Diesel Fuel Oil (Canada)

Synonyms: Automotive Gas Oil

Reference ID

Grade 1-D: straight-run fractions including kerosenes to intermediate distillates from mixed-base crudes; used for mobile service such as trucks, railroads and submarines.
Grade 2-D: similar to Grade 1-D but with lower volatility.; used for industrial and heavy mobile service.
Grade 4-D: residual fuel oils blended with more viscous distillates; used for larger stationary installations.

Data from EETD 85 are for a diesel sample purchased from a service station in the summer of 1984.

Data from Shell 1999 were taken from MSDS Number 322-110.

For additional fuel specifications refer to ASTM D975.

ASTM D 975

API Gravity

39.4		EETD 84

Equation(s) for Predicting Evaporation

Short term (<5 days): $\%Ev = (0.31 + 0.018T)\sqrt{(t)}$
Long term: $\%Ev = (5.8 + 0.045T)\ln(t)$
Where %Ev = weight percent evaporated; T = surface temperature (°C); t = time (minutes)

ESD 96

Sulphur (weight %)

0.10		EETD 86
0.16	(a)	

(a) winter diesel

Flash Point (°C)

>40	Shell 99a

Flammability Limits in Air (volume %)

1 to 6	Shell 99a

Ignition Temperature (°C)

250	Shell 99a

Reid Vapour Pressure (kPa)

2	ESD 91

Density (g/mL)

Evaporation (weight %)	Temperature (°C)		
0	0	0.8380	EETD 84
	15	0.8245	ESD 96
		<0.876	Shell 99a
	25	0.8171	ESD 96
	40	0.8063	
28	0	0.8450	EETD 89
	15	0.8350	

Pour Point (°C)

-30	EETD 86

Dynamic Viscosity (mPa·s or cP)

Temperature (°C)		
0	4	EETD 85
15	2	ESD 96
25	2	
40	1	

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Kinematic Viscosity (mm²/s or cSt)

Temperature (°C)		Reference ID
40	1.3 to 4.1	Shell 99a

Hydrocarbon Groups (weight %)

Waxes	1	ESD 91

Surface Tension (mN/m or dynes/cm)

Temperature (°C)		
0	27.7	EETD 84
15	26.5	ESD 96
25	23.8	
40	22.7	

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

Temperature (°C)		
0	28.2	EETD 85
15	28.0	

Oil/Fresh Water Interfacial Tension (mN/m or

Temperature (°C)		
0	30.1	EETD 85
15	29.4	

(a) estimated

Boiling Point Distribution (weight %)

Boiling Point (°C)	Weight %	
40	1	ESD 95
60	1	
80	1	
100	1	
120	1	
140	3	
160	11	
180	23	
200	34	
250	65	
300	91	
350	99	

Boiling Point Distribution (°C)

Weight %	Boiling Point (°C)	
5		ESD 95
10		
15		
20		
25		
30		
35		
40		
45		
50		
55		

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Boiling Point Distribution (°C)

Weight %	Boiling Point (°C)	Reference ID
60		ESD 95
65		
70		
75		
80		
85		
90		
95		

Boiling Range (°C)

246 to 388		Shell 99a

Metals (ppm)

Barium	<0.3	Cao 92
Chromium	<1.5	
Copper	<0.6	
Iron	4.6	
Lead	<3	
Magnesium	12.3	
Molybdenum	<0.6	
Nickel	<1	
Titanium	<0.6	
Vanadium	<0.6	
Zinc	1.2	

Aqueous Solubility (mg/L)

Temperature (°C)			
20 (approx.)	39	(a)	MacLean 89
22	3	(a)	Suntio 86
	2	(b) (d)	Murray 84
	8	(b) (e)	
20 (approx.)	60	(c)	MacLean 89