Jet A/Jet A-1

Synonyms: Aviation Turbine Fuel (Kerosene Type)
Turbo Fuel A/Turbo Fuel A-1

Reference ID

A petroleum distillate blended from kerosene fractions and used in civil aviation. Jet A-1, the operational fuel for all turboprop and turbojet aircraft requiring a low freezing point product, is similar to Jet A except for a lower freezing point.

Data from Shell 1999 were taken from MSDS Number 142-012.

The sample analyzed by ESD was Jet A-1, collected in the summer of 1998 at the MacDonald-Cartier International Airport in Ottawa, Ontario.

For additional fuel specifications refer to ASTM D1655.

API Gravity

41.8	ESD 98

Equation(s) for Predicting Evaporation

$\%Ev = (0.59 + 0.013T)\sqrt{(t)}$

Where %Ev = weight percent evaporated; T = surface temperature (°C); t = time (minutes)

ESD 98

Sulphur (weight %)

Evaporation (weight %)		
0	0.03	ESD 99
12	0.03	
23	0.04	
37	0.06	

Water Content (weight %)

Evaporation (weight %)		
0	<0.1	ESD 99
12	<0.1	
23	<0.1	
37	<0.1	

Flash Point (°C)

Evaporation (weight %)		
0	>38	Shell 99a
	54	ESD 98
12	66	
23	71	
37	76	

Flammability Limits in Air (volume %)

0.7 to 5	Shell 99a

Ignition Temperature (°C)

210	Shell 99a

Reid Vapour Pressure (kPa)

>1	Shell 99a

Density (g/mL)

Evaporation (weight %)	Temperature (°C)		
0	0	0.8269	ESD 98
	15	0.8159	
		0.775 to 0.840	Shell 99a

Jet A/Jet A-1

Density (g/mL)

Evaporation (weight %)	Temperature (°C)		Reference ID
0	25	0.8086	ESD 98
12	0	0.8303	
	15	0.8193	
	25	0.8120	
23	0	0.8327	
	15	0.8216	
	25	0.8145	
37	0	0.8354	
	15	0.8244	
	25	0.8173	

Pour Point (°C)

Evaporation (weight %)			
0		-55	ESD 98
		<-47	Shell 99a
12		-55	ESD 98
23		-50	
37		-44	

Dynamic Viscosity (mPa·s or cP)

Evaporation (weight %)	Temperature (°C)		
0	0	3	ESD 98
	15	2	
	25	2	
12	0	3	
	15	2	
	25	2	
23	0	3	
	15	2	
	25	2	
37	0	3	
	15	2	
	25	2	

Kinematic Viscosity (mm²/s or cSt)

	Temperature (°C)		
	-20	<8	Shell 99a

Chemical Dispersibility (volume %)

Evaporation (weight %)			
0	Corexit 9500	57	ESD 99
23		43	
37		50	

Hydrocarbon Groups (volume %)

Evaporation (weight %)			
0	Saturates	94	ESD 99
	Aromatics	6	
	Resins	0	
	Asphaltenes	0	
12	Saturates	98	

Jet A/Jet A-1

				Reference ID
Hydrocarbon Groups (volume %)				
Evaporation (weight %)				
12	Aromatics	2		ESD 99
	Resins	0		
	Asphaltenes	0		
23	Saturates	96		
	Aromatics	3		
	Resins	1		
	Asphaltenes	0		
37	Saturates	98		
	Aromatics	2		
	Resins	0		
	Asphaltenes	0		
Adhesion (g/m²)				
Evaporation (weight %)				
0		1	SD = 0	ESD 98
12		0	SD = 0	
23		1	SD = 0	
37		6	SD = 3	
Volatile Organic Compounds (ppm)				
Evaporation (weight %)				
0	Benzene	82		ESD 99
	Toluene	800		
	Ethylbenzene	604		
	Xylenes	3560		
	C3-benzenes	19255		
	Total BTEX	5047		
	Total VOCs	24302		
12	Benzene	48		
	Toluene	9		
	Ethylbenzene	49		
	Xylenes	490		
	C3-benzenes	11820		
	Total BTEX	596		
	Total VOCs	12416		
23	Benzene	50		
	Toluene	9		
	Ethylbenzene	1		
	Xylenes	22		
	C3-benzenes	5505		
	Total BTEX	82		
	Total VOCs	5587		
37	Benzene	42		
	Toluene	11		
	Ethylbenzene	1		
	Xylenes	4		
	C3-benzenes	1319		
	Total BTEX	58		
	Total VOCs	1377		

Jet A/Jet A-1

Surface Tension (mN/m or dynes/cm)

Evaporation (weight %)	Temperature (°C)		Reference ID
0	0	26.9	ESD 00
	15	26.4	ESD 98
	25	25.5	ESD 00
12	0	27.3	
	15	27.2	ESD 98
	25	26.0	ESD 00
23	0	27.6	
	15	26.8	ESD 98
	25	26.0	ESD 00
37	0	27.5	
	15	27.0	ESD 98
	25	26.2	ESD 00

Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)

Evaporation (weight %)	Temperature (°C)		
0	0	26.5	ESD 00
	15	31.2	ESD 98
	25	26.4	ESD 00
12	0	26.7	
	15	31.0	ESD 98
	25	26.8	ESD 00
23	0	29.5	
	15	29.0	ESD 98
	25	25.3	ESD 00
37	0	25.0	
	15	29.0	ESD 98
	25	26.0	ESD 00

Oil/Fresh Water Interfacial Tension (mN/m or

Evaporation (weight %)	Temperature (°C)		
0	0	27.0	ESD 00
	15	37.0	ESD 98
	25	29.1	ESD 00
12	0	28.7	
	15	33.2	ESD 98
	25	28.2	ESD 00
23	0	31.0	
	15	33.8	ESD 98
	25	27.8	ESD 00
37	0	25.5	
	15	33.1	ESD 98
	25	27.7	ESD 00

Boiling Range (°C)

145 to 300		Shell 99a

Metals (ppm)

Evaporation (weight %)			
0	Barium	0.3	Cao 92
	Chromium	<1.5	
	Copper	<0.6	
	Iron	39.0	

Jet A/Jet A-1

				Reference ID
Metals (ppm)				
Evaporation (weight %)				
0	Lead	<3		Cao 92
	Magnesium	9.6		
	Molybdenum	1.9		
	Nickel	<1		
	Titanium	2.7		
	Vanadium	<0.6		
	Zinc	2.4		
46	Barium	<0.3		
	Chromium	<1.5		
	Copper	<0.6		
	Iron	<4		
	Lead	<3		
	Magnesium	4.7		
	Molybdenum	<0.6		
	Nickel	<1		
	Titanium	<0.6		
	Vanadium	<0.6		
	Zinc	0.8		

Acute Toxicity of Water Soluble Fraction (mg/L)				
	Test Organism			
48h LC50	Daphnia magna	6	(a)	Harris 94

(a) results based on GC purge-and-trap analysis