



TABLE 1 Detailed Requirements for Leaded Aviation Gasolines

Property		Grade 80	Grade 91	Grade 100VLL	Grade 100LL	Grade 100	ASTM Test Method ^B
COMBUSTION							
Net heat of combustion, MJ/kg ^C	min	43.5	43.5	43.5	43.5	43.5	D4529 or D3338
Octane Rating							
Knock value, lean mixture ^D							
Motor Octane Number	min	80.7	90.8	99.6	99.6	99.6	D2700
Aviation Lean Rating	min	80.0	91.0	100.0	100.0	100.0	D2700
Knock value, rich mixture							
Octane number	min	87	98				D909
Performance number ^{E,F}	min			130.0	130.0	130.0	D909
COMPOSITION							
Sulfur, mass percent	max	0.05	0.05	0.05	0.05	0.05	D1266 or D2622
Tetraethyl lead							D3341 or D5059
mL TEL/L	max	0.13	0.53	0.43	0.53	1.06	
g Pb/L	max	0.14	0.56	0.45	0.56	1.12	
Color							
Dye content ^G , mg/L							D2392
Blue dye	max	0.2	3.1	2.7	2.7	2.7	
Yellow dye	max	none	none	none	none	2.8	
Red dye	max	2.3	2.7	none	none	none	
Orange dye	max	none	6.0	none	none	none	
Requirements for All Grades							
VOLATILITY							
Vapor pressure, 38 °C, kPa	min			38.0			D323 or D5191 ^H
	max			49.0			
Density at 15 °C, kg/m ³				Report			D1298 or D4052
Distillation, °C							D86
Initial boiling point				Report			
Fuel Evaporated							
10 volume percent at °C	max			75			
40 volume percent at °C	min			75			
50 volume percent at °C	max			105			
90 volume percent at °C	max			135			
Final boiling point	max			170			
Sum of 10 % + 50 % evaporated temperatures	min			135			
Recovery volume percent	min			97			
Residue volume percent	max			1.5			
Loss volume percent	max			1.5			
FLUIDITY							
Freezing point, °C	max			-58 ^I			D2386
CORROSION							
Copper strip, 2 h at 100 °C	max			No. 1			D130
CONTAMINANTS							
Oxidation stability, mg/100 mL (5 h aging) ^{J,K}							D873
Potential gum	max			6			
Lead precipitate	max			3			
Water reaction							D1094
Volume change, mL	max			±2			
OTHER							
Electrical conductivity, pS/m	max			450 ^L			D2624