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	IN	Aviation Fuel OBR 91UL	ed. VII

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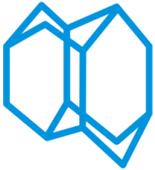
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**I am approving for applying
From 20.08.2014**

Stanisław Bartuś

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(Director of the Company)

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1. The scope of TS

The scope of TS is aviation fuel OBR 91 UL, which is the mixture of hydrocarbon compounds, derived from conservative and secondary processes of the crude petroleum and appropriate antioxidant and antistatic additives.

Requirements concerning the scope of TS were formulated on the basis standard ASTM D 7547.

2. The application of TS

The aviation fuel is applied for air piston engines.

The product meets the requirements of standard ASTM D 7547.

3. The division and designation

The division – does not apply

Designation – Aviation fuel OBR 91UL.

4. Requirements and research

4.1 General requirements

The Producer is obliged to publish the name and quantity of the added additives in issued quality certificate. The aviation fuel OBR 91 UL shall be produced in accordance with the explicitly settled technology.

4.1.1. Antioxidant additives

Antioxidant additives prevent from formulating gums and other oxidizing products.

The content of the additives expressed in mass of the active element shall not exceed 12,0 mg/L of the fuel. There is used BHT as the antioxidizing additive (2,6 – ditertiary butyl-4-methylphenol).

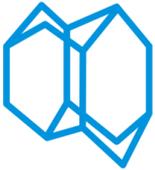
4.1.2. Antistatic additives

Antistatic additives prevent from making static electricity during pumping and fueling.

There is applicable STADIS 450 as the antistatic additive, the concentration of the additive in fuel shall not exceed 3,0 mg/liter.

4.1.3. Stability

The aviation fuel meets the requirements of TS within two years from the date of production on condition of proper storing.

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4.1.4. Packaging, storage and transport

The aviation fuel OBR 91 UL is supplied in specific tank trucks, isotanks or in steel drums allowed to transport aviation fuel.

The package in which the fuel will be transported must be checked if it is clean, dry and unharmed.

In case of tanks, on each packaging unit, in shipping documents shall be permanently placed designation including:

- The name of the fuel
- The quantity of the fuel in package
- The production date and batch number
- Warning of fire hazard and Health and Safety at work
- The code of supply contract, if required

The fuel shall be stored in packages protecting the fuel from the access of air, humidity and mechanical contamination. In places protected from direct influence of sunbeams, heating (the underground containers with limited air exchange). This restriction is made to limit both the losses associated with evaporation and losses of the lightest components, what will cause the change of two key parameters of the fuel: reid vapour pressure and fractional composition.

On the tanks there shall be placed the informational table with identification number of ADR hazards and identification number of material UN.

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1203

4.2 Detailed requirements

4.2.1. Research

For each portion of aviation fuel (after finishing the composing) shall be made following analyses in accordance with the table of detailed requirements:

- Appearance,
- Colour,
- Fractional composition,
- Density at 15 °C,
- Reid vapour pressure at 37,8 °C,
- Freezing point,
- Electrical conductivity at 20 °C,
- Motor Octane Number,
- Research Octane Number,
- Oxidation Stability at 100°C, through 16 hours,
- Total Sulphur,
- Lead content,
- Specific energy,
- Corrosion copper strip,

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- Water Reaction.

Standards and requirements for above determinants are specified in the table of detailed requirements.

4.2.2. Visual examination of Appearance

The product shall be poured into glass barrel made of colourless glass with diameter from 40 mm to 50 mm, and next shall be visually examined in the light traversing through appearance of product.

The research shall be made at $20 \pm 5^\circ\text{C}$. The fuel meets the requirements if while the research the fuel is colourless liquid free from solid matter, turbidity and water.

4.2.3. Sampling

The sample shall be taken from connection pipe of circulating pump after finishing the mixing (the mixing time: min. 4 hours) in quantity around 3 liters for incomplete research and 5 liters to total extent of TS, to the bottle made from amber glass. In three bottles shall be left around 50 cm^3 of air because of liquid expandability.

Two of the bottles shall be filled up to $0,8 \text{ dm}^3$ (assigned for pressure analysis).

4.2.4. Table of detailed requirements for aviation fuel OBR 91UL

Nr	Property	Units	Limits	Method
1	Appearance	-	Meets the requirements	ASTM D 4176-4 WT-06/OBR PR/PD/66 p. 4.2.2.
2	Colour	-	Colourless Natural	Visual examination
3	Knock Rating: - Motor Octane Number MON - Research Octane Number, RON	-	Min 91 Min 96	ASTM D2700 ASTM D 2699
4	Distillation: - Initial Boiling Point	$^\circ\text{C}$	Report	ASTM D 86
	10 vol %	$^\circ\text{C}$	Max 75	
	40 vol %	$^\circ\text{C}$	Min 75	
	50 vol %	$^\circ\text{C}$	Max 105	

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	90 vol %	°C	Max 135	
	Final Boiling Point	°C	Max 170	
	Productivity	% (v/v)	Min 97	
	Residue	% (v/v)	Max 1,5	
	Loss	% (v/v)	Max 1,5	
	Sum of 10% + 50% evaporated temperatures	°C	Min 135	
5	Total sulphur	% m/m	Max 0,05	ASTM D 2622
6	Density at 15°C	kg/m ³	Report	ASTM D 4052 ASTM D 1298
7	Lead Content	g/L	Max 0,013	ASTM D 3237 ASTM D 5059 meth. C
8	Specific energy	MJ/kg	Min 43,5	ASTM D 4529 ASTM D 3338
9	Freezing point	°C	Max (-58)	ASTM D 2386
10	Corrosion copper strip, through 2 hours at 100 °C	Corrosion level	Max 1	ASTM D 130
11	Water Reaction -volume change	ml	Max ± 2	ASTM D 1094
12	Electrical conductivity at 20 °C	pS/m	50 ÷ 450	ASTM D 2624
13	Reid vapour pressure at 37,8 °C	kPa	38 ÷ 49	ASTM D 5191 ASTM D 323
14	Oxidation Stability at 100 °C, through 16 hours - Potential Gum	mg/100 ml	Max 6	ASTM D 873

THE END

ADDITIONAL INFORMATION

The Institution responsible for formulating TS:

OBR Joint Stock Company.