
Fuel Testing Guidelines

Table 1.1 Fuel Testing Guidelines

	Test	Unit	Analytical method
1	Material properties		
	Moisture Content	%, as-received	ASTM -D3173
	Higher Heating Value	BTU/lb, dry basis	ASTM -D5865/E711
	Bulk Density - Uncompacted (Green)	lb/cubic ft.	
	Bulk Density - Uncompacted (O.D.)	lb/cubic ft.	
	Bulk Density - Compacted (Green)	lb/cubic ft.	
	Bulk Density - Compacted (O.D.)	lb/cubic ft.	
2	Proximate Analysis		
	Volatile matter	%, dry basis	ASTM - D3175
	Fixed carbon	%, dry basis	ASTM - D3172
	Ash @ 750°C	%, dry basis	ASTM - D3174
3	Ultimate Analysis		
	Carbon, C	%, dry basis	ASTM - D5373
	Hydrogen, H	%, dry basis	ASTM - D5373
	Nitrogen, N	%, dry basis	ASTM - D5373
	Oxygen, O (by difference)	%, dry basis	
	Total Sulfur, S	%, dry basis	Paptac - G28
	Chloride, Cl	%, dry basis	ESM 360B/040C
4	Fuel Size Distribution (sieve analysis)		
	<3 inch	%	
	1 1/8" diameter roundhole	% retained	
	7/8" diameter roundhole	% retained	
	5/8" diameter roundhole	% retained	
	3/8" diameter roundhole	% retained	
	3/16" diameter roundhole	% retained	
	Pass 3/16" diameter roundhole	% retained	
5	Ash Fusion Temperature (Reducing Atmosphere)		
	Initial Deformation	°C	ASTM - D1857
	Softening (h=W)	°C	ASTM - D1857
	Hemispherical	°C	ASTM - D1857
	Fluid	°C	ASTM - D1857

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6	Ash Particle Size (Tyler sieve)		
	No. 20 - 850 µm	%, retained	
	No. 40 - 425 µm	%, retained	
	No. 60 - 250 µm	%, retained	
	No. 100 - 150 µm	%, retained	
	No. 200 - 75 µm	%, retained	
	No. 400 - 38 µm	%, retained	
	Pan - < 38 µm	%, retained	
7	Ash Composition*		
	Aluminum, Al	mg/kg	
	Arsenic, As	mg/kg	
	Barium, Ba	mg/kg	
	Boron, B	mg/kg	
	Cadmium, Cd	mg/kg	
	Calcium, Ca	mg/kg	
	Chromium, Cr	mg/kg	
	Cobalt, Co	mg/kg	
	Copper, Cu	mg/kg	
	Iron, Fe	mg/kg	
	Lead, Pb	mg/kg	
	Lithium, Li	mg/kg	
	Magnesium, Mg	mg/kg	
	Manganese, Mn	mg/kg	
	Molybdenum, Mo	mg/kg	
	Nickel, Ni	mg/kg	
	Phosphorus, P	mg/kg	
	Potassium, K	mg/kg	
	Silicon, Si	mg/kg	requires salt fusion
	Sodium, Na	mg/kg	
	Strontium, Sr	mg/kg	
	Titanium, Ti	mg/kg	
	Vanadium, V	mg/kg	
	Zinc, Zn	mg/kg	

*special consideration for mercury content

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8	Metal Oxides in Ash*		
	Aluminum, Al ₂ O ₃	%	
	Calcium, CaO	%	
	Iron, Fe ₂ O ₃	%	
	Magnesium, MgO	%	
	Manganese, MnO	%	
	Phosphorus, P ₂ O ₅	%	
	Potassium, K ₂ O	%	
	Silicon, SiO ₂	%	
	Sodium, Na ₂ O	%	

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