LUKOIL NEFTOCHIM - BOURGAS - AD	COMPANY SPECIFICATION	FTS 1.5:2001
	TURBINE FUEL JET A-1	Supersedes TS 1.5 – 99
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1. FIELD OF APPLICATION

This Company specification applies to Turbine Fuel JET A-1, produced from directly distilled kerosene fractions, from kerosene fraction improved by hydroprocessing, by hydrocracking, or by hydrogenation, or by blending directly distilled and improved kerosene fractions at definite ratios. The contents of the improved components, as volume percentage, is obligatory to indicate in the Quality Certificate issued by the manufacturing refinery.

2. SPECIFICATION REQUIREMENTS AND TEST METHODS

The Turbine Fuel JET A-1 complies with Issue No.18 (November 1999) of the Unified Fuel Exploitation Systems for the JET A-I fuel (AFQRJOS), and covers the requirements of the below listed standards:

- DEF STAN 91-91 [Issue 3 (DERD 2494)] 12 November 1999;
- ASTM D 1655-99 for Turbine Fuels JET A1.

The fuel must conform to the requirements specified in the table below:

No.	PROPERTIES	VALUE	STANDARD REQUIREMENT	TEST METHOD
1.	**APPEARANCE**		Clear, transparent, free from mechanical impurities and insoluble water at ambient temperature	
2.	**COMPOSITION**			
2.1	Acidity, not higher than	mg KOH/g	0.015	ASTM D 3242-93
2.2	Aromatics, not more than	vol. %	25.0	ASTMD 1319-95
2.3	Total sulfur, not more than	wt. %	0.30	ASTM D 4294-95
2.4	Mercaptan sulfur, not more than	wt. %	0.0030	ASTM D 3227-96
	OR Doctor test[1)]		negative	ASTM D 4952-96
2.5	Hydroprocessed fuel in batch	vol. %	Record (incl. “nil” or 100%)	
2.6	Hydrocracking components	vol. %	Record (incl. “Nil” or 100%)	

IN FORCE AS OF:

No.	PROPERTIES	VALUE	STANDARD REQUIREMENT	TEST METHOD
3.	**VOLATILITY**			
3.1	Distillation range - initial boiling point (IBP)	°C	To be determined, not standardized	ASTM D 86-96
	- 10 vol. % recovered at a temperature not higher than	°C	205	
	-50 vol. % recovered at a temperature	°C	To be determined, not standardized	
	-90 vol. % recovered at a temperature	°C	To be determined, not standardized	
	- final boiling point (FBP), not higher than	°C	300	
	- Distillation residue, not more than	vol. %	1.5	
	- Distillation loss, not more than	vol. %	1.5	
3.2	Flash point, not lower than	°C	40	ASTM D 56-97a
3.3	Density at 15°C	kg/m^3	775 - 840	ASTMD 1298-90 ASTM D 4052-96
4.	**FLUIDITY**			
4.1	Clouding point, not higher than	°C	minus 47	ASTMD 2386-97
4.2	Kinematic viscosity at minus 20°C, not higher than	mm^2/s	8.0	ASTM D 445-97
5.	**COMBUSTION**			
5.1	Gross specific combustion heat [2)], not less than	MJ/kg	42.8	ASTM D 4809-95 ASTM D 4529-95
5.2	Smoke point, not less than	mm	25	ASTMD 1322-97
	OR Smoke point, not less than AND Naphthalenes, not more than	mm vol. %	19 3.0	ASTM D 1,322-97 ASTMD 1840-96
6.	**CORROSION**			
	Copper Strip corrosion (2 hours at 100°C), not higher than	*bale*	1	ASTMD 130-94
7.	**STABILITY**			
7.1	Thermal Stability (JFTOT) at 260°C			ASTMD 324 1-97

No.	PROPERTIES	VALUE	STANDARD REQUIREMENT	TEST METHOD
	Filter Pressure Differential , not higher than	mm Hg	25.0	
	Tube Deposits Rating, not higher than	*bale*	3, with no multicolor spectrum (P) or other non characteristic coloration (A)	visual
8.	**CONTAMINANTS**			
8.1	Existent gum, not more than	mg/100 cm^3	7	ASTMD381-94
8.2	Water Separation Characteristics: water reaction interface, not higher than	*bale*	1b	AST MD 1094-97
	modified index (MSEP) - antistatic graft fuel, not less than - fuel with no antistatic graft, not less than		 70 85	AST MD 3948-93
9.	**CONDUCTIVITY**			
9.1	Specific electric conductivity[4)]	pS/m	50 - 450	AST MD 2624-95
10.	**LUBRICATING ABILITY** [5)]			
10.1	Occlusion circle diameter (BOCLE), not higher than	mm	0.85	AST MD 5001
11.	**GRAFTS** (inclusion of grafts admissible only for grafts approved by DEF STAN 91-91/3)			
11.1	Antioxidizing[6)] in hydroprocessed fuels (obligatory) in non hydroprocessed fuels (not obligatory), not more than	mg/dm^3	 17-24 24	
11.2	Metal deactivating agent (MOA)[7)] (not obligatory), not more than	mg/dm^3	5.7	
11.3	Antistatic (obligatory) first dose Stadis 450, not more than second dose [8)]	mg/dm^3	 3.0	

The antioxidizing grafts are obligatory for hydroprocessed fuels and must be added immediately following purification.
The type and the concentration of all grafts used, including at “Nil” doses must be recorded in the Quality Certificate issued by the refinery, as well as in other quality documents.
Corrosion inhibitor/lubricating graft is not admissible unless by joint agreement of all members of the United System (AFQRJOS).
Antifrost inhibitor for the combustion system is not admissible unless by joint agreement of all members of the Unified System (AFQRJOS).

NOTES TO THE TABLE:

1) The Doctor test is an alternative assay for detecting mercaptan sulfur. In the event of discrepancies between the results from the "mercaptan sulfur test" and the "Doctor test" the results from the "mercaptan sulfur test" shall be accepted.
2) The ASTM D 4809 method is an arbitrary method.
3) The standard limit values are applicable at the production site. Changes in the MSEP values are indicative of fuel contamination during transport and may be the ground for initiating investigations, but not for refusing the fuel.
4) The standard limit values for specific electric conductivity apply at the destination site, at the temperature and at the time of receipt by the customer.
5) The lubricating ability, in accordance with Issue 18 (November 1999) of the Unified Fuel Exploitation Systems for the JET A1 (AFQRJOS) fuel, shall be determined only for fuels, containing more than 95% hydroprocessed components, with at least 20% of those being the product of hydrocracking. The fuel manufactured by LUKoil Neftochim- Bourgas - AD is a 100% hydroprocessed kerosene fraction free of hydrocracking components and therefore this criterion is not subject to testing.
6) The approved antioxidizing grafts are listed under Annex A. 1.4 of the DEF STAN 91-91/3 along with their respective registration numbers RDE/A/, which needs to be indicated in the Certificate of Analysis, issued by the manufacturer.
7) The approved metal deactivation agents are listed under Annex A.2.2 of the DEF STAN 91-91/3. Annex A 2 1 specifies the necessity for determining the thermal stability before and after the addition of the metal deactivation agent in the cases when metal contamination of the JET A1 fuel by any of the metals listed under that Annex has failed to be confirmed.
8) Limit values for a second dose of an antistatic graft:

- Additional Stadis 450 concentration (RDE/A/ 621)	2.0 mg/dm^3
- total concentration, not more than	5.0 mg/dm^3

3. ACCEPTING AND SAMPLING PROCEDURES

3.1. The Turbine Fuel JET A-1 shall be accepted by individual batches (item 2.1 as per Bulgarian State Standard (BSS) 11035-81)

3.2. Sampling must be carried out in accordance with the requirements set forth in the BSS ISO 3170-98.

4. PACKAGING, LABELING, STORAGE AND TRANSPORT

4.1. Packaging, labeling storage and transportation of the Turbine Fuel JET A-1 must conform to the BSS 11035-81. Only tankers, pipelines and tank lorries, or other vessels, used solely for the Turbine Fuel JET A-1 may be used.

Each individual package must be marked with the "Toxic" and "Flammable" symbols according to the BSS 16114 85.

4 2. Transportation shall be carried out observing the rules for transporting flammable goods.

4.3. The manufacturer guarantees that quality of the Turbine Fuel JET A-1 is in conformity with the requirements under this specification, subject to the condition that the transportation and storage requirements established by the BSS 11035-81 are observed.

5. DOCUMENTATION

5.1. Each separate batch of the Turbine Fuel JET A-1, intended for delivery must be accompanied by a Quality Certificate, stating the following:

- Name of the manufacturing company;
- Name of the product;
- Tank number;
- Quality Certificate Number and date of issue;
- Test results under Section 2;
- Signature of the Head of the Laboratory;
- FTS 1.5:2001;
- the OK symbol.

5.2 Each lorry tank must be accompanied by a ticket (computer print outs), which must contain the following data:

- Name of the product;
- Tank number;
- Quality Certificate Number and date of issue;
- Lorry tank number the ticket is valid for;
- FTS 1.5:0.2001.

END