Draft of 20.01.2026

REGULATION

OF THE MINISTER FOR CLIMATE AND ENVIRONMENT[1]

of...

on quality requirements, methods for testing quality and the manner of sampling of biocomponents, excluding biocomponents produced in the co-hydrogenation process, gaseous biocomponents, and biocomponents used for the production of aviation fuels and marine fuels[2]

Pursuant to Article 22(6) of the Act of 25 August 2006 on biocomponents and liquid biofuels (Journal of Laws of 2025, item 901), the following is hereby decreed:

§ 1. 1. Quality requirements for biocomponents, excluding biocomponents produced through co-hydrogenation, gaseous biocomponents, and biocomponents used for the production of aviation and marine fuels, are specified for:

1) bioethanol (ethanol as a component of motor petrol) – Annex 1 to the Regulation;
2) methyl ester – Annex 2 to the Regulation;
3) liquid biocarbons intended for the manufacture of liquid fuels or liquid biofuels for use in spark ignition engines – Annex 3 to the Regulation;
4) liquid biocarbons intended for the manufacture of liquid fuels or liquid biofuels for use in compression-ignition engines – Annex 4 to the Regulation.

2. Methods for testing the quality of the biocomponents referred to in Section 1 are set out in Annex 5 to the Regulation.

3. The method of sampling of biocomponents referred to in Section 1 is set out in Annex 6 to the Regulation.

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[1] The Minister for Climate and Environment heads the government administration department responsible for climate, pursuant to § 1(2)(1) of the Regulation of the Prime Minister of 25 July 2025 on the detailed scope of activities of the Minister for Climate and Environment (Journal of Laws, item 995).

[2] This Regulation was notified to the European Commission on ……….. under number ……/……/PL, pursuant to § 4 of the Cabinet Regulation of 23 December 2002 on the functioning of the national system for notification of standards and legal acts (Journal of Laws, item 2039, and 2004, item 597), which implements the Directive (EU) 2015/1535 of the European Parliament and of the Council of 9 September 2015 laying down a procedure for the provision of information in the field of technical regulations and of rules on Information Society services (harmonisation) (OJ L 241 of 17.9.2015, p. 1).

§ 2. Provisions of this Regulation shall apply to the performance of quality tests on biocomponents started under existing provisions and not completed before the date of entry into force of this Regulation.

§ 3. This Regulation shall enter into force 14 days after its publication.3)

THE MINISTER FOR CLIMATE

AND ENVIRONMENT

Approved for legal, legislative, and editorial compliance
Head of the Legal Department
at the Ministry for Climate and Environment
Izabela Wereśniak-Masri
(– signed with a qualified electronic signature)

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3)This Regulation was preceded by the Regulation of the Minister for Climate and Environment of 9 August 2021 on quality requirements for biocomponents, methods for testing the quality of biocomponents and the manner of sampling of biocomponents (Journal of Laws, item 1707), which is repealed on the date of entry into force of this Regulation, in accordance with Article 22(1) of the Act of 21 February 2025 amending the Act on biocomponents and liquid biofuels and certain other acts (Journal of Laws, item 303).

Annexes to the Regulation
Minister for Climate and
Environment
of ………………… (Journal of
Laws, item …)

Annex No. 1

QUALITY REQUIREMENTS FOR BIOETHANOL (ETHANOL AS A COMPONENT OF MOTOR GASOLINE)[4]

Item	Characteristic	Entity	Range	
			minimum	maximum
1	Content of ethanol and higher saturated alcohols	% (m/m)	98.7	–
2	Content of higher saturated (C3-C5) monohydric alcohols [1]	% (m/m)	–	2.0
3	Methyl alcohol content	% (m/m)	–	1.0
4	Water content	% (m/m)	–	0.300
5	Inorganic chloride content	mg/kg	–	1.5
6	Copper content	mg/kg	–	0.100
7	Total acidity (expressed as acetic acid content)	% (m/m)	–	0.007
8	Appearance	–	clear and colourless	
9	Phosphorus content	mg/l	–	0.15
10	Non-volatile matter content	mg/100 ml	–	10
11	Sulphur content	mg/kg	–	10.0
12	Electrical conductivity	µS/cm	–	2.5
13	Sulphate content	mg/kg	–	3.0
Key: [1] Where bioethanol (ethanol as a component of motor gasoline) is intended for the synthesis of ethers, the content of higher saturated (C3-C5) monohydric alcohols is agreed between the supplier and the recipient.				

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[4] Quality requirements apply to bioethanol (ethanol as a component of motor gasoline) before contamination.

Annex 2

QUALITY REQUIREMENTS FOR METHYL ESTER

Item	Characteristic	Entity	Range		
			minimum	maximum	
1	Fatty acid methyl esters (FAME) content[1]	% (m/m)	96.5	–	
2	Density at 15 °C	kg/m^3	860	900	
3	Viscosity at 40 °C	mm^2/s	3.50	5.00	
4	Flash point	ºC	101	–	
5	Sulphur content	mg/kg	–	10.0	
6	Cetane number	–	51.0	–	
7	Sulphated ash content	% (m/m)	–	0.02	
8	Water content	% (m/m)	–	0.050	
9	Total contamination	mg/kg	–	24	
10	Test method for detection of copper corrosion (3 h at 50 ºC)	Assessment	Class 1		
11	Oxidative stability at 110 °C	h	8.0	–	
12	Acid value	mg KOH/g	–	0.50	
13	Iodine value	g iodine / 100 g	–	120	
14	Content of linolenic acid methyl ester	% (m/m)	–	12.0	
15	Methyl alcohol content	% (m/m)	–	0.20	
16	Monoacylglycerol content	% (m/m)	–	0.70	
17	Diacyloglycerol content	% (m/m)	–	0.20	
18	Triacyloglycerol content	% (m/m)	–	0.20	
19	Total glycerol content	% (m/m)	–	0.25	
20	Free glycerol content	% (m/m)	–	0.02	
21	Group I metal content (Na + K)	mg/kg	–	5.0	
22	Group II metal content (Ca + Mg)	mg/kg	–	5.0	
23	Phosphorus content	mg/kg	–	4.0	
24	Content of polyunsaturated fatty acids methyl esters (≥ 4 double bonds)	% (m/m)	–	1.00	
25	Cold Filter Plugging Point (CFPP)	°C	–	0[2]	-10[3]
26	Cloud point	°C, maximum	–	5[2]	-3[3]

Key:

[1] No other ingredients other than processing additives are permitted. Where C17 esters occur naturally within the fatty acid methyl esters (FAME) content, this fact may result in a reduced determined content of fatty acid methyl esters (FAME).

[2] For the summer period spanning 16 April to 30 September.

[3] For the transitional period and the winter period from 1 October to 15 April.

Annex 3

QUALITY REQUIREMENTS FOR LIQUID BIOCARBONS INTENDED FOR THE MANUFACTURE OF LIQUID FUELS OR LIQUID BIOFUELS FOR SPARK IGNITION ENGINES

Item	Characteristic	Entity	Range	
			minimum	maximum
1	Sulphur content	mg/kg	–	10.0
2	Oxidising stability	minutes	360	–
3	Content of resins present (after washing with solvent)	mg/100 ml	–	5
4	Test method for detection of copper corrosion (3 h at 50 ℃)	Assessment	Class 1	
5	Fractional composition:			
	- end of distillation temperature	°C	–	210
	- residue after distillation	% (V/V)	–	2
6	Benzene content	% (V/V)	–	1.00
7	Total contamination	mg/kg	–	10.0
8	Total halogen content	mg/kg	–	2.0

Annex 4

QUALITY REQUIREMENTS FOR LIQUID BIOCARBONS FOR THE MANUFACTURE OF LIQUID FUELS OR LIQUID BIOFUELS FOR COMPRESSION IGNITION ENGINES

Item	Characteristic	Entity	Range	
			minimum	maximum
1	Density at 15 °C	kg/m³	–	845.0
2	Sulphur content	mg/kg	–	10.0
3	Polycyclic aromatic hydrocarbons content	% (m/m)	–	8.0
4	Flash point	°C	over 55.0	–
5	Total contamination	mg/kg	–	24
6	Test method for detection of copper corrosion (3 h at 50 ºC)	Assessment	Class 1	
7	Fractional composition: 95% (V/V) distils up to the temperature	°C	–	360.0

Annex 5

QUALITY TEST METHODS FOR BIOETHANOL (ETHANOL AS A COMPONENT OF MOTOR GASOLINE), METHYL ESTER, LIQUID BIOHYDROCARBONS FOR THE PRODUCTION OF LIQUID FUELS OR LIQUID BIOFUELS FOR SPARK-IGNITION ENGINES, LIQUID BIOHYDROCARBONS FOR THE PRODUCTION OF LIQUID FUELS OR LIQUID BIOFUELS FOR COMPRESSION-IGNITION ENGINES

I. Quality test methods for bioethanol (ethanol as a component of motor gasoline) for particular characteristics of this biocomponent

1. The content of ethanol and higher saturated alcohols is determined by a gas chromatography method consisting in introducing a portion of the sample into a gas chromatograph, separating ethanol and higher alcohols from the remaining constituents, detecting them by means of a flame ionisation detector (FID), and determining their content by reference to an internal standard on the basis of the response factor.

1.1. The method of determination, the reagents and materials used, the type of apparatus used, its equipment, the method of calculation, as well as the method of preparation of the test report are consistent with the state of the art, described, in particular, in the Polish Standard introducing standard EN 15721. The water content of the sample is taken into account in the calculation of the content of ethanol and higher alcohols.

1.2. The precision of the method referred to in paragraph 1 is consistent with the state of the art, as described, in particular, in the Polish Standard implementing standard EN 15721.

2. The content of higher saturated (C3–C5) monohydric alcohols is determined by a gas chromatography method consisting in introducing a portion of the sample into a gas chromatograph, separating the higher saturated (C3–C5) monohydric alcohols from the remaining constituents, detecting them by means of a flame ionisation detector (FID), and determining their content by reference to an internal standard on the basis of the response factor.

2.1. The method of determination, the reagents and materials used, the type of apparatus used, its equipment, the method of calculation, as well as the method of preparation of the test report are consistent with the state of the art, described, in particular, in the Polish Standard introducing standard EN 15721.

2.2. The precision of the method referred to in paragraph 2 is consistent with the state of the art, as described, in particular, in the Polish Standard implementing standard EN 15721.

3. The methanol content is determined by a gas chromatography method consisting in introducing a portion of the sample into a gas chromatograph, separating methanol from the remaining constituents, detecting it by means of a flame ionisation detector (FID), and determining its content by reference to an internal standard on the basis of the response factor.

3.1. The method of determination, the reagents and materials used, the type of apparatus used, its equipment, the method of calculation, as well as the method of preparation of the test report are consistent with the state of the art, described, in particular, in the Polish Standard introducing standard EN 15721.

3.2. The precision of the method referred to in paragraph 3 is consistent with the state of the art, as described, in particular, in the Polish Standard implementing standard EN 15721.

4. For the reference of the gas chromatographic results of ethanol and higher saturated alcohols content, higher saturated (C3-C5) monohydric alcohols content and methyl alcohol content to the water-free sample, the water content of the sample is taken into account by a separate determination using an appropriate method, and a correction factor is calculated from the result of the determination of the water, so as to relate the results of the water sample to the results of the water-free sample, according to the formula:

$$W = \frac{100 - C_{Water}}{100},$$

where individual symbols shall mean:

$W -$¿, the correction factor,
C_{water} −¿ water designation expressed in % (m/m).

The result of the determination by gas chromatography of the ethanol and higher alcohols content, the content of higher saturated (C3–C5) monohydric alcohols, and the methanol content are multiplied by a correction factor and reported as the test result corrected for a water-free sample.

5. Water content is determined with the following method:

1) Karl Fischer's coulometric titration, which consists of the introduction of a weighed sample into the titration vessel of Karl Fischer’s coulometric apparatus, where Karl Fischer’s iodine is released electrolytically on the anode, in proportion to the amount of water contained in the sample, or
2) Karl Fischer’s potentiometric titration, which involves the introduction of a weighed sample into the Karl Fischer potentiometer titration vessel, in which the current water is titrated using a Karl Fischer reagent.

5.1. For the determination of water content with the method referred to in paragraph 5(1):

1) when all water is titrated, the excess iodine is detected by the electrometric endpoint sensor and the titration is interrupted; based on the stoichiometry of the reaction, one mole of iodine reacts with one mole of water, therefore the amount of water is proportional to the total charge according to Faraday’s law;
2) the method of determination, the reagents and materials used, the type of apparatus used, the method of preparation of the sample and apparatus, the control test of the apparatus, the method of calculation and presentation of the results and the method of drawing up the test report are consistent with the state of the art described, in particular, in the Polish standard implementing EN 15489;
3) the precision of the method is consistent with the state of the art, as described, in particular, in the Polish standard implementing standard EN 15489.

5.2. For the determination of water content with the method referred to in paragraph 5(2):

1) the reaction iodine is introduced in the presence of anhydrous sulphur dioxide, methanol and the corresponding nitrogenous base; based on the stoichiometry of reaction, one mole of iodine reacts with one mole of water;
2) the method of determination, reagents and materials used, the type of apparatus used, the method of preparation of the sample and apparatus, the control test of the apparatus, the method of calculation and presentation of the results and the method of drawing up the test report are consistent with the state of the art described, in particular, in the Polish standard implementing standard EN 15692;
3) the precision of the method is consistent with the state of the art, as described, in particular, in the Polish standard implementing standard EN 15692.

6. Non-organic chloride content is determined through ion chromatography consisting in evaporating a sample in water bath, dissolving the dry residue in water and determining

the chloride content by comparing the peak surface of the test sample with the reference calibration curve.

6.1. The method of determination, reagents used, the type of apparatus used, the method of preparation of the calibration solution and apparatus, the method of calculation and reporting of results, as well as the method of preparation of the test report are consistent with the current state of knowledge, described, in particular, in the Polish Standard introducing standard EN 15492.

6.2. The precision of the method referred to in paragraph 6 is consistent with the state of the art, as described, in particular, in the Polish Standard implementing standard EN 15492.

7. The copper content is determined with the following method:

   1) atomic absorption spectrometry with electrothermal atomisation in a graphite furnace, consisting in introducing a portion of the sample onto the inner surface or the shelf of the cuvette and heating the cuvette according to the appropriate temperature programme, or
   2) optical emission spectrometry of an inductively coupled plasma, consisting of the insertion of a sample into the mist chamber of an inductively coupled plasma emission spectrometer.

7.1. For determination of copper content with the method referred to in paragraph 7(1):

   1) the amount of light absorbed by copper atoms during the final stage of the programme is measured in specific time units, and the integrated absorbance produced by the copper contained in the sample is compared with a reference curve determined on the basis of signals from reference solutions of copper dissolved in ethanol;
   2) the method of determination, reagents and materials used, the type of apparatus used, the method of preparation of the blank test solution and standard solutions, the method of calculation and presentation of the results and the method of drawing up the test report are consistent with the state of the art described, in particular, in the Polish standard implementing standard EN 15488;
   3) the precision of the method is consistent with the state of the art, as described, in particular, in the Polish standard implementing standard EN 15488.

7.2. For determination of copper content with the method referred to in paragraph 7(2):

1) the copper content is determined by comparing the emission of the element in the analytical sample with the emission in the reference solutions at the same wavelength;
2) the method of determination, reagents and materials used, the type of apparatus used, the method of preparation of the blank test solution and standard solutions, the method of calculation and presentation of the results and the method of drawing up the test report are consistent with the state of the art described, in particular, in the Polish standard implementing standard EN 15837;
3) the precision of the method is consistent with the state of the art, as described in particular in the Polish standard implementing standard EN 15837.

8. The total acidity (expressed as acetic acid content) is determined by a colourimetric titration method, consisting in mixing the sample with an equal portion of neutral, carbon dioxide-free water and titrating with a potassium hydroxide solution in the presence of phenolphthalein until the acidic compounds are neutralised.

8.1. The method of determination, reagents and materials used, the type of apparatus used, the method of sampling and handling the sample, the method of calculating and reporting the results, as well as the method of preparing the report are consistent with the state of the art, as described, in particular, in the Polish Standard implementing standard EN 15491.

8.2. The precision of the method referred to in paragraph 8 is consistent with the state of the art, as described, in particular, in the Polish Standard implementing standard EN 15491.

9. The appearance is inspected visually by assessing the colour and transparency and comparing them with a sample of water against a white and black background.

9.1. The method of making the determination, the type of apparatus used, the method of interpreting and reporting the results and the method of drawing up the test report are consistent with the state of the art described, in particular, in the Polish Standard implementing EN 15769 standard.

10. Phosphorus content is determined with the following method:

1) spectrometry, by evaporating the sample, dissolving the dry residue in water and adding an acidic solution containing molybdenum ions and antimony to obtain an antimony-phosphoric-molybdenum complex, or

2) optical emission spectrometry of an inductively coupled plasma, consisting of the insertion of a sample into the mist chamber of an inductively coupled plasma emission spectrometer.

10.1. For determination of phosphorus content with the method referred to in paragraph 10(1):

1) the complex is treated with ascorbic acid in order to obtain a molybdenum complex with a strong blue colour. The phosphorus content is obtained by measuring the absorbance of the complex at a wavelength of 880 nm;
2) the method of determination, reagents and materials used, the type of apparatus used, the method of calibration, calculation and reporting of results, as well as the method of preparation of the test report are consistent with the state of the art, as described, in particular, in the Polish Standard implementing standard EN 15487;
3) the precision of the method is consistent with the state of the art, as described, in particular, in the Polish standard implementing standard EN 15487.

10.2. For determination of phosphorus content with the method referred to in paragraph 10(2):

1) the phosphorus content is determined by comparing the emission of the element in the analytical sample with the emission in the reference solutions at the same wavelength;
2) the method of determination, reagents and materials used, the type of apparatus used, the method of preparation of the blank test solution and standard solutions, the method of calculation and presentation of the results and the method of drawing up the test report are consistent with the state of the art described, in particular, in the Polish standard implementing standard EN 15837;
3) the precision of the method is consistent with the state of the art, as described, in particular, in the Polish standard implementing standard EN 15837.

11. The content of non-volatile matter is determined by a gravimetric method, consisting in weighing the residue remaining after the alcohol has been evaporated in a boiling water bath and dried in the dryer.

11.1. The method of determination, the type of apparatus and equipment used, the method of sampling, the method of calculation and reporting of the results and the method of drawing up the test and quality control report are consistent with the state of the art described, in particular, in the Polish standard implementing standard EN 15691;

11.2. The precision of the method referred to in paragraph 11 is consistent with the state of the art, as described, in particular, in the Polish Standard implementing standard EN 15691.

12. The sulphur content is determined with the following method:
   1) X-ray fluorescence spectroscopy with wavelength dispersion, consisting in exposing the test sample placed in a cuvette to primary radiation with specified wavelengths generated by an X-ray tube, or
   2) fluorescence in superviolet, involving the fluorescence phenomenon of sulphur dioxide induced by ultraviolet radiation resulting from the combustion of the test sample under certain conditions, or
   3) optical emission spectrometry of an inductively coupled plasma, consisting of the insertion of a sample into the mist chamber of an inductively coupled plasma emission spectrometer.

12.1. For the determination of sulphur content with the method referred to in paragraph 12(1):
   1) the sulphur content is determined on the basis of the calibration curve specified for the relevant measuring range;
   2) the method of determination, reagents and materials used, the type of apparatus used, the method of preparation of calibration solutions, the method of calibration, the presentation of the results and the method of drawing up the test report are consistent with the state of the art described, in particular, in the Polish Standard implementing EN 15485;
   3) the precision of the method is in consistent with the state of the art, as described, in particular, in the Polish standard implementing standard EN 15485.

12.2. For the determination of sulphur content with the method referred to in paragraph 12(2):
   1) the method of determination, reagents and materials used, the method of calibration and verification of the apparatus, the method of calculation and reporting of the results, as well as the method of preparation of the test report are consistent with

the state of the art, as described, in particular, in the Polish Standard implementing standard EN 15486;

2) the precision of the method is consistent with the state of the art, as described, in particular, in the Polish standard implementing standard EN 15486.

12.3. For the determination of sulphur content with the method referred to in paragraph 12(3):

1) The sulphur content is determined by comparing the emission of the element in the analytical sample with the emission in the reference solutions at the same wavelength;
2) the method of determination, reagents and materials used, the type of apparatus used, the method of preparation of the blank solution and standard solutions, the method of calculation and reporting of the results, as well as the method of preparation of the report are consistent with the current state of knowledge, as described, in particular, in the Polish Standard introducing standard EN 15837;
3) the precision of the method is consistent with the state of the art, as described in particular in the Polish standard implementing standard EN 15837.

13. Electrical conductivity is determined prior to the addition of any additive by measuring the electrical conductance using a conductometer with a measuring cell, at the sample temperature of (25 ±0.1) °C.

13.1. The method of making the determination, the type of apparatus used, and the method of drawing up the test report are consistent with the state of the art described, in particular, in the Polish standard implementing standard EN 15938;

13.2. The precision of the method referred to in paragraph 13 is consistent with the state of the art, as described, in particular, in the Polish Standard implementing standard EN 15938.

14. Sulphate content is determined through ion chromatography consisting in evaporating a sample in water bath, dissolving the dry residue in water and determining the sulphate ion content by comparing the peak surface of the test sample with the reference curve.

14.1. The method of making the determination, the type of apparatus used and the method of drawing up the test report are consistent with the state of the art described, in particular, in the Polish standard implementing standard EN 15492.

14.2. The precision of the method referred to in paragraph 14 is consistent with the state of the art, as described, in particular, in the Polish Standard implementing standard EN 15492.

II. Methods for testing the quality of methyl ester, for the individual properties of this biocomponent

1. The content of the fatty acid methyl esters is determined by gas chromatography using an internal reference, which consists in the separation of the mixture into individual components in the gaseous phase.

1.1. Chromatographic conditions should be selected so that the peaks of methyl esters of lignoceric acid (C24:0) and nervonic acid (C24:1) are clearly visible. Integration should be carried out in such a way as to include peaks from the methyl ester of hexanoic acid (C6:0) to the peak of the methyl ester of nervonic acid (C24:1).

1.2. The content of fatty acid methyl esters (FAME) is calculated based on the total area of the methyl ester peaks from C6:0 to C24:1 and the area of the peak corresponding to the methyl ester of heptadecanoic acid, and expressed as a mass fraction in percent.

1.3. The method of determination, reagents and materials used, the type of apparatus used, the method of sample preparation, the method of reporting the results and the method of drawing up the test report are consistent with the state of the art described, in particular, in the Polish standard implementing EN 14103 standard.

1.4. The precision of the method referred to in paragraph 1 is consistent with the state of the art, as described, in particular, in the Polish Standard implementing standard EN 14103.

2. The density at 15 °C is determined with the following method:
   1) hydrometric method using a hydrometer, consisting in measuring the density of the test sample at a specified temperature using a hydrometer immersed in the sample contained in a cylinder, or
   2) oscillatory method, introducing a sample of approximately 1 ml into the measuring cell of an oscillatory densitometer thermostatted to maintain a reference temperature of 15 °C.

2.1. For the determination of density at 15 °C with the method referred to in paragraph 2(1):

1) the reading on the isometer scale is read and the temperature of the test sample recorded; if density is determined at a temperature other than 15 °C, the result of the measurement is converted using a formula determined in accordance with the current state of knowledge, as described, in particular, in Annex B to the Polish Standard implementing standard EN 14214+A2:2019-05, to refer to a temperature of 15 °C;

2) the method of determination, the type of apparatus used and the manner of preparation and control of the determination, the method of sample preparation, the method of calculation and reporting of the results and the method of drawing up the test report are consistent with the state of the art described, in particular, in the Polish standard implementing EN ISO 3675.

2.2. For the determination of density at 15 °C with the method referred to in paragraph 2(2), the method of determination, the reagents and materials used, the type of apparatus used and the method of its preparation, methods of sampling and sample preparation, the method of calculation and reporting of results, as well as the method of preparation of the test report are consistent with the state of the art, as described, in particular, in the Polish Standard implementing standard EN ISO 12185.

2.3. The precision of the method for determining density at 15 °C by the method referred to in paragraph 2(1) or (2) is consistent with the state of the art, as described, in particular, in Annex A to the Polish standard implementing standard EN 14214+A2:2019-05.

3. Viscosity at 40 °C is determined with the method consisting in:

1) measuring the flow time of a specified volume of the test sample under the influence of gravity through a calibrated glass capillary viscometer, under repeatable conditions, at a defined, precisely maintained, constant, and strictly controlled temperature, or

2) introducing the test sample into strictly temperature-controlled measuring chambers consisting of a pair of rotating, co-axial cylinders and an oscillating U-tube, followed by determining the dynamic viscosity on the basis of the equilibrium rotational speed of the internal cylinder and the density o the basis of the frequency of the U-tube oscillations.

3.1. For the determination of viscosity with the method referred to in paragraph 3(1):

1) the viscosity at 40 °C is calculated by multiplying the measured flow time of a constant fluid volume between the lines of the measuring vessel by the viscometer constant;

2) the method of determination, reagents and materials used, the type of apparatus and its calibration, the quality control, the method of preparation of the sample, the method of calculation and reporting of the results and the method of drawing up the test report are consistent with the state of the art described, in particular, in the Polish standard implementing EN ISO 3104 standard;

3) the precision of the method for determining the viscosity at 40 °C is in consistent with the state of the art, as described, in particular, in Annex A to the Polish Standard implementing standard EN 14214+A2:2019-05.

3.2. For the determination of viscosity with the method referred to in paragraph 3(2):

1) viscosity is calculated by dividing the measured dynamic viscosity by the measured density;

2) the method of determination, reagents and materials used, the type of apparatus used and the method of its preparation and calibration, the method of calculation and reporting of results, as well as the method of preparation of the test report are consistent with the state of the art, as described, in particular, in the Polish Standard implementing standard EN 16896;

3) the precision of the method is consistent with the state of the art, as described, in particular, in Annex A to the Polish standard implementing standard EN 14214+A2:2019-05.

4. The flash point is determined with the following method:

1) determination of ignition or absence of ignition and flash point by means of a small-scale closed-cup apparatus, whereby the test sample is placed in the crucible and heated until ignition of the vapours is observed on the surface of the test sample, or

2) by means of the closed-cup Pensky-Martens method, consisting in placing the test sample in a cup and heating it, with continuous stirring, until an ignition source introduced through the opening in the cup lid causes the vapours on the surface of the test sample to ignite.

4.1. For the determination of flash point with the method referred to in paragraph 4(1):

1) a specific volume of 2 ml of the test sample and a flash point determination apparatus equipped with a thermal temperature recording device are used for the test;
2) the lowest temperature, adjusted to take account of differences in relation to a normal pressure of 101.3 kPa, at which the application of the ignition source will cause the vapours of the test sample to ignite and the flame to spread over the surface of the liquid, under specified test conditions, is taken as the flash point;
3) the method of determination, reagents and materials used, the type of apparatus used and the method of its preparation, the method of sampling and handling the sample, the method of calculation and reporting of the results, as well as the method of drawing up the test report are consistent with the current state of knowledge, as described, in particular, in the Polish Standard implementing standard EN ISO 3679;
4) the precision of the method is consistent with the state of the art, as described, in particular, in Annex A to the Polish standard implementing standard EN 14214+A2:2019-05.

4.2. For the determination of flash point with the method referred to in paragraph 4(2):
1) the lowest temperature at which the application of the ignition source causes the vapours of the test sample to ignite and the flame to spread over the surface of the liquid is taken as the flash point at ambient conditions;
2) the measured flash point of the test sample under ambient conditions is adjusted to the standard pressure of 101.3 kPa;
3) method of closed Pensky-Martens crucible method and an ignition temperature apparatus equipped with a thermal detection device are used, each time with new analytical sample and changing the temperature at which the sample is heated.

4.3. For the determination of flash point with the method referred to in paragraph 4(2):
1) the method of determination, reagents and materials used, the type of apparatus used and the method of its preparation, the method of handling the sample, the method of calculating and indicating the results, as well as the method of drawing up the test report are consistent with the current state of knowledge, as described, in particular, in the Polish Standard introducing the EN ISO 2719 standard;

2) the precision of the method is consistent with the state of the art, as described, in particular, in Annex A to the Polish standard implementing standard EN 14214+A2:2019-05.

5. The sulphur content is determined with the following method:

   1) X-ray fluorescence spectroscopy with wavelength dispersion, consisting in exposing the test sample placed in a cuvette to primary radiation with specified wavelengths generated by an X-ray tube, or
   2) fluorescence in superviolet, involving the fluorescence phenomenon of sulphur dioxide induced by ultraviolet radiation resulting from the combustion of the test sample under certain conditions, or
   3) X-ray fluorescence spectrometry with energy dispersion consisting in placing the analytical sample located in a cuvette adapted to the X-ray transmitting window in the stream of exciting X-ray lamp.

5.1. For the determination of sulphur content with the method referred to in paragraph 5(1):

   1) the sulphur content is determined on the basis of the measured count rates of X-ray fluorescence of the S-Kα line and the background radiation, using a calibration curve;
   2) the method of determination, reagents and materials used, the type of apparatus used and the method of its preparation, the method of calculation and reporting of the results are consistent with the state of the art, as described, in particular, in the Polish Standard implementing standard EN ISO 20884;
   3) the precision of the method is consistent with the state of the art, as described, in particular, in Annex A to the Polish standard implementing standard EN 14214+A2:2019-05.

5.2. For the determination of sulphur content with the method referred to in paragraph 5(2):

   1) the measure of the sulphur content of a test sample is the intensity of fluorescent ultraviolet radiation;
   2) the method of determination, reagents and materials used, the type of apparatus used and the method of preparation thereof, the method of taking and handling the sample, the method of calculating and reporting the results and the method of drawing up the test report are consistent with the state of the art described, in particular, in the Polish Standard implementing EN ISO 20846;

3) the precision of the method is consistent with the state of the art, as described, in particular, in Annex A to the Polish standard implementing standard EN 14214+A2:2019-05.

5.3. For the determination of sulphur content with the method referred to in paragraph 5(3):

1) the intensity of the characteristic sulphur X-ray line K-$L_{2,3}$ is measured, and the the cumulative number of counts is compared with the values of the calibration curve obtained for the reference solutions with sulphur content adequate for the concentration range tested;
2) the method of determination, reagents used, the type of apparatus used, the method of calculation and reporting of the results, as well as the method of drawing up the test report, are consistent with the state of the art, as described, in particular, in the Polish Standard implementing standard EN ISO 13032;
3) the precision of the method is consistent with the state of the art, as described, in particular, in Annex A to the Polish standard implementing standard EN 14214+A2:2019-05.

6. The cetane number is determined with the following method:

1) the engine test, consisting in comparing the self-ignition properties of the test sample with properties of reference fuel mixtures of known cetane numbers, using a test engine under standardised conditions, or
2) combustion in a constant volume chamber, consisting in injecting the test sample into a compressed air charge in a constant-volume chamber, detecting the start of injection and the start of combustion by sensors, over a specified number of cycles, and determining the ignition delay time, or
3) combustion in a high-temperature and pressure-controlled constant volume chamber consisting in injecting the test sample into a heated, compressed, synthetic air of required quality, generating a dynamic pressure wave due to the combustion of the test sample and detecting it by means of a pressure sensor, or
4) combustion in a constant-volume chamber, consisting in directly injecting the test sample into heated, compressed air and determining the indicated cetane number (WLC) by comparing the ignition characteristics of the test sample with those of primary reference fuel mixtures of known indicated cetane number (WLC) under standardised operating conditions.

6.1. For the determination of cetane number with the method referred to in paragraph 6(1):

1) the method of determination, reagents and materials used, the type of apparatus used and the method of preparation thereof, the method of sampling and preparation of the sample, the method of calculation and reporting of the results, and the method of drawing up the test report are consistent with the state of the art described, in particular, in the Polish standard implementing EN ISO 5165 standard;
2) the precision of the method is consistent with the state of the art, as described, in particular, in Annex A to the Polish standard implementing standard EN 14214+A2:2019-05.

6.2. For the determination of cetane number with the method referred to in paragraph 6(2), the average ignition delay determined for a specified number of cycles are used in the equation enabling the calculation of the derivative cetane number (DCN). The DCN is an estimate of the cetane number (CN) described, in particular, according to the Polish Standard introducing the EN ISO 5165 standard in a conventional full-size test engine.

6.3. For the determination of cetane number with the method referred to in paragraph 6(2):

1) the method of determination, reagents and materials used, the type of apparatus used and the method of its preparation, the method of calculation and reporting of results, as well as the method of preparation of the test report are consistent with the current state of knowledge, as described, in particular, in the Polish Standard implementing standard EN 15195;
2) the precision of the method is consistent with the state of the art, as described, in particular, in Annex A to the Polish standard implementing standard EN 14214+A2:2019-05.

6.4. For the determination of cetane number with the method referred to in paragraph 6(3), the cetane number derivative (DCN) sis calculated by means of an equation on the basis of the determined ignition delay and the amount of combustion delay.

6.5. For the determination of cetane number with the method referred to in paragraph 6(3):

1) the method of determination, reagents and materials used, the type of apparatus used and the method of its preparation, the method of calculation and reporting of results, as well as the method of preparation of the test report are consistent with

the current state of knowledge, as described, in particular, in the Polish Standard implementing standard EN 16715;

2) the precision of the method is consistent with the state of the art, as described, in particular, in Annex A to the Polish standard implementing standard EN 14214+A2:2019-05.

6.6. For the determination of cetane number with the method referred to in paragraph 6(4), the analytical sample of the test material is automatically drawn from a sample vial placed in the automatic sample feeder carousel, heated during pressurisation and then, at the start of the combustion cycle, the subsample is injected into a constant volume combustion chamber with controlled temperature and pressure previously charged with compressed air of a specified quality. Each injection along with subsequent ignition causes a sudden increase in the pressure in the combustion chamber which is detected by a dynamic pressure sensor.

6.7. For the determination of cetane number with the method referred to in paragraph 6(4):

1) the method of determination, reagents and materials used, the type of apparatus used and the method of its preparation and the method of calculation and reporting of results, as well as the method of preparation of the test report, are consistent with the current state of knowledge, as described, in particular, in the Polish Standard implementing standard EN 17155;

2) the precision of the method is consistent with the state of the art, as described, in particular, in Annex A to the Polish standard implementing standard EN 14214+A2:2019-05.

7. The sulphate ash content is determined by weight method, by calculating the content of sulphate ash obtained by burning the test sample and reaction of the incineration residue with sulphuric acid.

7.1. The test sample is burned until only ash and coal remain. After cooling the combustion products, they are subjected to sulphuric acid and roasted at 775 °C until carbon oxidation is complete. The ash is then cooled, re-treated with sulphuric acid and roasting until solid mass is obtained.

7.2. The method of determination, reagents used, the type of apparatus used, the method of calculation and reporting of results, as well as the method of preparation of the test report are consistent with the current state of knowledge, described, in particular, in the Polish Standard introducing the ISO 3987 standard.

7.3. The precision of the method referred to in paragraph 7 is consistent with the state of the art, as described, in particular, in Annex A to the Polish Standard implementing standard EN 14214+A2:2019-05.

8. The water content is determined by the Karl Fischer coulometric titration method, consisting in introducing a weighed sample into the titration vessel of a Karl Fischer coulometric apparatus, in which iodine for the Karl Fischer reaction is generated electrolytically at the anode in proportion to the amount of water present in the sample.

8.1. When all the water content has been titrated, the excess iodine is detected by the electrometric end-point sensor and the titration is interrupted; based on the stoichiometry of the reaction, one mole of iodine reacts with one mole of water, therefore the amount of water is proportional to the total charge according to Faraday’s law.

8.2. The method of determination, reagents and materials used, the type of apparatus used and the method of its preparation and control test, the method of sample preparation, the method of calculation and reporting of results, as well as the method of preparation of the test report are consistent with the current state of knowledge, described, in particular, in the Polish Standard implementing standard EN ISO 12937.

8.3. The precision of the method referred to in paragraph 8 is consistent with the state of the art, as described, in particular, in Annex A to the Polish Standard implementing standard EN 14214+A2:2019-05.

9. The total contamination is determined by determining the proportion of the weight of the impurities filtered out by the filter in relation to the total mass of the sample.

9.1. A specified amount of the prepared sample is filtered at room temperature using vacuum by means of a pre-weighed filter, and the the weight of impurities remaining on the filter is determined in relation to the total weight of the sample.

9.2. The method of determination, reagents used, the type of apparatus used and the method of its preparation, the method of sample preparation, the method of calculation and reporting of results, as well as the method of preparation of the test report are consistent with the current state of knowledge, described, in particular, in the Polish Standard implementing standard EN 12662-2.

9.3. The precision of the method referred to in paragraph 9 is consistent with the state of the art, as described, in particular, in the Polish Standard implementing standard EN 12662-2.

10. The testing of the corrosive effect on copper (3 hours at 50 °C) is carried out comparatively to standardised corrosion benchmarks.

10.1. The copper plate is immersed in the test sample of a specific volume and then heated under strictly specified conditions. After the heating is finished, the copper plate is removed, washed and its colour is assessed by comparing it with corrosion benchmarks.

10.2. The method of performing the test, reagents and materials used, the type of apparatus used, the method of interpretation and presentation of the results, as well as the method of preparing the test report are consistent with the current state of knowledge, described, in particular, in the Polish Standard introducing the EN ISO 2160 standard.

11. Oxidative stability (at 110 °C) is determined with the following method:

1) releasing a purified air stream through the test sample; volatile compounds released from the sample by oxidation process pass with air into a vessel containing demineralised or distilled water, fitted with an electrode for measuring the conductivity, combined with a measuring unit indicating the end of the induction period, or
2) accelerated oxidation by passing a purified air stream through the test sample; volatile compounds released from the sample by oxidation process pass with air into a vessel containing demineralised or distilled water, fitted with an electrode for measuring conductivity, combined with a measuring unit indicating the end of the induction period when the conductivity begins to increase rapidly; accelerated growth is caused by dissociation of volatile carboxylic acids, which are formed by oxidation and are absorbed in water.

11.1. For the determination of oxidative stability with the method referred to in paragraph 11(1):

1) the method of determination, the reagents used, the type of apparatus used, the method of sampling, the method of calculation and reporting of results, as well as the method of preparation of the test report are consistent with the state of the art, as described, in particular, in the Polish Standard introducing standard EN 14112;

2) the precision of the method is consistent with the state of the art, as described, in particular, in Annex A to the Polish standard implementing standard EN 14214+A2:2019-05.

11.2. For the determination of oxidative stability with the method referred to in paragraph 11(2):

1) the method of determination, reagents used, the type of apparatus used, the method of calculation and reporting of the results, as well as the method of drawing up the test report, are consistent with the state of the art, as described, in particular, in the Polish Standard implementing standard EN 15751;
2) the precision of the method is consistent with the state of the art, as described, in particular, in Annex A to the Polish standard implementing standard EN 14214+A2:2019-05.

12. The acid value is determined by the titration method by dissolving the test sample in a solvent mixture and titration with a diluted potassium hydroxide solution using phenolphthalein as an indicator to determine the titration end point.

12.1. The method of determination, the reagents used, the type of apparatus used, the method of sampling and preparation of the test sample, the method of calculation and reporting of the results, as well as the method of preparation of the test report are consistent with the current state of knowledge, described, in particular, in the Polish Standard implementing standard EN 14104.

12.2. The precision of the method referred to in paragraph 12 is consistent with the state of the art, as described, in particular, in Annex A to the Polish Standard implementing standard EN 14214+A2:2019-05.

13. The iodine value is determined with the following method:

1) titration, consisting in dissolving the test sample in a mixture of solvents, adding Wijs reagent and then, after a certain time, adding to the sample potassium iodide and water, and the titration of the released iodine as sodium thiosulphate solution, or
2) calculation on the basis of gas chromatography data, in which the gas chromatography results for individual fatty acid methyl esters are used as inputs.

13.1. For the determination of iodine value with the method referred to in paragraph 13(1):

1) the method of determination, reagents used, the type of apparatus used, the method of taking and preparing the test sample, the method of calculating and reporting the results and the method of drawing up the test report are consistent with the state of the art described, in particular, in the Polish standard implementing standard EN 14111;

2) the precision of the method is consistent with the state of the art, as described, in particular, in Annex A to the Polish standard implementing standard EN 14214+A2:2019-05.

13.2. For the determination of iodine value with the method referred to in paragraph 13(2):

1) the method of determination, reagents used, the type of apparatus used, the method of calculation and reporting of the results, as well as the method of drawing up the test report, are consistent with the state of the art, as described, in particular, in the Polish Standard implementing standard EN 16300;

2) the precision of the method is consistent with the state of the art, as described, in particular, in Annex A to the Polish standard implementing standard EN 14214+A2:2019-05.

14. The content of linolenic acid methyl ester is determined by gas chromatography using an internal reference, which consists in the separation of the mixture into individual components in the gaseous phase.

14.1. Chromatographic conditions should be selected so that the peaks of methyl esters of lignoceric acid (C24:0) and nervonic acid (C24:1) are clearly visible. Integration should be carried out in such a way as to include peaks from the methyl ester of hexanoic acid (C6:0) to the peak of the methyl ester of nervonic acid (C24:1).

14.2. The content of methyl linolenate are calculated on the basis of the area of peak corresponding to methyl linolenate and the area of peak corresponding to methyl nonadecanoate, and expressed as a percentage by mass fraction.

14.3. The method of determination, reagents and materials used, the type of apparatus used, the method of sample preparation, the method of reporting the results and the method of drawing up the test report are consistent with the state of the art described, in particular, in the Polish standard implementing EN 14103 standard.

14.4. The precision of the method referred to in paragraph 14 is consistent with the state of the art, as described, in particular, in the Polish Standard implementing standard EN 14103.

15. The methyl alcohol content is determined with a method consisting in heating the sample at a temperature of 80 °C in a hermetically sealed vial and then, after reaching the equilibrium, injecting a specific part of the gaseous phase into the chromatograph where methanol is detected using a flame ionisation detector and its quantity is determined by reference to the external reference.

15.1. The methyl alcohol content can also be determined by adding an internal reference solution to the sample and then using an internal calibration factor.

15.2. The method of determination, reagents and standard solutions used, the type of apparatus used and the method of drawing up the test report are consistent with the state of the art, as described, in particular, in the Polish Standard implementing standard EN 14110.

15.3. The precision of the method referred to in paragraph 15 is consistent with the state of the art, as described, in particular, in the Polish Standard implementing standard EN 14110.

16. The content of monoacylglycerols, diacylglycerols, triacylglycerols and general glycerols is determined by a method of analysis of silate derivatives using gas chromatography on a short capillary column with thin layer film, using direct column dispensation and flame ionisation detectors.

16.1. After calibration, quantitative analysis is performed using the internal benchmark method and the total glycerol content is calculated on the basis of the results obtained.

16.2. The method of determination, reagents used, the type of apparatus used, the preparation of solutions, the method of sampling, the method of calculation and reporting of results, as well as the method of preparation of the test report are consistent with the current state of knowledge, described, in particular, in the Polish Standard implementing standard EN 14105.

16.3. The precision of the method referred to in paragraph 16 is consistent with the state of the art, as described, in particular, in the Polish Standard implementing standard EN 14105.

17. The free glycerol content is determined with a method consisting in:

1) analysis of silicone derivatives by gas chromatography on a short capillary column with a thin-layer film, using direct column dispensation and flame ionisation detectors, or
2) adding, to the test sample, ethanol, water, hexane and an internal benchmark, which will result in the formation of two phases and quantitative transfer of free glycerol to the lower phase, the analysis of which, by gas chromatography, allows quantification of the concentration of free glycerol.

17.1. For the determination of free glycerol content with the method referred to in paragraph 17(1):

1) after calibration, the quantitative analysis of free glycerol is performed using the internal standard method;
2) the method of determination, reagents used, the type of apparatus used, the method of preparation of solutions, the method of sampling, the method of calculation and reporting of results, as well as the method of preparation of the test report are consistent with the current state of knowledge, as described, in particular, in the Polish Standard implementing standard EN 14105;
3) the precision of the method is consistent with the state of the art, as described, in particular, in the Polish standard implementing standard EN 14105.

17.2. For the determination of free glycerol content with the method referred to in paragraph 17(2):

1) the method of determination, reagents used, the type of apparatus used, the method of reporting the results and the method of drawing up the test report are consistent with the state of the art described, in particular, in the Polish standard implementing standard EN 14106;
2) the precision of the method is consistent with the state of the art, as described, in particular, in the Polish standard implementing standard EN 14106.

18. Group I metal content (Na + K) is determined in the following way:

18. 1. For sodium (Na) content:

1) directly — by atomic absorption spectrometry at a wavelength of 589.0 nm, having dissolved the test sample in a solution of xylene, or
2) by optical emission spectral analysis with inductively excited plasma, having diluted the sample with naphtha.

18.1.1. For the determination of sodium (Na) content with the method referred to in paragraph 18.1(1):

1) reference solutions are used, prepared from an organic sodium compound in the form of salt dissolved in a mixture of xylene and diluting oil;
2) the method of determination, reagents used, the type of apparatus used, the method of reporting the results and the method of drawing up the test report are consistent with the state of the art described, in particular, in the Polish standard implementing standard EN 14108;
3) the precision of the method is consistent with the state of the art, as described, in particular, in Annex A to the Polish standard implementing standard EN 14214+A2:2019-05.

18.1.2. For the determination of sodium (Na) content with the method referred to in paragraph 18.1(2):

1) sodium content is determined by comparing the atomic emission intensity of the reference solution and the sample at specified wavelengths.
2) the method of determination, reagents and standard solutions used, the type of apparatus used and the method of its preparation, the method of calculation and reporting of results, as well as the method of preparation of the test report are consistent with the current state of knowledge, as described, in particular, in the Polish Standard implementing standard EN 14538;
3) the precision of the method is consistent with the state of the art, as described, in particular, in Annex A to the Polish standard implementing standard EN 14214+A2:2019-05.

18.2. For potassium content (K):

1) directly — by atomic absorption spectrometry at a wavelength of 766.5 nm, having dissolved the sample in a solution of xylene and a stabiliser, or
2) by optical emission spectral analysis with inductively excited plasma, having diluted the sample with naphtha.

18.2.1 For the determination of potassium (K) content with the method referred to in paragraph 18.2(1):

1) reference solutions are used, prepared from an organic potassium compound in the form of salt, dissolved in a mixture of xylene and a stabiliser;

2) the method of determination, reagents used, the type of apparatus used, the method of reporting the results and the method of drawing up the test report are consistent with the state of the art described, in particular, in the Polish standard implementing standard EN 14109;

3) the precision of the method is consistent with the state of the art, as described, in particular, in the Polish standard implementing standard EN 14109.

18.2.2. For the determination of potassium (K) content with the method referred to in paragraph 18.2(2):

1) the potassium (K) content is determined by comparing the atomic emission intensity of the reference solution and the sample at specified wavelengths;

2) the method of determination, reagents and standard solutions used, the type of apparatus used and the method of its preparation, the method of calculation and reporting of results, as well as the method of preparation of the test report are consistent with the current state of knowledge, as described, in particular, in the Polish Standard implementing standard EN 14538;

3) the precision of the method is consistent with the state of the art, as described, in particular, in the Polish standard implementing standard EN 14538.

18.2.3. The precision of the determination of the sum of the group I metal contents (Na + K), as regards the determination of the sodium content using the method described, in particular, in the Polish standard implementing EN 14108 and the method described, in particular, in the Polish standard implementing EN 14109 and the method described, in particular, in the Polish standard implementing EN 14538, is consistent with the state of the art described, in particular, in Annex A to the Polish standard implementing EN 14214+A2:2019-05.

19. The content of group II metals (Ca + Mg) is determined by optical emission spectrometry with inductively coupled plasma, after diluting the sample with a naphtha fraction.

19.1. The sum of the content of group II metals (Ca + Mg) is determined by comparing the atomic emission intensity of the reference solution and the sample at specified wavelengths.

19.2. The method of determination, reagents and standard solutions used, the type of apparatus used and the method of its preparation, the method of calculation and reporting of results, as well as the method of preparation of the test report are consistent with the current state of knowledge, described, in particular, in the Polish Standard implementing standard EN 14538.

19.3. The precision of the method referred to in paragraph 19 is consistent with the state of the art, as described, in particular, in Annex A to the Polish Standard implementing standard EN 14214+A2:2019-05.

20. Phosphorus content is determined with the following method:

    1) dissolving the test sample in xylene and its introduction, in the form of an aerosol, together with reference solutions prepared from an organic phosphorus compound, into an inductively coupled argon plasma, or
    2) inductively excited plasma optical emission spectrometry, which consists in passing the sample dissolved in naphtha through a spectrometer.

20.1. For the determination of phosphorus content with the method referred to in paragraph 20(1):

    1) the phosphorus content is determined by comparing the emission of the element in the test sample solution with the reference emissions at the same wavelength;
    2) the method of determination, reagents used, the type of apparatus, the method of calculation and presentation of the results and the method of drawing up the test report are consistent with the state of the art described, in particular, in the Polish standard implementing standard EN 14107;
    3) the precision of the method is provided consistent with the state of the art, as described, in particular, in Annex A to the Polish standard implementing standard EN 14214+A2:2019-05.

20.2. For determination of phosphorus content with the method referred to in paragraph 20(2):

    1) phosphorus content is determined by comparison with the reference solution;
    2) the method of determination, reagents used, the type of apparatus used, the method of calculation and reporting of the results, as well as the method of drawing up the test report, are consistent with the state of the art, as described, in particular, in the Polish Standard implementing standard EN 16294;

3) the precision of the method is consistent with the state of the art, as described, in particular, in Annex A to the Polish standard implementing standard EN 14214+A2:2019-05.

21. The content of polyunsaturated fatty acid methyl esters (≥ 4 double bonds) is determined by gas chromatography using the internal benchmark C23:0 methyl ester.

21.1. The method of making the determination, the type of apparatus used and the method of drawing up the test report is consistent with the state of the art described, in particular, in the Polish standard implementing standard EN 15779.

21.2. The precision of the method referred to in paragraph 21 is consistent with the state of the art, as described, in particular, in the Polish Standard implementing standard EN 15779.

22. Cold filter plugging point (CFPP) is determined with the following method:

1) constituting the aspiration of the test sample through a standardised filter into the pipette under controlled negative pressure and at a temperature reduced in steps of 1 °C, until the flow stops or slows down so that the filling time of the pipette exceeds 60 seconds or the fuel does not flow completely into the measuring vessel, or

2) aspirating the test sample through a standardised mesh filter into a pipette under controlled negative pressure of 2 kPa and at a temperature lowered in 1 °C decreased in a linear manner in a cooling bath until the flow time is stopped or slowed down so that the pipette filling time exceeds 60 seconds or the fuel does not flow completely into the measuring vessel.

22.1. For the determination of cold filter plugging point (CFPP) with the method referred to in paragraph 22(1):

1) the method of making the determination, the type of apparatus used, the method of preparing the sample, the method of reporting the results and the method of drawing up the test report are consistent with the state of the art described, in particular, in the Polish standard implementing EN 116 standard;

2) the precision of the method is consistent with the state of the art, as described, in particular, in Annex A to the Polish standard implementing standard EN 14214+A2:2019-05.

22.2. For the determination of cold filter plugging point (CFPP) with the method referred to in paragraph 22(2):

1) the method of determination, reagents and materials used, the type of apparatus used, the method of sampling and preparation of the sample, the method of reporting the results, as well as the method of drawing up the test report are consistent with the state of the art, as described, in particular, in the Polish Standard implementing standard EN 16329;
2) the precision of the method is consistent with the state of the art, as described, in particular, in Annex A to the Polish standard implementing standard EN 14214+A2:2019-05.

23. The opacity temperature is determined with the method of measuring the temperature of the chilled test sample at a specified rate in the cooling bath and observing the appearance of this sample.

23.1. The temperature at which cloudiness at the bottom of the test sample is observed is taken as the cloud point of the sample.

23.2. The method of making the determination, the type of apparatus used and the method of drawing up the test report are consistent with the state of the art described, in particular, in the Polish Standard implementing EN ISO 3015.

23.3. The precision of the method referred to in paragraph 23 is consistent with the state of the art, as described, in particular, in Annex A to the Polish Standard implementing standard EN 14214+A2:2019-05.

III. Quality test methods for liquid biocarbons intended for the manufacture of liquid fuels or liquid biofuels used for spark ignition engines

1. The sulphur content, oxidative stability, content of resins present (after solvent washing), copper corrosion test (3 h at 50 °C), fractional composition, and benzene content is determined by the test methods for motor gasoline specified in the regulations issued pursuant to Article 26(1) of the Act of 25 August 2006 on the system of monitoring and controlling fuel quality (Journal of Laws of 2025, item 1529).
2. The total content of impurities is determined by a gravimetric method by filtering the known volume of fuel through a pre-weighted membrane filter.

2.1. The mass of molecular impurity is determined by increasing the mass of the membrane filter relative to the control filter.

2.2. The method of testing, reagents and materials used, the type of apparatus used, the method of sampling and preparation of samples, the method of preparation of apparatus, the method of determination, calculation and reporting of results, as well as the method of drawing up the test protocol are consistent with the state of the art, as described, in particular, in ASTM D 5452.

2.3. The precision of the method referred to in paragraph 2 is consistent with the state of the art, as described, in particular, in ASTM D 5452.

3. The total halogen content is determined by the oxidative microcoulometry method, which involves injecting the sample into the heated zone of the pyrolyser tube, where it is vaporised; the combustion products, together with the halogenated hydrocarbons, are passed in dispersed form through a sulphuric acid scrubber, introduced into a coulometric vessel and titrated with electrolytically generated silver ions.

3.1. Indications of the microcoulometer are checked using liquid organic compounds.

3.2. The method of performing the test, reagents and materials used, the type of equipment used, the method of sampling and sample preparation, the method of equipment preparation, the method of performing the determination, the calculation and reporting of results, as well as the method of preparing the test report are consistent with the current state of knowledge, described, in particular, in the Polish Standard implementing EN 14077.

3.3. The precision of the method referred to in paragraph 3 is consistent with the state of the art, as described, in particular, in the Polish Standard implementing standard EN 14077.

IV. Quality test methods for liquid biocarbons intended for the manufacture of liquid fuels or liquid biofuels used for compression-ignition engines

1. The density at 15 °C, sulphur content, polycyclic aromatic hydrocarbons content, flash point, total content of impurities, copper corrosion test, and fractional composition (temperature to which 95 % (V/V) distils) is determined by the test methods for diesel fuel specified in the regulations issued pursuant to Article 26(1) of the Act of 25 August 2006 on the system of monitoring and controlling fuel quality.

V. Criteria consistent with the current state of knowledge, in particular, those described in the Polish Standard implementing EN ISO 4259-2, are used to interpret the test results.

Annex 6

METHOD OF SAMPLING FOR BIOETHANOL (ETHANOL AS A COMPONENT OF MOTOR GASOLINE), METHYL ESTER, LIQUID BIOHYDROCARBONS FOR THE PRODUCTION OF LIQUID FUELS OR LIQUID BIOFUELS USED FOR SPARK-IGNITION ENGINES, LIQUID BIOHYDROCARBONS FOR THE PRODUCTION OF LIQUID FUELS OR LIQUID BIOFUELS USED FOR COMPRESSION-IGNITION ENGINES

1. Samples are taken by hand from the container or unit pack when the contents are at rest, and samples of bioethanol (ethanol as a component of motor gasoline) are taken by hand consistent with the state of the art, as described, in particular, in the Polish Standard implementing standard EN ISO 3170. Due to the hygroscopic properties of ethanol, special attention should be paid during sampling to the fact that the sample may be contaminated with moisture from the air or the sampler.
2. Samples are taken from the container to obtain representative samples in order, from the liquid surface to the bottom, so as to avoid disturbances in the lower levels of the liquid.
3. Samples from the unit packet are taken from the selected liquid level or as a cross-sectional sample, representative of the entire volume of the packet.
4. Samples are taken using appropriate sampling devices.

4.1. Sampling instruments meet at least the requirements consistent with the current state of knowledge, as described, in particular, in:
   1) the Polish standard implementing standard EN ISO 3170 for bioethanol (ethanol as a component of motor gasoline);
   2) the Polish Standard implementing EN ISO 3170 or the Polish Standard implementing EN ISO 3171 for methyl ester;
   3) the Polish Standard implementing EN ISO 3170 or the Polish Standard implementing EN ISO 3171 for liquid biocarbons.

5. Samples are collected into appropriate containers.

5.1. Containers for samples of:
   1) bioethanol (ethanol as a component of motor gasoline) should be made of glass or plastics that are chemically inert to bioethanol (e.g. HTPE, PET);
   2) methyl ester should be made of chemically inert materials, such as stainless steel, plastics, or dark glass, and in cases where a visual assessment of the sample is performed – of clear glass; for sampling for total impurities content, glass

containers with a wide-neck, made of brown or clear glass, should be used, equipped with a cover protecting against direct sunlight during transport and storage;

3) liquid biohydrocarbons should be:

   a) glass, including those made of brown glass or colourless borosilicate glass, with a cover protecting against direct sunlight during transport and storage, or

   b) metal

   – made of lead-free material.

5.2. Containers intended for samples should:

1) have a maximum capacity of 5 dm3 for bioethanol (ethanol as a component of motor gasoline), methyl ester and liquid biohydrocarbons; sample containers for testing solid impurities in methyl esters should have a capacity of 0,5 l or 1 l, and caps; the amount of sample necessary for determination should be considered;
2) be fitted with seals or have tight connections that can withstand internal pressures arising during normal operation;
3) be capable of securing the sample with a seal.

5.3. Containers intended for samples may not be protected against corrosion by means of petroleum-based products.

5.4. Containers intended for samples should have a tight seal; it is permissible to use a cap with a matching cap that is resistant to the effects of the bio-component being collected; the cap must not be made of cork or rubber.

6. Sampling devices and containers intended for samples should be made of materials that are chemically inert with respect to the sampled biocomponent.

7. A container intended for the sample:

1) for bioethanol (ethanol as a component of motor gasoline), methyl ester or liquid biohydrocarbons, is filled so that at least 5% of the free space remains for expansion of the product; the sample taken is kept liquid and the degree of filling of the sample container should guarantee its safe transport and use; the sample container for testing the total impurities in methyl esters is filled to 80-85% of its capacity;
2) is closed immediately after being filled with the biocomponent, using a closure that ensures the preservation of the sample's quality properties.

8. The tightness of the sealed container for sampling liquid biocomponents should be checked by turning the container upside down and keeping it in this position for 30 seconds. In the event of a liquid biocomponent leak, the container closure should be replaced with a new one and its tightness is to be checked again.

8.1. In the event of a continuous leakage of the biocomponent, the sample is re-collected using a new container with a new closure, and then the integrity of the container and its closure is re-assessed.

9. The sampling procedure, sample handling and safety requirements in this regard meet at least the requirements consistent with the current state of knowledge, as described, in particular, in:
    1) the Polish standard implementing standard EN ISO 3170 for bioethanol (ethanol as a component of motor gasoline);
    2) the Polish Standard implementing EN ISO 3170 or the Polish Standard implementing EN ISO 3171 for methyl ester;
    3) the Polish Standard implementing EN ISO 3170 or the Polish Standard implementing EN ISO 3171 for liquid biocarbons.

9.1. In the case of sampling for the total content of impurities in methyl esters, the method of preparation of sample containers and the procedure for taking samples for testing are consistent with the state of the art described, in particular, in the Polish Standard implementing standard EN 12662-2.