	OBR J.S.C.	TECHNICAL SPECIFICATION	WT-06/OBR PR/PD/60
	IN	<b>Aviation Fuel B 91/115</b>	ed. VII

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### 1. The scope of TS

The scope of TS is aviation fuel, which is the mixture of hydrocarbon compounds, derived from conservative and secondary processes of the crude petroleum.

To the composition of the aviation can be added antiknock, antistatic, antioxidant, anticorrosive and dyeing additives.

Requirements concerning the scope of TS were formulated on the basis of the requirements of the standard GOST 1012-72.

### 2. The application of TS

The aviation fuel is applied for air piston engines. The product meets the requirements of standard GOST 1012-72, in the scope of tested parameters.

### 3. The division and designation

The division – does not apply

Designation – Aviation fuel B 91/115.

### 4. Requirements and research

#### 4.1 General requirements


The Producer is obliged to add to the aviation fuel dyeing and antiknock additives. There may be used also other additives specified in this TS. The Producer is obliged to publish the name and quantity of the added additives in issued quality certificate. The aviation fuel shall be produced in accordance with the explicitly settled technology.

#### 4.1.1. Antiknock additives

Tetraethyl lead shall be present and added in the form of an antiknock mixture containing not less than 61% (m/m) of tetraethyl lead and the same amount of ethylene dibromide to provide two atoms of bromine per atom of lead. As the antiknock additive there is used the ethyl liquid TEL-B from Innospec / Alcor company.

#### 4.1.2. Dyeing additives

The aviation fuel shall contain the identifying additive dyeing into green (fat-soluble: green 6 Ž lipid – or anthraquinone green lipid-soluble) in quantity 6 mg/kg of fuel.

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#### 4.1.3. Antioxidant additives

Antioxidant additives prevent from formulating gums and other oxidizing products, as well as knocking out the lead compounds.

The content of the additives expressed in mass of the active element shall not exceed 24,0 mg/l of the fuel. There is used BHT as the oxidizing additive (2,6 – ditertiary butyl-4-methylphenol).

#### 4.1.4. Antistatic additives

Antistatic additives prevent from formulating 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.

#### 4.1.5 Anticorrosive additives

Anticorrosive additives may be implemented into fuel to prevent the corrosion of storage containers as well as airplanes' fuel systems.

As the anticorrosive additive there is applicable HITEC 480, its concentration in the fuel shall not exceed 22,5 mg/l.

#### 4.1.6 Stability

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

#### 4.1.7. Packaging, storage and transport


The aviation fuel B 91/115 is supplied in specific tank trucks, isotanks and 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 use-by-date
- 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

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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.

33  
1203

## 4.2 Detailed requirements

### 4.2.1. Research

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

- Appearance,
- Colour,
- Motor Octane Number,
- Fractional composition,
- Total Sulphur,
- Lead content and tetraethyl lead content,
- Density at 15 °C,
- Specific energy,
- Freezing point,
- Corrosion copper strip,
- Existent Gum,
- Reid vapour pressure at 37,8 °C,
- Iodine number,
- Aromatic hydrocarbons content,
- Reaction of the water extract,
- Acidity,
- Marking the resistance to oxidation – method of induction period.


The determination of Performance Number shall be made every half a year.

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 ±5°C. The fuel meets the requirements if while the research the fuel is colourless liquid free from solid matter, turbidity and (undissolved )water.

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#### 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 in quantity around 5 liters for total research, to the bottle made from amber glass. In three bottles shall be left around 50 cm<sup>3</sup> of air because of liquid expandability.

Two of the bottles shall be filled up to 0,8 dm<sup>3</sup> (assigned for pressure analysis).

#### 4.2.4. Table of detailed requirements for aviation fuel B 91/115

Test	Property	Units	Limits	Method
1	Appearance	-	Meets the requirements	WT-06/OBR PR/PD/60 p.4.2.2. ASTM D 4176-04
2	Colour	-	Green	Visual examination
3	Knock Rating: - Motor Octane Number MON - Performance Number *	- - -	Min 91 Min 115	PN-EN 25163 ASTM D2700/IP236 ASTM D 909/IP119
4	Distillation: - Initial Boiling Point	°C	Min 40	PN-EN ISO 3405 ASTM D 86
	10 vol %	°C	Max 82	
	50 vol %	°C	Max 105	
	90 vol %	°C	Max 145	
	97,5 vol %	°C	Max 180	
	Residue	% (v/v)	Max 1,5	
	Loss	% (v/v)	Max 1,5	
5	Total sulphur	mg/kg	Max 300	ASTM D 2622 ASTM D 5453
6	Lead Content	g Pb/L	Max 1,60	PN-92/C-04195 ASTM D 5059
	Tetraethyl lead content	g CEO/kg	Max 2,5	GOST 1012 p. 2.4
7	Density at 15°C	kg/m <sup>3</sup>	Report	PN-EN ISO 3675 PN-EN ISO 12185 ASTM D 4052

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8	Specific energy	MJ/kg	Min 42,947	ASTM D 4529
9	Freezing point	°C	Max (-60)	ASTM D 2386/IP16 ASTM D 7153
10	Corrosion copper strip, through 2 hours at 100 °C	Corrosion level	Max 1	PN-EN ISO 2160 ASTM D 130/IP154
11	Existent Gum	mg/100 ml	Max 3	PN-EN ISO 6246 ASTM D 381/IP131
12	Iodine Number	G J <sub>2</sub> /100g	Max 2,0	PN-82/C-04068
13	Aromatic hydrocarbons content	% m/m	Max 35	ASTM D 1319 PN-EN 15553
14	Reid vapour pressure at 37,8 °C	kPa	29,3 - 48,0	PN-EN 13016-1 ASTM D 5191
15	Reaction of the water extract	-	Neutral	PN-84/C-04064
16	Acidity	mg KOH/ 100 cm <sup>3</sup>	Max 0,3	PN-85/C-04066
17	Marking the resistance to oxidation – method of induction period	Hour	Min 12	PN ISO 7536/Ap1

\*Test of performance number shall be made every half a year.

THE END

ADDITIONAL INFORMATION

The Institution responsible for formulating TS:

OBR J.S.C.