Jet A-1

Refª.: FEC-COM-JET.01.IN

DESCRIPTION:

Aviation Kerosene – Turbine fuel – that conforms to AFQRJOS – Aviation Fuel Quality Requirements for Jointly Operated Systems – Issue 30 and DEF STAN 91-91 - Turbine Fuel, Aviation Kerosine Type, Jet A-1, Issue 10.

Property	Unity	Limits Oficial Specification		Method Test
		Min	Max	
Appearance				
Visual appearance		Clear, bright and visually free from solid matter and un-dissolved water at ambient fuel temperature		Visual ASTM D 4176 – Proc.1 (Anexo F.1 da DEF STAN 91-091/10)
Colour	-	Report		ASTM D 156; ASTM D 6045
Partículate contamination[1]	mg/l	-	1.0	IP 423; ASTM D 5452
Particulate cumulative channel particle counts, ISO Code & Individual Channel Counts [2]	Individual Channel Counts e ISO Code [3]			IP 564; IP 565; IP 577
≥ 4 µm(c)	-	Report		
≥ 6 µm(c)	-	Report		
≥ 14 µm(c)	-	Report		
≥ 21 µm(c)	-	Report		
≥ 25 µm(c)	-	Report		
≥ 30 µm(c)	-	Report		
Composition				
Total acidity	mg KOH/g	-	0.015	IP 354; ASTM D 3242
Hydrocarbon aromatics				
Aromatics	% v/v	-	25.0	IP 156; ASTM D 1319
or Total Aromatics	% v/v		26.5	IP 436; ASTM D 6379
Sulphur, total	% m/m		0.30	ASTM D 1266; IP 336; ASTM D 2622; ASTM D 4294; ASTM D 5453; IP 107; IP 243; IP 373; IP 447

COMPOSITION:

Complex hydrocarbon combination, derived from crude oil. It consists mainly of hydrocarbons with C_9 to C_{16} carbon atom chains. It may contain additives.

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Property	Unity	Limits Oficial Specification		Method Test
		Min	Máx	
Sulphur, mercaptan	% m/m	-	0.0030	IP 342; ASTM D 3227
Or Doctor Test		Negative		IP 30; ASTM D 4952
Refinery Components at point of manufacture[3]				
Non Hydroprocessed Components	% v/v		Report (incl "nil" or 100%)	
Midly Hydroprocessed Components	% v/v		Report (incl "nil" or 100%)	
Severely Hydroprocessed Components	% v/v		Report (incl "nil" or 100%)	
Synthetic Components	% v/v		Report (incl "nil" or 50%)	Limits in Anexo B of DEF STAN 91-091/10
Incidental Materials				
Fame	mg/kg		50.0	IP 585; IP 590; IP 583; IP 599; ASTM D 7797
Volatility				
Distillation				IP 123; ASTM D 86; IP 406; ASTM D 2887; ASTM D 7345
Initial Boiling Pont	ºC	Report		
10% v/v recovered	ºC	-	205.0	
50% v/v recovered	ºC	Report		
90% v/v recovered	ºC	Report		
End Point	ºC	-	300.0	
Residue	% v/v	-	1.5	
Loss	% v/v	-	1.5	
Flash Point	ºC	38.0	-	IP 170; IP 523; ASTM D 3828; ASTM D 56
Density at 15ºC	kg/m^3	775.0	840.0	IP 365; ASTM D 4052; IP 160; ASTM D 1298
Fluidity				
Freezing Point	ºC	-	-47.0	IP 16; ASTM D 2386; IP 435; ASTM D 5972; IP 528; ASTM D 7153; IP 529; ASTM D 7154
Viscosity at -20º C	cSt (mm^2/s)	-	8.000	IP 71; ASTM D 445; ASTM D 7042
Combustion				
Specific Energy, net	MJ/kg	42.80	-	ASTM D 1338; ASTM D 4809; IP 12 e IP 355
Smoke Point or	mm	25.0	-	IP 598; ASTM D 1322
Smoke Point and	mm	18.0	-	IP 598; ASTM D 1322

Property	Unity	Limits Official Specifications		Method Test
		Min	Max	
Naphthalens		-	3.00	ASTM D 1840
CORROSION				

Corrosion, Copper strip, classification (2h +/- 5 min at 100ºC +/-1ºC)	Classe	-	1	IP 154; ASTM D 130
STABILITY				
Thermal Stability (JFTOT)				IP 323; ASTM D 3241
Control temperature	ºC	260	-	- -
Filter Pressure Diferential	mmHg	-	25	
One of the following requirements shall be met: Annex B (VTR)	-	Less than 3 no 'Peacock' or 'Abnormal' colour deposits		-
Annex C (ITR) or Annex D (ETR), average over area of 2,5mm^2	nm	-	85	-
CONTAMINANTS				
Existent Gum,	mg/100ml	-	7	IP 540; ASTM D 381
Microseparometer (MSEP), rating[4]	Classification			ASTM D 3948
Fuel with Static Dissipator Additive (SDA) or		70	-	-
Fuel without Static Dissipator Additive (SDA)		85	-	-
CONDUCTIVITY				
Electrical Condutivity	pS/m	50	600	IP 274; ASTM D 2624
LUBRICITY				
BOCLE wear scar diameter	mm	-	0.85	ASTM D 5001
ADDITIVES (Names and aproval code from DEF STAN 91-091/10 should be quoted on Quality certificates).	For additional informations about additives, see the Annex A of DEF STAN 91-091/10			
Antioxidant				
In hydroprocessed and synth. Fuels (Mandatory)	mg/l	17.0	24.0	-
In non-hydroprocessed fuels (opcional)		-	24.0	-
Metal Desactivador (opcional)				

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Property	Unity	Limits Official Specifications		Method Test
		Min	Max	
First Doping	mg/l	-	2.0	-
Cumulative concentration after field-re-doping	mg/l	-	5.7	-
Static Dissipatdor[5]				
First Doping	mg/l	-	3.0	-
Cumulative concentration after field-re-doping	mg/l	-	5.0	-

[1] This limit shall apply at point of manufacture only. For more information on particulate contamination refer to Annex F of DEF STAN 91-091 Issue 10. For guidance on contamination limits for into-plane fuelling refer to 7th Edition IATA Guidance Material (Part III).

[2] This requirement shall apply at point of manufacture only. Both the number of particles and the number of particles as a scale number as defined by Table 1 of ISO 4406 shall be reported. It is the Specification Authority's intention to replace the gravimetric Milipore test with Particle Counting at the earliest opportunity.

[3] The need to report the % v/v of non-hydroprocessed, midly hydroprocessed, severely hydroprocessed and synthetic components (including "nil", "50%" or "100%" as appropriate) on refinery certificates of Quality for Jet A-1 to Check List derives from DEF STAN 91-091/10.

[4] Where SDA is added at the point of manufacture the MSEP limit of 70 shall apply. No precision data are available for fuels containing SDA; if MSEP testing is carried out during downstream distribution, no specification limits apply and the results are not be used as the sole reason for rejection of a fuel. A protocol (Bulletin 65) giving guidelines on possible actions to be taken following failed MSEP.

[5] When the original dosage of additives is unknown, it has to be assumed the first doping was applied at maximum dose rate. The methods IP 568 or ASTM D 7524 are adequated for the determination of Stadis 450/Av Guard SDA at the point of manufacture.