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To:	General Secretariat of the Council
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Subject:	ANNEX to the Commission Regulation amending Regulation (EU) No 582/2011 as regards the emissions type-approval of heavy duty vehicles using pure biodiesel

Delegations will find attached annex to document D082551/02.

Encl.:annex to D082551/02

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ANNEX

ANNEX

to the

Commission Regulation

amending Regulation (EU) No 582/2011 as regards the emissions type-approval of heavy duty vehicles using pure biodiesel

ANNEX

(1) Annex I is amended as follows:

(a) In point 1.1.2 the introductory sentence is replaced by the following:

(2) ‘1.1.2. If the manufacturer permits the engine family to run on market fuels that do not comply either with Directive 98/70/EC of the European Parliament and of the Council*, or with CEN standard EN 228:2012 in the case of unleaded petrol or CEN standard EN 590:2013 in the case of diesel or CEN standard EN 14214:2012+A2:2019 in the case of FAME B100, such as paraffinic fuel (CEN standard EN 15940) or others, the manufacturer shall, in addition to the requirements in point 1.1.1, comply with the following requirements’;

*Directive 98/70/EC of the European Parliament and of the Council of 13 October 1998 relating to the quality of petrol and diesel fuels and amending Council Directive 93/12/EEC (OJ L 350, 28.12.1998, p. 58).’;

(a) after point 1.3. the following point is added:

‘1.4. Requirements on B100 type-approval

1.4.1. The type-approval of a B100 family with a parent engine tested on FAME B100 shall be extended to all family members and biodiesel blends with a FAME content that exceeds that of FAME B30 (CEN standard EN 16709), without further testing. The type-approval may be extended to biodiesel blends with a lower FAME content, if the requirements of this regulation are also satisfied for these blends without making any adjustments to the vehicle. In such a case the manufacturer shall declare the biodiesel blends the engine family is capable of running on in point 3.2.2.2.1 of the Information Document as set out in Part 1 of Appendix 4. If the approval authority determines that the submitted application is not fully representative, biodiesel blends other than FAME B100 may be selected by the approval authority and tested.’;

(b) the following point 3.2.1.7. is inserted:

‘3.2.1.7. In the case of a B100 type-approval, the approval mark shall contain ‘B100’ after the national symbol.’;

(c) In Appendix 4 PART 1 point 3.2.2.2 is replaced by the following:

‘3.2.2.2. Heavy duty vehicles Diesel/Petrol/LPG/NG-H/NG-L/NG-HL/Ethanol (ED95)/Ethanol (E85)/LNG/LNG_{20}/B100 ([1]) ([6])’;

(d) In the Addendum to Appendix 5 point 1.1.5 is replaced by the following:

‘1.1.5. Category of engine: Diesel/Petrol/LPG/NG-H/NG-L/NG-HL/Ethanol (ED95)/Ethanol (E85)/LNG/LNG_{20}/B100 ([1])’;

(e) Point 8 of Appendix 6 is replaced by the following:

‘8. Signature:

Attachment: Information package.

Test report.

Addendum’

(f) The following Addendum is added to Appendix 6:

‘*Addendum*

to EC type-approval certificate No …

1. ADDITIONAL INFORMATION

1.1. Particulars to be completed in relation to the type-approval of a vehicle with an approved engine installed:

1.1.1. Make of engine (name of undertaking):

1.1.2. Type and commercial description (mention any variants):

1.1.3. Manufacturer's code as marked on the engine:

1.1.4. Category of vehicle (if applicable) ([b]):

1.1.5. Category of engine: Diesel/Petrol/LPG/NG-H/NG-L/NG-HL/Ethanol (ED95)/Ethanol (E85)/LNG/LNG_{20}/ B100 ([1]):

1.1.5.1. Type of dual-fuel engine: Type 1A/Type 1B/Type 2A/Type 2B/Type 3B ([1])([d1]):

1.1.6. Name and address of manufacturer:

1.1.7. Name and address of manufacturer's authorised representative (if any):

1.2. If the engine referred to in 1.1 has been type approved as a separate technical unit:

1.2.1. Type-approval number of the engine/engine family ([1]):

1.2.2. Engine Control Unit (ECU) software calibration number:

1.3. Particulars to be completed in relation to the type-approval of an engine/engine family ([1]) as a separate technical unit (conditions to be respected in the installation of the engine on a vehicle):

1.3.1. Maximum and/or minimum intake depression:

1.3.2. Maximum allowable back pressure:

1.3.3. Exhaust system volume:

1.3.4. Restrictions of use (if any):

1.4. Emission levels of the engine/parent engine ([1])

Deterioration Factor (DF): calculated/fixed ([1])

Specify the DF values and the emissions on the WHSC (if applicable) and WHTC tests in the table below

1.4.1. WHSC test

Table 4

WHSC test

WHSC test (if applicable) ([10])([d5])							
DF	CO	THC	NMHC ([d4])	NO_X	PM Mass	NH_3	PM Number
Mult/add ([1])							

Emissions	CO (mg/kWh)	THC (mg/kWh)	NMHC ([d4]) (mg/kWh)	NO_x (mg/kWh)	PM Mass (mg/kWh)	NH_3 ppm	PM Number (#/kWh)
Test result							
Calculated with DF							

CO_2 mass emission: … g/kWh

Fuel consumption … g/kWh

1.4.2. WHTC test

Table 5

WHTC Test

WHTC test ([10])([d5])								
DF	CO	THC	NMHC ([d4])	CH4 ([d4])	NO_x	PM Mass	NH_3	PM Number
Mult/add ([1])								
Emissions	CO (mg/kWh)	THC (mg/kWh)	NMHC ([d4]) (mg/kWh)	CH4 ([d4]) (mg/kWh)	NO_x (mg/kWh)	PM Mass (mg/kWh)	NH_3 ppm	PM Number (#/kWh)
Cold start								
Hot start w/o regeneration								
Hot start with regeneration ([1])								
$k_{r,u}$ (mult/add) ([1])								
$k_{r,d}$ (mult/add) ([1])								
Weighted test result								
Final test result with DF								

CO_2 mass emission: … g/kWh

Fuel consumption: … g/kWh

1.4.3. Idle test

Table 6

Idle test

Test	**CO value (% vol.)**	**Lambda ([1])**	**Engine speed (min^{-1})**	**Engine oil temperature (°C)**
Low idle test		N/A		
High idle test				

1.4.4. PEMS demonstration test

Table 6a

PEMS demonstration test

Vehicle type (e.g. M_3, N_3 and application e.g. rigid or articulated truck, city bus)						
Vehicle description (e.g. vehicle model, prototype)						
Pass-fail results ([7])	CO	THC	NMHC	CH_4	NO_x	PM number
Work window conformity factor ([11])						
CO_2 mass window conformity factor ([11])						
Trip information	Urban		Rural		Motorway	
Shares of time of the trip characterised by urban, rural and motorway operation as described in point 4.5 of Annex II to Regulation (EU) No 582/2011						
Shares of time of the trip characterised by accelerating, decelerating, cruising and stop as described in point 4.5.5 of Annex II to Regulation (EU) No 582/2011						
	Minimum			Maximum		
Work window average power (%)						
CO_2 mass window duration (s)						
Work window: percentage of valid windows						
CO_2 mass window: percentage of valid windows						
Fuel consumption consistency ratio						

1.5 Power measurement

1.5.1.E*ngine power measured on test bench*

Table 7

Engine power measured on test bench

Measured engine speed (rpm)							
Measured fuel flow (g/h)							
Measured torque (Nm)							
Measured power (kW)							
Barometric pressure (kPa)							
Water vapour pressure (kPa)							
Intake air temperature (K)							
Power correction factor							
Corrected power (kW)							
Auxiliary power (kW) (1)							
Net power (kW)							
Net torque (Nm)							
Corrected specific fuel consumption (g/kWh)							

1.5.2. Additional data, e.g. the power correction factor for each fuel declared (if applicable)

’;

(g) In the Addendum to Appendix 7 point 1.1.5 is replaced by the following:

‘1.1.5. Category of engine: Diesel/Petrol/LPG/NG-H/NG-L/NG-HL/Ethanol (ED95)/Ethanol (E85)/LNG/LNG_{20}/B100 ([1])’;

(3) In Annex II, point 4.4.2. the following sentence is added:

‘In the case of a B100 type-approval, approval authorities may request to test the vehicle on biodiesel with any FAME content.’;

(4) In Annex IX, under the heading ‘Technical data on fuels for testing compression ignition and dual-fuel engines’, the following table is inserted after the table ‘Type: Diesel (B7)’:

‘**Type: pure Biodiesel (B100)** for compression ignition engines

Parameter	Unit	Limits		Test method
		Minimum	Maximum	
FAME content	% (m/m)	96,5	–	EN 14103
Density at 15 °C	kg/m_3	860	900	EN ISO 3675

				EN ISO 12185
Viscosity at 40 °C ([1])	mm^2/s	3,50	5,00	EN ISO 3104 EN 16896
Flash point	°C	101	–	EN ISO 2719 EN ISO 3679 ([2])
Cetane number ([3])	–	51,0	–	EN ISO 5165 EN 15195 EN 16715 EN 17155
Copper strip corrosion (3 h at 50 °C)	Rating	class 1		EN ISO 2160
Oxidation stability (at 110 °C)	h	8,0	–	EN 14112 EN 15751
Acid value	mg KOH/g	–	0,50	EN 14104
Iodine value	g iodine/100 g	–	120	EN 14111 EN 16300
Linolenic acid methyl ester	% (m/m)	–	12,0	EN 14103
Polyunsaturated (≥4 double bonds) methyl esters	% (m/m)	–	1,00	EN 15779
Methanol content	% (m/m)	–	0,20	EN 14110
Monoglyceride content	% (m/m)	–	0,70	EN 14105
Diglyceride content	% (m/m)	–	0,20	EN 14105
Triglyceride content	% (m/m)	–	0,20	EN 14105
Free glycerol	% (m/m)	–	0,02	EN 14105 EN 14106
Total glycerol	% (m/m)	–	0,25	EN 14105
Water content	% (m/m)	–	0,050	EN ISO 12937
Total contamination	mg/kg	–	24	EN 12662
Sulfated ash content	% (m/m)	–	0,02	ISO 3987

Sulfur content	mg/kg	–	10,0	EN ISO 20846 EN ISO 20884 EN ISO 13032
Group I metals (Na+K)	mg/kg	–	5,0	EN 14108 EN 14109 EN 14538
Group II metals (Ca+Mg)	mg/kg	–	5,0	EN 14538
Phosphorus content	mg/kg	–	4,0	EN 14107 EN 16294

([1]) If CFPP is −20 °C or lower, the viscosity shall be measured at −20 °C. The measured value shall not exceed 48 mm^2/s. In this case, the standard test methods are applicable without the precision data owing to non-Newtonian behaviour in a two-phase system.

([2]) A 2 ml sample and apparatus equipped with a thermal detection device shall be used.

([3]) The determination of derived cetane number for FAME is not included in the precision determinations of some test methods.

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