mentioned in Table 2 have ever been accepted as eligible for tonnage taxation in Malta (with parallel exemption from regular income taxation). Also the composition of the fleet in 2015 is shown in Table 2.

Table 2

Type of ship	Total number of tonnage taxed ships (December 2015)
barge	7
bulk carrier	113
car carrier	5
cement carrier	2
commercial yacht ⁽¹⁾	29
container	12
general cargo	120
passenger	24
roll-on/roll-off (ro/ro)	5
support vessel ⁽²⁾	3
tanker	155
tug	2
TOTAL	477

⁽¹⁾ Yachts of 15 metres in overall length and that do not carry cargo and do not carry more than 12 passengers, not used for pleasure purposes. These are governed by the Commercial Yacht Code issued by the Malta Transport Centre's Merchant Shipping Directorate; <http://www.transport.gov.mt/superyacht-registration/commercial-yacht-code>

⁽²⁾ The support vessels can be divided into two types according to the operations they perform: (i) supply vessels used for the transportation of supplies and equipment to assist the offshore installations; and (ii) conveyance vessels used for the transportation of crew to and from the offshore installations or combinations of both categories.

- (62) Malta has confirmed that 100 % of the ships benefiting from exemptions from regular income taxation (the 'Maltese tonnage taxed fleet') is EU/EEA-flagged/registered ⁽⁴⁶⁾ and that no non-EU/EEA-flagged ship has ever been part of the tonnage taxed fleet since 2004.
- (63) In terms of tonnage, the Maltese tonnage taxed fleet amounted to approximately 10,4 million gross tons at the end of 2015 which is less than 20 % of ships registered in Malta.

⁽⁴⁶⁾ Bareboat chartered vessels are registered in Malta but may fly another flag. The only ships not flagged to Malta benefiting from tonnage tax are flagged EU/EEA.

- (64) Malta submitted a commitment to continue to limit the vessels which are eligible for the tonnage tax scheme to those involved in the international carriage of goods or passengers by sea and certain other shipping activities as have been previously approved by the Commission as eligible under the Maritime Guidelines for tonnage tax purposes on application by other Member States.
- (65) Malta will furthermore specify that only genuine shipping organisations will be able to benefit from tonnage taxation under the scheme, specifically organisations which have assumed risks and responsibilities related (i) to the operation of a ship that carries out maritime transport as defined in the Maritime Guidelines ⁽⁴⁷⁾ (such as responsibilities related to technical management and crewing); or (ii) to the carrying out of maritime transport as defined in the Maritime Guidelines (including with vessels chartered in with crew under certain conditions ⁽⁴⁸⁾).

4.2.1.2. Application of tonnage tax to barges

- (66) Barges which are not engaged in the 'international transport of goods' are not eligible for the Maltese tonnage tax system irrespective of whether they are self-propelled or otherwise. Barges that are designed and normally used for navigation in open seas and that are also engaged in international maritime transport may qualify for the Maltese tonnage tax scheme. This is deemed necessary for cargo that cannot be transported by conventional vessels.
- (67) The energy industry uses barges to transport components such as anchors, pipes, and chains that cannot be transported on conventional ships. Modules for new platforms for drilling and production and drill rigs are also barge-transported. Other barges carry equipment for laying pipe lines in deep water or very high-capacity cranes and derricks. Non-propelled barges are also used to supply power stations with coal.

4.2.1.3. Application of tonnage tax to cruise vessels

- (68) Cruise (passenger) ships qualify for the Maltese tonnage tax scheme. Malta stressed that Cyprus, Denmark France, Germany, Ireland, Italy, the Netherlands, Norway and the United Kingdom consider cruise ships to be qualifying ships, provided that such ships are not mainly used for gambling/casino or similar non-shipping purposes.
- (69) The sector is highly beneficial for the Union maritime cluster and yields a lot of added value to a considerable number of Member States. The industry is subject to aggressive international competition and employs a substantial number of skilled and expert personnel.

4.2.1.4. Application of tonnage tax to commercial yachts

- (70) Commercial yachts used in the international transport of passengers may qualify for the tonnage tax scheme, provided they are registered as commercial yachts in Malta. They must be engaged in the commercial carriage of up to 12 passengers ⁽⁴⁹⁾ and must comply with a set of rigorous safety and operational standards. Yachts that are certified as commercial yachts are considered equivalent to small passenger ships as they are able to sail in international waters. The Malta Commercial Yacht Code ⁽⁵⁰⁾ sets the technical standards which those commercial yachts must meet to qualify as tonnage tax ships. Those standards are equivalent to those regulating the construction and operation of merchant ships which are contained in international conventions such as SOLAS and MARPOL ⁽⁵¹⁾. The rest of the eligibility criteria applicable for commercial yachts are the same as for other types of vessels.
- (71) Owners of these commercial yachts enter into third-party management agreements with yacht management companies. The Taxation Regulations allow both owners and managers to be eligible under the tonnage tax scheme. To date there were no instances where both the owner and the manager of a commercial yacht registered under the Merchant Shipping Act have benefitted from the scheme.

⁽⁴⁷⁾ Section 2 of the Maritime Guidelines.

⁽⁴⁸⁾ See recitals 100 to 101.

⁽⁴⁹⁾ Any vessel carrying more than 12 passengers is defined as a passenger ship in accordance with the International Convention for the Safety of Life at Sea (SOLAS Convention) and thus is required to comply with the requirements and standards provided in the applicable international conventions.

⁽⁵⁰⁾ Commercial Yacht Code issued by the Malta Transport Centre's Merchant Shipping Directorate; <http://www.transport.gov.mt/superyacht-registration/commercial-yacht-code>

⁽⁵¹⁾ The Commercial Yacht Code has been notified to the International Maritime Organisation as an equivalent arrangement to the international conventions.

- (72) The international commercial yachting industry is very competitive and yachts registered in the Union/EEA, are facing increased competition from operators of commercial yachts established outside the EEA. Third countries provide corporate tax incentives to register yachts there.

4.2.1.5. Application of tonnage tax to towage and dredging vessels

- (73) Where a licensed shipping organisation derives income from towage vessels which are tonnage tax ships, the organisation is only entitled to the tonnage tax scheme in respect of that income which it derives from 'shipping activities'. Towage services within harbours are excluded from the tonnage tax scheme. Tugs are only eligible when it is confirmed that the majority of their operational time is spent in the international carriage of goods, respecting the 50 % threshold set out in the Maritime Guidelines ⁽⁵²⁾.
- (74) The 2012 Rules on Internal Procedure exclude non-ocean going tugs from the tonnage tax scheme and make clear that those ships not prescribed are not simply eligible for the tonnage tax scheme but must meet the requirements contained in the Taxation Regulations. The new draft Merchant Shipping Taxation Regulations will state expressly that for tugboats or dredgers to be eligible, they must be registered in an EU/EEA register. Whilst this was not previously spelled out clearly, the latter requirement has always been respected.
- (75) Malta committed to transpose the exact wording of the Maritime Guidelines as regards towing and dredging activities into the relevant texts.

4.2.1.6. Application of tonnage tax to service vessels

- (76) Malta explained that only a few service/support vessels have been covered by the tonnage tax scheme. Those have been multipurpose/break-bulk vessels ⁽⁵³⁾.
- (77) Malta argues that service/support vessels are subject to the same operational and regulatory framework as vessels that perform maritime transport (within the meaning of the Maritime Guidelines), in terms of:
- (a) technical requirements, including all relevant international instruments and regulations governing ship structure, safety, and protection of the environment, as well as classification rules;
 - (b) manning: these ships are manned in compliance with international legislation that also applies to merchant vessels, in particular the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers of the International Maritime Organisation (STCW convention) and the Maritime Labour Convention of the International Labour Organisation; seafarers employed on board these vessels are subject to the same training requirements and to the same working and living conditions as those employed on board traditional merchant vessels;
 - (c) legal environment: ship owners operating these vessels are subject to the same legal constraints as regards security, liability in case of accident or pollution, and competition rules.
- (78) Service vessels are confronted with competition from international competitors, with competitors benefiting from lower wages for crews, lower taxes, reduced maintenance programmes, etc.
- (79) Furthermore, service vessels contribute to the fulfilment of the objectives of the Maritime Guidelines as other (merchant) vessels do. They contribute to the development of the maritime cluster and have a positive impact on employment and on maritime knowhow in the Union.
- (80) Malta has given a commitment to limit the eligible vessels to those involved in international carriage of goods or passengers by sea in accordance with the Maritime Guidelines.
- (81) Malta noted that the Commission has already accepted cable-laying, pipe-laying, research and crane vessels as eligible for tonnage taxation ⁽⁵⁴⁾.

⁽⁵²⁾ Section 3.1 of the Maritime Guidelines.

⁽⁵³⁾ Multipurpose and break-bulk vessels are engaged in maritime transport as defined in the Maritime Guidelines. Break-bulk vessels transport goods that must be loaded individually and not in intermodal containers.

⁽⁵⁴⁾ See e.g. recital 47 of Commission decision of 27 April 2010 in case N 714/09, the Netherlands — Extension of the tonnage tax scheme to cable layers, pipeline layers, research vessels and crane vessels (OJ C 158, 18.6.2010, p. 2).

4.2.2. *Income eligible for tonnage taxation*

4.2.2.1. Eligibility of ancillary services provided in the context of maritime transport

- (82) The term ‘ancillary activities’ referred to in the definition of ‘shipping activities,’ contained in Article 85(1) of the Taxation Regulations, has always been interpreted as requiring the existence of a strict link between the international transport of goods and passengers and the ancillary activity. Whether a particular activity is considered ancillary is examined on a case by case basis.
- (83) In determining whether an activity is ancillary account is taken of the Commentary to Article 8 of the OECD’s Model Tax Convention (‘the Commentary’), including paragraph 4.2 of the Commentary that states that, in the context of international transport, income derived from ancillary operations is income derived from activities which ‘make a minor contribution relative to [the operation of ships in international traffic] and are so closely related to such operation that they should not be regarded as a separate business or source of income of the enterprise’.
- (84) Malta stresses that passenger transport normally includes a variety of complementary services which are included in the ticket price. These services include the provision of sleeping accommodation and catering and also other services which form part of the passenger’s expectation during the same journey such as embarkation and disembarkation services. Passengers of large passenger ships would also expect to have a cinema, spa, hairdresser and similar services. Such services and local excursion services are to be considered ancillary activities to the shipping activity provided the relevant service represents a bought-in service at arm’s-length conditions. Malta also stressed that it is a legal requirement that the shops on board cruise ships are closed while the ships are at port.
- (85) Ticket sales are the primary source of revenues for cruise ships’ operators and on-board earnings are an ancillary but key component for the sustainability of the passenger carrying activity. Industry reports estimate that the majority of cruise ship revenues (60 % or more) are derived from ticket sales.
- (86) The 2012 Rules on Internal Procedure specifically exclude from the tonnage tax scheme ‘vessels the main purpose of which is to provide goods or services normally provided on land (e.g. floating hotel, supermarket or restaurant)’ and floating or cruising casinos. Of the 26 passenger ships that have benefitted from the tonnage tax scheme 17 do not have a casino service or sell luxury goods.
- (87) Malta submitted a commitment that upon the entry into force of the new Merchant Shipping Taxation Rules a number of activities that may be in competition with land-based companies and that are therefore not eligible for the tonnage tax scheme will be explicitly excluded. Those activities will include the sale on board of goods or services not customarily provided to passengers, for example, cars, domestic appliances or livestock or ship-based holidays where the ship remains moored and there is no sea transportation element.
- (88) Furthermore, Malta has given a commitment to cap revenues from ancillary activities at a maximum of 50 % of the gross revenues for each ship. Verification of compliance by the tax authorities will be carried out at the level of each ship within a group.
- (89) The capped ancillary activities that can benefit from tonnage tax will include:
- ‘(a) the carriage of passengers or cargo otherwise than on board a tonnage tax ship operated by the licensed shipping organisation, where
 - (i) there is a single contract with the customer for a journey which includes a voyage on the tonnage tax ship; and
 - (ii) the transport for the remainder of the journey is purchased or obtained by the licensed shipping organisation by provision which would have been made as between independent enterprises;
 - (b) sales and facilities which are normally provided to customers by seagoing passenger ships, including:
 - (i) the sale of alcoholic beverages, perfume and tobacco;
 - (ii) the exchange of amounts of different currencies for personal expenditure;
 - (iii) health and beauty and spa and wellness services;

- (c) administrative and insurance services which are directly related to the carriage of passengers or cargo, including under a single journey contract which includes a voyage on the tonnage tax ship;
 - (d) the provision of holidays, sold to the customer under a single contract, where
 - (i) part of the holiday is a voyage on a tonnage tax ship operated by the licensed shipping organisation, and the remaining part is land-based ("the land-based part");
 - (ii) the land-based part is purchased or obtained by the licensed shipping organisation by arm's length provision;
 - (e) the loading and unloading of cargo carried on a tonnage tax ship operated by the licensed shipping organisation, and the provision by the licensed shipping organisation of facilities used exclusively for those purposes;
 - (f) the consolidation or breaking of cargo carried on a tonnage tax ship operated by the licensed shipping organisation, immediately before or after the voyage, where the activity is not haulage-related;
 - (g) the temporary placement of cargo carried on a tonnage tax ship operated by the licensed shipping organisation, on or at the dockside, where the activity is not part of a long-term storage operation;
 - (h) the rental or provision to customers of containers for goods to be carried on a tonnage tax ship operated by the licensed shipping organisation;
 - (i) the provision of excursions for passengers of a tonnage tax ship operated by the licensed shipping organisation, where any cabin for the passenger remains available for exclusive use;.
- (90) Furthermore, the following ancillary revenues will be covered by the capped:
- (a) advertising and marketing, if these correspond to the sale of advertising space on board tonnage tax ships; and
 - (b) betting or gambling facilities normally offered to customers by seagoing passenger ships for on-board entertainment, and the sale to passengers on seagoing ships of luxury goods of a kind normally offered to such passengers, provided that the turnover from such activities amounts to less than 25 % of the gross revenues of the tonnage taxed ship.
- (91) According to the 2012 Rules on Internal Procedure non ship-specific ancillary activities, which are currently subject to tonnage tax in Malta, comprise (i) the operation of ticketing facilities and passenger terminals in connection with shipping activities subject to tonnage tax; (ii) any interest or return earned on working capital, where the interest/return is used for the purposes of financing the licensed shipping organisation or its shipping activities; (iii) and/or the acquisition and maintenance of a tonnage tax ship. Those activities will in the future legislation continue to benefit from tonnage tax under the heading 'Other ancillary activities recognised as eligible for tonnage tax purposes by the European Commission', as long as it will not lead to overall gross revenue from ancillary revenues (both ship-specific and other) exceeding 50 % of tonnage taxed revenues of a beneficiary company.
- (92) From a review covering the period 2004-2016 by the Registrar-General of Shipping and Seamen it resulted that all those which benefited from the tonnage tax scheme had respected the 50 % ceiling, in terms of the gross revenue as far as the ancillary activities are concerned. Particular attention was paid to cruise ships given the significance of this revenue. Checks carried out, per vessel, on the companies benefiting from tonnage tax, demonstrated that revenues from ancillary activities were well below the 50 % limit. Malta has subsequently confirmed that a 50 % threshold has been observed since May 2004 in respect of ancillary revenues. Malta stressed that the profits of any sub-contractors have never been eligible for tonnage tax.
- 4.2.2.2. Application of tonnage tax to entities chartering out eligible vessels on a bareboat basis
- (93) Malta argues that, in contrast to financial lessors, owners of ships which charter their ships out on a bareboat basis are not extraneous to the shipping industry and carry a certain level of responsibility for their vessels.

- (94) When the ship is exclusively involved in eligible activities and operated by the owner of the ship, the entire income from the ship is subject to tonnage tax. In this context, Malta considers that the same principle should be followed when the relevant income is shared between the owner of the ship and the operator, provided the necessary conditions (including the payment of tonnage tax by each party) are satisfied. Malta argues a too strict approach on this matter may lead to ship owners flagging out their ships outside the Union and higher ship rent rates for Union shipping companies.
- (95) No bareboat chartered out ships which were accepted in the past under the tonnage tax scheme were ships bareboat chartered out to third parties, as demonstrated by the overview covering the period 2004-2016 submitted to the Commission services.
- (96) Bareboat chartered out ships form approximately 10 % of ships falling under the Maltese tonnage taxation scheme. The charters were intra-group ⁽⁵⁵⁾.
- (97) To ensure that *de jure* there is no possibility in the future for pure ship lessors (including those leasing small yachts to natural persons ⁽⁵⁶⁾) to benefit from the tonnage tax scheme Malta has provided a commitment to limit the eligibility of bareboat chartering out transactions to:
- (a) intra-group transactions ⁽⁵⁷⁾;
 - (b) transactions of genuine shipping companies with third parties due to short-term over-capacity where the term of the charter does not exceed three years and provided that net tonnage chartered out on bareboat charter basis to third parties is below 50 % of the total tonnage of the tonnage tax company/group; the term 'short-term over-capacity' refers solely to ships acquired by the licensed shipping organisation for the purposes of carrying out its own shipping activities and does not include any ships specifically acquired for the purposes of chartering out on a bareboat basis.

4.2.2.3. Application of tonnage tax to transport services provided with ships rented from other companies with crew (time/voyage chartering)

- (98) Malta has confirmed that since 2004 no tonnage tax beneficiary in Malta has engaged in time chartering or similar activities.
- (99) Malta stressed, however, that the very nature of shipping calls for a possibility of flexible and swift decision-making from ship owners to adapt to developments on the market. Malta stressed that the Maritime Guidelines do not provide a limitation on the maximum tonnage which an organisation is able to charter in with crew in order to be entitled to the aid allowed under the Maritime Guidelines.
- (100) A time-chartered fleet is subject to the general flag link requirements of the Maltese law. The flag link requirement applies to the entire tonnage taxed fleet ⁽⁵⁸⁾. All time/voyage chartered ships that have been accepted under the Maltese tonnage tax scheme since May 2004 are EEA-flagged.
- (101) Malta clarified that it would require new entrants to have at least 25 % of their tonnage-taxed fleet under EEA flags, in line with the approach approved by the Commission in the French tonnage tax case ⁽⁵⁹⁾.

4.2.3. Application of the flag link rule

- (102) It is only since 2010 that the Taxation Regulations allow also non-EEA/EU registered vessels to be covered by the tonnage taxation subject to the conditions described in recital 27. Therefore the vast majority of the Maltese tonnage taxed fleet (90 %) is EEA/EU-flagged.

⁽⁵⁵⁾ A group is defined as two or more shipping companies which are owned and controlled, directly or indirectly, to more than fifty per cent by the same persons as well as in all control situations (independently of ownership percentage) as defined in Article 1 of Seventh Council Directive 83/349/EEC of 13 June 1983 based on the Article 54(3)(g) of the Treaty on consolidated accounts (OJ L 193, 18.7.1983, p. 1), and IFRS 10 'Consolidated Statements'.

⁽⁵⁶⁾ Small yachts which do not correspond the definition referred to in footnote 49.

⁽⁵⁷⁾ See footnote 55.

⁽⁵⁸⁾ Except for bareboat chartered out ships.

⁽⁵⁹⁾ Commission Decision (EU) 2015/667 of 4 February 2015 on State aid SA.14551 (2013/C) implemented by France resulting from the change to the conditions for aid granted to time charterers under the tonnage tax scheme (OJ L 110, 29.4.2015, p. 15), recital 46.

- (103) Malta has provided a commitment to require that any new entrant has at least a 25 % share of EEA-flagged vessels in the tonnage taxed fleet it operates ⁽⁶⁰⁾ which it will have to maintain or increase in accordance with section 3.1 of the Maritime Guidelines. Under this commitment the share of the EEA-flagged fleet of tonnage tax beneficiaries must not decrease on average over a period of three years. A derogation from this obligation will be granted only when 60 % of the tonnage taxed fleet ⁽⁶¹⁾ that the beneficiary company operates is EEA-flagged. A check will be done whenever a vessel is added or taken out of a tonnage tax fleet.
- (104) Malta has also submitted a commitment that the entire strategic and commercial management must take place within the EEA.
- (105) Vessels which are not commercially and strategically managed from the EEA, will be accepted under the tonnage tax scheme only if flying an EEA flag, except for vessels bareboat chartered out, under conditions respecting certain limitations ⁽⁶²⁾.

4.2.4. Tonnage tax rates

- (106) Malta stressed that its tonnage tax scheme is based on a similar principle as the Cypriot tonnage tax scheme approved by the Commission in 2010. Malta charges an annual tonnage tax in the form of a lump sum depending on the tonnage of the vessel.
- (107) The rates of tonnage tax payable in Malta vary according to the net tonnage of the vessel as well as age. Table 3 provides a comparison of the level of tonnage tax payable in Malta in relation to the Cypriot and Polish tonnage tax schemes approved by the Commission.
- (108) Malta stresses that if one were to consider the change in tax payable as determined solely by the tonnage of the vessel ⁽⁶³⁾, the estimated annual tonnage tax payable in Malta would be very similar to that payable in Cyprus and Poland:

Table 3

Net Tonnage	Malta	Cyprus	Poland
2 500	1 000	830	711
8 000	3 200	2 537	2 046
10 000	3 580	3 158	2 531
15 000	4 280	4 161	3 225
20 000	4 880	5 165	3 918
25 000	5 330	6 169	4 473
30 000	5 780	6 808	4 820
40 000	6 480	8 086	5 513
50 000	7 180	8 816	6 207
60 000	7 680	9 546	6 900

- (109) Malta furthermore stresses that the tonnage tax calculation shown for Poland in table 3 assumes that the vessels will be operational for 365 days in a year. Vessels under the Polish tonnage tax scheme not operational for the full year are entitled to a pro-rata reduction. In Cyprus where the vessel is laid-up for a period of at least three months, the amount of tonnage tax payable in respect of such vessel is reduced by 25 %.

⁽⁶⁰⁾ Including chartered in vessels (with crew or on a bareboat basis) but excluding vessels bareboat chartered out.

⁽⁶¹⁾ Including chartered in vessels (with crew or on a bareboat basis) but excluding vessels bareboat chartered out.

⁽⁶²⁾ See commitment 4 in the Annex to this decision.

⁽⁶³⁾ Standard tax rate which applies to ships in the most common age category (10-15 years).

- (110) Malta provides a reduction from the standard tonnage tax rate where the vessel is less than 10 years old. At the same time, Malta increases the tonnage tax payable when the vessel is 15 years old or more. The purpose of this rule is to encourage shipowners and operators to register younger (and therefore more efficient and environmentally-friendly) vessels and discourage them from registering older vessels. Since newer vessels are in general likely to be safer, more secure, more efficient and more environmentally friendly than older vessels, such a rule is considered to support the first objective listed in section 2.2 of the Maritime Guidelines, that is, 'improving a safe, efficient, secure and environment friendly maritime transport'. This also contributes towards the 2020 targets on the mitigation of greenhouse gas emissions adopted by the EU.
- (111) Malta argued that the increase in the tonnage tax rate when the vessel becomes older should be taken into account when considering the rate overall. However, in any event, given the reductions applied in Poland and Cyprus relating to the non-operation of vessels, even with the reduction applied in Malta the rates are comparable. For purposes of proper comparison Malta submitted that where a vessel was in operation 75 % in Poland the comparison between Malta and Poland would look as set out in table 4:

Table 4

Net Tonnage	Poland	Malta (vessel 0-5 y)	Malta (vessel 5-10 y)
2 500	533,25	700	850
8 000	1 535	2 240	2 720
10 000	1 898	2 506	3 043
15 000	2 419	2 996	3 638
20 000	2 939	3 416	4 148
25 000	3 355	3 731	4 530
30 000	3 615	4 046	4 913
40 000	4 135	4 536	5 508
50 000	4 655	5 026	6 103
60 000	5 175	5 376	6 528

- (112) With regard to the discretion of the Minister to '[...] under such conditions as he may deem appropriate, exempt any ship or any class of ships from the payment of all or part of the fees payable in terms of these regulations' Malta explained that this rule applies solely to annual and registration fees, also called tonnage taxes, and only to ensure flexibility in cases involving humanitarian and philanthropic situations. This rule has never been applied.
- (113) As to reductions on the account of tonnage tax paid in another State, Malta explained that the purpose of the relevant rule is prevention of the double taxation. An entity that has been subjected to tonnage tax in respect of a vessel in another country should not then be made to pay again the full tonnage tax in Malta. The system of relief from double tonnage taxation that is granted by Malta is based on the ordinary credit method that applies also in the context of income taxes. Malta pointed to previous statements of the Commission on the matter consistent with this approach ⁽⁶⁴⁾.
- (114) The double taxation relief is limited to the lower of the actual tonnage tax incurred in respect of the vessel outside Malta or 75 % of the Maltese tonnage tax that would be payable before the granting of any credit. Relief is only granted for tonnage tax paid in respect of the same vessel by the same licensed shipping organisation in another Member State.

⁽⁶⁴⁾ Commission Communication, 'Towards an Internal Market without Tax Obstacles', COM (2001) 582 final, 23 October 2001 and Commission Communication 'Co-ordinating Member-States' direct tax systems in the Internal Market', COM (2006) 823 final, 19 December 2006.

4.2.5. Ring-fencing measures

- (115) Malta maintains that the ring-fencing measures contained in the Taxation Regulations effectively dissuade abuses and prevent spill-overs into non-eligible activities.
- (116) The Taxation Regulations impose the obligation on a licensed shipping organisation to maintain separate accounts that distinguish income and gains derived from shipping activities from other sources of income. In addition, a licensed shipping organisation is also obliged to prepare financial statements that are in accordance with International Financial Reporting Standards endorsed by the Union and submit them to audits by a certified public accountant.
- (117) Failure to maintain separate accounts will automatically disqualify a shipping organisation from benefitting from any of the tax exemptions.
- (118) A licensed shipping organisation has an obligation to register with the Minister responsible for Finance, if it wishes to benefit from the tonnage tax system.
- (119) A licensed shipping organisation that derives benefits from the tonnage tax system is required to submit an annual income tax return that clearly shows the split between eligible and non-eligible income. In situations where the entire income of a licensed shipping organisation falls within the scope of the tonnage tax system, in lieu of a tax return the said organisation has the option to submit a declaration which must be submitted by a qualified person that is independent of the licensed shipping organisation being either a certified public accountant and auditor or a person holding the warrant of advocate. Severe penalties exist in case of false declarations or gross negligence of such duties.
- (120) Losses from activities subject to income tax cannot be set off against tonnage tax liability.
- (121) A shipping organisation cannot decide whether to opt in or out of the Maltese tonnage tax system depending on whether it has taxable profits or losses. Unless the licensed shipping organisation elects otherwise, it falls within the scope of the tonnage tax scheme. Where the organisation opts out this decision is irrevocable ⁽⁶⁵⁾.
- (122) No Maltese shipping organisation may have part of its ships under the tonnage tax scheme and part under the income tax scheme ⁽⁶⁶⁾.
- (123) Article 51 of the Income Tax Act contains wide ranging anti-abuse provisions intended to counter artificial arrangements and schemes aimed at obtaining any unjustified tax advantage. This general anti-abuse rule follows the Commission Recommendation of 6 December 2012 on Aggressive Tax Planning ⁽⁶⁷⁾. The anti-abuse measures are supported by severe penalties that are imposed in case of breaches. Thus, in such cases, apart from payment of the unpaid tax, interest is imposed at the rate of 0,54 % per month (i.e. 6,48 % per annum), together with additional penalties at the rate of up to 1,5 % per month (i.e. 18 % per annum) on such unpaid tax.
- (124) The rules on deductibility of expenses contained in the Income Tax Act require the existence of a direct link between an expense and the income it produces. Article 14(1) of the Income Tax Act only allows an expense to be deductible if the expense is 'wholly and exclusively incurred in the production of the income'. It is therefore not possible to claim deductions for expenses incurred in generating exempt profits (including tonnage taxed profits) against other types of taxable income.
- (125) All licensed shipping organisations are required to maintain proper and sufficient records of its income and expenditure to enable the respective income and allowable deductions to be readily ascertained.

⁽⁶⁵⁾ Article 6 of the Taxation Regulations.

⁽⁶⁶⁾ Article 6 of the Taxation Regulations.

⁽⁶⁷⁾ OJ L 338, 12.12.2012, p. 41.

- (126) Malta submitted a commitment to require beneficiaries of tonnage tax to submit mandatory annual compliance declarations for all controllable parameters such as type of vessel, activities performed with the vessel, net tonnage, days in use, flag, types of operation and compliance with the aid ceiling.

4.3. Tax treatment of dividends in relation to shares in shipping companies

- (127) Malta explained the operation of the general Maltese tax system. Under this system dividends paid to shareholders by Maltese companies do not incur liability to declare the dividend ⁽⁶⁸⁾ and pay taxation ⁽⁶⁹⁾. This system applies without exception to all sectors.

4.4. Exemption from taxation of capital gains from the sale or transfer of ships

- (128) Malta refers to the relevant Maltese legislation which requires that a ship be a tonnage tax ship in order for it to take advantage of the tax exemption ⁽⁷⁰⁾.
- (129) Malta furthermore explains that only ship sales and transactions related to tonnage tax ships bought and sold by shipping companies while under tonnage taxation have ever benefitted from the tax exemption in the past. Furthermore, in Malta the decision to leave the tonnage tax regime is irrevocable.

4.5. Exemption from taxation of capital gains in relation to shares in shipping companies

- (130) Malta submitted that in order to ensure the competitiveness and attractiveness of European registers compared to those of third countries shipowners (i.e. shareholders) should be able to enjoy the fruits of the shipping activities carried out.
- (131) Under Article 12(1)(c)(ii) of the Income Tax Act any gains or profits accruing to or derived by any person not resident in Malta on a transfer of any shares or securities in a company, which is not a property company, are exempt from the tax, provided that the beneficial owner of the gain is a person not resident in Malta and such person is not owned and controlled by an individual or individuals who are ordinarily resident in Malta. Additionally a participation exemption applies under Article 12(1)(u)(1) of the Income Tax Act which stipulates that any income or gains derived by a company registered in Malta from a participating holding or from the transfer of such holding is exempt from the tax.
- (132) The double taxation agreements entered into by Malta, in line with the provisions of Article 13(5) of the OECD Model Tax Convention, allocate the right to tax such capital gains to the country of residence of the person. Malta has double taxation treaties with all EEA Member States.
- (133) The only share transfer transaction involving a Maltese shareholder since Malta's accession to the Union was a transaction which took place in 2006. This transaction related to the transfer of shares in [...]. The benefit of the relevant tax exemption was well below the *de minimis* threshold ⁽⁷¹⁾, involving a maximum — theoretical — aid amount of below EUR 1 400 given the sales price, even counted together with the benefit of the related exemption from the duty as regards transaction with ships. The shareholder received no further aid in the relevant period and has also not benefitted from tonnage tax ⁽⁷²⁾.
- (134) All share transactions carried out otherwise since 2004 would have benefitted from the exemption from capital gains tax for non-residents, enshrined in Article 12(1)(c)(ii) of the Income Tax Act.
- (135) Malta provided a commitment to remove the current sector-specific exemption from taxation of capital gains stemming from the sale of shares in shipping companies for Maltese residents.

⁽⁶⁸⁾ Article 68(1) a of the Income Tax Act.

⁽⁶⁹⁾ Article 68(1) b of the Income Tax Act.

⁽⁷⁰⁾ Article 3(1)(b) and (4) of the Taxation Regulations.

⁽⁷¹⁾ Commission Regulation (EU) No 1407/2013 of 18 December 2013 on the application of Articles 107 and 108 of the Treaty on the Functioning of the European Union to *de minimis* aid (OJ L 352, 24.12.2013, p. 1).

⁽⁷²⁾ Shipping companies active only in Maltese territorial waters cannot benefit from tonnage tax, see recital 52.

4.6. Exemption from taxation of interest of other income in relation to financing of shipping companies or tonnage tax ships

- (136) Article 3(2) of the Taxation Regulations provides that, 'no tax under that Act [the Income Tax Act] shall be payable by any person on interest or other income payable to him in relation to any financing of the operations [...] of licensed shipping organisations, or the financing of any tonnage tax ship [...]. This exemption is not granted automatically but upon request. Malta has confirmed that no enterprise has ever been granted such an exemption. The Maltese authorities have confirmed that such exemption has never been granted including since the accession of Malta to the European Union and that 'no company has availed itself of such benefit'.
- (137) Malta has given a commitment to delete Article 3(2) of the Taxation Regulations.

4.7. Absence of duty as regards transactions with ships

- (138) Malta submitted that the provisions contained in the Taxation Regulations providing that no duty shall be charged as regards certain transactions with ships ⁽⁷³⁾ are of an informative nature. They do not provide any benefit to shipping companies as such transactions with ships are not subject to a duty under the Duty on Documents and Transfers Act, since duty is in general only chargeable on transfers of marketable securities, immovable property, auction sales and insurance policies.

4.8. Exemption from duty on documents and transfers

- (139) Similarly as in the case of capital gains from the sale of shares, Malta explained the exemption from duty ⁽⁷⁴⁾ set out in Article 5 of Taxation Regulations did not have a significant impact in the period since 2004 given the shareholder structure of the companies subject to the tonnage tax and the general exemptions existing under the Duty on Documents and Transfers Act.
- (140) Based on Article 47(3)d and 47(4) of the Duty on Documents and Transfers Act, no duty is applicable on transactions involving securities of a company in which more than half the ordinary share capital, voting rights and rights to profits are held by persons who are not resident in Malta and are not owned or controlled directly or indirectly by persons resident in Malta, provided the company has the majority of its business interests outside Malta. Transfers made on an intra-group basis in the context of group restructuring exercises, between companies which are majority owned and controlled by the same shareholders, benefit from an exemption under Article 42(1)(b) of that Act.
- (141) Malta has confirmed that only one transaction not covered by the general exemption from duty mentioned in recital 140 has taken place since 2004, involving shares owned by a Maltese shareholder. This transaction did not — in terms of tax benefit — exceed the *de minimis* threshold, even after adding the benefit of exemption from the capital gains taxation ⁽⁷⁵⁾.
- (142) Malta, has submitted a commitment to remove the exemption set out in Article 5 of the Taxation Regulations in respect of Maltese residents.

4.9. Entry into force of the commitments

- (143) Malta committed that the new rules that would render the measures of this Decision compatible with the internal market will come into force within three months of the date of this Decision. From the moment of adoption of this Decision and until the entry into force of the commitments, Malta gave a commitment to continue to administer the tonnage tax scheme and the other measures forming the object of this Decision in a way that does not lead to payment of incompatible aid that would then need to be recovered from the beneficiaries.

⁽⁷³⁾ Article 5 of the Taxation Regulations sets out that no duty is payable on the registration or transfer of tonnage tax ships; the assignment of rights over ships; and the registration of mortgages or other charges, see also recitals 40 ff.

⁽⁷⁴⁾ The exemption covers in particular the duty on the registration of tonnage tax ships and of mortgages and the transfer of shares, see recital 41.

⁽⁷⁵⁾ See recital 133.

4.10. Legitimate expectations, legal certainty, existing aid status

- (144) Malta has submitted that the scheme should be treated as existing aid and that there is a legitimate expectation to that effect on the part of Malta and shipping organisations.
- (145) Malta's tonnage tax scheme and accompanying measures were established in 1973. In this respect Malta submitted the relevant parts of the Merchant Shipping Act of 1973 in its original version ⁽⁷⁶⁾ and in particular Articles 85 and 86, which define exempt ships and the income exempt from income tax.
- (146) Malta submits these aid measures were subjected to the pre-accession screening process. Competition issues related to transport, including tonnage tax, were explicitly included under the Transport chapter during accession negotiations. Malta highlights that its tonnage tax scheme was not flagged as problematic by the Commission at the time. Malta asserts, by reference to correspondence, that the information it provided about this scheme proved satisfactory to the Commission. Malta refers specifically to the meeting of the Accession Conference of Malta to the EU held on 26 October 2001 where its notes reflect it was agreed to recommend the provisional closure of the negotiations on the transport Chapter. Malta asserts that, like those shipping organisations that have benefitted from the tonnage tax scheme, it has always understood and believed that the scheme was fully in line with the Maritime Guidelines.
- (147) The relevant Maltese legislation, the Merchant Shipping Act and the Taxation Regulations, were communicated to the Commission before 31 August 2004 as required by the Accession Act ⁽⁷⁷⁾. The tonnage tax scheme was communicated to the Commission in document CONF-M 51/00 of 19 October 2000 as supplemented by document CONF-M 65/01 of 18 September 2001.
- (148) The relevant legislation did not change between the date of accession and 1 May 2007. The national provisions were amended only in 2010 to transpose the principles introduced by the Communication from the Commission providing guidance on State aid to ship-management companies ('the Ship-management Guidelines') ⁽⁷⁸⁾.
- (149) Malta reminded the Commission that the tonnage tax scheme was not mentioned among the schemes needing to be adjusted when the three-year period granted by the Accession Treaty for amending existing aid measures was about to expire and that it therefore considered the scheme existing aid. In its letter of 24 April 2007 the Commission mentioned only two aid measures: Public Service Obligation — Gozo Channel Co Ltd and Public Service Obligation Sea Malta Co Ltd.

5. COMMENTS FROM THIRD PARTIES

- (150) As mentioned at recital 3 comments were received from six interested parties and a German shipping sector employee wishing to remain anonymous. These are summarised in recitals 151 to 177

5.1. Vessels eligible for tonnage taxation

- (151) The European Community Shipowners' Association ('ECSA') agreed with the Commission's initial assessment that fishing vessels, oil rigs and non-commercial leisure yachts should not be eligible for tonnage tax.

5.2. Application of tonnage tax to barges

- (152) The Malta International Shipping Council stressed that non-propelled barge carry cargo while the towing vessel ensures that the cargo reaches its destination. This was therefore one single operation and each ship had to be eligible for tonnage taxation.

⁽⁷⁶⁾ As amended by Act XXIV of 1986 and adding Article 85A authorising the responsible minister to accept as 'exempted' ships also ships under 1 000 net tons.

⁽⁷⁷⁾ Act concerning the conditions of accession of the Czech Republic, the Republic of Estonia, the Republic of Cyprus, the Republic of Latvia, the Republic of Lithuania, the Republic of Hungary, the Republic of Malta, the Republic of Poland, the Republic of Slovenia and the Slovak Republic and the adjustments to the Treaties on which the European Union is founded ('Accession Act') (OJ L 236, 23.9.2003, p. 33).

⁽⁷⁸⁾ OJ C 132, 11.6.2009, p. 6.

5.3. Application of tonnage tax to cruise vessels

- (153) The Malta International Shipping Council stressed that operation of cruise ships is synonymous with the carriage of passengers.
- (154) The ECSA submitted that the primary purpose of cruise ships is maritime transport even if used for leisure. ECSA also stressed cruise ships are subject to the same control and regulation as other large ocean-going vessels and their seafarers must meet the same certification requirements. They are also subject to the same flag and port state control and the same international conventions as all other vessels travelling internationally. The cruise industry has contributed significantly towards achieving the objectives of the Maritime Guidelines. The cruise industry faces competitiveness constraints from outside the Union. To the extent that a Contracting Party to the EEA Agreement or a Member State imposes taxes (or other costs) that are not imposed by other countries, the Member State can anticipate a movement of vessels to flag to another state where the overall cost is lower.

5.4. Application of tonnage tax to commercial yachts

- (155) Malta International Shipping Council, Malta Chamber of Commerce, Enterprise and Industry as well as Super Yachts Industry Network — Malta stressed that commercial yachts are active in the transportation of passengers where a great deal of international competition exists with offshore centres to attract the business of setting up ownership companies and registering commercial yachts.

5.5. Application of tonnage tax to service vessels

- (156) The ECSA insisted that there should not be a definitive and exclusive list of eligible vessel-types. It submitted there is no real difference between 'service' and 'transport' activities, all being commercial shipping activities. It welcomed recognition by the Commission of the eligibility of some service ships (for example, cable-layers) for State aid.

5.6. Income eligible for tonnage taxation

5.6.1. *Taxation of capital gains from the sale of tonnage tax ships*

- (157) The ECSA submitted that profits derived from buying and selling assets related to the normal operations of a ship operator should only be excluded from tonnage tax where a company has no other activities than buying and selling shipping assets. In that case, the company itself cannot be regarded as performing shipping services.
- (158) The ECSA argued capital gains from ship sales should also be covered by tonnage tax for ships acquired before entry into the tonnage tax scheme, whereby tonnage tax schemes should include fair and equitable transitional arrangements taking account of any fiscal claim accrued in the period before applying the tonnage tax.

5.6.2. *Application of tonnage tax to ancillary services provided in the context maritime transport*

- (159) According to the ECSA ancillary activities should be a normal part of the shipping service being offered by a shipping organisation. They argue there is no need to define 'ancillary activities' for the purpose of the application of the Maritime Guidelines but to leave it to Member States to make their own detailed interpretation under the monitoring of the Commission.
- (160) The ECSA agree with the Commission that services offered by financial institutions to shipping companies which happen to be in tonnage tax — such as loans and guarantees — should not be regarded as eligible 'ancillary activities'.
- (161) If the sole business of a company is the operation of qualifying ships, then the whole profit from the ship-operating business should fall inside the ring-fence as long as the business activities accord with custom and practice for the sector.

- (162) The ECSA noted many companies charge for their services on an inclusive basis and the broad approach would allow them to avoid the requirement to make arbitrary calculations for the purposes of apportioning profits. The ECSA stressed that the broad approach is supported by the OECD's Model Tax Convention.
- (163) The ECSA submitted that separately charged services are a necessary and normal element in the economic operation of most passenger shipping services. Without them the shipping activity would be unattractive to customers and not viable for shipping companies, therefore they should qualify for tonnage tax.
- (164) As regards cruise operations, the transport package consists also of a variety of services offered during the trip which form part of the passenger's expectations. The ECSA submitted these include communication services, bars, currency exchange, shore excursions, shopping, health & beauty, and entertainment. In some cases, like shore excursions, these ancillary activities are a service bought-in by the cruise line — they are normally 'packaged' by local agents who sell to the cruise line — and therefore they should be included as an eligible activity.
- (165) The ECSA recognises the principle of avoiding unfair competition with on-shore domestic businesses, noting that using ships primarily as floating supermarkets, casinos, or static hotels would not be acceptable.
- (166) The Malta International Shipping Council made similar representations about cruise and passenger packages.

5.6.3. *Application of tonnage tax to entities chartering out eligible vessels on a bareboat basis*

- (167) The ECSA argued Member States should decide whether any restrictions should be introduced, taking into account, for example, how the national shipping industry and maritime cluster are organised.
- (168) The Norwegian Shipowners' Association explained that bareboat chartering is a common arrangement for shipping companies. However, only a small percentage of the shipping companies' total tonnage is usually chartered out on bareboat term. There are few companies which only own ships that are bareboat chartered out. If income from bareboat chartering out is not fully tax exempt, EEA-based vessel owners would not be able to provide competitive charter rates. Furthermore, companies servicing the oil and gas industry operating on foreign shelves will usually separate the vessel ownership and operational activities in order to be competitive in the operating state. Often bareboat chartering out is the only possibility for entering protected foreign markets. Also, when the charterer is an oil-related company, the charterer often has its own in-house crewing and technical ship-management services organisation, which the charterer wishes to employ. There are also territories where the risk related to crew cost and availability, cost and timely access to ship repairs and other necessities for running the ship are deemed unacceptable and therefore bareboat chartering out arrangements are preferred.
- (169) The Norwegian Shipowners' Association argue that allowing tonnage taxed companies to bareboat charter ships out, will not lead to an increase of State aid to the shipping industry ⁽⁷⁹⁾. The tax exempted shipping income is merely split between the ship owning company, which charter the ship out, and the company operating the ship (for the ship operating company the tax exempted income is reduced with the bareboat hire, which is tax exempted income for the ship owning company).
- (170) Malta International Shipping Council submitted that ship owning and ship operating must be treated as a whole. Ship owning and ship operating activities can be carried out by the same organisation. At other times different entities focus on one activity. The different entities all have costs and responsibilities including that of seeing that the primary operation is run safely and efficiently. It is stressed that Maltese law and international law place heavy obligations and responsibilities on the owner of the ship even when it is bareboat chartered out. Therefore, if a ship chartered out is engaged in the international carriage of goods and passengers both the owner and the charterer should be included in the tonnage tax scheme.

⁽⁷⁹⁾ Compared to the scenario when ship-owning and ship-operating function are performed by the same organisation.

5.6.4. Application of tonnage tax to leasing of ships with crew (time/voyage chartering)

- (171) The ECSA stressed that the chartering activity creates direct and indirect employment for a lot of shipping professionals across Europe and a flexible approach contributes to keeping shipping companies' head offices within the EU.
- (172) Concerning some of the Commission's decisions which requested a minimum share of own shipping activity for time charterers to benefit from tonnage taxation, the ECSA considered that this requirement should be loosened.
- (173) According to the Norwegian Shipowners' Association, for commercial reasons, most shipping companies are represented in a number of maritime hubs across the world, and should an international shipping organisation have a strategy of increasing the share of time-chartered vessels in its fleet, it can do so regardless of any limitations in the European tonnage tax schemes. It will simply do so through a non-EEA resident subsidiary.

5.7. Flag-link rule

- (174) The ECSA considered that, essentially, the Maritime Guidelines contain a pragmatic degree of flexibility regarding the use of Member States' flags and this should not be further tightened.

5.8. Ring-fencing rules

- (175) The ECSA stressed that tonnage tax schemes need to provide a clear definition of qualifying activities.
- (176) A ship operator may bring within ring-fence the activity of 'buying in' services from other businesses but not the profits from carrying out other businesses. This arm's length principle is commonly used in the administration of tax and is known as a requirement for transfer-pricing. For example: if a ship operator provides land services such as road transport or hotel accommodation as part of a package, any mark-up it charges on the services above an arm's length cost should fall within tonnage tax. Thus if the services are provided at market rates by a third party, whatever profit the operator makes will fall inside the ring-fence. However, if the services are provided from within the ship operator's group, they will be subject to transfer-pricing and profits from the business of road transport or hotels will be excluded from tonnage tax — only the computed mark-up on such group services will qualify for tonnage tax.

5.9. Exemption from taxation of profits from financing shipping companies

- (177) The ECSA agreed with the Commission, that services offered by financial institutions to shipping companies which come under the tonnage tax scheme — such as loans and guarantees — should not be regarded as 'eligible' or 'ancillary' activities.

6. COMMENTS FROM MALTA ON THIRD PARTY COMMENTS

- (178) Malta believes that, from the majority of submissions received, it clearly emerges that there is a general satisfaction with the application of the Maritime Guidelines in Malta. Malta noted the stakeholders did not raise objections and supported the current arrangements.

7. ASSESSMENT OF THE AID

7.1. Existence of aid

- (179) According to Article 107(1) TFEU, 'any aid granted by a Member State or through State resources in any form whatsoever which distorts or threatens to distort competition by favouring certain undertakings or the provision of certain goods shall, in so far as it affects trade between Member States, be incompatible with the internal market'.

- (180) Accordingly, for a support measure to be considered aid within the meaning of Article 107(1) TFEU it must meet the following conditions cumulatively: (i) it must be financed by the State through State resources and the measure must be imputable to the State; (ii) it must confer a selective advantage on its recipient by favouring certain undertakings or the production of certain goods; (iii) it must distort or threaten to distort competition and (iv) it must have the potential to affect trade between Member States.
- (181) In the following the Commission will assess whether the (i) tonnage tax scheme; (ii) the exemption from taxation of capital gains arising from the sale or transfer of ships; (iii) the exemption from taxation of capital gains in relation to shares in shipping companies; (iv) the exemption from taxation of dividends in relation to shares in shipping companies; (v) the exemption from taxation of interest or other income in relation to financing of shipping companies or tonnage tax ships; (vi) the exemption from certain duties on documents and transfers (hereinafter collectively referred to as 'the national measures'), satisfy the criteria mentioned in recital 180 and consequently constitute State aid.

State resources, imputability and advantage

- (182) The Commission notes that the national measures concern exemptions from usual taxes and levies normally payable to the Maltese State. The tonnage tax scheme grants a tax reduction compared to the income tax normally payable on corporate income under the Income Tax Act. The exemption from taxation of dividends and capital gains in relation to shares in shipping companies and of capital gains relating to the sale of transfer of ships and of interest or other income in relation to financing of shipping companies or tonnage tax ships, consist in exemptions — relating to the Income Tax Act — granted by the Merchant Shipping Act and the Taxation Regulations. Likewise, the exemption from certain duties on documents and transfers stipulated by the Duty on Documents and Transfers Act is granted by the Merchant Shipping Act and the Taxation Regulations. The exemption from payment of fees at ministerial discretion is also an exemption from usual taxes and levies normally payable to the Maltese State.
- (183) The Commission notes that a loss of tax revenue for the State is equivalent to consumption of State resources in the form of fiscal expenditure. By allowing a reduction or exemption from taxes and duties under the Merchant Shipping Act, Malta foregoes revenue which constitutes State resources. Hence, the tax reduction and exemptions and the exemption from duties is granted through State resources. Those measures have been put into effect in the form of State regulation (the Merchant Shipping Act which is a parliamentary act and the Taxation Regulations which Malta considers subsidiary legislation implementing the Merchant Shipping Act). Since those fiscal measures are therefore granted by the Maltese authorities the measures are imputable to the State.
- (184) For a measure to constitute State aid the measure must confer a financial advantage to the recipients. The Commission notes that the national measures consist in an exemption from taxes and duties which confers an advantage to the beneficiary within the meaning of Article 107(1) TFEU.
- (185) The Commission therefore concludes that
- (i) the tonnage tax under the tonnage tax scheme;
 - (ii) the exemption from payment of fees at ministerial discretion;
 - (iii) the exemption from taxation of capital gains arising from the sale or transfer of ships;
 - (iv) the exemption from taxation of capital gains in relation to shares in shipping companies;
 - (v) the exemption from taxation of dividends in relation to shares in shipping companies;
 - (vi) the exemption from taxation of interest or other income in relation to financing of shipping companies or tonnage tax ships;
 - (vii) the exemption from certain duties on documents and transfers;

are granted from State resources and imputable to the State and confer an advantage to the beneficiaries.

- (186) In the following the further elements necessary for a measure to constitute State aid, namely the selective nature of the measure, its potential to distort competition and effect trade, are assessed separately for each measure.

7.1.1. *The tonnage tax scheme*

Selective advantage

- (187) For a measure to constitute State aid it must be selective in as much it favours certain undertakings or the production of certain goods according to Article 107(1) TFEU. Concerning the interpretation of the condition of selectivity, it is settled case law that a measure can be regarded as selective if it is 'intended partially to exempt those undertakings from the financial charges arising from the normal application of the general system of compulsory contributions imposed by law' ⁽⁸⁰⁾. A measure is therefore considered to be selective if it constitutes a departure from the normal application of the general tax framework.
- (188) For purposes of the assessment, the Court of Justice has emerged with a three-step analysis ⁽⁸¹⁾. First, the system of reference must be identified. Second, it should be determined whether a given measure constitutes a derogation from that system insofar as it differentiates between economic operators who, in light of the objectives intrinsic to the system, are in a comparable factual and legal situation. Assessing whether a derogation exists is the key element of this part of the test and allows a conclusion to be drawn as to whether the measure is *prima facie* selective. If the measure in question does not constitute a derogation from the reference system, it is not selective. However, if it does (and therefore is *prima facie* selective), it needs to be established, in the third step of the test, whether the derogation is justified by the nature or the general scheme of the (reference) system ⁽⁸²⁾. If a *prima facie* selective measure is justified by the nature and general scheme of the system, it will not be considered selective and will thus fall outside the scope of Article 107(1) TFEU ⁽⁸³⁾.
- (189) Undertakings in Malta are subject to taxation at 35 % under the Income Tax Act ⁽⁸⁴⁾. Shipping organisations which have opted for the tonnage tax scheme are exempted from taxation under the Income Tax Act as regards income generated from shipping activities and pay a lump sum instead. The Commission notes that the tonnage tax scheme described in section 2.1 or a comparable scheme is not available to all sectors or undertakings and is therefore *prima facie* selective. The tonnage tax enables the beneficiaries to save on their tax expenses. This derogation is not justified by the nature of the general system but is put in place with the specific objective of benefitting and promoting certain activities.
- (190) In view of the above, the Commission concludes that the tonnage tax scheme confers a selective economic advantage.

Distortion of competition and effect on trade

- (191) A measure granted by the State is considered to distort or threaten to distort competition when it is liable to improve the competitive position of the recipient compared to other undertakings with which it competes ⁽⁸⁵⁾. For all practical purposes, a distortion of competition within the meaning of Article 107 TFEU is thus assumed as soon as the State grants a financial advantage to an undertaking in a liberalised sector where there is, or could be, competition ⁽⁸⁶⁾. Where financial aid by a State strengthens the position of an undertaking as compared with other undertakings competing in intra-Community trade, the latter must be regarded as affected by the aid ⁽⁸⁷⁾.

⁽⁸⁰⁾ Case 173/73 Italian Republic v Commission of the European Communities [1974] ECR 709, paragraph 3.

⁽⁸¹⁾ See for instance Judgment of 18 December 2008, Government of Gibraltar/Commission (T-211/04 and T-215/04), ECR 2008 p. II-3745, T-211/04 and T-215/04, paragraphs 143-144.

⁽⁸²⁾ See for instance, Judgment of the Court of Justice of 8 September 2011, *Commission v Netherlands*, C-279/08 P, ECLI:EU:C:2011:551, paragraph 62; Judgment of the Court of Justice of 8 November 2001, *Adria-Wien Pipeline*, C-143/99, ECLI:EU:C:2001:598, paragraph 42.

⁽⁸³⁾ See for instance Judgment of the Court of Justice of 8 September 2011, *Paint Graphos and others*, Joined Cases C-78/08 to C-80/08, ECLI:EU:C:2011:550, paragraph 49 et seq.; Judgment of the Court of Justice of 29 April 2004, *GIL Insurance*, C-308/01, ECLI:EU:C:2004:252, paragraph 60 et seq.

⁽⁸⁴⁾ Article 56(6) of the Income Tax Act.

⁽⁸⁵⁾ Case 730/79 *Phillip Morris* [1980] ECR 267, para. 11; Joined Cases T-298/07, T-312/97 etc. *Alzetta* [2000] ECR II-2325, para. 80.

⁽⁸⁶⁾ Joined Cases T-298/07, T-312/97 etc. *Alzetta* [2000] ECR II-2325, paras 141-147.

⁽⁸⁷⁾ Case T-288/97 *Friulia Venezia Giulia* [2001] ECR II-1619, para. 41.

- (192) Shipping activities are essentially carried out on a worldwide market. In addition, the markets for both maritime cabotage routes and maritime services are fully liberalised⁽⁸⁸⁾. Thus, services provided by shipping companies benefiting from the tonnage tax scheme are open to competition within Member States, between Member States and between Member States and third countries. Consequently, the scheme threatens to distort competition and could affect trade between Member States.

Conclusion

- (193) In view of the above, the Commission considers that the tonnage tax constitutes State aid within the meaning of Article 107(1) TFEU.

7.1.2. Exemption from payment of fees at ministerial discretion

- (194) The current legislation does not adequately restrict the use of the discretion of the Minister to exempt ships from the payment of fees under the Taxation Regulations discussed in recitals 23 and 112. It is not drafted precisely enough to restrict the reduction to the intended non-economic activities with a humanitarian or philanthropic purpose.

- (195) The same considerations as set out in recitals 187 ff on selective advantage and in 191 ff on competition distortions and effect on trade apply also to the measures which potentially can be granted at the Minister's discretion.

Conclusion

- (196) The Commission therefore concludes that the possibility to exempt further vessels at the Minister's discretion constitutes State aid within the meaning of Article 107(1) of the Treaty.

7.1.3. Exemption from tax on capital gains from the sale of ships

- (197) Article 5(1)(a) of the Income Tax Act imposes a tax burden on capital gains derived from the transfer of capital assets. Article 3 (1) of the Taxation Regulations provides for an exemption from capital gains from the sale and transfer of tonnage tax ships.

Selective advantage

- (198) As mentioned in recital 187, a measure is considered to be selective if it constitutes a departure from the normal application of the general tax framework. Article 3(1) of the Taxation Regulations provides for an exemption from tax on capital gains from the sale of ships, while in the general tax framework Article 5(1) of the Income Tax Act imposes a tax burden on capital gains derived from the transfer of capital assets which amounts in principle to 35 %. Shipping organisations which have opted for the tonnage tax scheme are exempted from taxation under the Income Tax Act as regards capital gains from the sale of tonnage tax ships. The Commission notes that such exemption is not available to all sectors or undertakings and is therefore *prima facie* selective. The tax exemption enables the beneficiaries to save on their tax expenses. This derogation is not justified by the nature of the general system but is put in place with the specific objective of benefitting and promoting certain activities.

- (199) In view of the above, the Commission considers that the exemption from tax on capital gains from the sale of ships constitutes a selective advantage within the meaning of Article 107(1) TFEU.

Distortion of competition and effect on trade

- (200) As set out in recital 191 where financial aid by a State strengthens the position of an undertaking as compared with other undertakings competing in intra-Community trade, the latter must be regarded as affected by the aid⁽⁸⁹⁾.

⁽⁸⁸⁾ As from 1 January 1993: Regulation (EEC) No 3577/92; Regulation (EEC) No 4055/86.

⁽⁸⁹⁾ Case T-288/97 *Friulia Venezia Giulia* [2001] ECR II-1619, para. 41.

- (201) As set out in more detail in recital 192 shipping activities are essentially carried out on a worldwide market. Thus, services provided by shipping companies benefiting from the capital gains tax exemption are open to competition between Member States. Consequently, the measure threatens to distort competition and could affect trade between Member States.

Conclusion

- (202) In view of the above, the Commission considers that the exemption from tax on capital gains from the sale of ships constitutes State aid within the meaning of Article 107(1) TFEU.

7.1.4. Exemption from taxation of dividends in relation to shares in shipping companies

Selective advantage

- (203) The system of reference should be defined as being the general taxation system for dividends. Article 68 of the Income Tax Act provides that no person whether resident or non-resident in Malta shall be charged to tax on income from dividends. Furthermore, Article 68 sets out that nobody is obliged to declare dividend income in the tax return. The Maltese authorities have confirmed that, in essence, the general tax rate for dividends received by any kind of shareholder in Malta is zero. With respect to shareholders of shipping organisations, Article 3(1)(a) of the Taxation Regulations stipulates that 'no further tax under the Income Tax Act shall be charged or payable on the income [...] derived from shipping activities of a licensed shipping organisation', provided that all relevant fees and taxes have been duly paid by the shipping organisation. Therefore, both shareholders in a non-shipping company and in a shipping organisation having received a dividend from a company have no tax payable on the dividend. The tax exemption from dividends tax in relation to shares in shipping companies therefore constitutes a general measure which is not selective in nature.

Conclusion

- (204) Based on the foregoing assessment, the exemption from dividend tax is not selective and, therefore, does not constitute State aid within the meaning of Article 107(1) TFEU.

7.1.5. The exemption from taxation of interest or other income payable in relation to financing of shipping or tonnage tax ships

Selective advantage

- (205) The Commission notes that Article 84Z(1) of the Merchant Shipping Act provides for a wide variety of activities⁽⁹⁰⁾ which qualify an organisation as shipping organisation. Article 3(2) of the Merchant Shipping Act provides that no tax under the Income Tax Act is payable by financial institutions on interest or other income in relation to any financing of the activities by a licensed shipping organisation listed in Article 84Z(1) of the Merchant Shipping Act or the financing of a tonnage tax ship.
- (206) As mentioned in recital 187, a measure is considered to be selective if it constitutes a departure from the normal application of the general tax framework. Article 3(2) of the Taxation Regulations provides for an exemption from taxation of interest or other income payable in relation to financing of the operations of licensed shipping organisations set out in Article 84Z(1) of the Merchant Shipping Act or the financing of a tonnage tax ship, while in the general tax framework Article 4(1) of the Income Tax Act imposes a tax burden in the form of a flat rate of 35 % on interest income derived from financing activities like the granting of loans and guarantees. Hence, financial institutions are exempted from income tax with regard to income derived from the financing of broadly defined activities of licensed shipping organisations and from financing tonnage tax ships.
- (207) The Commission notes that such exemption is not available to financial institutions with regard to the financing of companies other than licensed shipping organisations. The exemption is therefore *prima facie* selective as it favours financial institutions which are active in financing the shipping sector. The tax exemption enables the beneficiaries to save on their tax expenses.

⁽⁹⁰⁾ See recital 9 of this Decision.

- (208) The Commission does not consider that there is any objective in the nature of the general scheme of Maltese income taxation which could justify the derogation in question but that the measure is put in place with the specific objective of benefitting and promoting certain activities.
- (209) In view of the above, the Commission considers that the exemption from taxation of interest or other income payable in relation to financing of the operations of licensed shipping organisations or to financing of tonnage tax ships constitutes a selective advantage within the meaning of Article 107(1) TFEU.

Distortion of competition and effect on trade

- (210) Financial services are essentially carried out on a European market where financial institutions are competing against each other. Thus, services provided by financial institutions benefitting from the tax exemption are open to competition between Member States.
- (211) Where financial aid by a State strengthens the position of an undertaking as compared with other undertakings competing in intra-Community trade, the latter must be regarded as affected by the measure ⁽⁹¹⁾. Consequently, the measure threatens to distort competition and could affect trade between Member States.

Conclusion

- (212) For the above reasons, the Commission concludes that the exemption from taxation of interest or other income payable in relation to financing of shipping or tonnage tax ships constitutes State aid within the meaning of Article 107(1) TFEU.

7.1.6. Exemption from taxation of capital gains relating to shares in shipping companies

Selective advantage

- (213) As mentioned in recital 187, a measure is considered to be selective if it constitutes a departure from the normal application of the general tax framework. Capital gains on shares for residents of Malta would normally be subject to a 35 % income taxation under the Income Tax Act ⁽⁹²⁾. However, the Taxation Regulations contain a tax exemption in favour of capital gains relating to shares in shipping companies ⁽⁹³⁾. The Commission notes that such exemption is not available to all sectors or undertakings and is therefore *prima facie* selective. The exemption constitutes a derogation from the general tax system since Maltese residents having gains or profit derived on a transfer of shipping companies are in a comparable legal and factual situation as Maltese residents having gains or profit derived on a transfer of any other companies in the light of the objective of the tax system, i.e. taxing any gains or profits on a transfer of any shares or securities.
- (214) Malta did not put forward any argument as to whether the measure could be justified by the logic of the tax system. The Commission does not consider that there is any objective in the nature and general scheme of Maltese income taxation which could justify the derogation in question and, therefore concludes that the exemption from tax on capital gains from the sale of shares in shipping companies to the benefit of Maltese residents is selective within the meaning of Article 107(1) TFEU.

Distortion of competition and effect on trade

- (215) As set out in recital 191 where financial aid by a State strengthens the position of an undertaking as compared with other undertakings competing in intra-Community trade, the latter must be regarded as affected by the aid.

⁽⁹¹⁾ Case T-288/97 *Friulia Venezia Giulia* [2001] ECR II-1619, para. 41.

⁽⁹²⁾ Article 5(1)(a)(ii) of the Income Tax Act. On the other hand, Article 12(1)(c)(ii) of the Income Tax Act, which exempts from income tax any gains or profits accruing to or derived by any person not resident in Malta on a transfer of any shares or securities in a company, is not relevant in the present selectivity assessment, since it does not form part of the general rule for residents of Malta.

⁽⁹³⁾ Article 3(1) c of the Merchant Shipping Taxation Regulations.

- (216) In the present case, Maltese residents holding shares in shipping companies are exposed to competition and trade between Member States. Investments activities are carried out on a worldwide market. Moreover, as set out in more detail in recital 192 shipping activities are essentially carried out on a worldwide market. Consequently, the tax measure under review affects trade in the Union and has the potential to distort competition between Member States.

Conclusion

- (217) In view of the above, the Commission considers that the exemption from tax on capital gains from the sale of shares in shipping companies constitutes State aid within the meaning of Article 107(1) TFEU.

7.1.7. Exemption from the duty on documents and transfers

Selectivity

- (218) The Duty on Documents and Transfers Act applies a duty to transfers of *inter alia* marketable securities ⁽⁹⁴⁾. As set out in recital 41, Article 5 of the Taxation Regulations provides for exemptions as regards transactions related to marketable securities relating to shipping organisations.
- (219) As mentioned in recital 187, a measure is considered to be selective if it constitutes a departure from the normal application of the general tax framework. Article 5 of the Taxation Regulations constitutes a derogation from the general system since entities undertaking transactions in securities in relation to shipping are in a comparable legal and factual situation as entities undertaking these transactions in relation to any other sector.
- (220) The Commission notes that such exemption is not available in other sectors. The exemption is therefore *prima facie* selective as it favours transactions in the shipping sector. The exemption enables the beneficiaries to save on their expenses.
- (221) Malta did not put forward any argument as to whether the measure could be justified by the logic of the system. The Commission does not consider that there is any objective in the nature and general scheme of Maltese system on duties which could justify the derogation in question.
- (222) In view of the above, the Commission considers that the exemption from the duty on documents and transfers grants a selective advantage within the meaning of Article 107(1) TFEU.

Distortion of competition and effect on trade

- (223) A measure granted by the State is considered to distort or threaten to distort competition when it is liable to improve the competitive position of the recipient compared to other undertaking.
- (224) As mentioned at recital 192, shipping is a liberalised sector, with competition both within the EU and worldwide. This measure therefore threatens to distort competition and could affect trade between Member States.

Conclusion

- (225) The measure therefore constitutes State aid within the meaning of Article 107(1) TFEU.

7.2. Compatibility of the aid

Legal basis for assessment

- (226) Pursuant to Article 107(3)(c) TFEU, aid to facilitate the development of certain activities may be considered compatible with the internal market, where such aid does not adversely affect trading conditions to an extent contrary to the common interest, and thus provides a possible basis for an exemption from the general prohibition of State aid. The Commission considers Article 107(3)(c) TFEU to be the appropriate legal basis applicable to the Maltese tonnage tax scheme.

⁽⁹⁴⁾ See recital 40. On the other hand, it is not relevant for the present selectivity assessment that there is no duty applicable on transactions with securities of a company with more than half the ordinary share capital, voting rights and rights to profits held by persons who are not resident in Malta, since this does not form part of this general rule.

- (227) In accordance with settled case-law, in the application of Article 107(3) TFEU the Commission enjoys wide discretion, the exercise of which involves complex economic and social assessments which must be made in a Community context. In adopting rules of conduct and announcing by publishing them that they will apply to the cases to which they relate, the Commission imposes a limit on the exercise of its aforementioned discretion and cannot depart from those rules under pain of being found, where appropriate, to be in breach of general principles of law, such as equal treatment or the protection of legitimate expectations. Therefore, in the specific area of State aid, the Commission is bound by the Guidelines and notices that it issues, to the extent that they do not depart from the rules in the Treaty ⁽⁹⁵⁾. In accordance with that settled case-law, the Commission will apply the Maritime Guidelines in the present case. The Maritime Guidelines determine the conditions under which a scheme to support a Member State's maritime transport sector is considered compatible with the internal market.
- (228) Section 2.2 of the Maritime Guidelines states the specific objectives in the Community maritime interest that may be supported with schemes as in particular:
- improving a safe, efficient, secure and environment friendly maritime transport,
 - encouraging the flagging or re-flagging to Member States' registers,
 - contributing to the consolidation of the maritime cluster established in the Member States while maintaining an overall competitive fleet on world markets,
 - maintaining and improving maritime know-how and protecting and promoting employment for European seafarers.

7.2.1. The tonnage tax scheme

7.2.1.1. Vessels eligible for tonnage tax

- (229) In accordance with section 2 of the Maritime Guidelines, their scope covers 'maritime transport'. In order to comply with the Maritime Guidelines, national aid measures must be limited to ships used for the purpose of maritime transport as defined therein by reference to Regulation (EEC) No 4055/86 and Regulation (EEC) No 3577/92 ⁽⁹⁶⁾.
- (230) Regulation (EEC) No 4055/86 defines 'maritime transport' as the carriage of passengers or goods by sea between any port of a Member State and any port or off-shore installation of another Member State or of a third country.
- (231) Regulation (EEC) No 3577/92 defines 'maritime transport' as the carriage of passengers or goods by sea between ports situated on the mainland or the main territory of a Member State (*mainland cabotage*) or the carriage of passengers or goods by sea between any port in a Member State and installations or structures situated on the continental shelf of that Member State (*off-shore supply services*) or the carriage of passengers or goods by sea between ports on the mainland and an island of the Member State or between ports situated on the islands of the Member State (*island cabotage*).
- (232) The Commission has also decided that certain activities, even if they do not fall, or only partially fall, within the definition of maritime transport, can be subject by analogy with maritime transport to the provisions of Section 3.1 of the Maritime Guidelines. This is the case for rescue and marine assistance vessels ⁽⁹⁷⁾ and for cable-laying, pipeline-laying, crane and research vessels ⁽⁹⁸⁾, given that they require similarly qualified staff and are similarly exposed to international competition.

⁽⁹⁵⁾ See inter alia Case C-464/09 P *Holland Malt v Commission* EU:C:2010:733, paras 46-47.

⁽⁹⁶⁾ See footnote 45.

⁽⁹⁷⁾ Commission decision of 13 April 2015 in case SA.38085 (2013/N) concerning the prolongation of the Italian tonnage tax scheme (including its application to vessels providing rescue at sea and marine assistance on the high seas), recital 54 (OJ C 406, 4.11.2016, p. 1).

⁽⁹⁸⁾ See in particular Commission Decision 2009/380/EC of 13 January 2009 on State aid SA C 22/07 (ex N 43/07) as regards the extension to dredging and cable-laying activities of the regime exempting maritime transport companies from the payment of the income tax and social contributions of seafarers in Denmark, recitals 65-72 (OJ L 119, 15.5.2009, p. 23); Commission decision of 27 April 2010 in case N 714/2009, *Intégration des transports de la pose de câbles, pose de canalisations, navires de grues et navires de recherche sous le régime de la 'tonnage tax'*, recital 44 (OJ C 158, 18.6.2010, p. 1); Commission decision of 27 April 2010 in case SA. N 714/2009, *The Netherlands — Extension of the tonnage tax scheme to cable layers, pipeline layers, research vessels and crane vessels*, recitals 37 to 46 (OJ C 158, 18.6.2010, p. 2).

- (233) In its opening decision the Commission presumed that fishing vessels, pontoons, barges, yachts, cruise vessels, pontoons and oil rigs were covered by the Maltese tonnage tax but doubted if it this was justifiable given the definition of maritime transport ⁽⁹⁹⁾.
- (234) Malta has clarified that, whilst all vessels registered in Malta pay a fee called 'tonnage tax', only those ships involved in 'shipping activities' according to the Taxation Regulations are exempt from normal income taxation and benefit from treatment as 'tonnage tax ships'.
- (235) The Commission had doubts on the compatibility of the definition of eligible shipping activities, which included also activities 'as otherwise may be prescribed' ⁽¹⁰⁰⁾.
- (236) According to Malta, the reason for the inclusion of the phrase 'or as otherwise may be prescribed' was to provide the competent authority with the appropriate legislative flexibility in the event that it becomes possible for certain new and emergent activities to be included within the definition of 'shipping activities' (e.g. due to developments of the industry or legislation at Union level). Malta has confirmed that no regulations, rules, orders or instructions were ever issued that sought to expand the definition of shipping activities.
- (237) In addition the Commission notes that based on the explanations provided by Malta the provision enshrined in Article 85A(1) of the Merchant Shipping Act empowering the responsible Minister to accept under the tonnage tax scheme vessels below the threshold of 1 000 minimum net tonnage ⁽¹⁰¹⁾ did not eliminate the requirement for the vessel to be involved in the international carriage of goods or passengers. The Commission, however, also notes that the discretion of the Minister to accept under the tonnage tax scheme vessels below the threshold of 1 000 minimum net tonnage is not based on any objective criteria. Therefore, the Commission welcomes the fact that Malta has given the commitment set out in the Annex in point 18.
- (238) The Commission concludes that the wording of the Maltese legislation seems to have left room to include by ministerial act under the tonnage tax scheme activities which go beyond the definition of maritime transport. Therefore, that aspect of the Maltese tonnage tax scheme is incompatible with the Maritime Guidelines.

Eligibility of non-propelled barges

- (239) In the opening decision the Commission questioned the eligibility of non-propelled barges, due to the fact that they do not carry out transport activities themselves but depend on other vessels to tow them ⁽¹⁰²⁾.
- (240) After having heard the observations of the Maltese authorities and third parties, the Commission remains of the view that non-propelled barges, because they do not carry out transport activities themselves but depend on other vessels to tow them, are not involved in maritime transport. The vessel providing the propulsion may be described as engaged in maritime transport but the activity of the barge is not.
- (241) The Commission concludes that accepting barges for tonnage tax goes beyond the definition of maritime transport. Therefore, that aspect of the Maltese tonnage tax scheme is incompatible with the Maritime Guidelines.

Eligibility of cruise ships and of commercial yachts

- (242) Concerning commercial yachts, in the opening decision ⁽¹⁰³⁾ the Commission was concerned that they were mostly used for local trips (often leisure trips) and doubted to what extent such ships could be covered by a tonnage tax scheme.

⁽⁹⁹⁾ See recital 50 of the opening decision.

⁽¹⁰⁰⁾ See recital 6 of the opening decision and recital 10 of this Decision.

⁽¹⁰¹⁾ See recital 7 of the opening decision and recital 11 of this Decision.

⁽¹⁰²⁾ See recital 50 of the opening decision.

⁽¹⁰³⁾ Recital 50 of the opening decision.

- (243) The eligibility of commercial yachts and cruise ships should be assessed in the light of the Communication from the Commission on the interpretation of Council Regulation (EEC) No 3577/92⁽¹⁰⁴⁾. Chapter 3.3 of this Communication confirms that cruise services fall within the scope of Regulation (EEC) No 3577/92 and Regulation (EEC) No 4055/86 as constituting maritime transport. Indeed, cruise ships carry passengers by sea between ports, and thus perform maritime transport activities. Therefore the Commission considers that cruise ships are eligible for tonnage taxation provided that the majority of their revenues stem from core shipping revenues. Limitations on ancillary services related to shipping activities are discussed below in recitals 266 to 274.
- (244) Transport services provided by commercial yachts fall under the definition of maritime transport, provided that they involve the transport of goods and/or persons by sea between ports, as well as between a port and an off-shore installation/structure. Therefore, the Commission considers that commercial yachts carrying out maritime transport for remuneration are eligible for tonnage taxation.

Eligibility of towage and dredging vessels

- (245) In the opening decision the Commission raised doubts whether towage and dredging vessels were accepted under the Maltese tonnage tax scheme in compliance with the strict conditions fixed by the Maritime Guidelines⁽¹⁰⁵⁾.
- (246) According to the Maritime Guidelines 'fiscal arrangements for companies (such as tonnage tax) may be applied to those dredgers whose activity consists in 'maritime transport' for more than 50 % of their annual operational time and only in respect of such transport activities'. In the case of dredging, maritime transport is defined by Section 3.1 of the Maritime Guidelines as 'the transport at deep sea of extracted materials' and excludes 'extractions or dredging as such'. In line with the Commission's decision making practice⁽¹⁰⁶⁾, the eligible part of the dredger's activities includes sailing between the port and the extraction site, sailing between different places of extraction, sailing between the place of extraction and the place where the extracted materials are to be unloaded, unloading of extracted material, sailing between the place of unloading and the port. By contrast, dredging and sailing while dredging is not considered as maritime transport activity.
- (247) As to tugboats, the Maritime Guidelines clearly indicate that 'towage activities which are carried out inter alia in ports, or assisting a self-propelled vessel to reach port do not constitute maritime transport'. In addition, the Maritime Guidelines foresee that towage is covered by their scope only if more than 50 % of the towage activity effectively carried out by a tug during a given year constitutes maritime transport (this would *inter alia* include towing barges between ports or between a port and an off-shore installation/structure or towing of vessels which due to a technical failure cannot sail on their own).
- (248) Malta has not had formal explicit legislation with regard to the 50 % requirement of maritime transport for towage and dredging activity explained in recitals 246 and 247. The Commission considers that the Maltese legislation seems to have left room to apply tonnage tax to revenues generated from dredgers and tugboats without restriction. The Commission, therefore, considers that the national measures currently in force in Malta for towage and dredging are not in line with the conditions set out in the Maritime Guidelines.

Eligibility of service and support vessels and other vessels

- (249) In the opening decision the Commission enquired what was meant by service/support vessels covered by the Maltese tonnage tax scheme and on which basis⁽¹⁰⁷⁾.
- (250) The Commission was initially of the view that the Maltese scheme potentially permitted the coverage of a wide variety of service/support vessels under the tonnage tax scheme.

⁽¹⁰⁴⁾ Communication of 22 April 2014, COM(2014) 232 final.

⁽¹⁰⁵⁾ See recital 46 of the opening decision.

⁽¹⁰⁶⁾ See in particular Decision 2009/380/EC, recitals 79-80.

⁽¹⁰⁷⁾ See recital 51 of the opening decision.

- (251) The Commission enquired as to whether cable repair vessels, diving support vessels, oil well stimulation vessels, pilot vessels, survey vessels, hydrographical surveying and construction vessels providing off shore services and mobile platforms had benefitted and indicated that the Commission did not have sufficient information in order to determine whether the admissibility of such vessels/structures could comply with the Maritime Guidelines. Malta has clarified that these vessels had not been subject to tonnage tax.
- (252) The Commission accepts that certain analogous activities, even if they do not fall within the strict definition of maritime transport, can be subject to the provisions of the Maritime Guidelines. This is the case for the operation of vessels specialised in servicing off-shore activities or performing installation and maintaining activities (e.g. cable-laying, pipe-laying, research and crane vessels) ⁽¹⁰⁸⁾ or vessels providing rescue at sea and marine assistance on the high seas, provided they require similarly qualified staff and are similarly exposed to international competition ⁽¹⁰⁹⁾.
- (253) With respect to the future, Malta has clarified that it seeks to apply tonnage tax to cable-laying, pipe-laying, crane and research vessels in line with Commission practice described in recital 252. Malta has committed to explicitly reflect this in its legislation ⁽¹¹⁰⁾. Therefore, based on that future legislation tonnage tax will be applied to cable-laying, pipe-laying, crane and research vessels in a manner compatible with the Maritime Guidelines applied by analogy.
- (254) As regards the current application of the Maltese tonnage tax scheme to 'service/support vessels', Malta has shown that the activities covered under that term concern the carriage of goods and/or persons by sea between ports or between a port and an off-shore installation/structure, and thus constitute maritime transport ⁽¹¹¹⁾. Therefore, those vessels are within the scope of the Maritime Guidelines.

Eligibility of fishing vessels

- (255) In the opening decision ⁽¹¹²⁾ the Commission had doubts whether fishing vessels were covered by the tonnage tax scheme.
- (256) The Commission considers that the primary purpose of fishing vessels is not the transport of goods and persons by sea between ports or between a port and an offshore installation/structure, as required by the Maritime Guidelines. Moreover, fishing vessels do not present the particular characteristics of certain service vessels, which would allow the Commission to accept their inclusion in tonnage taxation in application of the Maritime Guidelines by analogy ⁽¹¹³⁾.
- (257) Therefore the Commission considers that the inclusion of fishing vessels in the tonnage tax scheme is not compatible with the internal market.

Eligibility of oil rigs

- (258) The Commission reiterates the position expressed in its opening decision in the Belgian tonnage tax case ⁽¹¹⁴⁾, notably that the Maritime Guidelines do not cover exploitation of natural resources at sea.

⁽¹⁰⁸⁾ See recital 231 of this Decision.

⁽¹⁰⁹⁾ When assessing whether new vessel types can benefit from tonnage tax, the Commission considers whether there is a risk that the companies operating relevant service vessels could relocate their on-shore activities outside the EU for the purpose of finding more accommodating fiscal climates and subsequently re-flag those vessels under flags of third countries. The Commission may consider applying by analogy the Maritime Guidelines to companies operating service vessels if the following conditions are fulfilled. Those companies must operate in a global market and face similar challenges, in terms of global competition and relocation of on-shore activities, to those of the EU maritime transport sector. The activities of the relevant service vessels must be subject to the same legal environment as EU maritime transport in the fields of labour protection, technical requirements and safety. The activities must require qualified and trained seafarers, with similar qualifications as those working on board traditional maritime transport vessels. Seafarers on board service vessels should be governed by the same labour law and social framework as other seafarers. Service vessels must be sea-going vessels and they must be obliged to undergo the same technical and safety controls as vessels dedicated to maritime transport.

⁽¹¹⁰⁾ See point 2 of Annex to the present Decision.

⁽¹¹¹⁾ See in particular section 4.2.1.6 and footnote 2 of Table 2 of this Decision.

⁽¹¹²⁾ See recital 50 of the opening decision.

⁽¹¹³⁾ See recital 252 of the present Decision.

⁽¹¹⁴⁾ Commission decision of 19 March 2003, recitals 65-72 (OJ C 145, 21.6.2003, p. 4).

(259) Therefore, the Commission concludes that coverage by the tonnage tax scheme of oil rigs is not in line with the Maritime Guidelines.

7.2.1.2. Income of tonnage tax ships subject to tonnage tax

Revenues from bareboat chartering out

(260) In the opening decision the Commission ⁽¹¹⁵⁾ questioned the lack of legal restrictions as regards revenues from bareboat chartering.

(261) The Commission considers that, although bareboat chartering out is a legitimate economic activity, as a general rule, it should not be eligible to preferential tax treatment. In previous decisions ⁽¹¹⁶⁾, the Commission considered that pure ship lessors cannot be deemed to provide maritime transport services and, consequently, should not benefit from a tonnage tax regime.

(262) The Commission considers that the above principle should apply not only for bareboat chartering out contracts concluded with shipping companies, but also with final users in the sector of recreational vessels. The treatment of bareboat chartering out should not vary depending on the type of the charterer, since the key requirement under the Maritime Guidelines is that the beneficiary provides maritime transport services as defined in the relevant Council regulations.

(263) However, the situation is different in the context of *intra-group* contracts. Intra-group bareboat chartering out transactions can be compatible with the internal market under the Maritime Guidelines, since the beneficiary as a group performs the activity of maritime transport but through an intra-group leasing structure. Whether the beneficiary of tonnage taxation wishes to have: (i) one legal entity that does both maritime transport and owns the vessel; or (ii) two legal entities, one performing maritime transport and another one owning the vessel and leasing it to the former (e.g. for financing reasons) should, as a rule, not make any difference for the purpose of the Maritime Guidelines. In this respect, the Commission notes that intra-group bareboat chartering out transactions were unconditionally accepted in the Commission decision on the Irish tonnage tax ⁽¹¹⁷⁾. The Commission notes that intra-group bareboat chartering is in line with the Maritime Guidelines, as the objective of 'maintaining and improving maritime know-how and protecting and promoting employment for European seafarers' and 'contributing to the consolidation of the Maritime cluster established in the Member States while maintaining an overall competitive fleet on world markets' remains safeguarded.

(264) Apart from intra-group transactions, the Commission can accept a certain flexibility in favour of genuine shipping companies and assimilated companies ⁽¹¹⁸⁾, provided all of the following conditions are fulfilled ⁽¹¹⁹⁾.

(a) bareboat chartering out activities must be related to temporary excess capacity for a period of up to three years;

(b) bareboat chartering out activities must be restricted to a maximum period of three years;

(c) temporary excess capacity must be related to the beneficiary shipping organisation's own shipping services, i.e. excess capacity specifically acquired (bought or chartered) for chartering-out purposes is ineligible for tonnage taxation; and

⁽¹¹⁵⁾ See recital 58 of the opening decision.

⁽¹¹⁶⁾ See in particular Commission Decision 2014/200/EU of 17 July 2013 on the aid scheme SA.21233 C/11 (ex NN/11, ex CP 137/06) implemented by Spain Tax scheme applicable to certain finance lease agreements also known as the Spanish Tax Lease System (OJ L 114, 16.4.2014, p. 1); Commission Decision of 20 December 2011 in the Finnish tonnage tax case N448/2010, recital 32 (OJ C 220, 25.7.2012, p. 1); Commission decision of 1 April 2015 in the Croatian tonnage tax case SA. 37912, recital 86f (OJ C 142, 22.4.2016, p. 6).

⁽¹¹⁷⁾ Commission decision of 11 December 2002 in case N 504/02 (OJ C 15, 22.1.2003, p. 5), recitals 17 to 24.

⁽¹¹⁸⁾ E.g. companies operating cable-laying, pipe-laying, crane and research vessels, as well as vessels providing rescue at sea and marine assistance on the high seas.

⁽¹¹⁹⁾ See inter alia Commission decision in the Finnish tonnage tax case, recital 32; the Irish tonnage tax case, recital 28, and the Croatian tonnage tax case, recital 86 and footnote 23.

(d) the proportion of bareboat chartered-out capacity may not exceed a maximum percentage of the shipping organisation's fleet under the tonnage tax scheme, which can reach at most 50 %. The Commission considers that, if more than 50 % of the fleet of the tonnage tax beneficiary is bareboat chartered out, such activity would not be classified as 'ancillary activity'. On the other hand, a lower maximum threshold would not be appropriate, as it could discriminate against small operators.

(265) As the applicable legislation in Malta does not exclude pure ship lessors from the tonnage tax scheme, that legislation is not compatible with the Maritime Guidelines.

Cruise ships and ancillary revenues

(266) In the opening decision ⁽¹²⁰⁾, the Commission noted that operators of cruise ships offered casino, spa, entertainment and other services. It suspected that such services may constitute the main activity and source of profits of cruise ships. Consequently, the Commission doubted to what extent cruise ships could be covered by a tonnage tax scheme.

(267) Furthermore, the Commission noted in the opening decision ⁽¹²¹⁾ that the Maltese legal acts did not provide any precise guidance as to what types of activities could be covered under the tonnage tax as ancillary activities. Clear limitations are however necessary to ensure that beneficiaries of tonnage taxation remain genuine maritime transportation service providers.

(268) In the Cypriot tonnage tax case ⁽¹²²⁾ the Commission considered that in relation to the carriage of passengers by sea, also 'all hotel, catering, entertainment and retailing activities on board of a qualifying ship' are eligible, 'provided that these services are performed as ancillary activities to the activity of carriage of passengers by sea by that ship and are all consumed or used on board that ship'. In the UK tonnage tax case ⁽¹²³⁾, the Commission considered eligible also 'services or facilities offered, which are additional to the core activities, but which are part of the total package offered to customers, provided that these would be unlikely to yield a profit if the normal tax rules were applied.' In the Belgian tonnage tax case ⁽¹²⁴⁾ the Commission prohibited revenues from the sale of products not intended for consumption on board such as luxury goods ⁽¹²⁵⁾ and from gambling and casinos, as well as revenue from land-based excursions ⁽¹²⁶⁾ to benefit from tonnage taxation.

(269) The Commission also refers to its decision in the Finnish tonnage tax case ⁽¹²⁷⁾ and the Lithuanian tonnage tax case ⁽¹²⁸⁾ where it accepted port terminal operations such as passenger embarkation/disembarkation services and cargo loading/unloading services as well as administrative and insurance activities that are closely associated with the transport of passengers or goods can be covered by the tonnage taxation. Furthermore, in its decision in the Belgian tonnage tax case the Commission accepted that revenue from short-term investment of operating capital results from normal financial management and may therefore be subject to tonnage taxation if such revenue relates to the shipping organisation's normal working capital in connection with the pursuit of eligible activities ⁽¹²⁹⁾.

(270) In view of the above mentioned decision practice and recognising that it would be counterproductive to establish a definite list of services which may be covered by tonnage taxation as ancillary services, the Commission considers that some limitations are necessary to ensure that beneficiaries of tonnage taxation remain genuine maritime transportation service providers. The principle is that revenues from eligible ships should mainly be constituted by the core shipping revenues.

⁽¹²⁰⁾ See recital 50 of the opening decision.

⁽¹²¹⁾ See recital 63 of the opening decision.

⁽¹²²⁾ Commission decision of 24 March 2010 in case SA. 30338, recital 26 (OJ C 144, 3.6.2010, p. 28).

⁽¹²³⁾ Commission decision of 12 July 2000 in case SA. 15810 (OJ C 258, 9.9.2000, p. 3).

⁽¹²⁴⁾ Commission Decision 2005/417/EC of 30 June 2004 concerning a series of tax measures which Belgium is planning to implement for maritime transport (OJ L 150, 10.6.2005, p. 1), recital 47.

⁽¹²⁵⁾ Except for alcohol, tobacco and perfumes.

⁽¹²⁶⁾ Bought-in services.

⁽¹²⁷⁾ Supra footnote 116, recitals 9 and 31.

⁽¹²⁸⁾ Commission decision of 24 April 2017 in case SA. 45764, recital 9 (OJ C 219, 7.7.2017, p. 4).

⁽¹²⁹⁾ Supra footnote 114, recitals 139 to 141.

- (271) Core revenues are revenues from ticket sales or fees for cargo transportation and, in case of passenger transportation, letting of cabins in the context of maritime voyage and sale of food and drinks for immediate consumption on board. Ancillary revenues are other types of revenues which are frequently provided on board (especially in passenger transport) and which do not threaten to excessively distort competition with land-based providers, who are taxed according to the general rules of taxation. Examples of ancillary services would be the rental of advertising billboards on board; the sale of goods and the provision of services customarily offered on passenger ships, including spa, hairdresser services, gambling and other entertainment services; the renting out of ship premises to shop and services' operators; the intermediation in provision of local excursions, etc. The Commission considers that core revenues should always cover more than 50 % of the vessel's total (core and ancillary) gross revenues.
- (272) In the same vein, distortions of competition with land-based services should be limited. This inter alia requires that e.g. land-based services, such as local excursions or road part transportation included in the overall service package, should be bought-in either from unrelated companies or at arm's length price from the same group's entities, which are subject to usual income taxation.
- (273) Similarly, the conclusion of contracts non-customary for the maritime transport sector, such as acquisition of cars, livestock, property, should not be covered by tonnage taxation. Such revenues are entirely unrelated to maritime transport and thus should never be eligible for tonnage taxation, neither as core nor as ancillary revenues.
- (274) Since the Maltese tonnage tax scheme lacks clear provisions on the scope of ancillary activities and the extent to which they can benefit from tonnage tax, it does not provide guarantees that ancillary revenues are accepted for tonnage taxation only for genuine shipping companies. Therefore, that aspect of the Maltese tonnage tax scheme is incompatible with the Maritime Guidelines.

7.2.1.3. The level of tonnage tax

- (275) Section 3.1, penultimate paragraph, of the Maritime Guidelines stipulates that, in order to keep an equitable balance of tonnage tax rates, the Commission will only approve schemes giving rise to a tax-load for the same tonnage fairly in line with the schemes already approved.
- (276) The Commission notes that the method of calculation of the Maltese tonnage tax rate differs from the one applied by the majority of the Member States. Most of the Member States establish the so-called 'notional profit' for the different categories of ships based on their tonnage, on which they then apply the national corporate tax. The Commission accepts the possibility to use different methodologies for calculating the tonnage tax provided that the final tax burden for a given ship does not fall below what has been accepted by the Commission so far.
- (277) The tonnage tax rates applicable in Malta compared to those applicable in other Member States (in euros) are set out at recitals 106 to 114. The Commission notes that the ultimate level of taxation for Malta companies equals the average rate applied in the rest of the Union.
- (278) The Maltese scheme includes a reduction on the rate for ships younger than ten years old. Malta has asserted that this is to incentivise the usage of more efficient and environmentally friendly ships in accordance with the aims of section 2.2 Maritime Guidelines. The Maltese tonnage tax scheme institutes higher rates for ships over 15 years old.
- (279) The figures provided by Malta for comparison with tonnage tax rates applied in other Member States take only the typical rate as set out in the Merchant Shipping Act unadjusted for the age of the ship which is not sufficient to compare directly as the figures provided by Malta also assume a high number of days of inactivity and repair to describe the rates in the other Member States. However looking at the lowest rate payable in Malta, for a new ship, the reduced rates payable would still exceed those set by Poland for any vessel in use for 359 days a year (98 %) or less.

- (280) The Commission notes that the reduction of up to 75 % and the possibility for reduction/exemption upon discretion by the Minister referred to in recitals 71 to 73 of the opening decision does not relate to the tonnage tax under the scheme but to the (misleading) term of tonnage tax which is due when registering a vessel. Malta's commitment to amend the tonnage tax legislation to avoid ambiguous use of the term 'tonnage tax' will make this clear in the future.
- (281) Based on the information provided by the Maltese authorities concerning the applicable tonnage tax rates and the calculations carried out by the Commission, it appears that the tonnage tax rates in Malta are not lower than what has been accepted by the Commission so far. The Commission therefore concludes that the tonnage tax rate in Malta complies with the provisions of section 3.1 of the Maritime Guidelines.

7.2.1.4. The flag link requirement

- (282) In the opening decision, the Commission considered that the flag link requirements as laid down in the Maltese legislation were weaker than required by the Maritime Guidelines ⁽¹³⁰⁾.
- (283) According to section 3.1 of the Maritime guidelines, ship owners who register some of their ships outside the EEA can still benefit from an EEA tonnage tax regime if the EEA-flagged share of their fleet tonnage is above 60 %. If their EEA-flagged fleet tonnage is below 60 %, they can still register additional ships outside the EEA if (i) the share of their fleet tonnage under EEA flags has not decreased since 17 January 2004; or (ii) the total share under EEA flags of all vessels tax-liable in the Member State concerned has not decreased over the last three years.
- (284) However, the Maltese tonnage tax scheme does not ensure that the conditions set out in recital 283 are respected. In particular, a beneficiary can still benefit from the Maltese tonnage tax scheme, if that beneficiary has not decreased the EEA-flagged percentage of its tonnage taxed fleet over a period of three years ⁽¹³¹⁾. Moreover, a beneficiary can still benefit from the Maltese tonnage tax scheme, as long as such beneficiary simply commits to increasing or maintaining the EEA-flagged percentage of its tonnage taxed fleet ⁽¹³²⁾. The Commission therefore considers that the tonnage tax scheme does not provide sufficient safeguards to ensure that tonnage tax companies having also non-EEA flagged vessels in their fleet increase or maintain the share of EEA tonnage of the fleet and consequently that the share of EEA-flagged tonnage remains at satisfactory levels. In this respect the tonnage tax scheme is not in line with the Maritime Guidelines and it is therefore incompatible with the internal market ⁽¹³³⁾.

7.2.1.5. Time/voyage chartering

- (285) In the opening decision ⁽¹³⁴⁾, the Commission expressed doubts on a largely unrestricted eligibility of time charterers and similar companies that could benefit from tonnage tax. The Commission considered that this was not in line with the objectives of the Maritime Guidelines.
- (286) The Maritime Guidelines as interpreted by the Commission in its previous decisions allow voyage/time charterers and similar commercial operators of ships to benefit from tonnage taxation under certain conditions. The Commission considers that such companies can only benefit from tonnage taxation if they contribute to an objective of the Maritime Guidelines, notably the development of EU flag or the preservation of EU know-how or a combination of the two. This is the case, for instance, if, in addition to time/voyage chartered vessels equipped and manned by other companies, the tonnage tax beneficiary has in its fleet also vessels for which he himself ensures crew and technical management and provided such vessels constitute at least 20 % of the total tonnage

⁽¹³⁰⁾ See recitals 76 to 79 of the opening decision.

⁽¹³¹⁾ See lit. (c) of recital 24 of the present Decision.

⁽¹³²⁾ See recital 25 of the present Decision.

⁽¹³³⁾ The fact that in practice the requirements may have been met is a matter relevant for the recovery obligation (see section 7.3 of the present Decision).

⁽¹³⁴⁾ See recital 58 of the opening decision.

taxed fleet ⁽¹³⁵⁾. Another possibility is that the share of the vessels that are both non-EEA and time/voyage chartered does not exceed 75 % of the beneficiary's fleet under tonnage tax ⁽¹³⁶⁾. A further possibility is for Member States to require that at least 25 % of the beneficiary's entire fleet is EEA-flagged ⁽¹³⁷⁾. In all mentioned cases, the tonnage tax beneficiary stays under the obligation to maintain/increase the share of EEA-flagged tonnage of its own fleet (owned vessels or chartered in on a bareboat basis).

(287) The Maltese scheme does not impose any of the requirements mentioned at recital 286. Therefore, the Commission concludes that the legal framework relating to commercial operators providing transport services with fully equipped and manned ships of other companies is not in line with the Maritime Guidelines.

7.2.1.6. Ring-fencing measures

(288) Chapter 3.1 of the Maritime Guidelines requires that spill-over effects between eligible and non-eligible activities should be excluded. The Taxation Regulations impose the obligation on a licensed shipping organisation to maintain separate accounts that distinguish income and gains derived from shipping activities from other sources of income.

(289) The rules on deductibility of expenses contained in the Income Tax Act require the existence of a direct link between an expense and the income it produces. Article 14(1) of the Income Tax Act only allows an expense to be deductible if the expense is 'wholly and exclusively incurred in the production of the income'. It is therefore not possible to claim deductions for expenses incurred in generating exempt profits (including tonnage taxed profits) against other types of taxable income.

(290) A licensed shipping organisation that derives benefits from the tonnage tax system is required to submit an annual income tax return distinguishing between eligible and non-eligible income. Losses from activities subject to income tax cannot be set off against tonnage tax liability.

(291) Any licensed shipping organisation is obliged to prepare financial statements that are in accordance with International Financial Reporting Standards endorsed by the Union and to have them audited by a certified public accountant.

(292) A shipping organisation cannot decide whether to opt in or out of the Maltese tonnage tax system depending on whether it has taxable profits or losses. Unless the licensed shipping organisation elects otherwise, it falls within the scope of the tonnage tax scheme. Where the organisation opts out this decision is irrevocable ⁽¹³⁸⁾. As a result no Maltese shipping organisation/group has part of its ships under tonnage tax scheme and part under the income tax scheme.

(293) Article 51 of the Income Tax Act contains wide ranging anti-abuse provisions intended to counter artificial arrangements and schemes aimed at obtaining any unjustified tax advantage. This general anti-abuse rule follows the Commission Recommendation of 6 December 2012 on Aggressive Tax Planning.

(294) The anti-abuse measures are supported by penalties that are imposed in case of breaches. Thus, in such cases, apart from payment of the unpaid tax, interest is imposed at the rate of 0,54 % per month (i.e. 6,48 % per annum), together with additional penalties at the rate of up to 1,5 % per month (i.e. 18 % per annum) on such unpaid tax.

(295) The Commission also positively notes that the concern raised in the opening decision as regards the too broad scope of the eligible activities ⁽¹³⁹⁾ and organisations has been addressed by commitments from Malta.

⁽¹³⁵⁾ Commission decision in the Lithuanian tonnage tax case, recital 36.

⁽¹³⁶⁾ Commission decision of 13 May 2003 in the French tonnage tax case N737/2002, recital 35 (OJ C 38, 12.2.2004, p. 4); Commission decision in the Lithuanian tonnage tax case, recital 37.

⁽¹³⁷⁾ Decision (EU) 2015/667, recital 42.

⁽¹³⁸⁾ Article 6 of the Taxation Regulations.

⁽¹³⁹⁾ See recital 85 of the opening decision.

- (296) The Commission concludes that ring-fencing in Malta is robust and compliant with the requirements of the Maritime Guidelines and that its doubts raised in that regard are therefore alleviated.

7.2.1.7. The exemption from taxation of capital gains arising from the sale or transfer of tonnage tax ships

- (297) As set out in section 7.1.3 the exemption from taxation of capital gains from the sale or transfer of tonnage tax ships constitutes aid.
- (298) Article 3(1)(b) of the Taxation Regulations exempt from taxation capital gains from the sale or transfer of tonnage tax ships ⁽¹⁴⁰⁾. The Commission recognizes the exemption from taxation of capital gains from the sale or transfer of eligible ships which have been acquired and sold whilst being lawfully under the tonnage tax scheme ⁽¹⁴¹⁾. As to ships acquired before the entry of the beneficiary into the tonnage tax scheme, such exemption would be acceptable only within the limits of the aid ceiling set in section 11 of the Maritime Guidelines. Capital gains arising from the sale of over-depreciated ships (which occurs before the entry into the tonnage tax scheme) must be taken into account for purposes of calculating the aid ceiling. This means that in case of ships bought before the entry into the tonnage tax scheme, the hidden tax liabilities arising from over-depreciation have to be settled upon the entry into the tonnage tax scheme, unless they can be accommodated within the aid ceiling over a ten-years' period. Such hidden tax liabilities would normally have to be determined as the difference between the market value and the tax value of the ship at the moment of entry into the tonnage taxation system.
- (299) Given the current too broad wording of Article 85A of the Merchant Shipping Act which allows to declare a tonnage tax ship (which may consequently benefit from tonnage tax) any ship irrespective of the operations in which it is engaged and for lack of any rules to address potential over-depreciation of a ship acquired prior to the entry into the tonnage tax scheme, the Commission considers that the Maltese legal texts do not limit the exemption from taxation of capital gains from the sale or transfer of ships in an appropriate manner, neither in terms of amounts nor in terms of beneficiaries. Such general exemption as provided for in the Maltese scheme does not meet the requirements for compatibility.
- (300) The Commission concludes that the exemption from taxation of capital gains from the sales or transfer of ships in its current wording is incompatible with the internal market rules, since the exemption extends to ships having been depreciated under income tax rules prior to being transferred under the tonnage tax scheme. Therefore, the exemption constitutes illegal and incompatible aid. The respective provision therefore requires amendment.

7.2.1.8. Conclusion

- (301) On the basis of the above, the Commission concludes that the following aspects of the Maltese tonnage tax scheme are incompatible with the Maritime Guidelines: the eligibility of activities '*as otherwise may be prescribed*', the eligibility of non-propelled barges, the conditions of eligibility of towage and dredging vessels, the eligibility of fishing vessels and oil rigs, the exemption from taxation of capital gains from the sale or transfer of tonnage tax ships and the absence of safeguards regarding bareboat chartering out, ancillary revenues, the EEA flag link and time/voyage chartering. For those reasons, the Maltese tonnage tax scheme is incompatible with the internal market.
- (302) However, those incompatible aspects can be addressed for the future via the implementation of the commitments undertaken by Malta set out in the Annex, in particular points 1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 14, 15, 20, 21 and 22. Therefore, subject to implementation within the three-month deadline of the commitments in Annex, the Maltese tonnage tax scheme would be rendered compatible as of the date of such full implementation.

⁽¹⁴⁰⁾ See recital 14.

⁽¹⁴¹⁾ See e.g. Commission decisions in the Finnish tonnage tax case, recital 38; the Croatian tonnage tax case, recitals 50 to 53, 113; and the Italian tonnage tax case, recitals 28 to 33, 64 to 66.

7.2.2. *Exemption from taxation of capital gains in relation to shares in shipping companies*

- (303) As set out in section 7.1.3 the exemption from taxation of capital gains relating to shares in shipping companies applied to Maltese residents constitutes aid.
- (304) Buying and selling shares in shipping companies is part of the investment business (which is not eligible for tonnage taxation under the Maritime Guidelines ⁽¹⁴²⁾), rather than the shipping business. The Maritime Guidelines clearly state that Member States should 'preserve [...] normal tax levels for [...] personal remuneration of shareholders and directors'. Such rule is necessary in order for compatible aid to focus on the activity that needs support, and to limit as much as possible the distortion of competition in other sectors. Otherwise, shareholders of companies receiving compatible aid would also be entitled to tax exemptions (and so would the possible shareholders of those shareholders too). This, however, would multiply to unpredictably high levels the amount of aid initially accepted for a specific company in a given sector, so that in the end multiple sectors of the economy could be 'contaminated' by such aid (according to the beneficiary shareholders' activities). Such an outcome would be against the effectiveness of State aid rules and also against the principle of prohibition of State aid, which requires any exception (compatible aid) to be applied in a restrictive and well-targeted manner.
- (305) The Commission concludes that the exemption from taxation of capital gains in relation to shares in shipping companies to the benefit of Maltese residents is incompatible with the internal market rules. Therefore, the exemption constitutes illegal and incompatible aid, which must be abolished. The Commission notes positively that the Maltese authorities have committed to abolish that exemption under point 16 of the commitments in Annex.

7.2.3. *The exemption from taxation of interest or other income in relation to financing of shipping companies or tonnage tax ships*

- (306) As set out in recital 212 Article 3(2) of the Taxation Regulations constitutes aid to financial institutions.
- (307) The scope of the Maritime Guidelines and hence the benefit of tonnage tax is limited to the 'transport of goods and persons by sea'. This does not include financial institutions providing loans, issuing guarantees or issuing securities in relation to ship ownership, management, administration or operation as allowed by Article 3(2) of the Taxation Regulations.
- (308) As such the exemption under investigation has no compatibility grounds under the Maritime Guidelines. Malta did not provide any other compatibility reasoning on the basis of Article 107(2) or (3) TFEU. The Commission does not consider that the exemption under investigation could be considered compatible under any compatibility ground of the Treaty.
- (309) The Commission concludes that the current terms of the scheme relating to financial institutions are incompatible with the Maritime Guidelines and therefore constitute illegal and incompatible aid, which must be abolished. The Commission notes positively that the Maltese authorities have committed to abolish that exemption under point 3 of the commitments in Annex.

7.2.4. *The exemption from certain duties on documents and transfers*

- (310) Whilst it could be the case that exemptions from the duty on documents and transfers could be potentially accepted where the direct beneficiary is a genuine shipping company, but only within the limits of the aid ceiling prescribed by Section 11 of the Maritime Guidelines, the current exemption could potentially benefit non-shipping companies. Furthermore, there is no mechanism to respect Section 11 of the Maritime Guidelines.
- (311) Malta has not invoked any compatibility grounds and the Commission does not see any for the measure as it stands.

⁽¹⁴²⁾ See section 3.1 of the Maritime Guidelines.

- (312) The Commission concludes that the exemption from certain duties on documents and transfers as regards transactions related to marketable securities relating to shipping organisations to the benefit of Maltese residents is incompatible with the internal market rules. Therefore, the exemption constitutes illegal and incompatible aid, which must be abolished. The Commission notes positively that the Maltese authorities have committed to abolish that exemption under point 17 of the commitments in Annex.

7.2.5. *Exemption from payment of fees at ministerial discretion*

- (313) The current legislation does not adequately restrict the use of the discretion of the Minister to exempt ships from the payment of fees under the Taxation Regulations to philanthropic and humanitarian purposes as intended by the Maltese authorities.
- (314) Malta has not invoked any compatibility grounds and the Commission does not see any for the measure as it stands.
- (315) The Commission concludes that the possibility to exempt ships at the Minister's discretion is incompatible with the internal market rules. Therefore, this possibility for exemption constitutes illegal and incompatible aid, which must be abolished. The Commission notes positively that the Maltese authorities have committed under point 19 of the commitments in Annex to issue guidance to ensure that the ministerial discretion shall be exercised only in the case of humanitarian and philanthropic operations which do not involve the offer of goods and services on a market.

7.2.6. *Aid ceiling*

- (316) As regards the aid ceiling, Section 11, 2nd paragraph, of the Maritime Guidelines sets a maximum level of aid, in order to avoid cumulation of aid to levels which are disproportionate to the objectives of the Community common interest and could lead to a subsidy race between Member States. Total aid⁽¹⁴³⁾ for the benefit of shipping companies may not provide any benefit greater than the benefit represented by a reduction to zero of taxation and social charges for seafarers and a reduction to the level specified in Section 3.1, penultimate paragraph, of the Maritime Guidelines of corporate taxation of shipping activities.
- (317) Malta has provided credible information that the ceiling has always been respected in the past and committed to ensuring observation of the ceiling in the future. This is complemented by the commitment to require beneficiaries of tonnage tax to submit mandatory annual compliance declarations on compliance with the aid ceiling. Moreover, Malta has committed to introduce a formal provision on control of the aid ceiling under point 12 of the commitments in Annex.

7.3. **Recovery**

7.3.1. *New/existing aid classification, legitimate expectations and legal certainty*

- (318) Article 22 and Annex IV (Section 3) of the Accession Act⁽¹⁴⁴⁾ provides that aid to the transport sector shall be regarded as existing aid within the meaning of Article 88(1) of the Treaty until the end of the third year after the date of accession, provided it has been communicated to the Commission within four months of the date of accession.

⁽¹⁴³⁾ Except for aid for training, restructuring aid, aid related to public service obligations and start-up aid for new short sea shipping services.

⁽¹⁴⁴⁾ Act concerning the conditions of accession of the Czech Republic, the Republic of Estonia, the Republic of Cyprus, the Republic of Latvia, the Republic of Lithuania, the Republic of Hungary, the Republic of Malta, the Republic of Poland, the Republic of Slovenia and the Slovak Republic and the adjustments to the Treaties on which the European Union is founded ('Accession Act') (OJ L 236, 23.9.2003, p. 33). With respect to Malta's argument that the tonnage tax scheme and accompanying measures were established in 1973, suffice it to note that point 1(a) of Section 3 of Annex IV of the Accession Act does not apply to aid to the transport sector.

- (319) By the date of its accession, Malta had stated to the Commission that the Maltese tonnage tax regime was in line with the rules then in place and provided assurances on respecting the flag link but did not submit the details of the scheme to the Commission in accordance with the provisions of the Accession Treaty in order to establish it as existing aid. Discussions between the Commission and the Maltese authorities relating to transport matters took place on 19 October 2000 and 18 September 2001 and the brief discussion of tonnage tax is recorded in the minutes and negotiating position of the Maltese authorities⁽¹⁴⁵⁾. At the meeting of the Accession Conference of Malta to the EU held on 26 October 2001 it was agreed to recommend the provisional closure of the negotiations on the transport chapter of accession, which expressly included State aid in the transport sector.
- (320) The Commission considers that Malta and the beneficiaries do not benefit neither from legitimate expectations nor from legal certainty with respect to the aid measures subject to this Decision. It is settled case-law that there can be no legitimate expectations that an aid is lawful unless the aid has been granted in compliance with the procedure laid down in Article 108 TFEU, since a diligent businessman should normally be able to determine whether that procedure has been followed⁽¹⁴⁶⁾. In the present case, it is clear that the notification procedure of Article 108 TFEU, and the procedure provided for in the Accession Act were not followed and thus there are no legitimate expectations. Furthermore, the discussions cited by Malta⁽¹⁴⁷⁾, do not lead to the conclusion that precise, unconditional and consistent assurances would have been given by the Commission that the tonnage tax scheme would be treated as existing aid.
- (321) In view of the above, the measures of the present case do not constitute existing aid falling within any of the categories provided for in Article 1(b) of Council Regulation (EU) 2015/1589⁽¹⁴⁸⁾. In addition, Malta and the beneficiaries do not benefit neither from legitimate expectations nor from legal certainty with respect to the aid measures of this Decision.

7.3.2. The tonnage tax scheme

7.3.2.1. Eligible types of vessel

- (322) The 2012 Rules on Internal Procedure list fishing vessels, pleasure yachts, fixed offshore installations including oil rigs, mobile platforms, non-ocean-going tugs, non-self-propelled floating cranes, pontoons, vessels whose main purpose is to provide gambling and/or casino and similar vessels as not eligible for the income tax exemption and treatment as 'tonnage tax ships' as they are not engaged in 'shipping activities'⁽¹⁴⁹⁾.
- (323) The list of the tonnage tax ships provided by Malta and the accompanying explanations show that this is also how the rules have been implemented in practice and Malta confirms that no such vessels have benefitted from tonnage tax during the relevant period. The 2012 Rules on Internal procedure have clarified which types of vessels are not deemed to be carrying out shipping activities within the meaning of the Merchant Shipping Act. The past practice from 2004 did not deviate from these rules. The Commission therefore concludes that fishing vessels, pleasure yachts, fixed offshore installations including oil rigs, mobile platforms, non-ocean-going tugs, non-self-propelled floating cranes, pontoons, vessels whose main purpose is to provide gambling and/or casino vessels have in practice not benefitted from the tonnage tax scheme, although in theory it was available to them.
- (324) As regards the possibility according to Article 85 of the Merchant Shipping Act that shipping activities 'otherwise may be prescribed' Malta has confirmed that no regulations, rules, orders or instructions were ever issued that sought to expand the definition of shipping activities. The Commission therefore concludes that the definition of shipping activities was not extended beyond the international carriage of goods or passengers by sea.

⁽¹⁴⁵⁾ Maltese Accession record documents CONF-M 51/00 and CONF-M 65/01.

⁽¹⁴⁶⁾ See Case C-24/95 *Alcan Deutschland* ECLI:EU:C:1997:163, para. 25 and the case-law cited therein.

⁽¹⁴⁷⁾ See recital 319 of this Decision.

⁽¹⁴⁸⁾ Council Regulation (EU) 2015/1589 of 13 July 2015 laying down detailed rules for the application of Article 108 of the Treaty on the Functioning of the European Union (OJ L 248, 24.9.2015, p. 9); replacing Council Regulation No 659/1999 of 22 March 1999 laying down detailed rules for the application of Article 108 of the Treaty on the Functioning of the European Union (OJ L 83, 27.3.1999, p. 1).

⁽¹⁴⁹⁾ See recital 10 of this Decision.

- (325) The Commission therefore concludes that whilst the scope of the scheme was unacceptably wide no aid was paid out to the benefit of an ineligible vessel and therefore no recovery is required.

Towage and dredging vessels

- (326) Whilst Malta has not had explicit requirements in place for dredging and towage the Maltese authorities confirmed that during the period 2004 to 2016 they have accorded the status of tonnage tax schemes only to such vessels where it was confirmed that the vessels performed the majority of their operational time in the international carriage of goods in accordance with the parameters of the Maritime Guidelines. In particular tugboats operating in ports were excluded from the application of the tonnage tax and tonnage tax is limited to ships involved in international maritime transportation.
- (327) After examining the information provided by Malta, the Commission notes that there were only EEA-flagged vessels accepted for tonnage tax for towage and that *de facto* the requirements of the Guidelines were respected in the application of tonnage taxation to those vessels over the period concerned.
- (328) The Commission therefore concludes that no recovery is required.

7.3.2.2. Income subject to tonnage tax

Ancillary activities

- (329) As regards ancillary activities of cruise ships, based on the information provided by Malta, the Commission notes, firstly, that the profits of any sub-contractors have not been eligible under the tonnage tax scheme and, secondly, that services which are provided typically on board ships to customers as well as in relation to land excursions have benefitted from tonnage tax only if purchased by the shipping organisation at arm's length. The Commission is therefore satisfied that the interpretation of shipping activities as applied by Malta has ensured that the scope of the activities which the Commission has been accepting in the past as ancillary income eligible for tonnage tax has *de facto* been respected.
- (330) In addition the Commission notes that Malta has in practice entered into individual discussions with each owner/operator of cruise ships seeking to enter the Maltese tonnage tax regime to understand the scope of their operation prior to entry to the tonnage tax scheme. This has provided a mechanism by which the Maltese authorities have been able to ensure that the owners and operators of such ships only derive the benefits of the tonnage tax regime where appropriate. Whilst there was no formal requirement in place ensuring that less than 50 % of the tonnage taxed revenues of a vessel are ancillary, the Maltese authorities have demonstrated that core shipping revenues constituted the majority of shipping revenues per vessel. The Commission therefore concludes that no recovery is required.

Time/voyage chartering and bareboat chartering out

- (331) Following the explanations received from Malta, the Commission notes that Maltese shipping organisations which have benefitted from tonnage tax have not engaged in time chartering activities and that the Maltese tonnage tax fleet is predominantly (namely 90 %) EEA-flagged.
- (332) No bareboat chartered out ships which were accepted in the past under the tonnage tax scheme were ships bareboat chartered out to third parties, as demonstrated by the overview covering the period 2004-2016 submitted by Malta to the Commission services.
- (333) The Commission therefore concludes that no recovery is required regarding time/voyage chartering and bareboat chartering out.

7.3.2.3. Flag link

- (334) As regards the past Malta has provided data on the share of Maltese and EEA-flagged ships for beneficiaries. The ratio of EEA-flagged vessels per beneficiary exceeds by far the 60 %-share requested by the Maritime Guidelines.

7.3.2.4. The exemption from taxation of capital gains arising from the sale or transfer of tonnage tax ships

- (335) The respective provisions require amendment as the tax exemption is not restricted to proceeds from the sale or transfer of vessels which have been acquired and sold whilst under the tonnage tax scheme. Notwithstanding the too broad scope of the tax exemption Malta has credibly demonstrated that only ship sales and transactions related to tonnage tax ships bought and sold by shipping companies while under tonnage taxation have ever benefitted from the tax exemption in the past. The Commission therefore considers that no recovery is required.

7.3.2.5. Conclusion

- (336) Since in practice no amount has been paid out to ineligible beneficiaries under the Maltese tonnage tax scheme, the Commission concludes that no recovery is necessary in that regard.

7.3.3. Interest or other income payable in relation to financing of shipping companies and tonnage tax ships

- (337) In view of the explanations provided by Malta ⁽¹⁵⁰⁾ the Commission considers that no financial institution has benefitted in practice from the exemption from taxation of interest and other income in relation to the financing of shipping companies or tonnage tax ships. Since no aid has been paid out to any beneficiary under that measure, no recovery is required.

7.3.4. Exemption from the duty on documents and transfers and from taxation of capital gains relating to shares in shipping companies

- (338) Under the rules of the general tax system all non-residents of Malta would be exempt from capital gains on a transfer of shares. Article 12(1)(u)(1) of the Income Tax Act exempt any income derived by a company registered in Malta from a participating holding or from the transfer of such holding from the tax.
- (339) In relation to the duty on documents and transfers, where half the ordinary share capital is controlled by non-residents the transaction is exempt from duty under the general system. In addition there are also exemptions from the duty in the case of intragroup transfers.
- (340) Malta has taken steps to construct a representative sample of the shareholders of shipping companies to determine the typical ownership structure. Malta constructed this sample to reflect the composition of the Maltese tonnage tax fleet. Having identified an appropriate set of companies to accurately reflect the fleet Malta then went individually through the ownership of shares in these companies over the period. Malta established that all of these companies were exclusively owned by non-residents over the period 2004 to 2016. In addition Malta conducted a specific survey of shareholder transactions over the period to attempt to identify any transactions involving a Maltese resident. The result of the survey was that only one transaction was found involving a Maltese resident. This transaction involved a group where all other shareholders were non-resident. The size of the transaction identified meant that even if the general exemptions arising from foreign ownership had not applied, the value combining the capital gain and the duty on documents and transfers would have been vastly below the *de minimis* threshold.
- (341) The structured representative sampling by Malta, combined with the transaction search, the available exemptions under the general tax system and the *de minimis* threshold, indicates that recovery is not likely to be widespread. However, the pay out of aid under those two measures cannot be excluded where none of the aforementioned exemptions apply and the amount paid out exceeds the *de minimis* threshold. In such cases recovery of the aid disbursed should take place.
- (342) As regards the methodology for recovery, the amount to be recovered should consist in the duty or tax which should have been paid if the generally applicable rule had been applied. In order to identify potential beneficiaries the Maltese authorities will as, a first step, need to determine the ownership structure of shipping companies. As a second step, the Maltese authorities must verify whether transactions giving rise to duty on documents and transfers and taxation of capital gains relating to shares in shipping companies involved a Maltese resident.

⁽¹⁵⁰⁾ See recital 136.

7.3.5. Exemption from payment of fees at ministerial discretion

- (343) The ministerial discretion described at recitals 23 and 313 of this Decision has never been used and therefore no recovery is necessary.

7.4. Commitments

- (344) The Commission welcomes Malta's commitments as set out in the Annex to this Decision.

7.5. Language

- (345) Malta has waived its right to have the decision adopted in Maltese. The authentic language is therefore English.

8. CONCLUSION

- (346) The Commission finds that the tonnage tax scheme constitutes State aid within the meaning of Article 107(1) of the Treaty. In addition to the application of tonnage tax in relation to income from vessel operation, aid is present in the exemption from taxation of capital gains relating to shares in shipping companies applicable to Maltese residents; the exemption from taxation of capital gains from the sale or transfer of ships applicable to Maltese residents; the exemption from duty on documents and transfers relating to shares applicable to Maltese residents; the exemption from payment of fees at ministerial discretion; and the exemption of financial institutions from taxation of interest or other income payable in relation to financing of shipping companies and tonnage tax ships.
- (347) The Commission finds that the exemption from taxation of dividends from shares in shipping companies does not constitute State aid within the meaning of Article 107(1) of the Treaty as it does not provide a selective advantage.
- (348) The Commission finds that the following State aid measures are incompatible with the internal market.
- (a) The tonnage taxation scheme with respect to the following aspects: the eligibility of activities '*as otherwise may be prescribed*', the eligibility of non-propelled barges, the conditions of eligibility of towage and dredging vessels, the eligibility of fishing vessels and oil rigs, the exemption from taxation of capital gains from the sale or transfer of tonnage tax ships and the absence of safeguards regarding bareboat chartering out, ancillary revenues, the flag link with the EEA and time/voyage chartering;
 - (b) The exemption from taxation of capital gains from the sale of shares in shipping companies applied to Maltese residents;
 - (c) The exemption from income tax on the interest income or other income of financial institutions in relation to the financing of shipping companies or tonnage tax ships;
 - (d) The exemption from the duty on documents and transfers for the transfer of shares in shipping organisations for Maltese residents;
 - (e) The exemption from payment of fees at ministerial discretion.
- (349) The Commission finds that the incompatible State aid measures listed in recital 348 must be abolished. However, Malta's implementation of the commitments as set out in the Annex to this Decision would render the Maltese tonnage tax scheme compatible as of the date of such full implementation.
- (350) The Commission finds that the tonnage tax scheme as administered in practice by the Maltese authorities has not resulted in the disbursement of any aid amount to ineligible beneficiaries. Moreover, no disbursement of aid has taken place regarding the exemption from payment of fees at ministerial discretion and the exemption from income tax on the interest income or other income of financial institutions in relation to the financing of shipping companies or tonnage tax ships.

- (351) The Commission finds that the incompatible State aid disbursed regarding the exemption from taxation of capital gains from the sale of shares in shipping companies applied to Maltese residents and regarding the exemption from the duty on documents and transfers for the transfer of shares in shipping organisations for Maltese residents must be recovered to the extent it exceeds the *de minimis* threshold,

HAS ADOPTED THIS DECISION:

Article 1

The aid granted under the tonnage tax scheme constitutes new aid within the meaning of the Accession Treaty since 1 May 2004.

Article 2

The aid granted under the tonnage tax scheme is compatible with the internal market, subject to compliance with the commitments set out in the Annex.

Article 3

1. The following elements of the tonnage tax scheme are incompatible with the internal market:
 - (a) The eligibility for tonnage taxation of income generated from the operation of non-propelled barges, oil rigs and fishing vessels;
 - (b) The eligibility for tonnage taxation of income generated from towage and dredging vessels and from bareboat chartering out without restriction;
 - (c) The eligibility for tonnage taxation of vessels under time/voyage chartering without restriction;
 - (d) The eligibility for tonnage taxation of revenues from ancillary activities without the restriction that the majority of the tonnage taxed revenues of the tax beneficiary stem from core shipping activities and the lack of mechanisms in place to ensure that land-based services are provided at arm's length;
 - (e) The eligibility for tonnage taxation for companies engaged in shipping without the requirement that tonnage taxed shipping organisations having also non-EEA-flagged vessels in their fleet increase or maintain the share of EEA-flagged tonnage of the fleet if this share is below 60 %;
 - (f) the eligibility for tonnage taxation of activities 'as otherwise may be prescribed';
 - (g) The exemption from taxation of capital gains from the sale or transfer of ships applied to Maltese residents.
2. The following measures are also incompatible with the internal market:
 - (a) The exemption from taxation of capital gains from the sale of shares in shipping companies applied to Maltese residents;
 - (b) The exemption from income tax on the interest income or other income of financial institutions in relation to the financing of shipping companies or tonnage tax ships;
 - (c) The exemption from the duty on documents and transfers for the transfer of shares in shipping organisations for Maltese residents;
 - (d) The exemption from payment of fees at ministerial discretion.

Malta shall remove those tax exemptions from its legislation and adapt the scope of the tonnage tax scheme as specified in the commitments set out in the Annex.

Article 4

Individual aid has not been granted in relation to the measure set out in Article 3, first paragraph, as well as in relation to the measures set out in Article 3, second paragraph, indents (b) and (d). No recovery is required in relation to these measures.

Article 5

Individual aid granted under the measures referred to in Article 3, second paragraph, indents (a) and (c) is incompatible and must be recovered, save where it fulfils the conditions laid down by Article 3 of Regulation (EU) No 1407/2013 on the application of Articles 107 and 108 of the Treaty on the Functioning of the European Union to *de minimis* aid.

Article 6

1. Malta shall recover incompatible aid granted under the measures referred to in Article 5 from any beneficiaries.
2. The sums to be recovered shall bear interest from the date on which they were put at the disposal of the beneficiaries until their actual recovery.
3. The interest shall be calculated on a compound basis in accordance with Chapter V of Commission Regulation (EC) No 794/2004 ⁽¹⁵¹⁾ and to Commission Regulation (EC) No 271/2008 ⁽¹⁵²⁾ amending Regulation (EC) No 794/2004.

Article 7

1. Recovery of any incompatible aid granted under the measures referred to in Article 5 shall be immediate and effective.
2. Malta shall ensure that this Decision is implemented within four months following the date of notification of this Decision.

Article 8

Malta shall inform the Commission, within two months of the notification of this Decision, of the measures taken to comply with it and shall submit the following information:

- (a) the total amount of incompatible aid received by any beneficiaries identified;
- (b) the total amount (principal and recovery interests) to be recovered from each beneficiary;
- (c) a detailed description of the measures already taken and planned to comply with this Decision;
- (d) documents demonstrating any beneficiaries have been ordered to repay incompatible aid.

⁽¹⁵¹⁾ Commission Regulation (EC) No 794/2004 of 21 April 2004 implementing Council Regulation (EC) No 659/1999 laying down detailed rules for the application of Article 93 of the EC Treaty (OJ L 140, 30.4.2004, p. 1).

⁽¹⁵²⁾ Commission Regulation (EC) No 271/2008 of 30 January 2008 amending Regulation (EC) No 794/2004 implementing Council Regulation (EC) No 659/1999 laying down detailed rules for the application of Article 93 of the EC Treaty (OJ L 82, 25.3.2008, p. 1).

Article 9

This Decision is addressed to the Republic of Malta.

Done at Brussels, 19 December 2017.

For the Commission
Margrethe VESTAGER
Member of the Commission

ANNEX

COMMITMENTS PROVIDED BY MALTA

1. Malta commits to specifically exclude from the operation of tonnage tax the following vessels:
 - (a) Fishing and fish factory ships;
 - (b) Private yachts and ships used primarily for sport or recreation;
 - (c) Fixed offshore installations and floating storage units;
 - (d) Non-ocean-going tug boats and dredgers;
 - (e) Ships whose main purpose is to provide goods or services normally provided on land;
 - (f) Stationary ships employed for hotel and or catering operations (floating hotels or restaurants);
 - (g) Ships employed mainly for gambling/as casinos (floating or cruising casinos).
2. Malta commits to reflect explicitly in legislation, following directly the terms of the Maritime Guidelines, a restriction of tonnage tax to vessels engaged in the international carriage of good or passengers by sea and the following vessels (previously approved on submission by other Member States):
 - (a) Cable-laying vessels;
 - (b) Pipe-laying vessels;
 - (c) Crane vessels; and
 - (d) Research vessels.
3. Malta commits to delete Point 3(2) of the Taxation Regulations and to remove the possibility of financial institutions benefitting from tonnage tax and to restrict the benefits of tonnage tax to organisations which have assumed risks and responsibilities for the operation of a tonnage tax ship (i.e. technical management and crewing) or the carrying out of shipping activities.
4. Malta commits to explicitly limit the application of tonnage taxation to the chartering out of vessels on bareboat basis and similar transactions between third parties ⁽¹⁾. The chartering out of vessels on bareboat basis to third parties and similar transactions can be eligible only as ancillary activity of genuine shipping companies in the context of temporary overcapacity subject to the following conditions:
 - (a) Only to deal with a situation of temporary excess capacity;
 - (b) For a maximum period of up to three years;
 - (c) Bareboat chartered out capacity will not exceed 50 % of the shipping companies' fleet, calculated on a group basis;
 - (d) Excess capacity specifically acquired for chartering out cannot be eligible.
5. Malta commits that existing and new entrants to the tonnage tax scheme must have at least 25 % of their tonnage tax fleet EEA-flagged notwithstanding the requirement to maintain or increase the share as set out in 3.1 (paragraph 8) of the Maritime Guidelines.
6. Malta commits to explicitly limit eligibility to tonnage taxation for dredgers to those dredgers whose activity consists in 'maritime transport' — that is, the transport at deep sea of extracted materials — for more than 50 % of their annual operational time and only in respect of such transport activities. Eligible dredgers will be only those registered in a Member State or the EEA.

⁽¹⁾ This also includes renting of ships (especially yachts) on bareboat charter basis to natural persons.

7. Malta commits to explicitly limit eligibility to tonnage taxation for towage to those vessels whose activity consists in maritime transport for more than 50 % of their annual operation. Waiting time may be proportionally assimilated to that part of total activity effectively carried out by a tug which constitutes maritime transport. Towage activities which are carried out *inter alia* in ports, or which consist in assisting a self-propelled vessel to reach port will not constitute maritime transport and only vessels registered in a Member State or the EEA will be eligible.
8. Malta commits to regulate the eligibility of revenues ancillary as set out at recitals 88 to 91 of the Commission's final Decision in the present case, by way of detailed regulation the draft of which has been shared with the Commission and that ship specific and non-ship-specific ancillary activities will not exceed 50 % of overall gross revenue (both ship-specific and other) of a beneficiary company. Malta also commits to exclude entirely from tonnage taxation revenues from the activities set out in recital 87 of the Commission's final Decision in the present case.
9. Malta commits to ensure that the capital gains exemption on the sale of ships covers only ships operated under the tonnage tax regime by companies engaged in genuine shipping activities and to introduce a requirement that only ships acquired and sold whilst under the tonnage tax regime may benefit from such an exemption.
10. Malta commits that shipping companies (except ship management companies) will not benefit from tonnage tax (except for ship management companies^(?)) unless they:
 - (a) have at least 60 % of the tonnage of their fleet^(?) under the flag of a Member State of the Union or of a State party to the EEA Agreement on entering the scheme; or
 - (b) maintain or increase the share of tonnage of their fleet that they operated under the flag of a Member State of the Union or of a State party to the EEA Agreement at the moment that they entered the scheme.

In any event, by the third year of operation the organisation must have at least 60 % of the tonnage taxed fleet EEA-flagged.

However, in connection with the initial entry of a shipping organisation into the Maltese tonnage tax system, the said applicable threshold may be reduced to twenty-five percent (25 %). Malta will continue to check that the share of EEA-flagged fleet has not decreased on average over a period of three years (both for existing and new beneficiaries).

11. Malta commits that income from non-EEA-flagged vessels will only be eligible when the above criteria on flagging (see commitment 10) are met and shall apply only to fleets which are entirely managed from the EEA for commercial and strategic management. Ships which are not commercially and strategically managed from the EEA will be accepted under tonnage taxation only if flying an EEA flag (except for vessels bareboat chartered out under conditions respecting the limitations mentioned in commitment 4).
12. Malta commits to introducing a formal provision on control of the aid ceiling set in Section 11 of the Maritime Guidelines.
13. Malta commits that legislation will be amended to clearly distinguish between:
 - (a) fees which are payable by vessels on registration and annual taxes on non-qualifying ships under the Maltese flag; and
 - (b) tonnage tax, which is only payable in respect of qualifying ships.
14. Malta commits to publishing internal guidelines which will make clear the ineligibility of a number of activities that may be in competition with land-based companies, in particular:
 - (a) shipbuilding;
 - (b) sale on board of goods or services not customarily provided to passengers e.g. cars, domestic appliances or livestock; and
 - (c) the operation of a port or harbour, ship-based holidays where the ship remains moored and there is no sea transportation element.

^(?) The current Taxation Regulations already provide for precise rules on newcomer companies (in line with the rules enshrined in the Ship-management Guidelines).

^(?) Including the fleet chartered in (with crew or on bareboat basis) while excluding bareboat chartered out vessels.

15. Malta commits to require beneficiaries of tonnage tax to submit mandatory annual compliance declarations for all controllable parameters such as type of vessel, activities performed with the vessel, net tonnage, days in use, flag, types of operation and compliance with the aid ceiling.
 16. Malta commits to remove current sector-specific exemption from taxation of capital gains on shares in shipping companies for Maltese residents, as set out in Article 84Z(1)C of the Merchant Shipping Act.
 17. Malta commits to remove the exemption in Article 5 of the Merchant Shipping Taxation Regulations from fees and charges payable under the Duty on Documents and Transfers Act.
 18. Malta commits to amend the legislation to clarify that ships below 1 000 net tonnes may only be declared as eligible for tonnage tax where that ship is engaged in shipping activities and which but for its tonnage would be eligible for such treatment under Article 85(1) of the Merchant Shipping Act. and to exercise the power in such cases where the criteria are met by applicants. Malta will reformulate Article 85A(1) of the Merchant Shipping Act in the following way: 'The Minister shall with the concurrence of the Minister responsible for finance and subject to such conditions deemed appropriate in line with these Regulations, declare to be a tonnage tax ship, a ship of any net tonnage, which is engaged in shipping activities'.
 19. Malta commits to issue guidance clarifying that the ministerial discretion contained in the First Schedule to the Merchant Shipping Act to exempt any ship or class of ships from the payment of fees shall be exercised only in the case of philanthropic and humanitarian operations which do not involve the offer of goods or services on a market.
 20. Malta commits to separate accounting wherever a company is not solely engaged in shipping activities.
 21. Malta commits to restricting the benefit of tonnage tax to organisations which have assumed risks and responsibilities related to the operation of a tonnage tax scheme or to the carrying out of shipping activities and will include a specific definition in legislation following that in the Maritime Guidelines.
 22. Malta commits to delete from Article 85 of the Merchant Shipping Act the words 'or as otherwise may be prescribed'.
 23. Malta commits that the new rules that will render the measures of this Decision compatible with the internal market will come into force within three months of the date of this Decision.
 24. Malta commits to continue to administer the tonnage tax scheme and the other measures forming the object of this Decision in a way that does not lead to payment of incompatible aid that would then need to be recovered from the beneficiaries.
 25. Malta commits to re-notify the tonnage tax scheme within ten years of the date of the Commission's final Decision in the present case.
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COMMISSION IMPLEMENTING DECISION (EU) 2019/1117**of 24 June 2019****amending Decisions 2007/305/EC, 2007/306/EC and 2007/307/EC as regards a change of the addressee of the Decisions***(notified under document C(2019) 4523)***(Only the German text is authentic)**

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Regulation (EC) No 1829/2003 of the European Parliament and the Council of 22 September 2003 on genetically modified food and feed ⁽¹⁾, and in particular Article 8(6) and Article 20(6) thereof,

Whereas:

- (1) Commission Decisions 2007/305/EC ⁽²⁾, 2007/306/EC ⁽³⁾ and 2007/307/EC ⁽⁴⁾ laying down the rules for the withdrawal from the market of Ms1xRf1 (ACS-BNØØ4-7xACS-BNØØ1-4) hybrid oilseed rape, Ms1xRf2 (ACS-BNØØ4-7xACS-BNØØ2-5) hybrid oilseed rape and Topas 19/2 (ACS-BNØØ7-1) oilseed rape respectively, as well as their derived products are addressed to Bayer CropScience AG, based in Germany.
- (2) By letter dated 1 August 2018, Bayer CropScience AG, based in Germany requested, that the Commission transfers its rights and obligations pertaining to all its authorisations and pending applications for genetically modified products, to BASF Agricultural Solutions Seed US LLC, based in the United States. By letter dated 19 October 2018, BASF Agricultural Solutions Seed US LLC confirmed its agreement with this transfer and authorised BASF SE, based in Germany, to act as its representative in the Union.
- (3) The implementation of the requested change requires the amendment of Decisions 2007/305/EC, 2007/306/EC and 2007/307/EC as regards the addressee of those Decisions.
- (4) The proposed amendments to the authorisation decisions are purely administrative in nature and do not entail a new assessment of the products concerned.
- (5) The measures provided for in this Decision are in accordance with the opinion of the Standing Committee on Plants, Animals, Food and Feed,

HAS ADOPTED THIS DECISION:

Article 1

In Decision 2007/305/EC, Article 4 is amended as follows:

'Bayer CropScience AG, Alfred-Nobel-Str. 50, D-40789 Monheim am Rhein' is replaced by 'BASF SE, Carl-Bosch-Str. 38, 67063 Ludwigshafen, Germany'.

Article 2

In Decision 2007/306/EC, Article 4 is amended as follows:

'Bayer CropScience AG, Alfred-Nobel-Str. 50, D-40789 Monheim am Rhein' is replaced by 'BASF SE, Carl-Bosch-Str. 38, 67063 Ludwigshafen, Germany'.

⁽¹⁾ OJ L 268, 18.10.2003, p. 1.

⁽²⁾ Commission Decision 2007/305/EC of 25 April 2007 on the withdrawal from the market of Ms1xRf1 (ACS-BNØØ4-7xACS-BNØØ1-4) hybrid oilseed rape and its derived products (OJ L 117, 5.5.2007, p. 17).

⁽³⁾ Commission Decision 2007/306/EC of 25 April 2007 on the withdrawal from the market of Ms1xRf2 (ACS-BNØØ4-7xACS-BNØØ2-5) hybrid oilseed rape and its derived products (OJ L 117, 5.5.2007, p. 20).

⁽⁴⁾ Commission Decision 2007/307/EC of 25 April 2007 on the withdrawal from the market of Topas 19/2 (ACS-BNØØ7-1) oilseed rape and its derived products (OJ L 117, 5.5.2007, p. 23).

Article 3

In Decision 2007/307/EC, Article 3 is amended as follows:

'Bayer CropScience AG, Alfred-Nobel-Str. 50, D-40789 Monheim am Rhein' is replaced by 'BASF SE, Carl-Bosch-Str. 38, 67063 Ludwigshafen, Germany'.

Article 4

This Decision is addressed to BASF SE, Carl-Bosch-Str. 38, 67063 Ludwigshafen, Germany.

Done at Brussels, 24 June 2019.

For the Commission
Vytenis ANDRIUKAITIS
Member of the Commission

COMMISSION IMPLEMENTING DECISION (EU) 2019/1118**of 27 June 2019****on the Seine – Scheldt cross-border project on the North Sea – Mediterranean and Atlantic Core Network Corridors***(notified under document C(2019) 4561)***(Only the Dutch and French texts are authentic)**

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010/EU ⁽¹⁾, and in particular Article 47(2) thereof,

Whereas:

- (1) Decarbonising transport, in particular through creating the conditions for an ambitious modal shift of long-distance freight traffic to energy-efficient transport modes is a key policy objective of the European Union. The Paris agreement has confirmed and strengthened the EU ambitions towards fighting climate change.
- (2) In this context, fostering inland waterway transport to move goods is a clear priority of the EU transport policy and a long-standing priority of the TEN-T policy.
- (3) Through the completion of the Seine – Scheldt network, the Seine basin will be directly linked by continuous high-gauge inland waterway to the Scheldt basin in the north of France, Belgium and the Netherlands and further, to other important European waterway basins such as the Rhine and the Maas. This will create a continuous, effective and consistent high capacity inland waterway network linking the numerous maritime and inland ports of this wider European cross-border region.
- (4) Through connecting France, Belgium, the Netherlands, and beyond Germany, the Seine-Scheldt network has a clear cross-border dimension.
- (5) The Seine – Scheldt project is pre-identified on the North Sea – Mediterranean Core Network Corridor and the section Le Havre – Paris is pre-identified on the Atlantic Core Network Corridor. The Declaration on the implementation of the TEN-T Core Network Corridor North Sea – Mediterranean (the Declaration of Tallinn) of 17 October 2013, signed by the Belgian, Dutch and French Transport Ministers and by the Transport Commissioner, has further underlined the commitment of the concerned parties to implement it. Moreover, the Work Plan for the North Sea – Mediterranean Core Network Corridor emphasises the need to ensure completion of the Seine – Scheldt project as the foundation for establishing a fully functioning multimodal transport corridor.
- (6) One of the major objectives of the project is to ensure that the main Seine – Scheldt itineraries are at least of ECMT class Va and to secure good navigation conditions.
- (7) All components of the project Seine – Scheldt are essential for its completion. Among them, the Canal Seine-Nord Europe is the main missing link, without which the Seine – Scheldt network cannot be realised.
- (8) The Seine – Scheldt project is a complex cross-border project, involving Belgium (the regions of Flanders and Wallonia) and France and involving works aiming both at creating new infrastructure and at improving existing infrastructure with minimal impact on navigation. Sufficient coordination is therefore an important challenge. In order to support the coordinated and timely implementation of the project, it is necessary to adopt provisions laying down a description of the necessary actions and the timetable for their implementation. This would help achieving the cross-border objectives of the Work Plan for the North Sea – Mediterranean Core Network Corridor, as well as to complete the Seine – Scheldt project at the earliest possible date and, in any case, by 2030 at the latest.
- (9) The clear identification of the necessary actions to complete the Seine – Scheldt project and the timetable for their implementation is also important to plan and fully optimise the availability of European, national and regional funding as well as private financing. EU co-financing has a leverage effect on national and regional decision-making for the implementation of the actions.

⁽¹⁾ OJ L 348, 20.12.2013, p. 1.

- (10) Belgium (the regions of Flanders and Wallonia) and France have already carried out significant works (studies and infrastructure works) contributing to the realisation of the Seine-Scheldt project. Most of them have been co-financed by the European Union, under different programmes. Activities are currently performed under a Grant Agreement of the Connecting Europe Facility (2014-EU-TM-0373-M, 'Seine-Escaut 2020'), involving Union funding up to 50 % of the eligible costs.
- (11) The cross-border dimension of the project requires setting up dedicated governance structures. Belgium (the regions of Flanders and Wallonia) and France closely cooperate since years, notably within the framework of the Inter-Governmental Commission for the preparation of the completion of the Seine – Scheldt project, established in September 2009. This Inter-Governmental Commission has the operational support of the Seine –Scheldt European Economic Interest Grouping (Seine-Scheldt EEIG) gathering Voies Navigables de France (VNF), the Société du canal Seine-Nord Europe (SCSNE), the Public Service of Wallonia (SPW) and De Vlaamse Waterweg NV. The Société du Canal Seine-Nord Europe, in charge of the construction of the canal Seine-Nord, has been set up in May 2017. These dedicated entities constitute an integrated management structure that supervise and coordinate the completion of the Seine – Scheldt project. The European Coordinator for the North Sea – Mediterranean Core Network Corridor and a representative of the Commission should regularly participate in the meetings of the Inter-Governmental Commission and Seine-Scheldt EEIG as observers. Moreover, the European Coordinator and a representative of the Commission should participate in the meetings of the supervisory board (conseil de surveillance) of the SCSNE as observers. Further appropriate arrangements may be envisaged by France in order to keep the Commission duly involved in this supervisory board.
- (12) In order to monitor progress of the implementation, the Member States should provide the Commission with regular reports on the matter, concerning the sections situated in their respective territories, and notify any delays encountered.
- (13) The implementation timetable set out by this Decision should be without prejudice to the fulfilment of the requirements defined in the international and Union law, including provisions to protect the environment and human health. This timetable should allow to plan and fully optimise the availability of funding, without prejudging the financial commitment of a Member State or of the Union. It should, under no circumstances, compromise the Union's high standards for environmental protection and public participation.
- (14) Without prejudice to Article 47(2) second subparagraph of Regulation (EU) No 1315/2013, it is appropriate to foresee a review clause in this Decision.
- (15) The measures provided for in this Decision have been approved by Belgium and France.
- (16) The measures provided for in this Decision are in accordance with the opinion of the Committee referred to in Article 52 of Regulation (EU) No 1315/2013,

HAS ADOPTED THIS DECISION:

Article 1

Subject matter

This Decision lays down a description of the actions and the implementation timetable for the cross-border project Seine – Scheldt, as well as related governance provisions.

Article 2

Actions and timetable

Belgium and France shall ensure the timely implementation of the following actions:

- (a) Seine-Amont, from Nogent-sur-Seine to Paris: improvement of the navigation conditions, by December 2030
- improvement of the navigation conditions, including the reconstruction of the weirs (Beaulieu, Livon, Vives-Eaux), by December 2027, and rehabilitation of the secondary locks (Coudray, Vives-Eaux, La Cave, Champagne), by December 2023;
 - establishment of the remote control of the locks and weirs, by December 2024;
 - improvement of the facilities for navigation and services to the users, by December 2027;

- (b) Seine-Aval, from Suresnes to Le Havre: upgrades and improvement of the navigation conditions, by December 2027
- lengthening and rehabilitation of the locks (such as Méricourt and Bougival), by December 2026;
 - modernisation of the weirs (Port-Mort, Poses, Méricourt, Bougival, Suresnes, Andrésy), by December 2027, including the reinforcement of the embankment of Croissy-sur-Seine by December 2022;
 - establishment of the remote control of the locks and weirs, by December 2024;
 - improvement of the facilities for navigation and services to the users, by December 2027;
 - construction of the footbridge of Poses-Amfreville, by December 2022 and construction of fish passes, by December 2030;
- (c) Oise, from Conflans-Sainte-Honorine to Compiègne: upgrade to ECMT class Vb and improvement of navigation conditions, by December 2028
- upgrade of the Oise river to ECMT class Vb (MAGEO: bank rescues and bridge piers between Creil and Compiègne, dredging, creation of the Venette landing stage), by June 2027;
 - reconstruction of the bridge of Mours, by December 2025;
 - establishment of the remote control of the locks and weirs, by December 2028;
- (d) canal Seine-Nord Europe, from Compiègne to Aubencheul-au-Bac: construction and entry into operation, with ECMT class Vb and enabling three layers of containers, by December 2028
- (1) sector 1 from Compiègne to Passel, including the construction of the lock of Montmacq:
- spatial territorial planning by September 2020;
 - single environmental authorisation by September 2020;
 - start of the main works by October 2020;
 - completion of the works by December 2026;
 - entry into operation by June 2027;
- (2) sector 2 from Passel to Allaines (49 km) crossing 33 municipalities, Sector 3 from Allaines to Etricourt-Manancourt (11 km) crossing 3 municipalities and Sector 4 from Etricourt-Manancourt to Aubencheul-au-Bac (30 km) crossing 11 municipalities, including the construction of the locks of Noyon, Campagne, Allaines, Marquion-Bourlon, Oisy-Le-Verger and Moislains (the junction lock with the Canal du Nord), of the storage basin of Louette and of the canal bridge (pont-canal) of 1,33 km crossing the Somme Valley:
- spatial territorial planning by December 2022;
 - single environmental authorisation by October 2022;
 - start of the main works by December 2023;
 - completion of the works by June 2028;
 - entry into operation by December 2028;
- (e) Dunkerque – Scheldt axis, including the canal of Dunkerque from Valenciennes to the Scheldt and to the Walloon backbone, and the Deûle in the direction of Gent: upgrade to ECMT class Va (bidirectional) and class Vb (unidirectional), and improvement of the navigation conditions, by December 2027
- (1) on all sections:
- studies to increase the capacity of the locks (by doubling and/or lengthening), by December 2023;
 - establishment of the remote control of the locks, by December 2025;
 - securing of the navigation conditions for ECMT class V vessels, by December 2027;
- (2) section from Arleux to Anzin: modernisation and rehabilitation of the Denain lock, by December 2022;

- (3) section from Arleux to Halluin:
- upgrade of the Deûle to ECMT class Va (bidirectional) and class Vb (unidirectional), by December 2022;
 - modernisation and rehabilitation of the locks (including Don and Grand-Carré), by December 2020, and lengthening of the Quesnoy-sur-Deûle lock, by December 2026;
- (4) section from Bauvin to Dunkerque:
- defenses of the riverbanks of the canal of Aire Neufossé (phases 1 and 2), by December 2026, and defenses of the riverbanks and rehabilitation of the waterline on the biefs of Fontinettes, by December 2023;
 - modernisation and rehabilitation of the Fontinettes lock, by December 2019;
- (f) canal Condé-Pommerœul: reopening with ECMT class Va, by December 2022;
- (g) Walloon Backbone, from Pommerœul to Namur: upgrade to ECMT class Va, by December 2028
- (1) Pommerœul to Seneffe: upgrade to ECMT class Va, including the adaptation of the Nimy-Blaton-Péronnes canal and duplication of the Obourg lock, with finalisation of the studies by December 2022 and completion of the works by December 2027;
- (2) Seneffe to Charleroi: upgrade to ECMT class Va and duplication of the locks (Marchienne, Gosselies and Viesville), with preparatory works by December 2022 and completion by December 2027;
- (3) Charleroi to Namur:
- adaptation of the Auvelais lock, by December 2022;
 - improvement of crossing possibilities, with studies to be finalised by December 2022 and works by 2028;
- (h) Upper Scheldt:
- (1) in the region of Wallonia (Belgium):
- upgrade to ECMT class Va, including adaptation of the Tournai crossing to an unidirectional Va and adjustment of the 'Pont des Trouis' and 'Pont-à-Pont', by December 2022;
 - capacity increase and securing of the lock sites, through the adaptation of the locks of Hérinnes and Kain, with finalisation of the studies by December 2023 and of the works by December 2030;
- (2) in the region of Flanders (Belgium): finalisation of the studies for an upgrade of the locks to ECMT class Vb by December 2022, and drawing up of a technical and financial implementation plan by December 2023;
- (i) Lys: upgrade to ECMT class Vb (unidirectional) and Va (bidirectional), enabling 3 layers of containers, by December 2027, including:
- (1) in the region of Flanders (Belgium), between Ghent and Wervik:
- all the locks adapted to ECMT class Vb, including the locks in St-Baafs-Vijve and in Harelbeke, by December 2021;
 - ECMT class Vb calibration, including lifting up of bridges enabling 3 layers of containers, by December 2022 on the Lys diversion canal, and by December 2027 on the remaining sections;
- (2) in the region of Wallonia (Belgium), on the municipality of Comines: upgrade to ECMT class Vb, including the crossing of Comines, by December 2027, and securing of the navigation, especially with the replacement of the weir in Comines, by December 2030;
- (3) in France, between Deülémont and Comines: upgrade to ECMT class Vb, by December 2024;

- (j) connecting network in Flanders:
- (1) studies for the upgrade of the Flemish inland waterway sections connecting directly to the Seine-Scheldt main link, by December 2022:
 - upgrade to ECMT class Va, enabling 3 layers of containers, of the connections to the maritime ports of Zeebrugge (canal Ghent – Bruges) and Antwerp (Upper-Seascheldt);
 - upgrade to ECMT class Va of the canals Roeselare-Lys and Bossuit-Kortrijk;
 - (2) drawing up of a technical and financial implementation plan, including a detailed priority assessment, for the necessary upgrades on the above sections, by December 2023;
- (k) Seneffe – Antwerp, on the Flemish and Walloon sections: conduct studies, in particular for the upgrade to a fully-fledged ECMT class IV, by December 2022, and drawing up of a technical and financial implementation plan of the necessary upgrades, by December 2023;
- (l) general actions:
- (1) drawing up of a policy framework, coordinated between the different parties, to promote the full deployment of alternative fuels infrastructure along the whole Seine-Scheldt network, in line with the National Policy Frameworks submitted by Belgium and France in the context of Directive 2014/94/EU of the European Parliament and of the Council ⁽²⁾, by December 2022, with a view to gradual implementation by December 2030;
 - (2) implementation of integrated and efficient cross-border traffic and transport management services along the whole Seine-Scheldt network, including the full-scale RIS implementation according to Directive 2005/44/EC of the European Parliament and of the Council ⁽³⁾, by December 2028;
 - (3) development of multimodal logistics platforms on the Seine – Scheldt network, by December 2028.

Article 3

Governance

1. The European Coordinator for the North Sea – Mediterranean Core Network Corridor and a representative of the European Commission shall be invited to participate as observer in the meetings of the supervisory board (conseil de surveillance) of the Société du canal Seine-Nord Europe.
2. The progress of the actions referred to in Article 2 shall be regularly discussed in the framework of the Inter-governmental Commission for the preparation of the completion of the Seine – Scheldt project, as well as in the framework of the Seine – Scheldt EEIG. The European Coordinator for the North Sea –Mediterranean Core Network Corridor and a representative of the Commission shall be invited to participate as observers in the meetings of the Inter-governmental Commission at least biannually and in the meetings of the Seine – Scheldt EEIG at least three times a year.

Article 4

Reporting

Belgium and France shall report at least once a year to the Commission and to the European Coordinator for the North Sea – Mediterranean Core Network Corridor on the progress in implementing the actions referred to in Article 2 and shall notify any delay encountered, specifying the causes for the delay and indicating the corrective measures taken. For this purpose those Member States may use, when appropriate, the content of the Annual Status Reports to be submitted under the Connecting Europe Facility Grant Agreements.

Article 5

Review

By 31 December 2023 at the latest, the Commission shall, following a request from Belgium and France, or at its own initiative, carry out a review of the actions and of the timetable referred to in Article 2, with the assistance of the European Coordinator for the North Sea – Mediterranean Core Network Corridor.

⁽²⁾ Directive 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the deployment of alternative fuels infrastructure (OJ L 307, 28.10.2014, p. 1).

⁽³⁾ Directive 2005/44/EC of the European Parliament and of the Council of 7 September 2005 on harmonised river information services (RIS) on inland waterways in the Community (OJ L 255, 30.9.2005, p. 152).

Article 6

This Decision is addressed to the Kingdom of Belgium and the French Republic.

Done at Brussels, 27 June 2019.

For the Commission
Violeta BULC
Member of the Commission

COMMISSION IMPLEMENTING DECISION (EU) 2019/1119**of 28 June 2019****on the approval of efficient vehicle exterior lighting using light emitting diodes for use in internal combustion engine vehicles and non-externally chargeable hybrid electrified vehicles as an innovative technology for reducing CO₂ emissions from passenger cars pursuant to Regulation (EC) No 443/2009 of the European Parliament and of the Council****(Text with EEA relevance)**

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Regulation (EC) No 443/2009 of the European Parliament and of the Council of 23 April 2009 setting emission performance standards for new passenger cars as part of the Community's integrated approach to reduce CO₂ emissions from light duty vehicles ⁽¹⁾, and in particular Article 12(4) thereof,

Whereas:

- (1) On 6 September 2018, the manufacturers Toyota Motor Europe NV/SA, Opel Automobile GmbH – PSA, FCA Italy S.p.A., Automobiles Citroën, Automobiles Peugeot, PSA Automobiles SA, Audi AG, Ford Werke GmbH, Jaguar Land Rover, Hyundai Motor Europe Technical Center GmbH, Škoda Auto a.s., BMW AG, Renault SA, Honda Motor Europe Ltd, Volkswagen AG and Volkswagen AG Nutzfahrzeuge (the 'applicants'), submitted a joint application for the approval of efficient vehicle exterior lighting using light emitting diodes (efficient LED lighting) for use in internal combustion engine vehicles and non-externally chargeable hybrid electrified vehicles as an innovative technology. The application has been assessed in accordance with Article 12 of Regulation (EC) No 443/2009 and Commission Implementing Regulation (EU) No 725/2011 ⁽²⁾.
- (2) Efficient LED lighting is a lighting module equipped with light emitting diodes sources that has lower power consumption than conventional halogen lighting.
- (3) The application has been assessed in accordance with Article 12 of Regulation (EC) No 443/2009, Implementing Regulation (EU) No 725/2011 and the Technical Guidelines for the preparation of applications for the approval of innovative technologies pursuant to Regulation (EC) No 443/2009 (Technical Guidelines, version July 2018).
- (4) The application concerns CO₂ savings from the use of efficient LED lighting as assessed by reference to the Worldwide Harmonised Light Vehicle Test Procedure (WLTP) set out in Commission Regulation (EU) 2017/1151 ⁽³⁾.
- (5) Efficient LED lighting has already been approved by Commission Implementing Decisions 2014/128/EU ⁽⁴⁾, (EU) 2015/206 ⁽⁵⁾, (EU) 2016/160 ⁽⁶⁾, (EU) 2016/587 ⁽⁷⁾ and (EU) 2016/1721 ⁽⁸⁾ as an innovative technology capable of reducing CO₂ emissions by reference to the New European Driving Cycle (NEDC) set out in Commission Regulation (EC) No 692/2008 ⁽⁹⁾. Based on the experience gained from those Decisions, as well as taking into account the current application, it has been satisfactorily and conclusively demonstrated that efficient LED lighting including one or more appropriate combinations of efficient LED lights, such as the low beam headlamp, high beam headlamp, front position, front fog, rear fog, front turn signal, rear turn signal, licence plate and reversing lamps, meet the eligibility criteria referred to in Article 12 of Regulation (EC) No 443/2009 and Implementing Regulation (EU) No 725/2011.
- (6) The CO₂ savings from the use of efficient LED lighting may be partially demonstrated on the WLTP test. However, the applicants have provided a testing methodology with which it can be demonstrated, in a way capable of producing repeatable, verifiable and comparable results, that the savings achieved, whilst taking the partial coverage into account, are at least 0,5 g CO₂/km.
- (7) In order to ensure continuity, in particular with regard to the transition from the application of the NEDC to the WLTP CO₂ emissions test, it is appropriate to maintain halogen lighting as the baseline technology as provided for in Implementing Decisions 2014/128/EU, (EU) 2015/206, (EU) 2016/160, (EU) 2016/587, and (EU) 2016/1721.

- (8) Manufacturers should have the possibility to apply with a type-approval authority for the certification of CO₂ savings from the use of efficient LED lightings in internal combustion engine vehicles and non-externally chargeable hybrid electrified vehicles. The manufacturer should for that purpose ensure that the application for certification is accompanied by a verification report from an independent verification body confirming the level of CO₂ savings to be certified and that all relevant conditions are met.
- (9) If the type approval authority finds that the LED lighting does not satisfy the conditions for certification, the application for certification of the savings should be rejected.
- (10) In order to facilitate a wider deployment of efficient LED lighting in new vehicles, a manufacturer should also have the possibility to apply for the certification of the CO₂ savings from several efficient LED lightings by a single certification application. It is however appropriate to ensure that, where that possibility is used, a mechanism is applied that incentivises the deployment of only those LED lighting that offer the highest efficiency.
- (11) The CO₂ savings certified pursuant to this Decision are to be taken into account for the calculation of the average specific CO₂ emissions of manufacturers starting from calendar year 2021.
- (12) For the purposes of determining the general eco-innovation code to be used in the relevant type approval documents in accordance with Annexes I, VIII and IX to Directive 2007/46/EC of the European Parliament and of the Council ⁽¹⁰⁾, the individual code to be used for the innovative technology for efficient LED Lightings for internal combustion engine vehicles and non-externally chargeable hybrid electrified vehicles should be specified,

HAS ADOPTED THIS DECISION:

Article 1

Approval

The technology used in efficient light emitting diodes (LED) lighting is approved as an innovative technology within the meaning of Article 12 of Regulation (EC) No 443/2009, where that innovative technology is used for the purpose of external lighting in internal combustion engine passenger cars and non-externally chargeable hybrid electrified passenger cars.

Article 2

Definition

For the purpose of this Decision, efficient LED lighting means a technology consisting of a lighting module that is equipped with light emitting diode (LED) sources that are used for the exterior lighting of a vehicle and that has a lower power consumption than conventional halogen lighting.

Article 3

Application for certification of CO₂ savings

1. Any manufacturer may apply for the certification of CO₂ savings from one or several exterior efficient LED lightings where those are used for the external lighting of internal combustion engine M₁ vehicles and non-externally chargeable hybrid electrified M₁ vehicles. The efficient LED lighting shall include one or a combination of the following LED lights:

- (a) low beam headlamp (including adaptative front lighting system);
- (b) high beam headlamp;

- (c) front position lamp;
- (d) front fog lamp;
- (e) rear fog lamp;
- (f) front turn signal lamp;
- (g) rear turn signal lamp;
- (h) licence plate lamp;
- (i) reversing lamp;
- (j) cornering lamp;
- (k) static bending lamp.

The LED light or the combination of LED lights forming the efficient LED lighting shall as a minimum provide the CO₂ reduction specified in Article 9(1)(b) of Implementing Regulation (EU) No 725/2011 as demonstrated using the testing methodology set out in the Annex to this Decision.

2. An application for the certification of the savings from one or a combination of efficient LED lighting shall be accompanied by an independent verification report confirming that the conditions set out in paragraph 1 are met.
3. The type approval authority shall reject the application for certification if it finds that the conditions set out in paragraph 1 are not met.

Article 4

Certification of CO₂ savings

1. The reduction in CO₂ emissions from the use of an efficient LED lighting referred to in Article 3(1) shall be determined using the methodology set out in the Annex.
2. Where a manufacturer applies for the certification of the CO₂ savings from more than one efficient LED lighting referred to in Article 3(1) in relation to one vehicle version, the type approval authority shall determine which of the efficient LED lighting tested delivers the lowest CO₂ savings, and record the lowest value in the relevant type approval documentation. That value shall be indicated in the certificate of conformity in accordance with Article 11(2) of Implementing Regulation (EU) No 725/2011.
3. The type approval authority shall record the verification report and the test results on the basis of which the savings were determined and shall make that information available to the Commission on request.

Article 5

Eco-innovation code

The eco-innovation code No 28 shall be entered into the type approval documentation where reference is made to this Decision in accordance with Article 11(1) of Implementing Regulation (EU) No 725/2011.

CO₂ savings recorded by reference to that eco-innovation code may be taken into account for the calculation of the average specific emissions of a manufacturer starting from calendar year 2021.

Article 6

Entry into force

This Decision shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

Done at Brussels, 28 June 2019.

For the Commission

The President

Jean-Claude JUNCKER

⁽¹⁾ OJ L 140, 5.6.2009, p. 1.

⁽²⁾ Commission Implementing Regulation (EU) No 725/2011 of 25 July 2011 establishing a procedure for the approval and certification of innovative technologies for reducing CO₂ emissions from passenger cars pursuant to Regulation (EC) No 443/2009 of the European Parliament and of the Council (OJ L 194, 26.7.2011, p. 19).

⁽³⁾ Commission Regulation (EU) 2017/1151 of 1 June 2017 supplementing Regulation (EC) No 715/2007 of the European Parliament and of the Council on type-approval of motor vehicles with respect to emissions from light passenger and commercial vehicles (Euro 5 and Euro 6) and on access to vehicle repair and maintenance information, amending Directive 2007/46/EC of the European Parliament and of the Council, Commission Regulation (EC) No 692/2008 and Commission Regulation (EU) No 1230/2012 and repealing Commission Regulation (EC) No 692/2008 (OJ L 175, 7.7.2017, p. 1).

⁽⁴⁾ Commission Implementing Decision 2014/128/EU of 10 March 2014 on the approval of the light emitting diodes low beam module 'E-Light' as an innovative technology for reducing CO₂ emissions from passenger cars pursuant to Regulation (EC) No 443/2009 of the European Parliament and of the Council (OJ L 70, 11.3.2014, p. 30).

⁽⁵⁾ Commission Implementing Decision (EU) 2015/206 of 9 February 2015 on the approval of the Daimler AG efficient exterior lighting using light emitting diodes as an innovative technology for reducing CO₂ emissions from passenger cars pursuant to Regulation (EC) No 443/2009 of the European Parliament and of the Council (OJ L 33, 10.2.2015, p. 52).

⁽⁶⁾ Commission Implementing Decision (EU) 2016/160 of 5 February 2016 on the approval of the Toyota Motor Europe efficient exterior lighting using light emitting diodes as an innovative technology for reducing CO₂ emissions from passenger cars pursuant to Regulation (EC) No 443/2009 of the European Parliament and of the Council (OJ L 31, 6.2.2016, p. 70).

⁽⁷⁾ Commission Implementing Decision (EU) 2016/587 of 14 April 2016 on the approval of the technology used in efficient vehicle exterior lighting using light emitting diodes as an innovative technology for reducing CO₂ emissions from passenger cars pursuant to Regulation (EC) No 443/2009 of the European Parliament and of the Council (OJ L 101, 16.4.2016, p. 17).

⁽⁸⁾ Commission Implementing Decision (EU) 2016/1721 of 26 September 2016 on the approval of the Toyota efficient exterior lighting using light emitting diodes for the use in non-externally chargeable hybrid electrified vehicles as an innovative technology for reducing CO₂ emissions from passenger cars pursuant to Regulation (EC) No 443/2009 of the European Parliament and of the Council (OJ L 259, 27.9.2016, p. 71).

⁽⁹⁾ Commission Regulation (EC) No 692/2008 of 18 July 2008 implementing and amending Regulation (EC) No 715/2007 of the European Parliament and of the Council on type-approval of motor vehicles with respect to emissions from light passenger and commercial vehicles (Euro 5 and Euro 6) and on access to vehicle repair and maintenance information (OJ L 199, 28.7.2008, p. 1).

⁽¹⁰⁾ Directive 2007/46/EC of the European Parliament and the Council of 5 September 2007 establishing a framework for the approval of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles (Framework Directive) (OJ L 263, 9.10.2007, p. 1).

ANNEX

Methodology to determine the CO₂ savings of efficient LED lighting by reference to the Worldwide Harmonised Light Vehicle Test Procedure

1. INTRODUCTION

In order to determine the CO₂ emission reductions that can be attributed to efficient LED lighting consisting of an appropriate combination of external vehicle LED lights for the use in internal combustion engine M1 vehicles and non-externally chargeable hybrid electrified M1 vehicles, it is necessary to establish the following:

- (1) the test conditions;
- (2) the test equipment;
- (3) the procedure to determine the power savings;
- (4) the procedure to determine the CO₂ savings;
- (5) the procedure to determine the uncertainty of the CO₂ savings.

2. SYMBOLS, PARAMETERS AND UNITS

Latin symbols

AFS	—	Adaptive Front lighting System
B	—	Baseline
CO ₂	—	Carbon dioxide
C _{CO₂}	—	CO ₂ savings [g CO ₂ /km]
C	—	Number of classes of the adaptive front lighting system
CF	—	Conversion factor (l/100 km) - (g CO ₂ /km) [gCO ₂ /l]
EI	—	Eco-innovative
HEV	—	Hybrid Electrified Vehicle
K _{CO₂}	—	CO ₂ correction factor, $\left[\left(\frac{\text{gCO}_2}{\text{km}} \right) / \left(\frac{\text{Wh}}{\text{km}} \right) \right]$ as defined in Regulation (EU) 2017/1151 Sub-Annex 8 Appendix 2
$\overline{K_{CO_2}}$	—	Average of the T values of K _{CO₂} $\left[\left(\frac{\text{gCO}_2}{\text{km}} \right) / \left(\frac{\text{Wh}}{\text{km}} \right) \right]$
m	—	Number of efficient exterior LED lights composing the package
MT	—	Minimum threshold [g CO ₂ /km]
n	—	Number of measurements of the sample
NOVC	—	Not Off-Vehicle Charging
P	—	Power consumption of the vehicle light [W]
P _{B_i}	—	Power consumption of the corresponding i light in a baseline vehicle [W]
P _{c_n}	—	Power consumption of the corresponding n sample for each class vehicle [W]
$\overline{P_c}$	—	Power consumption for each class of vehicle (average of the n measurements) [W]
P _{EI,AFS}	—	Power consumption of the Low beam AFS [W]
$\overline{P_{Ei}}$	—	Average power consumption of the corresponding eco-innovative vehicle light [W]

ΔP_i	— Power savings of each efficient exterior LED light [W]
s_{cCO_2}	— Standard deviation of the total CO ₂ savings [g CO ₂ /km]
$s_{K_{CO_2}}$	— Standard deviation of the K_{CO_2} $\left[\left(\frac{gCO_2}{km} \right) / \left(\frac{Wh}{km} \right) \right]$
$s_{K_{CO_2t}}$	— Standard deviation of average of the T values of K_{CO_2t} $\left[\left(\frac{gCO_2}{km} \right) / \left(\frac{Wh}{km} \right) \right]$
s_{P_c}	— Standard deviation of average of power consumption for each class of vehicle [W]
$s_{P_{EI}}$	— Standard deviation of the LED light power consumption in eco-innovative vehicle [W]
$s_{P_{EI}}$	— Standard deviation of the average LED light power consumption mean in eco-innovative vehicle [W]
$s_{P_{EIAFS}}$	— Uncertainty or Standard deviation of average of power of the Low beam AFS [W]
T	— Number of measurements performed by the manufacturer for the extrapolation of the K_{CO_2}
t	— Driving duration of the Worldwide Light vehicles Test Cycle (WLTC) [s], which is 1 800 s
UF	— Usage factor for the vehicle light [-] as defined in Table 6
v	— Mean driving speed of the Worldwide Light vehicles Test Cycle (WLTC) [km/h]
V_{Pe}	— Consumption of effective power [l/kWh]
share _c	— Time percentage per speed band in each vehicle class
$\frac{\partial C_{CO_2}}{\partial P_{EI}}$	— Sensitivity of calculated CO ₂ savings related to the LED light power consumption
$\frac{\partial C_{CO_2}}{\partial K_{CO_2}}$	— Sensitivity of calculated CO ₂ savings related to the CO ₂ correction factor
η_A	— Efficiency of the alternator [-]
η_{DCDC}	— Efficiency of the DC-DC converter [-]

Subscripts

Index (c) refers to number of class of the adaptive front lighting system measurement of the sample

Index (i) refers to each vehicle lights

Index (j) refers to measurement of the sample

Index (t) refers to each number of measurements of T

3. TESTING CONDITIONS

The testing conditions shall fulfil the requirements of UN/ECE Regulations Nos 4 ⁽¹⁾, 6 ⁽²⁾, 7 ⁽³⁾, 19 ⁽⁴⁾, 23 ⁽⁵⁾, 38 ⁽⁶⁾, 48 ⁽⁷⁾, 100 ⁽⁸⁾, 112 ⁽⁹⁾, 119 ⁽¹⁰⁾ and 123 ⁽¹¹⁾. The power consumption shall be determined in accordance with point 6.1.4 of UN/ECE Regulation No 112, and points 3.2.1 and 3.2.2 of Annex 10 to that Regulation.

⁽¹⁾ OJL 4, 7.1.2012, p. 17.

⁽²⁾ OJL 213, 18.7.2014, p. 1.

⁽³⁾ OJL 285, 30.9.2014, p. 1.

⁽⁴⁾ OJL 250, 22.8.2014, p. 1.

⁽⁵⁾ OJL 237, 8.8.2014, p. 1.

⁽⁶⁾ OJL 148, 12.6.2010, p. 55.

⁽⁷⁾ OJL 323, 6.12.2011, p. 46.

⁽⁸⁾ OJL 302, 28.11.2018, p. 114.

⁽⁹⁾ OJL 250, 22.8.2014, p. 67.

⁽¹⁰⁾ OJL 89, 25.3.2014, p. 101.

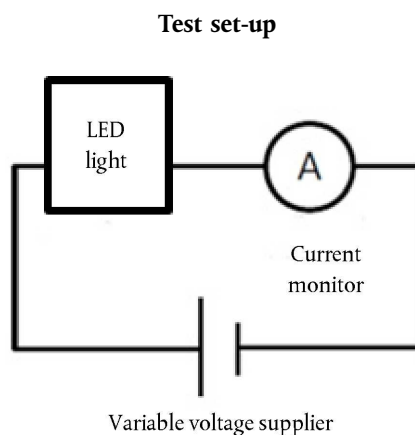
⁽¹¹⁾ OJL 222, 24.8.2010, p. 1.

For the low beam adaptive front lighting system (AFS) falling within at least two of the Classes C, E, V or W as defined in Regulation UN/ECE No 123, unless it is agreed with the technical service that Class C is the representative/average LED intensity for the vehicle application, power measurements shall be done at the LED intensity of each class (P_c) as defined in Regulation UN/ECE 123. If Class C is the representative/average LED intensity for the vehicle application, power measurements shall be done in the same way as for any other exterior LED light included in the combination.

Test equipment

The following equipment shall be used, as shown in the Figure below:

- a power supply unit (i.e. variable voltage supplier);
- two digital multimeters, one for measuring the DC-current, and the other for measuring the DC-voltage. In the Figure, a possible test set-up is shown, when the DC-voltage meter is integrated in the power supply unit.



Measurements and determination of the power savings

For each efficient exterior LED light included in the combination the measurement of the current shall be performed as shown in the Figure at a voltage of 13,2 V. LED module(s) operated by an electronic light source control gear, shall be measured as specified by the applicant.

The manufacturer may request that other measurements of the current shall be done at other additional voltages. In that case, the manufacturer shall hand over verified documentation on the necessity to perform those other measurements to the type-approval authority. The measurements of the currents at each of those additional voltages shall be performed consecutively at least five times. The exact installed voltages and the measured current shall be recorded in four decimals.

The power consumption shall be determined by multiplying the installed voltage with the measured current. The average of the power consumption for each efficient exterior LED light ($\overline{P_{E_{it}}}$) shall be calculated. Each value shall be expressed in four decimals. When a stepper motor or electronic controller is used for the supply of the electricity to the LED lights, the electric load of that component part shall be excluded from the measurement.

Additional measurements for Low beam Adaptive Front Lighting System (AFS)

Table 1

Classes of Low beam AFS

Class	See point 1.3 and footnote 2 of UN/ECE Regulation 123	% LED Intensity	Activation Mode (*)
C	Base Passing Beam (Country)	100 %	50 km/h < speed < 100 km/h Or when no mode of another passing beam class is activated (V, W, E)

Class	See point 1.3 and footnote 2 of UN/ECE Regulation 123	% LED Intensity	Activation Mode (*)
V	Town	85 %	Speed < 50 km/h
E	Motorway	110 %	Speed > 100 km/h
W	Adverse Conditions	90 %	Windshield wiper active > 2 min

(*) Activation speeds to be checked for each vehicle application in accordance with UN/ECE Regulation No 48 section 6, chapter 6.22, paragraphs 6.22.7.4.1 (class C), 6.22.7.4.2 (class V), 6.22.7.4.3 (class E), 6.22.7.4.4 (class W).

Where the power measurements at the LED intensity of each class are needed, after conducting the measurements of each P_c , the power of the Low beam AFS (P_{EiAFS}) shall be calculated as a weighted average of the LED Power during the WLTC speed bands, with the following Formula 1.

Formula 1

$$P_{EiAFS} = \sum_{c=1}^c \text{WLTC_share}_c \cdot \overline{P}_c$$

Where:

\overline{P}_c is the power consumption (mean of the n measurements) for each class;

WLTC_share_c is the WLTC time percentage per speed band in each class (WLTC last 1 800 s in total):

Table 2

Speed band	Time	WLTC_share _c (%)
< 50 km/h:	1 058 s	0,588 (58,8 %)
50 – 100 km/h	560 s	0,311 (31,1 %)
> 100 km/h	182 s	0,101 (10,1 %)

When the Low beam AFS only has 2 classes not covering all WLTC speeds (e.g. C & V), the weighting of Class C power shall also include the WLTC time not covered by the 2nd class (e.g. Class C time 't' = 0,588 + 0,101)

The resulting power savings of each efficient exterior LED light (ΔP_i) shall be calculated with the following Formula 2:

Formula 2

$$\Delta P_i = P_{B_i} - \overline{P}_{Ei}$$

where the power consumption of the corresponding baseline vehicle light is as specified in Table 3:

Table 3

Power consumptions for different baseline vehicle lights

Vehicle light	Total electric power (P_B) [W]
Low beam headlamp	137
High beam headlamp	150

Vehicle light	Total electric power (P_b) [W]
Front position	12
License plate	12
Front fog lamp	124
Rear fog lamp	26
Front turn signal lamp	13
Rear turn signal lamp	13
Reversing lamp	52
Cornering lamp	44
Static Bending lamp	44

4. CALCULATION OF THE CO₂ SAVINGS AND STATISTICAL MARGIN

4.1. Calculation of the CO₂ savings

The total CO₂ savings of the lighting package shall be calculated in accordance with the specific powertrain of the vehicle (i.e. Conventional, NOVC-HEV).

4.1.1. Conventional Vehicles (Internal Combustion Engine only)

The CO₂ savings shall be calculated in accordance with the following Formula 3:

Formula 3

$$C_{CO_2} = \left(\sum_{i=1}^m \Delta P_i \cdot UF_i \right) \cdot \frac{V_{pe}}{\eta_A} \cdot \frac{CF}{v}$$

Where:

v : Mean driving speed of the WLTC [km/h], which is 46,60 km/h

η_A : Efficiency of the alternator, which is 0,67

V_{pe} : Consumption of effective power as specified in Table 4

Table 4

Consumption of effective power

Type of engine	Consumption of effective power (V_{pe}) [l/kWh]
Petrol	0,264
Petrol Turbo	0,280
Diesel	0,220

CF: Conversion factor (l/100 km) - (g CO₂/km) [gCO₂/l] as specified in Table 5:

Table 5

Fuel conversion factor

Type of fuel	Conversion factor (l/100 km) - (g CO ₂ /km) (CF) [gCO ₂ /l]
Petrol	2 330
Diesel	2 640

UF_i: Usage factor for the vehicle light [-] as defined in Table 6.

Table 6

Usage factor for different vehicle lights

Vehicle light	Usage factor (UF) [-]
Low beam headlamp	0,33
High beam headlamp	0,03
Front position	0,36
License plate	0,36
Front fog lamp	0,01
Rear fog lamp	0,01
Front turn signal lamp	0,15
Rear turn signal lamp	0,15
Reversing lamp	0,01
Cornering lamp	0,076
Static Bending lamp	0,15

4.1.2. Hybrid Vehicles (NOVC-HEV only)

The CO₂ savings shall be calculated in accordance with the following Formula 4:

Formula 4

$$C_{CO_2} = \frac{\sum_{i=1}^m \Delta P_i \cdot UF_i}{v \cdot \eta_{DCDC}} \cdot K_{CO_2}$$

Where:

η_{DCDC} : Efficiency of the DC-DC converter

K_{CO_2} : CO₂ correction factor $\left[\left(\frac{gCO_2}{km} \right) / \left(\frac{Wh}{km} \right) \right]$, as defined in paragraph 2.2 of Appendix 2 to Sub-Annex 8 to Annex XXI to Regulation (EU) 2017/1151.

The efficiency of the DC-DC converter (η_{DCDC}) shall be evaluated in accordance with the appropriate vehicle architecture, as specified in Table 7:

Table 7

Usage factor for different vehicle lights

#	Architecture	η_{DCDC}
1	Lights connected in parallel to the low voltage battery (lights fed directly from the high voltage battery via DCDC converter)	0,xx
2	Lights connected in series after the low voltage battery, and the low voltage battery connected in series to the High voltage battery	1
3	High Voltage and low voltage batteries have exactly the same voltage (12 V, 48 V,...) as the lights	1

For architecture #1, the efficiency of the DC-DC converter (η_{DCDC}) shall be the highest value resulting from the efficiency tests performed in the operative electric current range. The measuring interval shall be equal or lower than 10 % of the operative electric current range.

4.2. Calculation of the statistical margin

The statistical margin of the lighting package shall be calculated in accordance with the specific powertrain of the vehicle (i.e. Conventional, NOVC-HEV).

4.2.1. Conventional Vehicles (Internal Combustion Engine only)

The statistical margin of the results of the testing methodology caused by the measurements shall be quantified. For each efficient exterior LED light included in the package the standard deviation shall be calculated in accordance with Formula 5:

Formula 5

$$s_{P_{Ei}} = \frac{S_{P_{Ei}}}{\sqrt{n}} = \sqrt{\frac{\sum_{j=1}^n (P_{Eij} - \bar{P}_{Ei})^2}{n(n-1)}}$$

Where:

n: Number of measurements of the sample, which is at least 5

Where the standard deviation of the power consumption of each efficient exterior LED light ($s_{P_{Ei}}$) leads to an error in the CO₂ savings (s_{CO_2}) that error shall be calculated by means of Formula 6:

Formula 6

$$s_{CO_2} = \sqrt{\sum_{i=1}^m \left(\frac{\partial C_{CO_2}}{\partial P_{Ei}} \cdot s_{P_{Ei}} \right)^2} = \frac{V_{Pe} \cdot CF}{\eta_A \cdot v} \cdot \sqrt{\sum_{i=1}^m (UF_i \cdot s_{P_{Ei}})^2}$$

4.2.2. Hybrid Vehicles (NOVC-HEV only)

The statistical margin of the results of the testing methodology caused by the measurements shall be quantified. For each efficient exterior LED light included in the package the standard deviation shall be calculated in accordance with Formula 7:

Formula 7

$$s_{\overline{P_{Eli}}} = \frac{s_{P_{Eli}}}{\sqrt{n}} = \sqrt{\frac{\sum_{j=1}^n (P_{Eli_j} - \overline{P_{Eli}})^2}{n(n-1)}}$$

Where:

n: Number of measurements of the sample, which is at least 5

The CO₂-emission correction factor K_{CO₂} shall be determined from a set of T measurements performed by the manufacturer, in accordance with paragraph 2.2 of Appendix 2 to Sub-Annex 8 to Annex XXI to Regulation (EU) 2017/1151. For each measurement, electric balance during the test and the measured CO₂-emissions shall be recorded.

In order to evaluate the statistical error of K_{CO₂}, all T combinations without repetitions of T-1 measurements shall be used to extrapolate T different values of K_{CO₂} (i.e. K_{CO_{2t}}). The extrapolation shall be performed in accordance with the method defined in paragraph 2.2 of Appendix 2 to Sub-Annex 8 to Annex XXI to Regulation (EU) 2017/1151.

The standard deviation of K_{CO₂} ($s_{\overline{K_{CO_2}}}$) shall be calculated in accordance with Formula 8.

Formula 8

$$s_{\overline{K_{CO_2}}} = \frac{s_{K_{CO_2}}}{\sqrt{T}} = \sqrt{\frac{\sum_{t=1}^T (K_{CO_{2t}} - \overline{K_{CO_2}})^2}{T(T-1)}}$$

Where:

T: Number of measurements performed by the manufacturer for the extrapolation of the K_{CO₂} as defined in paragraph 2.2 of Appendix 2 to Sub-Annex 8 to Annex XXI to Regulation (EU) 2017/1151.

$\overline{K_{CO_2}}$: mean of the T values of K_{CO_{2t}}

Where the standard deviation of the power consumption of each efficient exterior LED light ($s_{\overline{P_{Eli}}}$) and the standard deviation of the k_{CO₂} ($s_{\overline{k_{CO_2}}}$) lead to an error in the CO₂ savings (s_{CO₂}), that error shall be calculated by means of Formula 9.

Formula 9

$$s_{CO_2} = \sqrt{\sum_{i=1}^m \left(\frac{\partial C_{CO_2}}{\partial P_{Eli}} \cdot s_{\overline{P_{Eli}}} \right)^2 + \left(\frac{\partial C_{CO_2}}{\partial K_{CO_2}} \cdot s_{\overline{K_{CO_2}}} \right)^2}$$

$$= \sqrt{\left(\frac{K_{CO_2}}{v \cdot \eta_{DCDC}} \right)^2 \cdot \sum_{i=1}^m (UF_i \cdot s_{\overline{P_{Eli}}})^2 + \left(\sum_{i=1}^m s_{\overline{P_{Eli}}} \cdot UF_i \right)^2 \cdot \left(\frac{K_{CO_2}}{v \cdot \eta_{DCDC}} \right)^2}$$

4.3. Statistical margin for Low beam AFS

Where the Low beam AFS is present, formulae 9 shall be adapted to take into account the additional measurements required.

The value of the uncertainty ($s_{P_{EIAFS}}$) that is to be used for the Low beam AFS shall be calculated with the following formulae 10 and 11:

Formula 10

$$s_{\bar{P}_c} = \frac{s_{P_c}}{\sqrt{n}} = \sqrt{\frac{\sum_{n=1}^N (P_{c_n} - \bar{P}_c)^2}{n(n-1)}}$$

Formula 11

$$s_{P_{EIAFS}} = \sqrt{\sum_{c=1}^C (WLTC_share_c \cdot s_{\bar{P}_c})^2}$$

Where:

n: Number of measurements of the sample, which is at least 5

\bar{P}_c : mean of the n values of P_c

5. ROUNDING

The calculated CO₂ savings value (C_{CO_2}) and the statistical margin of the CO₂ saving ($s_{c_{CO_2}}$) shall be rounded to a maximum of two decimal places.

Each value used in the calculation of the CO₂ savings may be applied unrounded or rounded to the minimum number of decimal places which allows the combined impact of all rounded values on the savings to be lower than 0,25 gCO₂/km.

6. STATISTICAL SIGNIFICANCE

It shall be demonstrated for each type, variant and version of a vehicle fitted with the efficient LED lightings that the uncertainty of the CO₂ savings calculated in accordance with Formula 6 or Formula 9 is not greater than the difference between the total CO₂ savings and the minimum savings threshold specified in Article 9(1) of Implementing Regulation (EU) No 725/2011 (see Formula 12).

Formula 12

$$MT < C_{CO_2} - s_{c_{CO_2}}$$

Where:

MT: minimum threshold [g CO₂/km]

C_{CO_2} : total CO₂ saving [g CO₂/km]

$s_{c_{CO_2}}$: standard deviation of the total CO₂ saving [gCO₂/km]

Where the total CO₂ emission savings of the efficient LED lighting as determined in accordance with the testing methodology set out in this Annex are below the threshold specified in Article 9(1)(b) of Implementing Regulation (EU) No 725/2011 the second subparagraph of Article 11(2) of that Regulation shall apply.

ACTS ADOPTED BY BODIES CREATED BY INTERNATIONAL AGREEMENTS

Only the original UN/ECE texts have legal effect under international public law. The status and date of entry into force of this Regulation should be checked in the latest version of the UN/ECE status document TRANS/WP.29/343, available at:

<http://www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29fdocsts.html>

Regulation No 136 of the Economic Commission for Europe of the United Nations (UN/ECE) — Uniform provisions concerning the approval of vehicles of category L with regard to specific requirements for the electric power train [2019/1120]

Incorporating all valid text up to:

Original version of the Regulation — Date of entry into force: 20 January 2016

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1. SCOPE

This Regulation does not cover post-crash safety requirements of road vehicles.

- 1.1. Part I: Safety requirements with respect to the electric power train of vehicles of category L ⁽¹⁾ with a maximum design speed exceeding 6 km/h, equipped with one or more traction motor(s) operated by electric power and not permanently connected to the grid, as well as their high voltage components and systems which are galvanically connected to the high voltage bus of the electric power train.
- 1.2. Part II: Safety requirements with respect to the Rechargeable Electrical Energy Storage System (REESS) of vehicles of category L with a maximum design speed exceeding 6 km/h, equipped with one or more traction motors operated by electric power and not permanently connected to the grid.

Part II of this Regulation does not apply to REESS(s) whose primary use is to supply power for starting the engine and/or lighting and/or other vehicle auxiliaries systems.

2. DEFINITIONS

For the purpose of this Regulation the following definitions apply:

- 2.1. 'Active driving possible mode' means the vehicle mode when application of pressure to the accelerator pedal (or activation of an equivalent control) or release of the brake system will cause the electric power train to move the vehicle.
- 2.2. 'Barrier' means the part providing protection against direct contact to the live parts from any direction of access.
- 2.3. 'Basic insulation' means insulation applied to live parts for protection against direct contact under fault-free conditions.
- 2.4. 'Cell' means a single encased electrochemical unit containing one positive and one negative electrode which exhibits a voltage differential across its two terminals.

⁽¹⁾ As defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3.), document ECE/TRANS/WP.29/78/Rev.6, para. 2. — <http://www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29resolutions.html>

- 2.5. 'Chassis connected to the electric circuit' means AC and DC electric circuits galvanically connected to the electrical chassis.
- 2.6. 'Conductive connection' means the connection using connectors to an external power supply when the REESS is charged.
- 2.7. 'Coupling system for charging the REESS' means the electrical circuit used for charging the REESS from an external electric power supply including the vehicle inlet or a permanently affixed charging cable.
- 2.8. 'C Rate' of 'n C' is defined as the constant current of the tested-device, which takes 1/n hours to charge or discharge the tested-device between 0 per cent of the state of charge and 100 per cent of the state of charge.
- 2.9. 'Direct contact' means the contact of persons with live parts.
- 2.10. 'Double insulation' means insulation comprising both basic insulation and supplementary insulation.
- 2.11. 'Electrical chassis' means a set made of conductive parts electrically linked together, whose potential is taken as reference.
- 2.12. 'Electrical circuit' means an assembly of connected live parts which is designed to be electrically energized in normal operation.
- 2.13. 'Electric energy conversion system' means a system that generates and provides electric energy for electric propulsion.
- 2.14. 'Electric power train' means the electrical circuit which includes the traction motor(s), and may include the REESS, the electric energy conversion system, the electronic converters, the associated wiring harness and connectors, and the coupling system for charging the REESS.
- 2.15. 'Electronic converter' means a device capable of controlling and/or converting electric power for electric propulsion.
- 2.16. 'Enclosure' means the part enclosing the internal units and providing protection against direct contact from any direction of access.
- 2.17. 'Exposed conductive part' means the conductive part which can be touched under the provisions of the protection IPXXB, and which becomes electrically energized under isolation failure conditions. This includes parts under a cover that can be removed without using tools.
- 2.18. 'Explosion' means the sudden release of energy sufficient to cause pressure waves and/or projectiles that may cause structural and/or physical damage to the surrounding of the tested-device.
- 2.19. 'External electric power supply' means an alternating current (AC) or direct current (DC) electric power supply outside of the vehicle.
- 2.20. 'High Voltage' means the classification of an electric component or circuit, if its working voltage is > 60 V and ≤ 1 500 V DC or > 30 V and ≤ 1 000 V AC root mean square (rms).
- 2.21. 'Fire' means the emission of flames from a tested-device. Sparks and arcing shall not be considered as flames.
- 2.22. 'Flammable electrolyte' means an electrolyte that contains substances classified as Class 3 'flammable liquid' under 'UN Recommendations on the Transport of Dangerous Goods — Model Regulations (Revision 17 from June 2011), Volume I, Chapter 2.3' ⁽²⁾.
- 2.23. 'High voltage bus' means the electrical circuit, including the coupling system for charging the REESS that operates on high voltage.

Where electrical circuits, that are galvanically connected to each other, are galvanically connected to the electrical chassis and the maximum voltage between any live part and the electrical chassis or any exposed conductive part is ≤ 30 V AC and ≤ 60 V DC, only the components or parts of the electric circuit that operate on high voltage are classified as a high voltage bus.

⁽²⁾ www.unece.org/trans/danger/publi/unrec/rev17/17files_e.html

- 2.24. 'Indirect contact' means the contact of persons with exposed conductive parts.
- 2.25. 'Live parts' means the conductive part(s) intended to be electrically energized in normal use.
- 2.26. 'Luggage compartment' means the enclosed space in the vehicle intended for luggage accommodation.
- 2.27. 'Manufacturer' means the person or body who is responsible to the approval authority for all aspects of the type approval process and for ensuring conformity of production. It is not essential that the person or body be directly involved in all stages of the construction of the vehicle, system or component which is the subject of the approval process.
- 2.28. 'Onboard isolation resistance monitoring system' means the device which monitors the isolation resistance between the high voltage buses and the electrical chassis.
- 2.29. 'Open type traction battery' means a liquid type battery requiring refilling with water and generating hydrogen gas released to the atmosphere.
- 2.30. 'Passenger compartment' means the space for occupant accommodation, bounded by at least 4 of the following: the roof, floor, side walls, doors, window glass, front bulkhead and rear bulkhead, or rear gate, as well as by the barriers and enclosures provided for protecting the occupants from direct contact with live parts.
- 2.31. 'Protection degree' means the protection provided by a barrier/enclosure related to the contact with live parts by a test probe, such as a test finger (IPXXB) or a test wire (IPXXD), as defined in Annex 3.
- 2.32. 'Rechargeable Electrical Energy Storage System (REESS)' means the rechargeable energy storage system that provides electric energy for electric propulsion.
- The REESS may include subsystem(s) together with the necessary ancillary systems for physical support, thermal management, electronic control and enclosures.
- 2.33. 'Reinforced insulation' means insulation of live parts for protection against electric shock equivalent to double insulation. Insulation may comprise several layers which cannot be tested individually as supplementary or basic insulation.
- 2.34. 'Removable REESS' means a REESS that by design can be taken out from the vehicle by the vehicle user for off-board charging.
- 2.35. 'Rupture' means opening(s) through the casing of any functional cell assembly created or enlarged by an event, large enough for a 12 mm diameter test finger (IPXXB) to penetrate and make contact with live parts (see Annex 3).
- 2.36. 'Service disconnect' means the device for deactivation of the electrical circuit when conducting checks and services of the REESS, fuel cell stack, etc.
- 2.37. 'State of Charge (SOC)' means the available electrical charge in a tested-device expressed as a percentage of its rated capacity.
- 2.38. 'Solid insulator' means the insulating coating of wiring harnesses provided in order to cover and protect the live parts against direct contact from any direction of access; covers for insulating the live parts of connectors, and varnish or paint for the purpose of insulation.
- 2.39. 'Subsystem' means any functional assembly of REESS components.
- 2.40. 'Supplementary insulation' means independent insulation applied in addition to basic insulation for protection against electric shock in the event of a failure of the basic insulation.
- 2.41. 'Tested-device' means either the complete REESS or the subsystem of a REESS that is subjected to the tests prescribed by this Regulation.

- 2.42. 'Type of REESS' means systems which do not differ significantly in such essential aspects as:
- (a) The manufacturer's trade name or mark;
 - (b) The chemistry, capacity and physical dimensions of its cells;
 - (c) The number of cells, the mode of connection of the cells and the physical support of the cells;
 - (d) The construction, materials and physical dimensions of the casing; and
 - (e) The necessary ancillary devices for physical support, thermal management and electronic control.
- 2.43. 'Vehicle type' means vehicles which do not differ in such essential aspects as:
- (a) Installation of the electric power train and the galvanically connected high voltage bus;
 - (b) Nature and type of electric power train and the galvanically connected high voltage components.
- 2.44. 'Withstand voltage' means voltage to be applied to a specimen under prescribed test conditions which does not cause breakdown and/or flashover of a satisfactory specimen.
- 2.45. 'Working voltage' means the highest value of an electrical circuit voltage rms, specified by the manufacturer, which may occur between any conductive parts in open circuit conditions or under normal operating condition. If the electrical circuit is divided by galvanic isolation, the working voltage is defined for each divided circuit, respectively.
3. APPLICATION FOR APPROVAL
- 3.1. Part I: Approval of a vehicle type with regard to its electrical safety, including the High Voltage System
- 3.1.1. The application for approval of a vehicle type with regard to specific requirements for the electric power train shall be submitted by the vehicle manufacturer or by his duly accredited representative.
- 3.1.2. It shall be accompanied by the below-mentioned documents in triplicate and following particulars:
- 3.1.2.1. Detailed description of the vehicle type as regards the electric power train and the galvanically connected high voltage bus.
- 3.1.2.2. For vehicles with REESS, additional evidence showing that the REESS is in compliance with the requirements of paragraph 6 of this Regulation.
- 3.1.3. A vehicle representative of the vehicle type to be approved shall be submitted to the Technical Service responsible for conducting the approval tests and, if applicable, at the manufacturer's discretion with the agreement of the Technical Service, either additional vehicle(s), or those parts of the vehicle regarded by the Technical Service as essential for the test(s) referred to in the paragraph 6 of this Regulation.
- 3.2. Part II: Approval of a Rechargeable Electrical Energy Storage System (REESS)
- 3.2.1. The application for approval of a type of REESS or separate technical unit with regard to the safety requirements of the REESS shall be submitted by the REESS manufacturer or by their duly accredited representative.
- 3.2.2. It shall be accompanied by the under-mentioned documents in triplicate and comply with the following particulars:
- 3.2.2.1. Detailed description of the type of REESS or separate technical unit as regards the safety of the REESS.
- 3.2.3. A component(s) representative of the type of REESS to be approved plus, at the manufacturer's discretion, and with the agreement of the Technical Service, those parts of the vehicle regarded by the Technical Service as essential for the test, shall be submitted to the Technical Service responsible for conducting the approval tests.
- 3.3. The Type Approval Authority shall verify the existence of satisfactory arrangements for ensuring effective control of the conformity of production before type approval is granted.

4. APPROVAL
- 4.1. If the type submitted for approval pursuant to this Regulation meets the requirements of the relevant parts of this Regulation, approval of that type shall be granted.
- 4.2. An approval number shall be assigned to each type approved. Its first two digits (at present 00 for the Regulation in its form) shall indicate the series of amendments incorporating the most recent major technical amendments made to the Regulation at the time of issue of the approval. The same Contracting Party shall not assign the same number to another vehicle type.
- 4.3. Notice of approval or of refusal or of extension or withdrawal of approval or production definitively discontinued of a vehicle type pursuant to this Regulation shall be communicated to the Parties to the Agreement applying this Regulation, by means of a form conforming to the model in Annex 1, Part 1 or 2 as appropriate to this Regulation.
- 4.4. There shall be affixed, conspicuously and in a readily accessible place specified on the approval form, to every vehicle or REESS or separate technical unit conforming to a type approved under this Regulation an international approval mark consisting of:
- 4.4.1. A circle surrounding the letter 'E' followed by the distinguishing number of the country which has granted approval ⁽³⁾.
- 4.4.2. The number of this Regulation, followed by the letter 'R', a dash and the approval number to the right of the circle described in paragraph 4.4.1.
- 4.4.3. In the case of an approval of a REESS or a separate technical unit of the REESS the 'R' shall be followed by the symbol 'ES'.
- 4.5. If the vehicle or REESS conforms to a type approved under one or more other Regulations annexed to the Agreement in the country which has granted approval under this Regulation, the symbol prescribed in paragraph 4.4.1 need not be repeated; in this case the Regulation and approval numbers and the additional symbols of all the Regulations under which approval has been granted in the country which has granted approval under this Regulation shall be placed in vertical columns to the right of the symbol prescribed in paragraph 4.4.1.
- 4.6. The approval mark shall be clearly legible and shall be indelible.
- 4.6.1. In the case of a vehicle, the approval mark shall be placed on or close to the vehicle data plate affixed by the manufacturer.
- 4.6.2. In the case of a REESS or separate technical unit approved as a REESS, the approval mark shall be affixed on the major element of the REESS by the manufacturer.
- 4.7. Annex 2 to this Regulation gives examples of the arrangements of the approval mark.
5. PART I: REQUIREMENTS OF A VEHICLE WITH REGARD TO ITS ELECTRICAL SAFETY
- 5.1. Protection against electrical shock
- These electrical safety requirements apply to high voltage buses under conditions where they are not connected to external high voltage power supplies.
- 5.1.1. Protection against direct contact
- Protection against direct contact with high voltage live parts is also required for vehicles equipped with any REESS type approved under Part II of this Regulation.
- The protection against direct contact with the live parts, shall comply with paragraphs 5.1.1.1 and 5.1.1.2.
- These protections (solid insulator, barrier, enclosure, etc.) shall not be able to be opened, disassembled or removed without the use of tools.

⁽³⁾ The distinguishing numbers of the Contracting Parties to the 1958 Agreement are reproduced in Annex 3 to Consolidated Resolution on the Construction of Vehicles (R.E.3), document ECE/TRANS/WP.29/78/Rev.6.

- 5.1.1.1. For protection of live parts inside the passenger compartment or luggage compartment, the protection degree IPXXD shall be provided.
- 5.1.1.2. Protection of live parts in areas other than the passenger compartment or luggage compartment
- 5.1.1.2.1. For vehicles with a passenger compartment, the protection degree IPXXB shall be satisfied.
- 5.1.1.2.2. For vehicles without passenger compartment, the protection degree IPXXD shall be satisfied.
- 5.1.1.3. Connectors
- Connectors (including vehicle inlet) are deemed to meet this requirement if:
- (a) They comply with 5.1.1.1 and 5.1.1.2 when separated without the use of tools; or
 - (b) They are located underneath the floor and are provided with a locking mechanism; or
 - (c) They are provided with a locking mechanism and other components shall be removed with the use of tools in order to separate the connector; or
 - (d) The voltage of the live parts becomes equal or below 60 V DC or equal or below 30 V AC (rms) within one second after the connector is separated.
- 5.1.1.4. Service disconnect
- For a service disconnect which can be opened, disassembled or removed without tools, it is acceptable if protection degree IPXXB is satisfied under a condition where it is opened, disassembled or removed without tools.
- 5.1.1.5. Marking
- 5.1.1.5.1. In the case of a REESS having high voltage capability the symbol shown in the figure shall appear on or near the REESS. The symbol background shall be yellow, the bordering and the arrow shall be black.

Marking of high voltage equipment



- 5.1.1.5.2. The symbol shall also be visible on enclosures and barriers, which, when removed, expose live parts of high voltage circuits. This provision is optional to any connector for high voltage buses. This provision shall not apply to any of the following cases:
- (a) Where barriers or enclosures cannot be physically accessed, opened, or removed; unless other vehicle components are removed with the use of tools;
 - (b) Where barriers or enclosures are located underneath the vehicle floor.
- 5.1.1.5.3. Cables for high voltage buses which are not located within enclosures shall be identified by having an outer covering with the colour orange.
- 5.1.2. Protection against indirect contact
- Protection against indirect contact is also required for vehicles with high voltage live parts equipped with any REESS type approved under Part II of this Regulation.
- 5.1.2.1. For protection against electrical shock which could arise from indirect contact, the exposed conductive parts, such as the conductive barrier and enclosure, shall be galvanically connected securely to the electrical chassis by connection with electrical wire or ground cable, or by welding, or by connection using bolts, etc. so that no dangerous potentials are produced.

- 5.1.2.2. The resistance between all exposed conductive parts and the electrical chassis shall be lower than 0,1 Ω when there is current flow of at least 0,2 A.

This requirement is satisfied if the galvanic connection has been established by welding.

- 5.1.2.3. In the case of motor vehicles which are intended to be connected to the grounded external electric power supply through the conductive connection, a device to enable the galvanical connection of the electrical chassis to the earth ground shall be provided.

The device shall enable connection to the earth ground before exterior voltage is applied to the vehicle and retain the connection until after the exterior voltage is removed from the vehicle.

Compliance to this requirement shall be demonstrated either by using the connector specified by the vehicle manufacturer, or by analysis.

- 5.1.2.4. The requirement of paragraph 5.1.2.3 above shall not apply to the vehicles which satisfy (a) or (b) below:

- (a) The vehicle's REESS can be charged via the external electric power supply only by using an off-board charger with a double insulation or reinforced insulation structure between input and output.

The performance requirements regarding the previously mentioned insulation structure shall comply with the following requirements of paragraph 5.1.2.4.1 and paragraph 5.1.2.4.3 and stated in its documentation.

- (b) The on-board charger has a double or reinforced insulation structure between input and the vehicle's exposed conductive parts/electrical chassis.

The performance requirements regarding the previously mentioned insulation structure shall comply with the following requirements of paragraphs 5.1.2.4.1, 5.1.2.4.2 and 5.1.2.4.3.

If both systems are installed (a) and (b) have to be fulfilled.

- 5.1.2.4.1. Withstand voltage

- 5.1.2.4.1.1. For vehicle with on-board charger the test shall be conducted according to Annex 9A to this regulation.

- 5.1.2.4.1.2. Acceptance criteria

The insulation resistance shall be equal to or greater than 7 M Ω when applying 500 V DC between all the inputs connected together and the vehicle's exposed conductive parts/electrical chassis.

- 5.1.2.4.2. Protection against ingress of water

- 5.1.2.4.2.1. This test shall be conducted according to Annex 9B of this regulation.

- 5.1.2.4.2.2. Acceptance criteria

The insulation resistance shall be equal to or greater than 7 M Ω , when applying 500 V DC.

- 5.1.2.4.3. Handling instructions

Appropriate instructions for charging shall be provided and included in the manual (*).

- 5.1.3. Isolation resistance

This paragraph shall not apply to chassis connected electrical circuits where the maximum voltage between any live part and the electrical chassis or any exposed conductive part does not exceed 30 V AC (rms) or 60 V DC.

(*) Example of the content in the manual: 'If during charging, your vehicle or charger becomes submerged in water you should not touch either the vehicle nor the charger because of danger of electric shock. Also, do not use the battery nor the vehicle and ask your dealer to take (appropriate) measures.'

5.1.3.1. Electric power train consisting of separate Direct Current- or Alternating Current-buses

If AC buses and DC buses are galvanically isolated from each other, the isolation resistance between the high voltage bus and the electrical chassis shall have a minimum value of 100 Ω/V of the working voltage for DC buses, and a minimum value of 500 Ω/V of the working voltage for AC buses.

The measurement shall be conducted according to Annex 4A 'Isolation resistance measurement method for vehicle based tests'.

5.1.3.2. Electric power train consisting of combined DC- and AC-buses

If AC buses and DC buses are galvanically connected, isolation resistance between any high voltage bus and the electrical chassis shall have a minimum value of 500 $\Omega/volt$ of the working voltage.

However, if all AC high voltage buses are protected by one of the two following measures, isolation resistance between any high voltage bus and the electrical chassis shall have a minimum value of 100 Ω/V of the working voltage:

- (a) Double or more layers of solid insulators, barriers or enclosures that meet the requirement in paragraph 5.1.1 independently, for example wiring harness;
- (b) Mechanically robust protections that have sufficient durability over vehicle service life such as motor housings, electronic converter cases or connectors;

The isolation resistance between the high voltage bus and the electrical chassis may be demonstrated by calculation, measurement or a combination of both.

The measurement shall be conducted according to Annex 4A 'Isolation resistance measurement method for vehicle based tests'.

5.1.3.3. Fuel cell vehicles

If the minimum isolation resistance requirement cannot be maintained over time, then protection shall be achieved by any of the following:

- (a) Double or more layers of solid insulators, barriers or enclosures that meet the requirement in paragraph 5.1.1 independently;
- (b) On-board isolation resistance monitoring system together with a warning to the driver if the isolation resistance drops below the minimum required value. The isolation resistance between the high voltage bus of the coupling system for charging the REESS and the electrical chassis need not be monitored, because the coupling system for charging is only energized during charging of the REESS. The function of the on-board isolation resistance monitoring system shall be confirmed as described in Annex 5.

5.1.3.4. Isolation resistance requirement for the coupling system used to charge the REESS

For the coupling system (used to charge the REESS and intended to be conductively connected to the grounded external AC power supply) the isolation resistance shall be at least 1 M Ω when the charger coupler is disconnected. During the measurement, the REESS may be disconnected.

5.2. REESS

5.2.1. For a vehicle with a REESS, the requirement of either paragraph 5.2.1.1 or paragraph 5.2.1.2 shall be satisfied.

5.2.1.1. For a REESS which has been type approved in accordance with Part II of this Regulation, installation shall be in accordance with the instructions provided by the manufacturer of the REESS, and in conformity with the description provided in Part 2 of Annex 6 to this Regulation.

5.2.1.2. The REESS shall comply with the respective requirements of paragraph 6 of this Regulation.

5.2.2. Accumulation of gas

Spaces for open type traction batteries that may produce hydrogen gas shall be equipped with a ventilation fan, a ventilation duct or any other suitable means to prevent the accumulation of hydrogen gas.

5.2.3. Protection against electrolyte spills

Vehicles shall foresee that no spilled electrolyte from the REESS and its components shall reach the driver, rider or passenger or any person around the vehicle during normal condition of use and/or functional operation.

When the REESS is in the upside-down position, no electrolyte shall spill.

5.2.4. Accidental or unintentional detachment

The REESS and its components shall be installed in the vehicle in such a way so as to preclude the possibility of inadvertent or unintentional detachment of the REESS.

The REESS in the vehicle shall not be ejected when the vehicle is tilted.

The REESS components shall not be ejected when the REESS is put upside-down.

5.3. Functional safety

A momentary indication shall, as minimum, be given to the driver when the vehicle is in 'active driving possible mode'.

However, this provision does not apply under conditions where an internal combustion engine directly or indirectly provides the vehicle's propulsion power.

When leaving the vehicle, the driver shall be informed by a signal (e.g. optical or audible signal) if the vehicle is still in the active driving possible mode.

If the onboard REESS can be externally charged by the user, movement caused by the vehicle's propulsion system shall not be possible while the external electric power supply is physically connected to the vehicle inlet.

For vehicles with a permanently connected recharge cable, the requirement above is not applicable if using the cable to charge the vehicle prevents the use of the vehicle (e.g. seat cannot be closed, the cable position does not allow the rider to sit in or step into the vehicle). This requirement shall be demonstrated by using the connector specified by the vehicle manufacturer. The state of the drive direction control unit shall be identified to the driver.

5.3.1. Additional functional safety requirements

5.3.1.1. At least two deliberate and distinctive actions shall be performed by the driver at the start-up to select the active driving possible mode.

5.3.1.2. Only a single action shall be required to deactivate the active driving possible mode.

5.3.1.3. Indication of temporary reduced power (i.e. not resulting from a failure) and/or of state of charge (SOC) of REESS.

5.3.1.3.1. The vehicle shall have a function/device that indicates to the driver/rider if the power is automatically reduced below a certain level, (e.g. due to activation of the output controller to protect the REESS or the propulsion system) or due to a low SOC.

5.3.1.3.2. The conditions under which these indications are given shall be determined by the manufacturer.

A brief description of the power reduction and indicating strategy will be prescribed in Annex 6.

5.3.1.4. Driving or riding backwards

It shall not be possible to activate the vehicle reverse control function whilst the vehicle is in forward motion.

5.4. Determination of hydrogen emissions

5.4.1. This test shall be carried out on all vehicles equipped with open type traction batteries. If the REESS has been approved under Part II of this Regulation and installed in accordance with paragraph 5.2.1.1, this test can be omitted for the approval of the vehicle.

5.4.2. The test shall be conducted according to the method in Annex 7 of the present Regulation. The hydrogen sampling and analysis shall be prescribed. Other analysis methods can be approved if it is proven that they give equivalent results.

5.4.3. During a normal charge procedure in the conditions given in Annex 7, hydrogen emissions shall be below 125 g during 5 h, or below $25 \times t_2$ g during t_2 (in h).

5.4.4. During a charge carried out by a charger presenting a failure (conditions given in Annex 7), hydrogen emissions shall be below 42 g. The charger shall limit such a failure to 30 minutes maximum.

5.4.5. All the operations linked to the REESS charging shall be controlled automatically, including the stop for charging.

5.4.6. Manual control of the charging phases shall not be possible.

5.4.7. Normal operations of connection and disconnection to the mains or power cuts shall not affect the control system of the charging phases.

5.4.8. Important charging failures shall be permanently indicated. An important failure is a failure that can lead to a malfunction of the charger during charging later on.

5.4.9. The manufacturer shall indicate the vehicle's conformity in the owner's manual to these requirements.

5.4.10. The approval granted to a vehicle type relative to hydrogen emissions can be extended to different vehicle types belonging to the same family, in accordance with the definition of the family given in Annex 7, Appendix 2.

6. PART II: REQUIREMENTS OF A RECHARGEABLE ELECTRICAL ENERGY STORAGE SYSTEM (REESS) WITH REGARD TO ITS SAFETY

6.1. General

The procedures prescribed in Annex 8 of this Regulation shall be applied.

6.2. Vibration

6.2.1. The test shall be conducted in accordance with Annex 8A of this Regulation.

6.2.2. Acceptance criteria

6.2.2.1. During the test, there shall be no evidence of:

- (a) Electrolyte leakage;
- (b) Rupture (applicable to high voltage REESS (s) only);
- (c) Fire;
- (d) Explosion.

Evidence of electrolyte leakage shall be verified by visual inspection without disassembling any part of the tested-device.

6.2.2.2. For a high voltage REESS, the isolation resistance measured after the test in accordance with Annex 4B to this Regulation shall not be less than 100 Ω /Volt.

6.3. Thermal shock and cycling

6.3.1. The test shall be conducted in accordance with Annex 8B to this Regulation.

6.3.2. Acceptance criteria

6.3.2.1. During the test, there shall be no evidence of:

- (a) Electrolyte leakage;
- (b) Rupture (applicable to high voltage REESS(s) only);
- (c) Fire;
- (d) Explosion.

Evidence of electrolyte leakage shall be verified by visual inspection without disassembling any part of the tested-device.

6.3.2.2. For a high voltage REESS, the isolation resistance measured after the test in accordance with Annex 4B of this Regulation shall not be less than 100 Ω /Volt.

6.4. Mechanical tests

6.4.1. Drop test for removable REESS

6.4.1.1. The test shall be conducted in accordance with Annex 8C of this Regulation.

6.4.1.2. Acceptance criteria

6.4.1.2.1. During the test there shall be no evidence of

- (a) Electrolyte leakage;
- (b) Rupture (applicable to high voltage REESS(s) only);
- (c) Fire;
- (d) Explosion.

Evidence of electrolyte leakage shall be verified by visual inspection without disassembling any part of the tested-device.

6.4.1.2.2. For a high voltage REESS, the isolation resistance measured after the test in accordance with Annex 4B of this Regulation shall not be less than 100 Ω /Volt.

6.4.2. Mechanical shock

6.4.2.1. This test shall apply to vehicles with a centre and/or side stand.

The test shall be conducted in accordance with Annex 8D of this Regulation.

6.4.2.2. Acceptance criteria

6.4.2.2.1. During the test there shall be no evidence of

- (a) Electrolyte leakage;
- (b) Rupture (applicable to high voltage REESS(s) only);
- (c) Fire;
- (d) Explosion.

Evidence of electrolyte leakage shall be verified by visual inspection without disassembling any part of the tested-device.

6.4.2.2.2. For a high voltage REESS the isolation resistance of the tested-device shall ensure at least 100 Ω /Volt for the whole REESS measured after the test in accordance with Annex 4B to this Regulation.

6.5. Fire resistance

This test applies for vehicles with a passenger compartment only.

This test is required for REESS containing flammable electrolyte.

The test shall be carried out on one test sample.

At the manufacturer's choice the test may be performed as, either:

- (a) A vehicle based test in accordance with paragraph 6.5.1 of this Regulation, or
- (b) A component based test in accordance with paragraph 6.5.2 of this Regulation.

6.5.1. Vehicle based test

The test shall be conducted in accordance with Annex 8E in due consideration of paragraph 3.2.1 of Annex 8E.

The approval of a REESS tested according to this paragraph shall be limited to approvals for a specific vehicle type.

6.5.2. Component based test

The test shall be conducted in accordance with Annex 8E in due consideration of paragraph 3.2.2 of Annex 8E.

6.5.3. Acceptance criteria

6.5.3.1. During the test, the tested-device shall exhibit no evidence of explosion.

6.6. External short circuit protection

6.6.1. The test shall be conducted in accordance with Annex 8F of this Regulation.

6.6.2. Acceptance criteria;

6.6.2.1. During the test there shall be no evidence of:

- (a) Electrolyte leakage;
- (b) Rupture (applicable to high voltage REESS(s) only);
- (c) Fire;
- (d) Explosion.

Evidence of electrolyte leakage shall be verified by visual inspection without disassembling any part of the tested-device.

6.6.2.2. For a high voltage REESS, the isolation resistance measured after the test in accordance with Annex 4B to this Regulation shall not be less than 100 Ω/V .

6.7. Overcharge protection

6.7.1. The test shall be conducted in accordance with Annex 8G to this Regulation.

6.7.2. Acceptance criteria

6.7.2.1. During the test there shall be no evidence of:

- (a) Electrolyte leakage;
- (b) Rupture (applicable to high voltage REESS(s) only);

(c) Fire;

(d) Explosion.

Evidence of electrolyte leakage shall be verified by visual inspection without disassembling any part of the tested-device.

6.7.2.2. For a high voltage REESS, the isolation resistance measured after the test in accordance with Annex 4B to this Regulation shall not be less than 100 Ω/V .

6.8. Over-discharge protection

6.8.1. The test shall be conducted in accordance with Annex 8H to this Regulation.

6.8.2. Acceptance criteria

6.8.2.1. During the test there shall be no evidence of:

(a) Electrolyte leakage;

(b) Rupture (applicable to high voltage REESS(s) only);

(c) Fire;

(d) Explosion.

Evidence of electrolyte leakage shall be verified by visual inspection without disassembling any part of the tested-device.

6.8.2.2. For a high voltage REESS the isolation resistance measured after the test in accordance with Annex 4B to this Regulation shall not be less than 100 Ω/V .

6.9. Over-temperature protection

6.9.1. The test shall be conducted in accordance with Annex 8I to this Regulation.

6.9.2. Acceptance criteria

6.9.2.1. During the test there shall be no evidence of:

(a) Electrolyte leakage;

(b) Rupture (applicable to high voltage REESS(s) only);

(c) Fire;

(d) Explosion.

Evidence of electrolyte leakage shall be verified by visual inspection without disassembling any part of the tested-device.

6.9.2.2. For a high voltage REESS, the isolation resistance measured after the test in accordance with Annex 4B to this Regulation shall not be less than 100 Ω/V .

6.10. Emission

Possible emission of gases caused by the energy conversion process during normal use shall be considered.

6.10.1. Open type traction batteries shall meet the requirements of paragraph 5.4 of this Regulation with regard to hydrogen emissions.

Systems with a closed chemical process shall be considered as emission-free under normal operation (e.g. lithium-ion battery).

The closed chemical process shall be described and documented by the battery manufacturer in Annex 6 — Part 2.

Other technologies shall be evaluated by the manufacturer and the Technical Service regarding any possible emissions under normal operation.

6.10.2. Acceptance criteria

For hydrogen emissions see paragraph 5.4 of this Regulation.

For emission free systems with closed chemical process no verification is necessary.

7. MODIFICATIONS AND EXTENSION OF THE TYPE APPROVAL

7.1. Every modification of the vehicle or REESS type with regard to this Regulation shall be notified to the Type Approval Authority which approved the vehicle or REESS type. The Authority may then either:

7.1.1. Consider that the modifications made are unlikely to have an appreciable adverse effect and that in any case the vehicle or the REESS still complies with the requirements, or

7.1.2. Require a further test report from the Technical Service responsible for conducting the tests.

7.2. Confirmation or refusal of approval, specifying the alteration, shall be communicated by the procedure specified in paragraph 4.3 above to the Parties to the Agreement applying this Regulation.

7.3. The Type Approval Authority issuing the extension of approval shall assign a series number to each communication form drawn up for such an extension and inform thereof the other Parties to the 1958 Agreement applying the Regulation by means of a communication form conforming to the model in Annex 1 (Part 1 or Part 2) to this Regulation.

8. CONFORMITY OF PRODUCTION

8.1. Vehicles or REESS approved under this Regulation shall be so manufactured as to conform to the type approved by meeting the requirements of the relevant part(s) of this Regulation.

8.2. In order to verify that the requirements of paragraph 8.1 are met, appropriate production checks shall be carried out.

8.3. The holder of the approval shall, in particular:

8.3.1. Ensure the existence of procedures for the effective quality control of vehicles or REESS;

8.3.2. Have access to the testing equipment necessary for checking the conformity of each approved type;

8.3.3. Ensure that test result data are recorded and that the annexed documents remain available for a period to be determined in agreement with the Type Approval Authority;

8.3.4. Analyse the results of each type of test, in order to verify and ensure the consistency of characteristics of the vehicle or REESS, making allowance for permissible variations in industrial production;

8.3.5. Ensure that for each type of vehicle or component type at least the tests prescribed in the relevant part(s) of this Regulation are carried out;

8.3.6. Ensure that any set of samples or test pieces giving evidence of non-conformity with the type of test in question shall give rise to a further sampling and test. All necessary steps shall be taken to re-establish conformity of the corresponding production.

8.4. The Type Approval Authority which has granted type approval may at any time verify the conformity control methods applied in each production unit.

8.4.1. At every inspection, the test records and production records shall be presented to the visiting inspector.

- 8.4.2. The inspector may take samples at random to be tested in the manufacturer's laboratory. The minimum number of samples may be determined according to the results of the manufacturer's own checks.
- 8.4.3. When the quality level appears unsatisfactory or when it seems necessary to verify the validity of the tests carried out in application of paragraph 8.4.2, the inspector shall select samples to be sent to the technical service which has conducted the type approval tests.
- 8.4.4. The Type Approval Authority may carry out any test prescribed in this Regulation.
- 8.4.5. The normal frequency of inspections by the Type Approval Authority shall be one per year. If unsatisfactory results are recorded during one of these visits, the Type Approval Authority shall ensure that all necessary steps are taken to re-establish the conformity of production as rapidly as possible.

9. PENALTIES FOR NON-CONFORMITY OF PRODUCTION

- 9.1. The approval granted in respect of a vehicle/REESS type, pursuant to this Regulation may be withdrawn if the requirements laid down in paragraph 8 above are not complied with, or if the vehicle/REESS or its components fail to pass the tests provided for in paragraph 8.3.5 above.
- 9.2. If a Contracting Party to the Agreement applying this Regulation withdraws an approval it has previously granted, it shall forthwith so notify the other Contracting Parties applying this Regulation, by means of a communication form conforming to the Model in Annex 1 (Part 1 or Part 2) to this Regulation.

10. PRODUCTION DEFINITELY DISCONTINUED

If the holder of the approval completely ceases to manufacture a vehicle/REESS type approved in accordance with this Regulation, he shall so inform the Type Approval Authority which granted the approval. Upon receiving the relevant communication, that Authority shall inform thereof the other Contracting Parties to the 1958 Agreement applying this Regulation by means of a communication form conforming to the model in Annex 1 (Part 1 or Part 2) to this Regulation.

11. NAMES AND ADDRESSES OF TECHNICAL SERVICES RESPONSIBLE FOR CONDUCTING APPROVAL TESTS AND OF TYPE APPROVAL AUTHORITIES

The Contracting Parties to the 1958 Agreement applying this Regulation shall communicate to the United Nations Secretariat the names and addresses of the Technical Services responsible for conducting approval tests and the Type Approval Authorities which grant approval and to which forms certifying approval or extension or refusal or withdrawal of approval or production definitively discontinued, issued in other countries are to be sent.

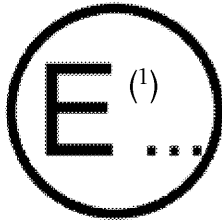
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ANNEX 1

PART 1

Communication

(Maximum format: A4 (210 × 297 mm))



Issued by: Name of administration

.....

.....

.....

Concerning ⁽²⁾: Approval granted,
 Approval extended,
 Approval refused,
 Approval withdrawn,
 Production definitively discontinued,

of a vehicle type with regard to its electrical safety pursuant to Regulation No 136

Approval No Extension No

1. Trade name or mark of the vehicle:
2. Vehicle type:
3. Vehicle category:
4. Manufacturer's name and address:
5. If applicable, name and address of manufacturer's representative:
6. Description of the vehicle:
- 6.1. REESS type:
- 6.1.1. The approval number of the REESS or descriptions of the REESS ⁽²⁾
- 6.2. Working voltage:
- 6.3. Propulsion system (e.g. hybrid, electric):
7. Vehicle submitted for approval on:
8. Technical Service responsible for conducting approval tests:
-
9. Date of report issued by that Service:
10. Number of report issued by that Service:
11. Location of the approval mark:
12. Reason(s) for extension of approval (if applicable) ⁽²⁾:
13. Approval granted/extended/refused/withdrawn ⁽²⁾:
14. Place:
15. Date:
16. Signature:
17. The documents filed with the request for approval or extension may be obtained on request.

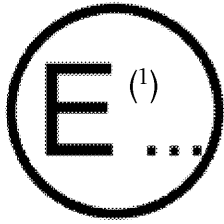
⁽¹⁾ Distinguishing number of the country which has granted, extended, refused or withdrawn approval (see approval provisions in the Regulation).

⁽²⁾ Strike out what does not apply.

PART 2

Communication

(Maximum format: A4 (210 × 297 mm))



Issued by: Name of administration

.....
.....
.....

- Concerning ⁽²⁾: Approval granted
- Approval extended
- Approval refused
- Approval withdrawn
- Production definitively discontinued

of a REESS type as component/separate technical unit ⁽²⁾ pursuant to Regulation No 136

Approval No Extension No

1. Trade name or mark of the REESS:
2. Type of REESS:
3. Manufacturer's name and address:
4. If applicable, name and address of manufacturer's representative:
5. Description of the REESS:
6. Installation restrictions applicable to the REESS:
7. REESS submitted for approval on:
8. Technical Service responsible for conducting approval tests:
9. Date of report issued by that Service:
10. Number of report issued by that Service:
11. Location of the approval mark:
12. Reason(s) for extension of approval (if applicable) ⁽²⁾:
13. Approval granted/extended/refused/withdrawn ⁽²⁾:
14. Place:
15. Date:
16. Signature:
17. The documents filed with the request for approval or extension may be obtained on request.

⁽¹⁾ Distinguishing number of the country which has granted/extended/refused/withdrawn approval (see approval provisions in the Regulation).
⁽²⁾ Strike out what does not apply.

ANNEX 2

ARRANGEMENTS OF THE APPROVAL MARKS

MODEL A

(See paragraph 4.2 of this Regulation)

Figure 1



a = 8 mm min.

The approval mark in Figure 1 affixed to a vehicle shows that the road vehicle type concerned has been approved in the Netherlands (E 4), pursuant to Regulation No 136, and under the approval number 002492. The first two digits of the approval number indicate that the approval was granted in accordance with the requirements of Regulation No 136 in its original form.

Figure 2

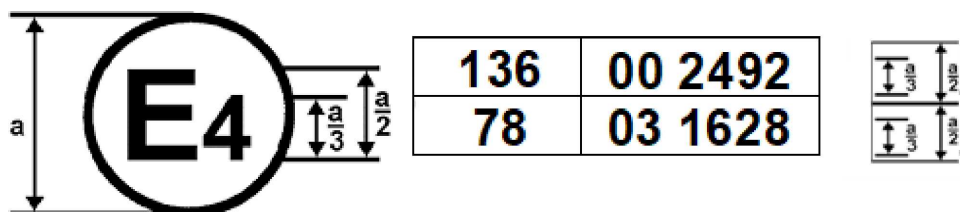


a = 8 mm min.

The approval mark in Figure 2 affixed to a REESS shows that the REESS type ('ES') concerned has been approved in the Netherlands (E 4), pursuant to Regulation No 136, and under the approval number 002492. The first two digits of the approval number indicate that the approval was granted in accordance with the requirements of Regulation No 136 in its original form.

MODEL B

(See paragraph 4.5 of this Regulation)



a = 8 mm min.

The above approval mark affixed to a vehicle shows that the road vehicle concerned has been approved in the Netherlands (E4) pursuant to Regulations Nos 136 and 78 ⁽¹⁾. The approval number indicates that, at the dates when the respective approvals were granted, Regulation No 136 was still in its original form and Regulation No 78 was amended by 03 series of amendments.

⁽¹⁾ The latter number is given only as an example.

ANNEX 3

PROTECTION AGAINST DIRECT CONTACTS OF PARTS UNDER VOLTAGE

1. ACCESS PROBES

Access probes to verify the protection of persons against access to live parts are given in the table.

2. TEST CONDITIONS

The access probe is pushed against any openings of the enclosure with the force specified in the table. If it partly or fully penetrates, it is placed in every possible position, but in no case shall the stop face fully penetrate through the opening.

Internal barriers are considered part of the enclosure.

A low-voltage supply (of not less than 40 V and not more than 50 V) in series with a suitable lamp should be connected, if necessary, between the probe and live parts inside the barrier or enclosure.

The signal-circuit method should also be applied to the moving live parts of high voltage equipment.

Internal moving parts may be operated slowly, where this is possible.

3. ACCEPTANCE CONDITIONS

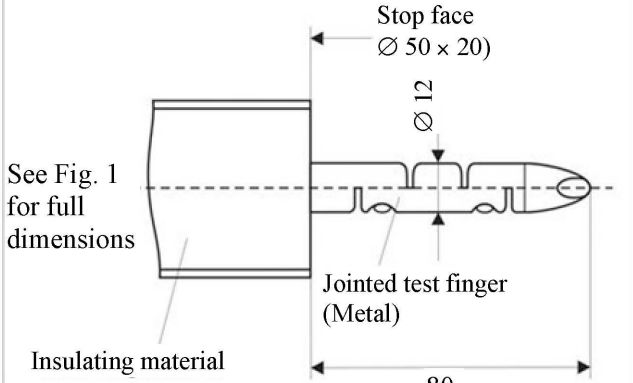
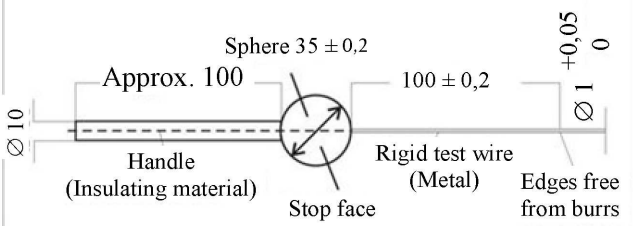
The access probe shall not touch live parts.

If this requirement is verified by a signal circuit between the probe and live parts, the lamp shall not light.

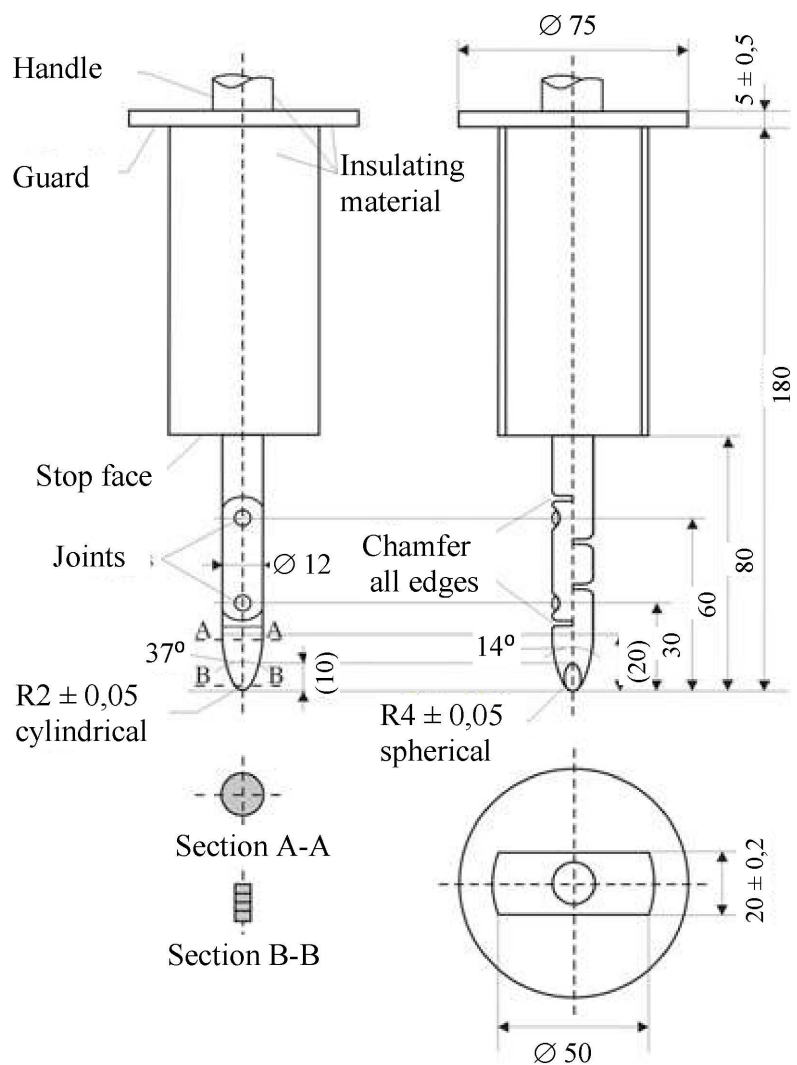
In the case of the test for IPXXB, the jointed test finger may penetrate to its 80 mm length, but the stop face (diameter 50 mm × 20 mm) shall not pass through the opening. Starting from the straight position, both joints of the test finger shall be successively bent through an angle of up to 90 degrees with respect to the axis of the adjoining section of the finger and shall be placed in every possible position.

In case of the tests for IPXXD, the access probe may penetrate to its full length, but the stop face shall not fully penetrate through the opening.

Access probes for the tests for protection of persons against access to hazardous parts

First numeral	Addit. letter	Access probe (Dimensions in mm)	Test force
2	B	<p style="text-align: center;">Jointed test finger</p>  <p>See Fig. 1 for full dimensions</p> <p>Stop face Ø 50 x 20</p> <p>Ø 12</p> <p>Jointed test finger (Metal)</p> <p>Insulating material</p> <p>80</p>	10 N ± 10%
4, 5, 6	D	<p style="text-align: center;">Test wire 1,0 mm diameter, 100 mm long</p>  <p>Sphere 35 ± 0,2</p> <p>Approx. 100</p> <p>100 ± 0,2</p> <p>Ø 10</p> <p>Handle (Insulating material)</p> <p>Stop face (Insulating material)</p> <p>Rigid test wire (Metal)</p> <p>Edges free from burrs</p> <p>Ø 1 +0,05 0</p>	1 N ± 10%

Jointed test finger



Material: metal, except where otherwise specified

Linear dimensions in millimeters

Tolerances on dimensions without specific tolerance:

(a) On angles: 0/- 10°;

(b) On linear dimensions: up to 25 mm: 0/- 0,05 mm over 25 mm: ± 0,2 mm

Both joints shall permit movement in the same plane and the same direction through an angle of 90° with a 0 to + 10° tolerance.

ANNEX 4A

ISOLATION RESISTANCE MEASUREMENT METHOD FOR VEHICLE BASED TESTS

1. GENERAL

The isolation resistance for each high voltage bus of the vehicle shall be measured or shall be determined by calculation using measurement values from each part or component unit of a high voltage bus (hereinafter referred to as the 'divided measurement').

2. MEASUREMENT METHOD

The isolation resistance measurement shall be conducted by selecting an appropriate measurement method from among those listed in paragraphs 2.1 through 2.2 of this annex, depending on the electrical charge of the live parts or the isolation resistance, etc.

The range of the electrical circuit to be measured shall be clarified in advance, using electrical circuit diagrams, etc.

Moreover, modification necessary for measuring the isolation resistance may be carried out, such as removal of the cover in order to reach the live parts, drawing of measurement lines, change in software, etc.

In cases where the measured values are not stable due to the operation of the on-board isolation resistance monitoring system, etc., necessary modification for conducting the measurement may be carried out, such as stopping of the operation of the device concerned or removing it. Furthermore, when the device is removed, it shall be proven, using drawings, etc., that it will not change the isolation resistance between the live parts and the electrical chassis.

Utmost care shall be exercised as to short circuit, electric shock, etc., for this confirmation might require direct operations of the high-voltage circuit.

2.1. Measurement method using voltage from off-vehicle sources

2.1.1. Measurement instrument

An isolation resistance test instrument capable of applying a DC voltage higher than the working voltage of the high voltage bus shall be used.

2.1.2. Measurement method

An insulator resistance test instrument shall be connected between the live parts and the electrical chassis. Then, the isolation resistance shall be measured by applying a DC voltage at least half of the working voltage of the high voltage bus.

If the system has several voltage ranges (e.g. because of boost converter) in galvanically connected circuit and some of the components cannot withstand the working voltage of the entire circuit, the isolation resistance between those components and the electrical chassis can be measured separately by applying at least half of their own working voltage with those component disconnected.

2.2. Measurement method using the vehicle's own REESS as DC voltage source

2.2.1. Test vehicle conditions

The high voltage-bus shall be energized by the vehicle's own REESS and/or energy conversion system and the voltage level of the REESS and/or energy conversion system throughout the test shall be at least the nominal operating voltage as specified by the vehicle manufacturer.

2.2.2. Measurement instrument

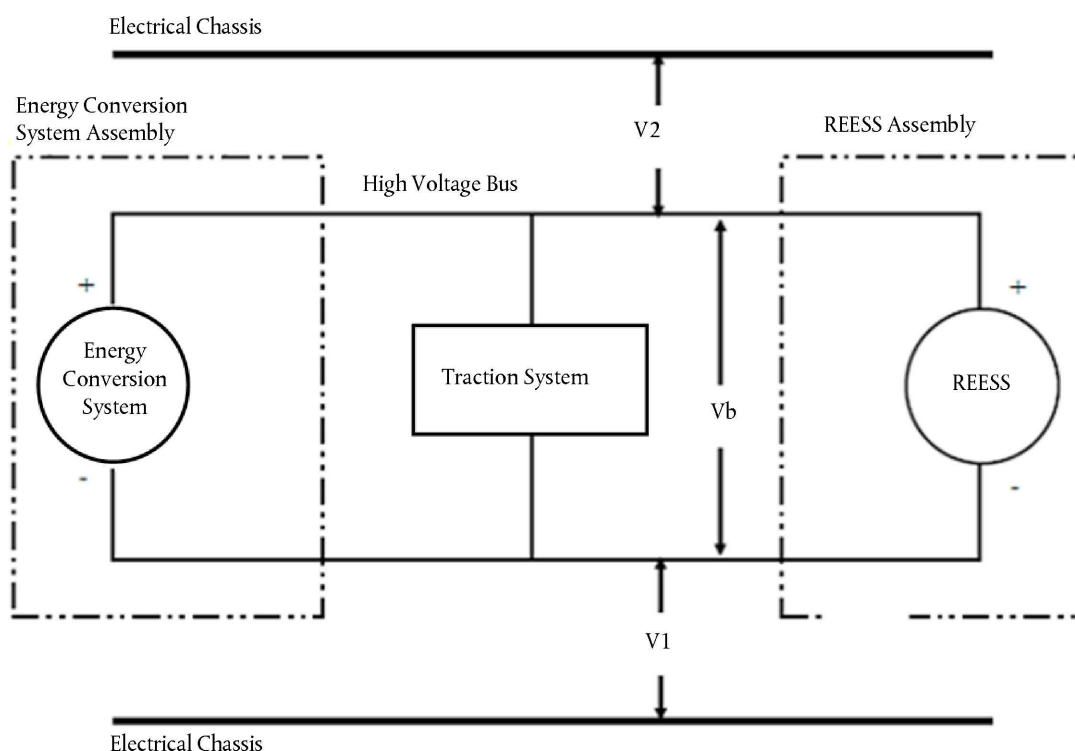
The voltmeter used in this test shall measure DC values and shall have an internal resistance of at least 10 MΩ.

2.2.3. Measurement method

2.2.3.1. First step

The voltage is measured as shown in Figure 1 and the high voltage bus voltage (V_b) is recorded. V_b shall be equal to or greater than the nominal operating voltage of the REESS and/or energy conversion system as specified by the vehicle manufacturer.

Figure 1

Measurement of V_b , V_1 , V_2 

2.2.3.2. Second step

Measure and record the voltage (V_1) between the negative side of the high voltage bus and the electrical chassis (see Figure 1).

2.2.3.3. Third step

Measure and record the voltage (V_2) between the positive side of the high voltage bus and the electrical chassis (see Figure 1).

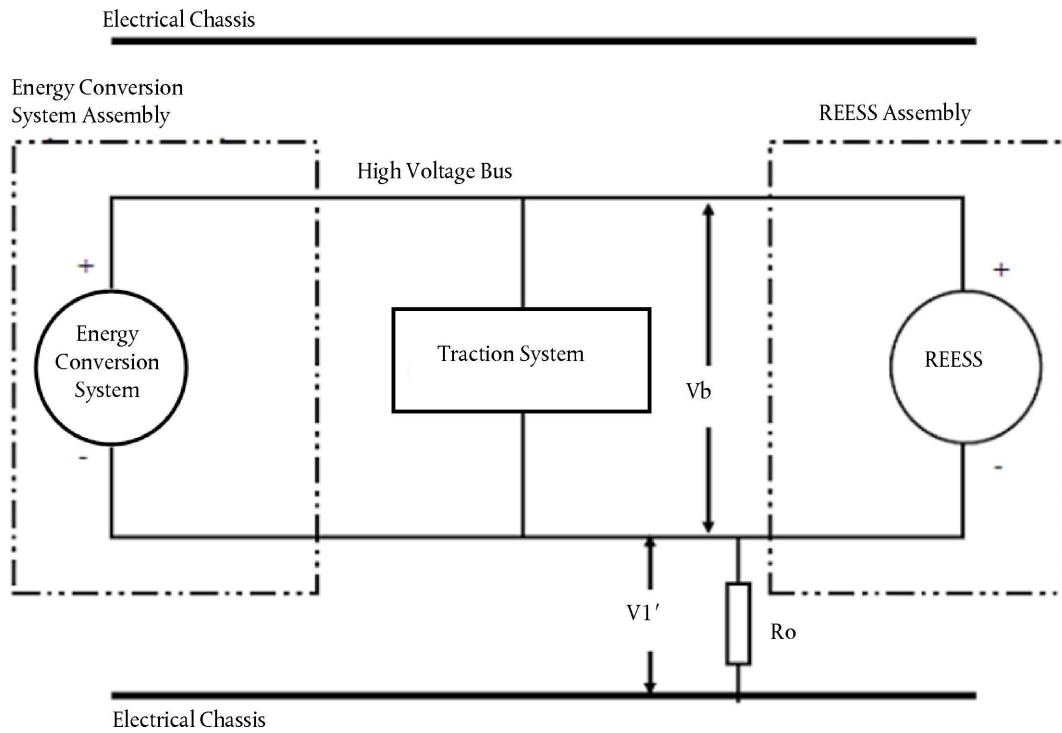
2.2.3.4. Fourth step

If V_1 is greater than or equal to V_2 , insert a standard known resistance (R_o) between the negative side of the high voltage bus and the electrical chassis. With R_o installed, measure the voltage (V_1') between the negative side of the high voltage bus and the electrical chassis (see Figure 2).

Calculate the electrical isolation (R_i) according to the following formula:

$$R_i = R_o \times (V_b/V_1' - V_b/V_1) \text{ or } R_i = R_o \times V_b \times (1/V_1' - 1/V_1)$$

Figure 2
Measurement of V1'

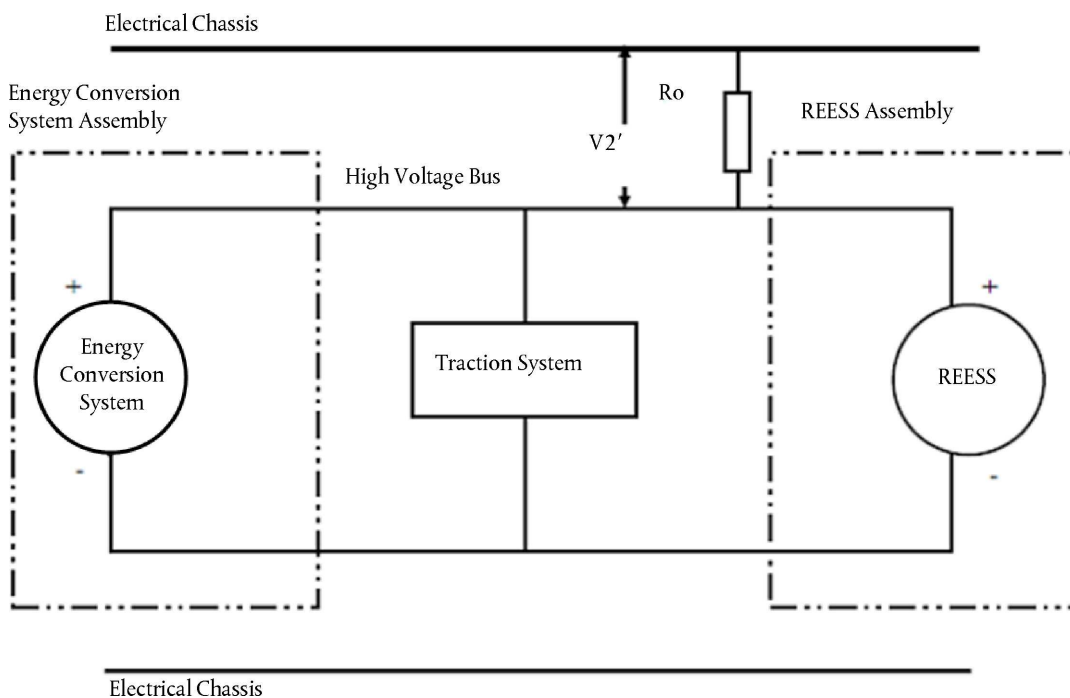


If V_2 is greater than V_1 , insert a standard known resistance (R_o) between the positive side of the high voltage bus and the electrical chassis. With R_o installed, measure the voltage (V_2') between the positive side of the high voltage bus and the electrical chassis (see Figure 3). Calculate the electrical isolation (R_i) according to the formula shown. Divide this electrical isolation value (in Ω) by the nominal operating voltage of the high voltage bus (in Volts).

Calculate the electrical isolation (R_i) according to the following formula:

$$R_i = R_o \times (V_b/V_2' - V_b/V_2) \text{ or } R_i = R_o \times V_b \times (1/V_2' - 1/V_2)$$

Figure 3
Measurement of V2'



2.2.3.5. Fifth step

The electrical isolation value R_i (in Ω) divided by the working voltage of the high voltage bus (in Volts) results in the isolation resistance (in Ω/V).

Note: The standard known resistance R_o (in Ω) should be the value of the minimum required isolation resistance (in Ω/V) multiplied by the working voltage of the vehicle plus/minus 20 per cent (in volts). R_o is not required to be precisely this value since the equations are valid for any R_o ; however, a R_o value in this range should provide good resolution for the voltage measurements.

ANNEX 4B

ISOLATION RESISTANCE MEASUREMENT METHOD FOR COMPONENT BASED TESTS OF A REESS

1. MEASUREMENT METHOD

The isolation resistance measurement shall be conducted by selecting an appropriate measurement method from among those listed in paragraphs 1.1 through 1.2 of this annex, depending on the electrical charge of the live parts or the isolation resistance, etc.

If the operating voltage of the tested-device (V_b , Figure 1) cannot be measured (e.g. due to disconnection of the electric circuit caused by main contactors or fuse operation) the test may be performed with a modified test device to allow measurement of the internal voltages (upstream the main contactors).

These modifications shall not influence the test results.

The range of the electrical circuit to be measured shall be clarified in advance, using electrical circuit diagrams, etc. If the high voltage buses are galvanically isolated from each other, isolation resistance shall be measured for each electrical circuit.

Moreover, modification necessary for measuring the isolation resistance may be carried out, such as removal of the cover in order to reach the live parts, drawing of measurement lines, change in software, etc.

In cases where the measured values are not stable due to the operation of the isolation resistance monitoring system, etc., necessary modification for conducting the measurement may be carried out, such as stopping the operation of the device concerned or removing it. Furthermore, when the device is removed, it shall be proven, using drawings, etc., that it will not change the isolation resistance between the live parts and the ground connection designated by the manufacturer as a point to be connected to the electrical chassis when installed on the vehicle.

Utmost care shall be exercised as to short circuit, electric shock, etc., for this confirmation might require direct operations of the high-voltage circuit.

1.1. Measurement method using voltage from external sources

1.1.1. Measurement instrument

An isolation resistance test instrument capable of applying a DC voltage higher than the nominal voltage of the tested-device shall be used.

1.1.2. Measurement method

An insulation resistance test instrument shall be connected between the live parts and the ground connection. Then, the isolation resistance shall be measured.

If the system has several voltage ranges (e.g. because of boost converter) in a galvanically connected circuit and some of the components cannot withstand the working voltage of the entire circuit, the isolation resistance between those components and the ground connection can be measured separately by applying at least half of their own working voltage with those component disconnected.

1.2. Measurement method using the tested-device as DC voltage source

1.2.1. Test conditions

The voltage level of the tested-device throughout the test shall be at least the nominal operating voltage of the tested-device.

1.2.2. Measurement instrument

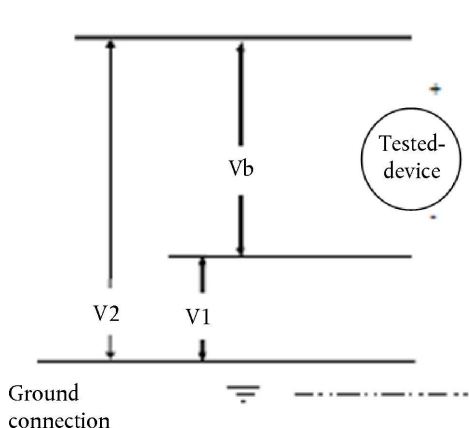
The voltmeter used in this test shall measure DC values and shall have an internal resistance of at least 10 MΩ.

1.2.3. Measurement method

1.2.3.1. First step

The voltage is measured as shown in Figure 1 and the operating voltage of the tested-device (V_b , Figure 1) is recorded. V_b shall be equal to or greater than the nominal operating voltage of the tested-device.

Figure 1



1.2.3.2. Second step

Measure and record the voltage (V_1) between the negative pole of the tested-device and the ground connection (Figure 1).

1.2.3.3. Third step

Measure and record the voltage (V_2) between the positive pole of the tested-device and the ground connection (Figure 1).

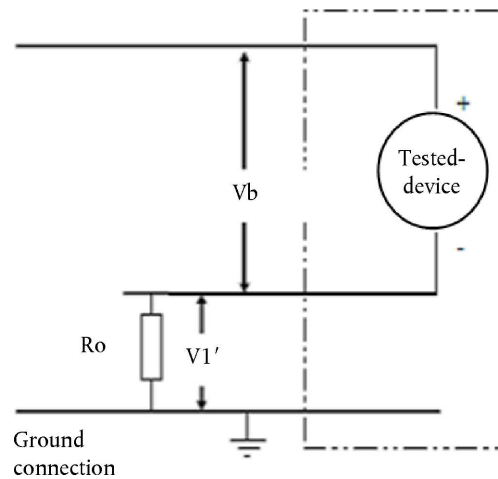
1.2.3.4. Fourth step

If V_1 is greater than or equal to V_2 , insert a standard known resistance (R_o) between the negative pole of the tested-device and the ground connection. With R_o installed, measure the voltage (V_1') between the negative pole of the tested-device and the ground connection (see Figure 2).

Calculate the electrical isolation (R_i) according to the following formula:

$$R_i = R_o \times (V_b/V_1' - V_b/V_1) \text{ or } R_i = R_o \times V_b \times (1/V_1' - 1/V_1)$$

Figure 2

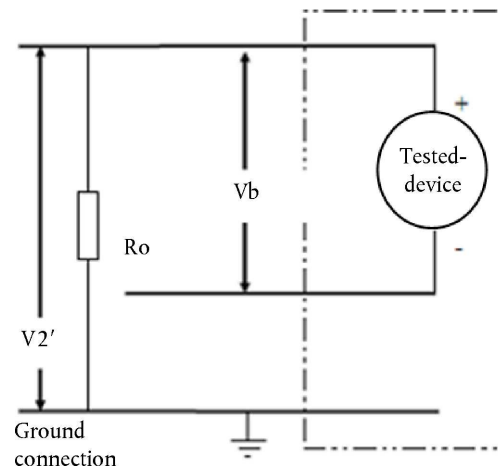


If V_2 is greater than V_1 , insert a standard known resistance (R_o) between the positive pole of the tested-device and the ground connection. With R_o installed, measure the voltage (V_2') between the positive pole of the tested-device and the ground connection (see Figure 3).

Calculate the electrical isolation (R_i) according to the following formula:

$$R_i = R_o \times (V_b/V_2' - V_b/V_2) \text{ or } R_i = R_o \times V_b \times (1/V_2' - 1/V_2)$$

Figure 3



1.2.3.5. Fifth step

The electrical isolation value R_i (in Ω) divided by the nominal voltage of the tested-device (in Volts) results in the isolation resistance (in Ω/V).

Note: The standard known resistance R_o (in Ω) should be the value of the minimum required isolation resistance (in Ω/V) multiplied by the nominal voltage of the tested-device plus/minus 20 per cent (in volts). R_o is not required to be precisely this value since the equations are valid for any R_o ; however, a R_o value in this range should provide good resolution for the voltage measurements.

ANNEX 5

CONFIRMATION METHOD FOR FUNCTION OF ON-BOARD ISOLATION RESISTANCE MONITORING SYSTEM

The function of the on-board isolation resistance monitoring system shall be confirmed by the following method:

Insert a resistor that does not cause the isolation resistance between the terminal being monitored and the electrical chassis to drop below the minimum required isolation resistance value. The warning shall be activated.

ANNEX 6

PART 1

Essential characteristics of road vehicles or systems

1. GENERAL

- 1.1. Mark (trade name of manufacturer):
- 1.2. Type:
- 1.3. Vehicle category:
- 1.4. Commercial name(s) if available:
- 1.5. Manufacturer's name and address:
- 1.6. If applicable, name and address of manufacturer's representative:
- 1.7. Drawing and/or photograph of the vehicle:
- 1.8. Approval number of the REESS:
- 1.9. Passenger compartment: Yes/No ⁽¹⁾:
- 1.10. Centre and/or side stand: Yes/No ⁽¹⁾:

2. ELECTRIC MOTOR (TRACTION MOTOR)

- 2.1. Type (winding, excitation):
- 2.2. Maximum net power and/or maximum 30 minutes power (kW):

3. REESS

- 3.1. Trade name and mark of the REESS:
- 3.2. Indication of all types of cells:
- 3.2.1. The cell chemistry:
- 3.2.2. Physical dimensions:
- 3.2.3. Capacity of the cell (Ah):
- 3.3. Description or drawing(s) or picture(s) of the REESS explaining:
 - 3.3.1. Structure:
 - 3.3.2. Configuration (number of cells, mode of connection, etc.):
 - 3.3.3. Dimensions:
 - 3.3.4. Casing (construction, materials and physical dimensions):
- 3.4. Electrical specification:
- 3.4.1. Nominal voltage (V):
- 3.4.2. Working voltage (V):
- 3.4.3. Rated capacity (Ah):
- 3.4.4. Maximum current (A):

- 3.5. Gas combination rate (in per cent):
- 3.6. Description or drawing(s) or picture(s) of the installation of the REESS in the vehicle:
- 3.6.1. Physical support:
- 3.7. Type of thermal management
- 3.8. Electronic control:
- 4. FUEL CELL (IF ANY)
- 4.1. Trade name and mark of the fuel cell:
- 4.2. Types of fuel cell:
- 4.3. Nominal voltage (V):
- 4.4. Number of cells:
- 4.5. Type of cooling system (if any):
- 4.6. Max Power (kW):
- 5. FUSE AND/OR CIRCUIT BREAKER
- 5.1. Type:
- 5.2. Diagram showing the functional range:
- 6. POWER WIRING HARNESS
- 6.1. Type:
- 7. PROTECTION AGAINST ELECTRIC SHOCK
- 7.1. Description of the protection concept:
- 8. ADDITIONAL DATA
- 8.1. Brief description of the power circuit components installation or drawings/pictures showing the location of the power circuit components installation:
- 8.2. Schematic diagram of all electrical functions included in power circuit:
- 8.3. Working voltage (V):
- 8.4. System descriptions for low performance driving mode(s)
- 8.4.1. Systems' SOC level(s) for which power reduction is activated, descriptions, rationales
- 8.4.2. Descriptions for systems' reduced power mode(s) and similar mode(s), rationales

PART 2

Essential characteristics of REESS

- 1. REESS
- 1.1. Trade name and mark of the REESS:
- 1.2. Indication of all types of cells:
- 1.2.1. The cell chemistry:

- 1.2.2. Physical dimensions:
- 1.2.3. Capacity of the cell (Ah):
- 1.3. Description or drawing(s) or picture(s) of the REESS explaining
 - 1.3.1. Structure:
 - 1.3.2. Configuration (number of cells, mode of connection, etc.):
 - 1.3.3. Dimensions:
 - 1.3.4. Casing (construction, materials and physical dimensions):
 - 1.3.5. Mass of REESS (kg):
- 1.4. Electrical specification
 - 1.4.1. Nominal voltage (V):
 - 1.4.2. Working voltage (V):
 - 1.4.3. Rated capacity (Ah):
 - 1.4.4. Maximum current (A):
- 1.5. Gas combination rate (in percentage):
- 1.6. Description or drawing(s) or picture(s) of the installation of the REESS in the vehicle:
- 1.6.1. Physical support:
- 1.7. Type of thermal management:
- 1.8. Electronic control:
- 1.9. Category of vehicles on which the REESS can be installed:

PART 3

Essential characteristics of road vehicles or systems with chassis connected to electrical circuits

- 1. GENERAL
 - 1.1. Mark (trade name of manufacturer):
 - 1.2. Type:
 - 1.3. Vehicle category:
 - 1.4. Commercial name(s) if available:
 - 1.5. Manufacturer's name and address:
 - 1.6. If applicable, name and address of manufacturer's representative:
 - 1.7. Drawing and/or photograph of the vehicle:
 - 1.8. Approval number of the REESS:
 - 1.9. Passenger compartment: Yes/No ⁽¹⁾:
 - 1.10. Centre and/or side stand: Yes/No ⁽¹⁾:

- 2. REESS
 - 2.1. Trade name and mark of the REESS:
 - 2.2. The cell chemistry:
 - 2.3. Electrical specification:
 - 2.3.1. Nominal voltage (V):
 - 2.3.2. Rated capacity (Ah):
 - 2.3.3. Maximum current (A):
 - 2.4. Gas combination rate (in per cent):
 - 2.5. Description or drawing(s) or picture(s) of the installation of the REESS in the vehicle:
- 3. ADDITIONAL DATA
 - 3.1. Working voltage (V) AC circuit:
 - 3.2. Working voltage (V) DC circuit:

(¹) Strike out what does not apply.

ANNEX 7

DETERMINATION OF HYDROGEN EMISSIONS DURING THE CHARGE PROCEDURES OF THE REESS

1. INTRODUCTION

This annex describes the procedure for the determination of hydrogen emissions during the charge procedures of the REESS of all road vehicles, according to paragraph 5.4 of this Regulation.

2. DESCRIPTION OF TEST

The hydrogen emission test (Figure 7.1 of the present annex) is conducted in order to determine hydrogen emissions during the charge procedures of the REESS with the charger. The test consists in the following steps:

- (a) Vehicle/REESS preparation,
- (b) Discharge of the REESS,
- (c) Determination of hydrogen emissions during a normal charge,
- (d) Determination of hydrogen emissions during a charge carried out with the charger failure.

3. TESTS

3.1. Vehicle based test

- 3.1.1. The vehicle shall be in good mechanical condition and have been driven at least 300 km during seven days before the test. The vehicle shall be equipped with the REESS subject to the test of hydrogen emissions, over this period.
- 3.1.2. If the REESS is used at a temperature above the ambient temperature, the operator shall follow the manufacturer's procedure in order to keep the REESS temperature in normal functioning range.

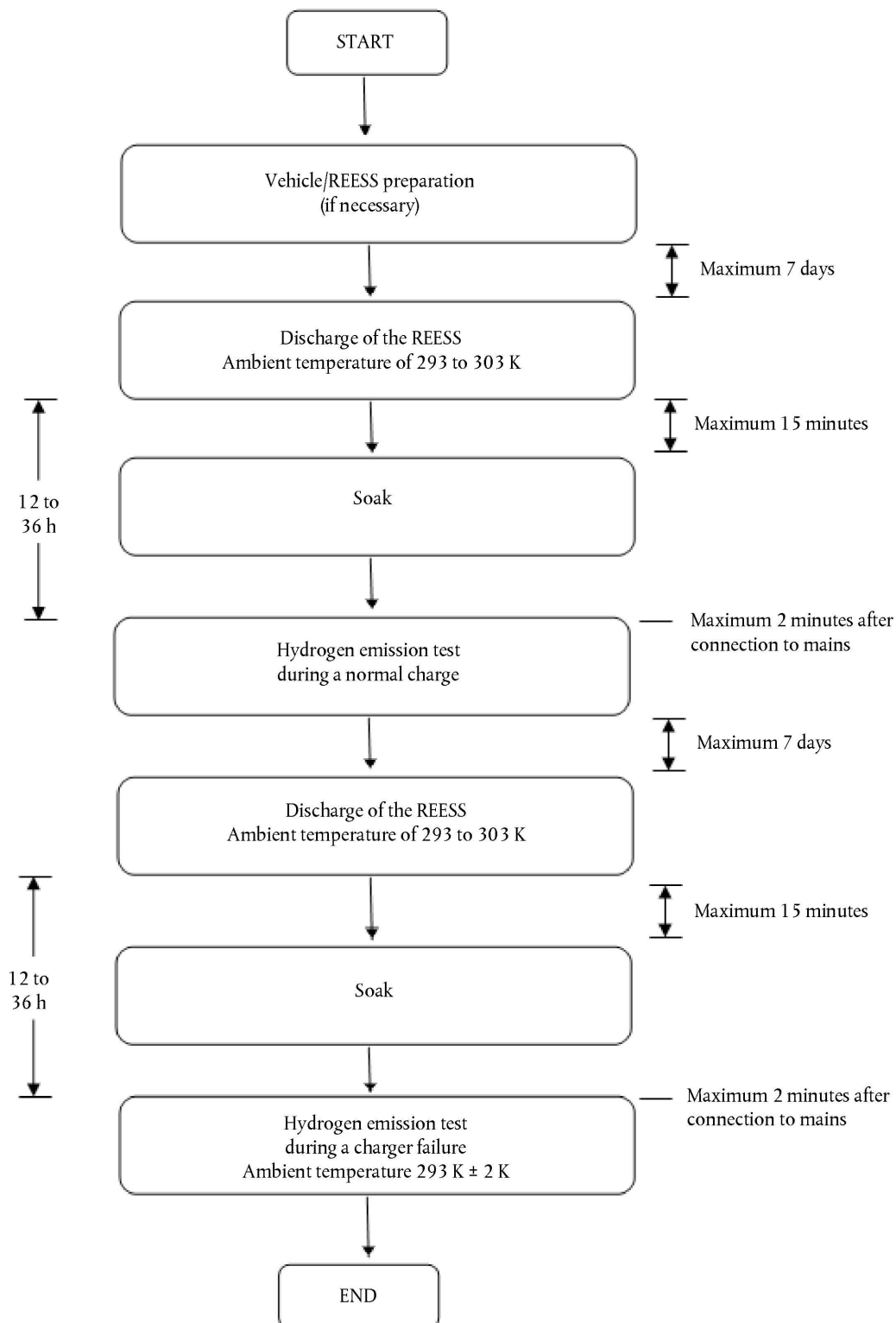
The manufacturer's representative shall be able to certify that the temperature conditioning system of the REESS is neither damaged nor presenting a capacity defect.

3.2. Component based test

- 3.2.1. The REESS shall be in good mechanical condition and have been subject to minimum of 5 standard cycles (as specified in Annex 8, Appendix 1).
- 3.2.2. If the REESS is used at a temperature above the ambient temperature, the operator shall follow the manufacturer's procedure in order to keep the REESS temperature in its normal functioning range.

The manufacturer's representative shall be able to certify that the temperature conditioning system of the REESS is neither damaged nor presenting a capacity defect

Figure 7.1

Determination of hydrogen emissions during the charge procedures of the REESS

4. TEST EQUIPMENT FOR HYDROGEN EMISSION TEST

4.1. Hydrogen emission measurement enclosure

The hydrogen emission measurement enclosure shall be a gas-tight measuring chamber able to contain the vehicle/REESS under test. The vehicle/REESS shall be accessible from all sides and the enclosure when sealed shall be gas-tight in accordance with Appendix 1 to this annex. The inner surface of the enclosure shall be impermeable and non-reactive to hydrogen. The temperature conditioning system shall be capable of controlling the internal enclosure air temperature to follow the prescribed temperature throughout the test, with an average tolerance of ± 2 K over the duration of the test.

To accommodate the volume changes due to enclosure hydrogen emissions, either a variable-volume or another test equipment may be used. The variable-volume enclosure expands and contracts in response to the hydrogen emissions in the enclosure. Two potential means of accommodating the internal volume changes are movable panels, or a bellows design, in which impermeable bags inside the enclosure expand and contract in response to internal pressure changes by exchanging air from outside the enclosure. Any design for volume accommodation shall maintain the integrity of the enclosure as specified in Appendix 1 to this annex.

Any method of volume accommodation shall limit the differential between the enclosure internal pressure and the barometric pressure to a maximum value of ± 5 hPa.

The enclosure shall be capable of latching to a fixed volume. A variable volume enclosure shall be capable of accommodating a change from its 'nominal volume' (see Annex 7, Appendix 1, paragraph 2.1.1), taking into account hydrogen emissions during testing.

4.2. Analytical systems

4.2.1. Hydrogen analyser

4.2.1.1. The atmosphere within the chamber is monitored using a hydrogen analyser (electrochemical detector type) or a chromatograph with thermal conductivity detection. Sample gas shall be drawn from the mid-point of one side-wall or roof of the chamber and any bypass flow shall be returned to the enclosure, preferably to a point immediately downstream of the mixing fan.

4.2.1.2. The hydrogen analyser shall have a response time to 90 per cent of final reading of less than 10 seconds. Its stability shall be better than 2 per cent of full scale at zero and at 80 per cent ± 20 per cent of full scale, over a 15-minute period for all operational ranges.

4.2.1.3. The repeatability of the analyser expressed as one standard deviation shall be better than 1 per cent of full scale, at zero and at 80 per cent ± 20 per cent of full scale on all ranges used.

4.2.1.4. The operational ranges of the analyser shall be chosen to give best resolution over the measurement, calibration and leak checking procedures.

4.2.2. Hydrogen analyser data recording system

The hydrogen analyser shall be fitted with a device to record electrical signal output, at a frequency of at least once per minute. The recording system shall have operating characteristics at least equivalent to the signal being recorded and shall provide a permanent record of results. The recording shall show a clear indication of the beginning and end of the normal charge test and charging failure operation.

4.3. Temperature recording

4.3.1. The temperature in the chamber is recorded at two points by temperature sensors, which are connected so as to show a mean value. The measuring points are extended approximately 0.1 m into the enclosure from the vertical centre line of each side-wall at a height of $0,9 \pm 0,2$ m.

4.3.2. The temperatures in the proximity of the cells are recorded by means of the sensors.

- 4.3.3. Temperatures shall, throughout the hydrogen emission measurements, be recorded at a frequency of at least once per minute.
- 4.3.4. The accuracy of the temperature recording system shall be within $\pm 1,0$ K and the temperature shall be capable of being resolved to $\pm 0,1$ K.
- 4.3.5. The recording or data processing system shall be capable of resolving time to ± 15 seconds.
- 4.4. Pressure recording
- 4.4.1. The difference D_p between barometric pressure within the test area and the enclosure internal pressure shall, throughout the hydrogen emission measurements, be recorded at a frequency of at least once per minute.
- 4.4.2. The accuracy of the pressure recording system shall be within ± 2 hPa and the pressure shall be capable of being resolved to $\pm 0,2$ hPa.
- 4.4.3. The recording or data processing system shall be capable of resolving time to ± 15 seconds.
- 4.5. Voltage and current intensity recording
- 4.5.1. The charger voltage and current intensity (battery) shall, throughout the hydrogen emission measurements, be recorded at a frequency of at least once per minute.
- 4.5.2. The accuracy of the voltage recording system shall be within ± 1 V and the voltage shall be capable of being resolved to $\pm 0,1$ V.
- 4.5.3. The accuracy of the current intensity recording system shall be within $\pm 0,5$ A and the current intensity shall be capable of being resolved to $\pm 0,05$ A.
- 4.5.4. The recording or data processing system shall be capable of resolving time to ± 15 seconds.
- 4.6. Fans
- The chamber shall be equipped with one or more fans or blowers with a possible flow of 0,1 to 0,5 m³/second in order to thoroughly mix the atmosphere in the enclosure. It shall be possible to reach a homogeneous temperature and hydrogen concentration in the chamber during measurements. The vehicle in the enclosure shall not be subjected to a direct stream of air from the fans or blowers.
- 4.7. Gases
- 4.7.1. The following pure gases shall be available for calibration and operation:
- (a) Purified synthetic air (purity < 1 ppm C₁ equivalent; < 1 ppm CO; < 400 ppm CO₂; $< 0,1$ ppm NO); oxygen content between 18 and 21 per cent by volume,
- (b) Hydrogen (H₂), 99,5 per cent minimum purity.
- 4.7.2. Calibration and span gases shall contain mixtures of hydrogen (H₂) and purified synthetic air. The real concentrations of a calibration gas shall be within ± 2 per cent of the nominal values. The accuracy of the diluted gases obtained when using a gas divider shall be within ± 2 per cent of the nominal value. The concentrations specified in Appendix 1 may also be obtained by a gas divider using synthetic air as the dilution gas.
5. TEST PROCEDURE
- The test consists in the five following steps:
- (a) Vehicle/REESS preparation;
- (b) Discharge of the REESS;
- (c) Determination of hydrogen emissions during a normal charge;

- (d) Discharge of the traction battery;
- (e) Determination of hydrogen emissions during a charge carried out with the charger failure.

If the vehicle/REESS has to be moved between two steps, it shall be pushed to the following test area.

5.1. Vehicle based test

5.1.1. Vehicle preparation

The ageing of REESS shall be checked, proving that the vehicle has performed at least 300 km during seven days before the test. During this period, the vehicle shall be equipped with the traction battery submitted to the hydrogen emission test. If this cannot be demonstrated then the following procedure will be applied.

5.1.1.1. Discharges and initial charges of the REESS

The procedure starts with the discharge of the REESS of the vehicle while driving on the test track at a steady speed of 70 per cent \pm 5 per cent of the maximum speed of the vehicle during 30 minutes.

Discharging is stopped:

- (a) When the vehicle is not able to run at 65 per cent of the maximum thirty minutes speed, or
- (b) When an indication to stop the vehicle is given to the driver by the standard on-board instrumentation, or
- (c) After having covered the distance of 100 km.

5.1.1.2. Initial charge of the REESS

The charge is carried out:

- (a) With the charger;
- (b) In an ambient temperature between 293 K and 303 K.

The procedure excludes all types of external chargers.

The end of REESS charge criteria corresponds to an automatic stop given by the charger.

This procedure includes all types of special charges that could be automatically or manually initiated like, for instance, the equalisation charges or the servicing charges.

5.1.1.3. Procedure from paragraphs 5.1.1.1 and 5.1.1.2 shall be repeated two times.

5.1.2. Discharge of the REESS

The REESS is discharged while driving on the test track at a steady speed of 70 per cent \pm 5 per cent from the maximum thirty minutes speed of the vehicle.

Stopping the discharge occurs:

- (a) When an indication to stop the vehicle is given to the driver by the standard on-board instrumentation, or
- (b) When the maximum speed of the vehicle is lower than 20 km/h.

5.1.3. Soak

Within fifteen minutes of completing the battery discharge operation specified in paragraph 5.2, the vehicle is parked in the soak area. The vehicle is parked for a minimum of 12 hours and a maximum of 36 hours, between the end of the traction battery discharge and the start of the hydrogen emission test during a normal charge. For this period, the vehicle shall be soaked at 293 K \pm 2 K.

5.1.4. Hydrogen emission test during a normal charge

- 5.1.4.1. Before the completion of the soak period, the measuring chamber shall be purged for several minutes until a stable hydrogen background is obtained. The enclosure mixing fan(s) shall also be turned on at this time.
- 5.1.4.2. The hydrogen analyser shall be zeroed and spanned immediately prior to the test.
- 5.1.4.3. At the end of the soak, the test vehicle, with the engine shut off and the test vehicle windows and luggage compartment opened shall be moved into the measuring chamber.
- 5.1.4.4. The vehicle shall be connected to the mains. The REESS is charged according to normal charge procedure as specified in paragraph 5.1.4.7 below.
- 5.1.4.5. The enclosure doors are closed and sealed gas-tight within two minutes from electrical interlock of the normal charge step.
- 5.1.4.6. The start of a normal charge for hydrogen emission test period begins when the chamber is sealed. The hydrogen concentration, temperature and barometric pressure are measured to give the initial readings C_{H_2i} , T_i and P_i for the normal charge test.

These figures are used in the hydrogen emission calculation (paragraph 6 of this annex). The ambient enclosure temperature T shall not be less than 291 K and no more than 295 K during the normal charge period.

5.1.4.7. Procedure of normal charge

The normal charge is carried out with the charger and consists of the following steps:

- (a) Charging at constant power during t_1 ;
- (b) Over-charging at constant current during t_2 . Over-charging intensity is specified by manufacturer and corresponds to the one used during equalisation charging.

The end of REESS charge criteria corresponds to an automatic stop given by the charger to a charging time of $t_1 + t_2$. This charging time will be limited to $t_1 + 5$ h, even if a clear indication is given to the driver by the standard instrumentation that the battery is not yet fully charged.

5.1.4.8. The hydrogen analyser shall be zeroed and spanned immediately before the end of the test.

- 5.1.4.9. The end of the emission sampling period occurs $t_1 + t_2$ or $t_1 + 5$ hours after the beginning of the initial sampling, as specified in paragraph 5.1.4.6 of this annex. The different times elapsed are recorded. The hydrogen concentration, temperature and barometric pressure are measured to give the final readings C_{H_2f} , T_f and P_f for the normal charge test, used for the calculation in paragraph 6 of this annex.

5.1.5. Hydrogen emission test with the charger failure

- 5.1.5.1. Within seven days maximum after having completed the prior test, the procedure starts with the discharge of the REESS of the vehicle according to paragraph 5.1.2 of this annex.
- 5.1.5.2. The steps of the procedure in paragraph 5.1.3 of this annex shall be repeated.
- 5.1.5.3. Before the completion of the soak period, the measuring chamber shall be purged for several minutes until a stable hydrogen background is obtained. The enclosure mixing fan(s) shall also be turned on at this time.
- 5.1.5.4. The hydrogen analyser shall be zeroed and spanned immediately prior to the test.
- 5.1.5.5. At the end of the soak, the test vehicle, with the engine shut off and the test vehicle windows and luggage compartment opened shall be moved into the measuring chamber.

- 5.1.5.6. The vehicle shall be connected to the mains. The REESS is charged according to failure charge procedure as specified in paragraph 5.1.5.9 below.
- 5.1.5.7. The enclosure doors are closed and sealed gas-tight within two minutes from electrical interlock of the failure charge step.
- 5.1.5.8. The start of a failure charge for hydrogen emission test period begins when the chamber is sealed. The hydrogen concentration, temperature and barometric pressure are measured to give the initial readings C_{H_2} , T_i and P_i for the failure charge test.

These figures are used in the hydrogen emission calculation (paragraph 6 of this annex). The ambient enclosure temperature T shall not be less than 291 K and no more than 295 K during the charging failure period.

5.1.5.9. Procedure of charging failure

The charging failure is carried out with the suitable charger and consists of the following steps:

- (a) Charging at constant power during t'_1 ;
- (b) Charging at maximum current as recommended by the manufacturer during 30 minutes. During this phase, the charger shall supply maximum current as recommended by the manufacturer.

5.1.5.10. The hydrogen analyser shall be zeroed and spanned immediately before the end of the test.

5.1.5.11. The end of test period occurs $t'_1 + 30$ minutes after the beginning of the initial sampling, as specified in paragraph 5.1.5.8 above. The times elapsed are recorded. The hydrogen concentration, temperature and barometric pressure are measured to give the final readings C_{H_2} , T_f and P_f for the charging failure test, used for the calculation in paragraph 6 of this annex.

5.2. Component based test

5.2.1. REESS preparation

The ageing of REESS shall be checked, to confirm that the REESS has performed at least 5 standard cycles (as specified in Annex 8, Appendix 1).

5.2.2. Discharge of the REESS

The REESS is discharged at 70 per cent \pm 5 per cent of the nominal power of the system.

Stopping the discharge occurs when minimum SOC as specified by the manufacturer is reached.

5.2.3. Soak

Within 15 minutes of the end of the REESS discharge operation specified in paragraph 5.2.2 above, and before the start of the hydrogen emission test, the REESS shall be soaked at 293 K \pm 2 K for a minimum period of 12 hours and a maximum of period of 36 hours.

5.2.4. Hydrogen emission test during a normal charge

5.2.4.1. Before the completion of the REESS's soak period, the measuring chamber shall be purged for several minutes until a stable hydrogen background is obtained. The enclosure mixing fan(s) shall also be turned on at this time.

5.2.4.2. The hydrogen analyser shall be zeroed and spanned immediately prior to the test.

5.2.4.3. At the end of the soak period, the REESS shall be moved into the measuring chamber.

5.2.4.4. The REESS shall be charged in accordance with the normal charge procedure as specified in paragraph 5.2.4.7 below.

5.2.4.5. The chamber shall be closed and sealed gas-tight within two minutes of the electrical interlock of the normal charge step.

5.2.4.6. The start of a normal charge for hydrogen emission test period shall begin when the chamber is sealed. The hydrogen concentration, temperature and barometric pressure are measured to give the initial readings C_{H_2i} , T_i and P_i for the normal charge test.

These figures are used in the hydrogen emission calculation (paragraph 6 of this annex). The ambient enclosure temperature T shall not be less than 291 K and no more than 295 K during the normal charge period.

5.2.4.7. Procedure of normal charge

The normal charge is carried out with a suitable charger and consists of the following steps:

- (a) Charging at constant power during t_1 ;
- (b) Over-charging at constant current during t_2 . Over-charging intensity is specified by manufacturer and corresponding to that used during equalisation charging.

The end of REESS charge criteria corresponds to an automatic stop given by the charger to a charging time of $t_1 + t_2$. This charging time will be limited to $t_1 + 5$ h, even if a clear indication is given by a suitable instrumentation that the REESS is not yet fully charged.

5.2.4.8. The hydrogen analyser shall be zeroed and spanned immediately before the end of the test.

5.2.4.9. The end of the emission sampling period occurs $t_1 + t_2$ or $t_1 + 5$ h after the beginning of the initial sampling, as specified in paragraph 5.2.4.6 above. The different times elapsed are recorded. The hydrogen concentration, temperature and barometric pressure are measured to give the final readings C_{H_2f} , T_f and P_f for the normal charge test, used for the calculation in paragraph 6 of this annex

5.2.5. Hydrogen emission test with the charger failure

5.2.5.1. The test procedure shall start within a maximum of seven days after having completed the test in paragraph 5.2.4 above, the procedure shall start with the discharge of the REESS of the vehicle in accordance with paragraph 5.2.2 above.

5.2.5.2. The steps of the procedure in paragraph 5.2.3 above shall be repeated.

5.2.5.3. Before the completion of the soak period, the measuring chamber shall be purged for several minutes until a stable hydrogen background is obtained. The enclosure mixing fan(s) shall also be turned on at this time.

5.2.5.4. The hydrogen analyser shall be zeroed and spanned immediately prior to the test.

5.2.5.5. At the end of the soak the REESS shall be moved into the measuring chamber.

5.2.5.6. The REESS shall be charged according to the failure charge procedure as specified in paragraph 5.2.5.9 below.

5.2.5.7. The chamber shall be closed and sealed gas-tight within two minutes from electrical interlock of the failure charge step.

5.2.5.8. The start of a failure charge for hydrogen emission test period begins when the chamber is sealed. The hydrogen concentration, temperature and barometric pressure are measured to give the initial readings C_{H_2i} , T_i and P_i for the failure charge test.

These figures are used in the hydrogen emission calculation (paragraph 6 of this annex). The ambient enclosure temperature T shall not be less than 291 K and no more than 295 K during the charging failure period.

5.2.5.9. Procedure of charging failure

The charging failure is carried out with a suitable charger and consists of the following steps:

- (a) Charging at constant power during t'_1 ,
- (b) Charging at maximum current as recommended by the manufacturer during 30 minutes. During this phase, the charger shall supply maximum current as recommended by the manufacturer.

5.2.5.10. The hydrogen analyser shall be zeroed and spanned immediately before the end of the test.

5.2.5.11. The end of test period occurs $t'_1 + 30$ minutes after the beginning of the initial sampling, as specified in paragraph 5.2.5.8 above. The times elapsed are recorded. The hydrogen concentration, temperature and barometric pressure are measured to give the final readings C_{H2f} , T_f and P_f for the charging failure test, used for the calculation in paragraph 6 below.

6. CALCULATION

The hydrogen emission tests described in paragraph 5 above allow the calculation of the hydrogen emissions from the normal charge and charging failure phases. Hydrogen emissions from each of these phases are calculated using the initial and final hydrogen concentrations, temperatures and pressures in the enclosure, together with the net enclosure volume.

The formula below is used:

$$M_{H2} = k \times V \times 10^{-4} \times \left(\frac{\left(1 + \frac{V_{out}}{V}\right) \times C_{H2f} \times P_f}{T_f} - \frac{C_{H2i} \times P_i}{T_i} \right)$$

Where:

M_{H2} = hydrogen mass, in grams

C_{H2} = measured hydrogen concentration in the enclosure, in ppm volume

V = net enclosure volume in cubic metres (m^3) corrected for the volume of the vehicle, with the windows and the luggage compartment open. If the volume of the vehicle is not determined a volume of 1,42 m^3 is subtracted.

V_{out} = compensation volume in m^3 , at the test temperature and pressure

T = ambient chamber temperature, in K

P = absolute enclosure pressure, in kPa

k = 2,42

Where: i is the initial reading

f is the final reading

6.1. Results of test

The hydrogen mass emissions for the REESS are:

M_N = hydrogen mass emission for normal charge test, in grams

M_D = hydrogen mass emission for charging failure test, in grams

APPENDIX 1

CALIBRATION OF EQUIPMENT FOR HYDROGEN EMISSION TESTING

1. CALIBRATION FREQUENCY AND METHODS

All equipment shall be calibrated before its initial use and then calibrated as often as necessary and in any case in the month before type approval testing. The calibration methods to be used are described in this appendix.

2. CALIBRATION OF THE ENCLOSURE

2.1. Initial determination of enclosure internal volume

2.1.1. Before its initial use, the internal volume of the chamber shall be determined as follows:

The internal dimensions of the chamber are carefully measured, taking into account any irregularities such as bracing struts.

The internal volume of the chamber is determined from these measurements.

The enclosure shall be latched to a fixed volume when the enclosure is held at an ambient temperature of 293 K. This nominal volume shall be repeatable within $\pm 0,5$ per cent of the reported value.

2.1.2. The net internal volume is determined by subtracting 1,42 m³ from the internal volume of the chamber. Alternatively the volume of the test vehicle with the luggage compartment and windows open or REESS may be used instead of the 1,42 m³.2.1.3. The chamber shall be checked as in paragraph 2.3 of this appendix. If the hydrogen mass does not agree with the injected mass to within ± 2 per cent then corrective action is required.

2.2. Determination of chamber background emissions

This operation determines that the chamber does not contain any materials that emit significant amounts of hydrogen. The check shall be carried out at the enclosure's introduction to service, after any operations in the enclosure which may affect background emissions and at a frequency of at least once per year.

2.2.1. Variable-volume enclosure may be operated in either latched or unlatched volume configuration, as described in paragraph 2.1.1 above. Ambient temperature shall be maintained at 293 K \pm 2 K, throughout the four-hour period mentioned below.

2.2.2. The enclosure may be sealed and the mixing fan operated for a period of up to 12 hours before the four-hour background-sampling period begins.

2.2.3. The analyser (if required) shall be calibrated, then zeroed and spanned.

2.2.4. The enclosure shall be purged until a stable hydrogen reading is obtained, and the mixing fan turned on if not already on.

2.2.5. The chamber is then sealed and the background hydrogen concentration, temperature and barometric pressure are measured. These are the initial readings C_{H_2i} , T_i and P_i used in the enclosure background calculation.

2.2.6. The enclosure is allowed to stand undisturbed with the mixing fan on for a period of four hours.

2.2.7. At the end of this time the same analyser is used to measure the hydrogen concentration in the chamber. The temperature and the barometric pressure are also measured. These are the final readings C_{H_2f} , T_f and P_f .

2.2.8. The change in mass of hydrogen in the enclosure shall be calculated over the time of the test in accordance with paragraph 2.4 of this annex and shall not exceed 0,5 g.

2.3. Calibration and hydrogen retention test of the chamber

The calibration and hydrogen retention test in the chamber provides a check on the calculated volume (paragraph 2.1 above) and also measures any leak rate. The enclosure leak rate shall be determined at the enclosure's introduction to service, after any operations in the enclosure which may affect the integrity of the enclosure, and at least monthly thereafter. If six consecutive monthly retention checks are successfully completed without corrective action, the enclosure leak rate may be determined quarterly thereafter as long as no corrective action is required.

- 2.3.1. The enclosure shall be purged until a stable hydrogen concentration is reached. The mixing fan is turned on, if not already switched on. The hydrogen analyser is zeroed, calibrated if required, and spanned.
- 2.3.2. The enclosure shall be latched to the nominal volume position.
- 2.3.3. The ambient temperature control system is then turned on (if not already on) and adjusted for an initial temperature of 293 K.
- 2.3.4. When the enclosure temperature stabilizes at $293\text{ K} \pm 2\text{ K}$, the enclosure is sealed and the background concentration, temperature and barometric pressure measured. These are the initial readings $C_{\text{H}_2\text{i}}$, T_{i} and P_{i} used in the enclosure calibration.
- 2.3.5. The enclosure shall be unlatched from the nominal volume.
- 2.3.6. A quantity of approximately 100 g of hydrogen is injected into the enclosure. This mass of hydrogen shall be measured to an accuracy of ± 2 per cent of the measured value.
- 2.3.7. The contents of the chamber shall be allowed to mix for five minutes and then the hydrogen concentration, temperature and barometric pressure are measured. These are the final readings $C_{\text{H}_2\text{f}}$, T_{f} and P_{f} for the calibration of the enclosure as well as the initial readings $C_{\text{H}_2\text{i}}$, T_{i} and P_{i} for the retention check.
- 2.3.8. On the basis of the readings taken in paragraphs 2.3.4 and 2.3.7 above and the formula in paragraph 2.4 below, the mass of hydrogen in the enclosure is calculated. This shall be within ± 2 per cent of the mass of hydrogen measured in paragraph 2.3.6 above.
- 2.3.9. The contents of the chamber shall be allowed to mix for a minimum of 10 hours. At the completion of the period, the final hydrogen concentration, temperature and barometric pressure are measured and recorded. These are the final readings $C_{\text{H}_2\text{f}}$, T_{f} and P_{f} for the hydrogen retention check.
- 2.3.10. Using the formula in paragraph 2.4 below, the hydrogen mass is then calculated from the readings taken in paragraphs 2.3.7 and 2.3.9 above. This mass may not differ by more than 5 per cent from the hydrogen mass given by paragraph 2.3.8 above.

2.4. Calculation

The calculation of net hydrogen mass change within the enclosure is used to determine the chamber's hydrocarbon background and leak rate. Initial and final readings of hydrogen concentration, temperature and barometric pressure are used in the following formula to calculate the mass change.

$$M_{\text{H}_2} = k \times V \times 10^{-4} \times \left(\frac{\left(1 + \frac{V_{\text{out}}}{V}\right) \times C_{\text{H}_2\text{f}} \times P_{\text{f}}}{T_{\text{f}}} - \frac{C_{\text{H}_2\text{i}} \times P_{\text{i}}}{T_{\text{i}}} \right)$$

Where:

M_{H_2} = hydrogen mass, in grams

C_{H_2} = measured hydrogen concentration into the enclosure, in ppm volume

V = enclosure volume in cubic metres (m^3) as measured in paragraph 2.1.1 above.

V_{out} = compensation volume in m^3 , at the test temperature and pressure

T = ambient chamber temperature, in K

P = absolute enclosure pressure, in kPa

k = 2,42

Where: i is the initial reading

f is the final reading

3. CALIBRATION OF THE HYDROGEN ANALYSER

The analyser should be calibrated using hydrogen in air and purified synthetic air. See paragraph 4.8.2 of Annex 7.

Each of the normally used operating ranges are calibrated by the following procedure:

- 3.1. Establish the calibration curve by at least five calibration points spaced as evenly as possible over the operating range. The nominal concentration of the calibration gas with the highest concentrations to be at least 80 per cent of the full scale.
- 3.2. Calculate the calibration curve by the method of least squares. If the resulting polynomial degree is greater than three, then the number of calibration points shall be at least the number of the polynomial degree plus two.
- 3.3. The calibration curve shall not differ by more than two per cent from the nominal value of each calibration gas.
- 3.4. Using the coefficients of the polynomial derived from paragraph 3.2 above, a table of analyser readings against true concentrations shall be drawn by steps no greater than 1 per cent of full scale. This is to be carried out for each analyser range calibrated.

This table shall also contain other relevant data such as:

- (a) date of calibration;
 - (b) span and zero potentiometer readings (where applicable);
 - (c) nominal scale;
 - (d) reference data of each calibration gas used;
 - (e) real and indicated value of each calibration gas used together with the percentage differences;
 - (f) calibration pressure of analyser.
- 3.5. Alternative methods (e.g. computer, electronically controlled range switch) can be used if it is proven to the technical service that these methods give equivalent accuracy.
-

APPENDIX 2

ESSENTIAL CHARACTERISTICS OF THE VEHICLE FAMILY

1. Parameters defining the family relative to hydrogen emissions

The family may be defined by basic design parameters which shall be common to vehicles within the family. In some cases there may be interaction of parameters. These effects shall also be taken into consideration to ensure that only vehicles with similar hydrogen emission characteristics are included within the family.

2. To this end, those vehicle types whose parameters described below are identical are considered to belong to the same hydrogen emissions family.

REESS:

- (a) trade name or mark of the REESS;
- (b) indication of all types of electrochemical couples used;
- (c) number of REESS cells;
- (d) number of REESS subsystems;
- (e) nominal voltage of the REESS (V);
- (f) REESS energy (kWh);
- (g) gas combination rate (in per cent);
- (h) type(s) of ventilation for REESS subsystem(s);
- (i) type of cooling system (if any).

On-board charger:

- (a) make and type of different charger parts;
 - (b) output nominal power (kW);
 - (c) maximum voltage of charge (V);
 - (d) maximum intensity of charge (A);
 - (e) make and type of control unit (if any);
 - (f) diagram of operating, controls and safety;
 - (g) characteristics of charge periods.
-

ANNEX 8

REESS TEST PROCEDURES

Reserved

—

APPENDIX

PROCEDURE FOR CONDUCTING A STANDARD CYCLE

A standard cycle will start with a standard discharge followed by a standard charge.

Standard discharge:

Discharge rate: The discharge procedure including termination criteria shall be defined by the manufacturer. If not specified, then it shall be a discharge with 1C current.

Discharge limit (end voltage): Specified by the manufacturer

Rest period after discharge: Minimum 30 min

Standard charge: The charge procedure including termination criteria shall be defined by the manufacturer. If not specified, then it shall be a charge with C/3 current.

ANNEX 8A

VIBRATION TEST

1. PURPOSE

The purpose of this test is to verify the safety performance of the REESS under a vibration environment which the REESS will likely experience during the normal operation of the vehicle.

2. INSTALLATIONS

2.1. This test shall be conducted either with the complete REESS or with related REESS subsystem(s) including the cells and their electrical connections. If the manufacturer chooses to test with related subsystem(s), the manufacturer shall demonstrate that the test result can reasonably represent the performance of the complete REESS with respect to its safety performance under the same conditions. If the electronic management unit for the REESS is not integrated in the casing enclosing the cells, then the electronic management unit may be omitted from installation on the tested-device if so requested by the manufacturer.

2.2. The tested-device shall be firmly secured to the platform of the vibration machine in such a manner as to ensure that the vibrations are directly transmitted to the tested-device.

3. PROCEDURES

3.1. General test conditions

The following conditions shall apply to the tested-device:

- (a) The test shall be conducted at an ambient temperature of 20 ± 10 °C;
- (b) At the beginning of the test, the SOC shall be adjusted to a value in the upper 50 per cent of the normal operating SOC range of the tested-device;
- (c) At the beginning of the test, all protection devices which affect the function(s) of the tested-device that are relevant to the outcome of the test shall be operational.

3.2. Test procedures

The tested-devices shall be subjected to a vibration having a sinusoidal waveform with a logarithmic sweep between 7 Hz and 200 Hz and back to 7 Hz traversed in 15 minutes

This cycle shall be repeated 12 times for a total of 3 hours in the vertical direction of the mounting orientation of the REESS as specified by the manufacturer.

The correlation between frequency and acceleration shall be as shown in Table 1 and Table 2.

Table 1

Frequency and acceleration (gross mass of tested-device less than 12 kg)

Frequency [Hz]	Acceleration [m/s^2]
7 - 18	10
18 - approximately 50 ⁽¹⁾	gradually increased from 10 to 80
50 - 200	80

Table 2

Frequency and acceleration (gross mass of tested-device of 12 kg or more)

Frequency [Hz]	Acceleration [m/s ²]
7 - 18	10
18 - approximately 25 ⁽¹⁾	gradually increased from 10 to 20
25 - 200	20

⁽¹⁾ The amplitude is then maintained at 0,8 mm (1,6 mm total excursion) and the frequency is increased until the maximum acceleration as described in Table 1 or Table 2 occurs.

At the request of the manufacturer, a higher acceleration level as well as a higher maximum frequency may be used.

At the request of the manufacturer a vibration test profile determined by the vehicle-manufacturer, verified for the vehicle application and agreed with the Technical Service may be used as a substitute for the frequency - acceleration correlation of Table 1 or Table 2. The approval of a REESS tested according to this condition shall be limited to approvals for a specific vehicle type.

After the vibration, a standard cycle as described in Annex 8, Appendix 1 shall be conducted, if not inhibited by the tested-device.

The test shall end with an observation period of 1 h at the ambient temperature conditions of the test environment.

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ANNEX 8B

THERMAL SHOCK AND CYCLING TEST

1. PURPOSE

The purpose of this test is to verify the resistance of the REESS to sudden changes in temperature. The REESS shall undergo a specified number of temperature cycles, which start at ambient temperature followed by high and low temperature cycling. It simulates a rapid environmental temperature change which a REESS would likely experience during its life.

2. INSTALLATIONS

This test shall be conducted either with the complete REESS or with related REESS subsystem(s) of the REESS including the cells and their electrical connections. If the manufacturer chooses to test with related subsystem(s), the manufacturer shall demonstrate that the test result can reasonably represent the performance of the complete REESS with respect to its safety performance under the same conditions. If the electronic management unit for the REESS is not integrated in the casing enclosing the cells, then the electronic management unit may be omitted from installation on the tested-device if so requested by the manufacturer.

3. PROCEDURES

3.1. General test conditions

The following conditions shall apply to the tested-device at the start of the test:

- (a) The SOC shall be adjusted to a value in the upper 50 per cent of the normal operating SOC range;
- (b) All protection devices, which would affect the function of the tested-device and which are relevant to the outcome of the test shall be operational.

3.2. Test procedure

The tested-device shall be stored for at least six hours at a test temperature equal to $60\text{ °C} \pm 2\text{ °C}$ or higher if requested by the manufacturer, followed by storage for at least six hours at a test temperature equal to $-40\text{ °C} \pm 2\text{ °C}$ or lower if requested by the manufacturer. The maximum time interval between test temperature extremes shall be 30 minutes. This procedure shall be repeated until a minimum of 5 total cycles are completed, after which the tested-device shall be stored for 24 hours at an ambient temperature of $20\text{ °C} \pm 10\text{ °C}$.

After the storage for 24 hours, a standard cycle as described in Annex 8, Appendix 1 shall be conducted, if not inhibited by the tested-device.

The test shall end with an observation period of 1 h at the ambient temperature conditions of the test environment.

ANNEX 8C

MECHANICAL DROP TEST FOR REMOVABLE REESS

1. PURPOSE

Simulates a mechanical impact load which may occur at an unintended drop after REESS removal.

2. PROCEDURES

2.1. General test conditions

The following conditions shall apply to the removed REESS at the start of the test:

- (a) Adjust the SOC to at least 90 per cent of the rated capacity as specified in the Annex 6, Part 1, paragraph 3.4.3 or Annex 6, Part 2, paragraph 1.4.3 or Annex 6, Part 3, paragraph 2.3.2.
- (b) The test shall be performed at $20\text{ °C} \pm 10\text{ °C}$

2.2. Test procedure

Free fall of the removed REESS from a height of 1,0 m (from bottom of the REESS) to a smooth, horizontal concrete pad or other flooring type with equivalent hardness.

The removed REESS shall be dropped six times from different orientations as decided by the Technical Service. The manufacturer may decide to use a different removed REESS for each drop.

Directly after the termination of the drop test a standard cycle as described in Annex 8, Appendix 1 shall be conducted, if not inhibited.

The test shall end with an observation period of 1 h at the ambient temperature conditions of the test environment.

ANNEX 8D

MECHANICAL SHOCK

1. PURPOSE

The purpose of this test is to verify the safety performance of the REESS under mechanical shock which may occur during fall on the side from stationary or parked situation.

2. INSTALLATIONS

- 2.1. This test shall be conducted either with the complete REESS or with related subsystems of the REESS including the cells and their electrical connections.

If the manufacturer chooses to test with related subsystem(s), the manufacturer shall demonstrate that the test result can reasonably represent the performance of the complete REESS with respect to its safety performance under the same conditions.

If the electronic management unit for the REESS is not integrated, then such a control unit may be omitted from installation on the Tested-Device if so requested by the manufacturer.

- 2.2. The Tested-Device shall be connected to the test fixture only by the intended mountings provided for the purpose of attaching the REESS or REESS subsystem to the vehicle.

3. PROCEDURES

- 3.1. General test conditions and requirements.

The following condition shall apply to the test:

- (a) The test shall be conducted at an ambient temperature of $20\text{ °C} \pm 10\text{ °C}$.
- (b) At the beginning of the test, the SOC shall be adjusted to a value in the upper 50 per cent of the normal operating SOC range.
- (c) At the beginning of the test, all protection devices which effect the function of the tested-device and which are relevant to the outcome of the test, shall be operational.

- 3.2. Test procedure

The tested-device shall be secured to the testing machine by means of a rigid mount which will support all mounting surfaces of the tested-device.

The tested-device with

- (a) A gross mass of less than 12 kg shall be subjected to a half-sine shock of peak acceleration of $1\ 500\text{ m/s}^2$ and pulse duration of 6 milliseconds.
- (b) A gross mass of 12 kg or more shall be subjected to a half-sine shock of peak acceleration of 500 m/s^2 and pulse duration of 11 milliseconds.

For both the tested-device shall be subjected to three shocks in the positive direction followed by three shocks in the negative direction of each three mutually perpendicular mounting positions of the tested-device for a total of 18 shocks.

Directly after the termination of the mechanical shock test a standard cycle as described in Annex 8, Appendix 1 shall be conducted, if not inhibited.

The test shall end with an observation period of 1 h at the ambient temperature conditions of the test environment.

ANNEX 8E

FIRE RESISTANCE

1. PURPOSE

The purpose of this test is to verify the resistance of the REESS, against exposure to fire from outside of the vehicle due to e.g. a fuel spill from a vehicle (either the vehicle itself or a nearby vehicle). This situation should leave the driver and passengers with enough time to evacuate.

2. INSTALLATIONS

- 2.1. This test shall be conducted either with the complete REESS or with related REESS subsystem(s) including the cells and their electrical connections. If the manufacturer chooses to test with related subsystem(s), the manufacturer shall demonstrate that the test result can reasonably represent the performance of the complete REESS with respect to its safety performance under the same conditions. If the electronic management unit for the REESS is not integrated in the casing enclosing the cells, then the electronic management unit may be omitted from installation on the tested-device if so requested by the manufacturer. Where the relevant REESS subsystems are distributed throughout the vehicle, the test may be conducted on each relevant of the REESS subsystem.

3. PROCEDURES

3.1. General test conditions

The following requirements and conditions shall apply to the test:

- (a) The test shall be conducted at a temperature of at least 0 °C;
- (b) At the beginning of the test, the SOC shall be adjusted to a value in the upper 50 per cent of the normal operating SOC range;
- (c) At the beginning of the test, all protection devices which effect the function of the tested-device and are relevant for the outcome of the test shall be operational.

3.2. Test procedure

A vehicle based test or a component based test shall be performed at the discretion of the manufacturer:

3.2.1. Vehicle based test

The tested-device shall be mounted in a testing fixture simulating actual mounting conditions as far as possible; no combustible material should be used for this with the exception of material that is part of the REESS. The method whereby the tested-device is fixed in the fixture shall correspond to the relevant specifications for its installation in a vehicle. In the case of a REESS designed for a specific vehicle use, vehicle parts which affect the course of the fire in any way shall be taken into consideration.

3.2.2. Component based test

The tested-device shall be placed on a grating table positioned above the pan, in an orientation according to the manufacturer's design intent.

The grating table shall be constructed by steel rods, diameter 6-10 mm, with 4-6 cm in between. If needed the steel rods could be supported by flat steel parts.

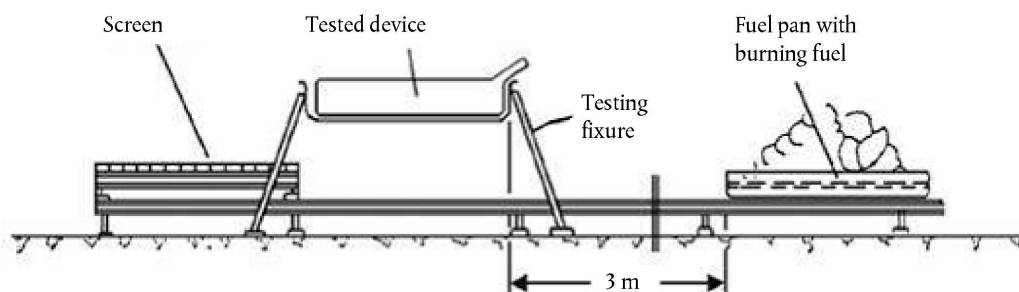
- 3.3. The flame to which the tested-device is exposed shall be obtained by burning commercial fuel for positive-ignition engines (hereafter called 'fuel') in a pan. The quantity of fuel shall be sufficient to permit the flame, under free-burning conditions, to burn for the whole test procedure.

The fire shall cover the whole area of the pan during whole fire exposure. The pan dimensions shall be chosen so as to ensure that the sides of the tested-device are exposed to the flame. The pan shall therefore exceed the horizontal projection of the tested-device by at least 20 cm, but not more than 50 cm. The sidewalls of the pan shall not project more than 8 cm above the level of the fuel at the start of the test.

- 3.4. The pan filled with fuel shall be placed under the tested-device in such a way that the distance between the level of the fuel in the pan and the bottom of the tested-device corresponds to the design height of the tested-device above the road surface at the unladen mass if paragraph 3.2.1 above is applied or approximately 50 cm if paragraph 3.2.2 above is applied. Either the pan, or the testing fixture, or both, shall be freely movable.
- 3.5. During phase C of the test, the pan shall be covered by a screen. The screen shall be placed $3 \text{ cm} \pm 1 \text{ cm}$ above the fuel level measured prior to the ignition of the fuel. The screen shall be made of a refractory material, as prescribed in Annex 8E — Appendix 1. There shall be no gap between the bricks and they shall be supported over the fuel pan in such a manner that the holes in the bricks are not obstructed. The length and width of the frame shall be 2 cm to 4 cm smaller than the interior dimensions of the pan so that a gap of 1 cm to 2 cm exists between the frame and the wall of the pan to allow ventilation. Before the test the screen shall be at least at the ambient temperature. The firebricks may be wetted in order to guarantee repeatable test conditions.
- 3.6. If the tests are carried out in the open air, sufficient wind protection shall be provided and the wind velocity at pan level shall not exceed 2,5 km/h.
- 3.7. The test shall comprise of three phases B-D, if the fuel is at least at temperature of 20 °C. Otherwise the test shall comprise four phases A-D.
- 3.7.1. Phase A: Pre-heating (Figure 1)

The fuel in the pan shall be ignited at a distance of at least 3 m from the tested-device. After 60 seconds pre-heating, the pan shall be placed under the tested-device. If the size of the pan is too large to be moved without risking liquid spills etc. then the tested-device and test rig can be moved over the pan instead.

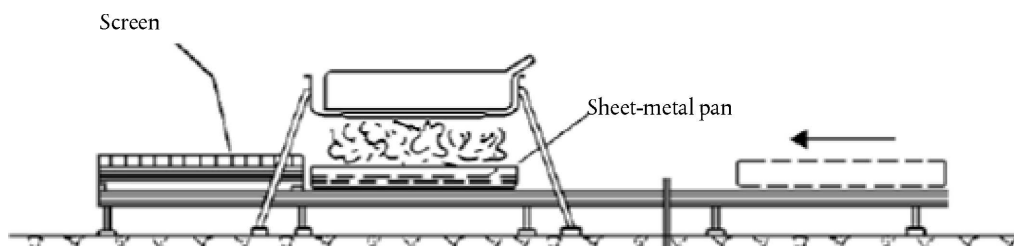
Figure 1

Phase A: Pre-heating

- 3.7.2. Phase B: Direct exposure to flame (Figure 2)

The tested-device shall be exposed to the flame from the freely burning fuel for 70 seconds.

Figure 2

Phase B: Direct exposure to flame

3.7.3. Phase C: Indirect exposure to flame (Figure 3)

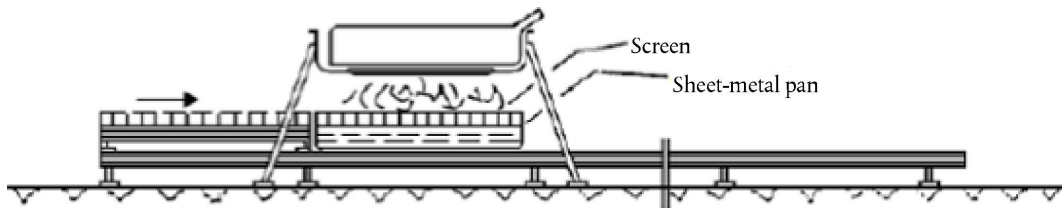
As soon as phase B has been completed, the screen shall be placed between the burning pan and the tested-device. The tested-device shall be exposed to this reduced flame for a further 60 seconds.

Instead of conducting phase C of the test, phase B may at the manufacturer's discretion be continued for an additional 60 seconds.

However this shall only be permitted where it is demonstrable to the satisfaction of the Technical Service that it will not result in a reduction in the severity of the test.

Figure 3

Phase C: Indirect exposure to flame

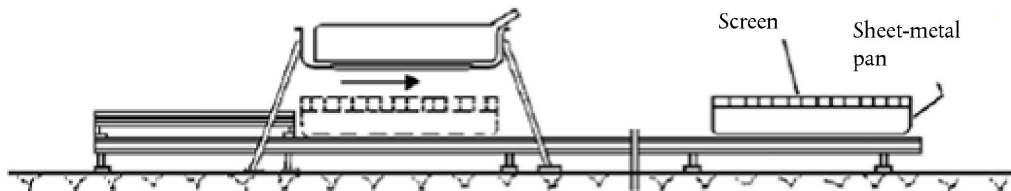


3.7.4. Phase D: End of test (Figure 4)

The burning pan covered with the screen shall be moved back to the position described in phase A. No extinguishing of the tested-device shall be done. After removal of the pan the tested-device shall be observed until such time as the surface temperature of the tested-device has decreased to ambient temperature or has been decreasing for a minimum of 3 hours.

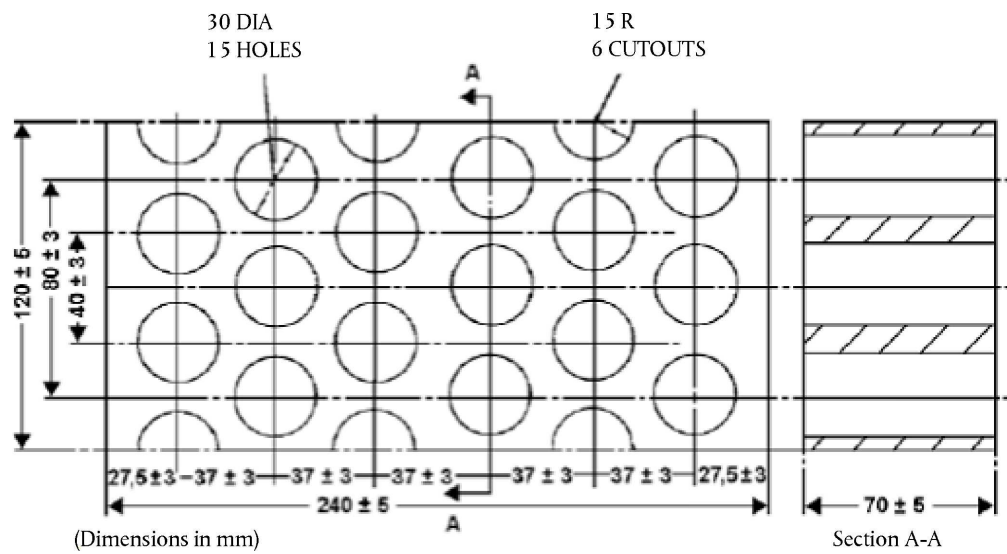
Figure 4

Phase D: End of test



APPENDIX

DIMENSION AND TECHNICAL DATA OF FIREBRICKS



Fire resistance: (Sege-Kegel) SK 30

Al₂O₃ content: 30 - 33 per cent

Open porosity (Po): 20 - 22 per cent vol.

Density: 1 900 - 2 000 kg/m³

Effective holed area: 44,18 per cent

ANNEX 8F

EXTERNAL SHORT CIRCUIT PROTECTION

1. PURPOSE

The purpose of this test is to verify the performance of the short circuit protection. This functionality, if implemented, shall interrupt or limit the short circuit current to prevent the REESS from any further related severe events caused by short circuit current.

2. INSTALLATIONS

This test shall be conducted either with the complete REESS or with related REESS subsystem(s), including the cells and their electrical connections. If the manufacturer chooses to test with related subsystem(s), the manufacturer shall demonstrate that the test result can reasonably represent the performance of the complete REESS with respect to its safety performance under the same conditions. If the electronic management unit for the REESS is not integrated in the casing enclosing the cells, then the electronic management unit may be omitted from installation on the tested-device if so requested by the manufacturer.

3. PROCEDURES

3.1. General test conditions

The following condition shall apply to the test:

- (a) The test shall be conducted at a ambient temperature of $20\text{ °C} \pm 10\text{ °C}$ or at higher temperature if requested by the manufacturer;
- (b) At the beginning of the test, the SOC shall be adjusted to a value in the upper 50 per cent of the normal operating SOC range;
- (c) At the beginning of the test, all protection devices which would affect the function of the tested-device and which are relevant to the outcome of the test shall be operational.

3.2. Short circuit

At the start of the test all relevant main contactors for charging and discharging shall be closed to represent the active driving possible mode as well as the mode to enable external charging. If this cannot be completed in a single test, then two or more tests shall be conducted.

The positive and negative terminals of the tested-device shall be connected to each other to produce a short circuit. The connection used for this purpose shall have a resistance not exceeding 5 mΩ.

The short circuit condition shall be continued until the operation of the REESS's protection function to interrupt or limit the short circuit current is confirmed, or for at least one hour after the temperature measured on the casing of the tested-device has stabilised, such that the temperature gradient varies by a less than 4 °C through 1 hour.

3.3. Standard cycle and observation period

Directly after the termination of the short circuit a standard cycle as described in Annex 8, Appendix 1 shall be conducted, if not inhibited by the tested-device.

The test shall end with an observation period of 1 h at the ambient temperature conditions of the test environment.

ANNEX 8G

OVERCHARGE PROTECTION

1. PURPOSE

The purpose of this test is to verify the performance of the overcharge protection.

2. INSTALLATIONS

This test shall be conducted, under standard operating conditions, either with the complete REESS (this maybe a complete vehicle) or with related REESS subsystem(s), including the cells and their electrical connections. If the manufacturer chooses to test with related subsystem(s), the manufacturer shall demonstrate that the test result can reasonably represent the performance of the complete REESS with respect to its safety performance under the same conditions.

The test may be performed with a modified tested-device as agreed by the manufacturer and the Technical Service. These modifications shall not influence the test results.

3. PROCEDURES

3.1. General test conditions

The following requirements and conditions shall apply to the test:

- (a) The test shall be conducted at an ambient temperature of $20\text{ °C} \pm 10\text{ °C}$ or at higher temperature if requested by the manufacturer;
- (b) At the beginning of the test, all protection devices which would affect the function of the tested-device and which are relevant to the outcome of the test shall be operational.

3.2. Charging

At the beginning all relevant main contactors for charging shall be closed.

The charge control limits of the test equipment shall be disabled.

The tested-device shall be charged with a charge current of at least $1/3C$ rate but not exceeding the maximum current within the normal operating range as specified by the manufacturer.

The charging shall be continued until the tested-device (automatically) interrupts or limits the charging. Where an automatic interrupt function fails to operate, or if there is no such function the charging shall be continued until the tested-device is charged to twice of its rated charge capacity.

3.3. Standard cycle and observation period

Directly after the termination of charging a standard cycle as described in Annex 8, Appendix 1 shall be conducted, if not inhibited by the tested-device.

The test shall end with an observation period of 1 h at the ambient temperature conditions of the test environment.

ANNEX 8H

OVER-DISCHARGE PROTECTION

1. PURPOSE

The purpose of this test is to verify the performance of the over-discharge protection. This functionality, if implemented, shall interrupt or limit the discharge current to prevent the REESS from any severe events caused by a too low SOC as specified by the manufacturer.

2. INSTALLATIONS

This test shall be conducted, under standard operating conditions, either with the complete REESS (this maybe a complete vehicle) or with related REESS subsystem(s), including the cells and their electrical connections. If the manufacturer chooses to test with related subsystem(s), the manufacturer shall demonstrate that the test result can reasonably represent the performance of the complete REESS with respect to its safety performance under the same conditions.

The test may be performed with a modified tested-device as agreed by the manufacturer and the Technical Service. These modifications shall not influence the test results.

3. PROCEDURES

3.1. General test conditions

The following requirements and condition shall apply to the test:

- (a) The test shall be conducted at an ambient temperature of $20\text{ °C} \pm 10\text{ °C}$ or at higher temperature if requested by the manufacturer;
- (b) The beginning of the test, all protection devices which would affect the function of the tested-device and which are relevant for the outcome of the test shall be operational.

3.2. Discharging

At the beginning of the test, all relevant main contactors shall be closed.

A discharge shall be performed with at least $1/3\text{ C}$ rate but shall not exceed the maximum current within the normal operating range as specified by the manufacturer.

The discharging shall be continued until the tested-device (automatically) interrupts or limits the discharging. Where an automatic interrupt function fails to operate, or if there is no such function then the discharging shall be continued until the tested-device is discharged to 25 per cent of its nominal voltage level.

3.3. Standard charge and observation period

Directly after termination of the discharging the tested-device shall be charged with a standard charge as specified in Annex 8, Appendix 1 if not inhibited by the tested-device.

The test shall end with an observation period of 1 h at the ambient temperature conditions of the test environment.

ANNEX 8I

OVER-TEMPERATURE PROTECTION

1. PURPOSE

The purpose of this test is to verify the performance of the protection measures of the REESS against internal overheating during the operation, even under the failure of the cooling function if applicable. In the case that no specific protection measures are necessary to prevent the REESS from reaching an unsafe state due to internal over-temperature, this safe operation must be demonstrated.

2. INSTALLATIONS

- 2.1. The following test shall be conducted with the complete REESS (maybe as a complete vehicle) or with related REESS subsystem(s), including the cells and their electrical connections. If the manufacturer chooses to test with related subsystem(s), the manufacturer shall demonstrate that the test result can reasonably represent the performance of the complete REESS with respect to its safety performance under the same conditions. The test may be performed with a modified tested-device as agreed by the manufacturer and the Technical Service. These modifications shall not influence the test results.
- 2.2. Where a REESS is fitted with a cooling function and where the REESS will remain functional without a cooling function system being operational, the cooling system shall be deactivated for the test.
- 2.3. The temperature of the tested-device shall be continuously measured inside the casing in the proximity of the cells during the test in order to monitor the changes of the temperature. The on-board sensor if existing may be used. The manufacturer and Technical Service shall agree on the location of the temperature sensor(s) used.

3. PROCEDURES

- 3.1. At the beginning of the test, all protection devices which affect the function of the tested-device and are relevant to the outcome of the test shall be operational, except for any system deactivation implemented in accordance with paragraph 2.2 above.
- 3.2. During the test, the tested-device shall be continuously charged and discharged with a steady current that will increase the temperature of cells as rapidly as possible within the range of normal operation as defined by the manufacturer.
- 3.3. The tested-device shall be placed in a convective oven or climatic chamber. The temperature of the chamber or oven shall be gradually increased until it reaches the temperature determined in accordance with paragraph 3.3.1 or 3.3.2 below as applicable, and then maintained at a temperature that is equal to or higher than this, until the end of the test.
 - 3.3.1. Where the REESS is equipped with protective measures against internal overheating, the temperature shall be increased to the temperature defined by the manufacturer as being the operational temperature threshold for such protective measures, to insure that the temperature of the tested-device will increase as specified in paragraph 3.2 above.
 - 3.3.2. Where the REESS is not equipped with any specific measures against internal over-heating, the temperature shall be increased to the maximum operational temperature specified by the manufacturer.
- 3.4. The end of test: The test will end when one of the followings is observed:
 - (a) The tested-device inhibits and/or limits the charge and/or discharge to prevent the temperature increase;
 - (b) The temperature of the tested-device is stabilised, which means that the temperature varies by a gradient of less than 4 °C through 2 hours;
 - (c) Any failure of the acceptance criteria prescribed in paragraph 6.9.2.1 of the Regulation.

ANNEX 9A

WITHSTAND VOLTAGE TEST

1. GENERAL

Insulation resistance shall be measured after application of the test voltage to the vehicle with the on-board (built-in) charger.

2. PROCEDURE

The following testing procedure shall be applicable to vehicles with on-board (built-in) chargers:

Between all the inputs of the charger (plug) and the vehicle's exposed conductive parts including the electrical chassis if present, apply a AC test voltage of $2 \times (U_n + 1\,200)$ V rms at a frequency of 50 Hz or 60 Hz for one minute, where U_n is the AC input voltage (rms);

The test shall be performed on the complete vehicle;

All the electrical devices shall be connected.

Instead of the specified AC voltage, the DC voltage whose value is equivalent to the specified AC voltage's peak value may be applied for one minute.

After the test, measure the insulation resistance when applying 500 V D.C. between all the inputs and the vehicle's exposed conductive parts including the electrical chassis if present.

ANNEX 9B

WATER RESISTANCE TEST

1. GENERAL

The isolation resistance shall be measured after the water resistance performance test has been conducted.

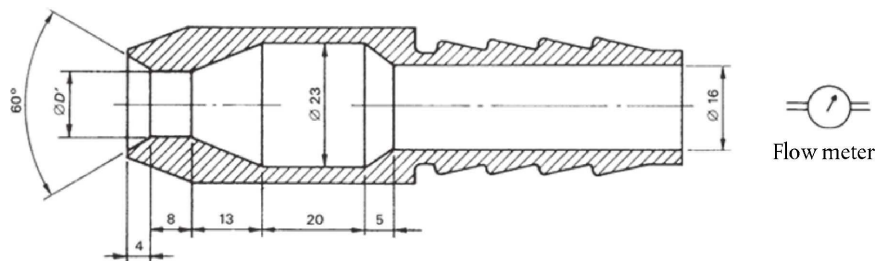
2. PROCEDURE

The following testing procedure shall be applicable to vehicles with on-board (built-in) charger.

In accordance with the test procedure to evaluate IPX5 protection against ingress of water, the water resistance shall be carried out by:

- (a) Spraying with a stream of fresh water the enclosure from all practicable directions with a standard test nozzle as shown in the figure.

Test device to verify protection against water jets (hose nozzle)



$\phi D' = 6,3 \text{ mm}$ unit: mm

The conditions to be observed are as follows:

- (i) Internal diameter of the nozzle: 6,3 mm;
 - (ii) Delivery rate: 12,5 l/min \pm 5 per cent;
 - (iii) Water pressure: to be adjusted to achieve the specified delivery rate;
 - (iv) Core of the substantial stream: circle of approximately 40 mm diameter at 2,5 m distance from nozzle;
 - (v) Test duration per square metre of enclosure surface area likely to be sprayed: 1 min;
 - (vi) Minimum test duration: 3 min;
 - (vii) Distance from nozzle to enclosure surface: between 2,5 m and 3 m.
- (b) Subsequently, apply 500 V DC between all high voltage inputs and the vehicle's exposed conductive parts/electrical chassis if present to measure the isolation resistance.

ISSN 1977-0677 (electronic edition)
ISSN 1725-2555 (paper edition)



Publications Office of the European Union
2985 Luxembourg
LUXEMBOURG

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