Summary of Fuel and Ash Analysis of Wood Residue of a Cabinet Workshop

			MFP	from silo #1	pure particle board	MFP with 1% sand	MFP with 4% sand	MFP	as comparison	
			Jan 18 - sample #1 as received	March 7 - sample #1 as received	March 7 - sample #2 as received	March 14 - sample #1 as received	March 14 - sample #1 as received	March 14 - sample #2 as received	MDF (from Internet)	Method
Fuel Analysis	% Total Moisture		6.87%	7.07%						ASTM D4442 (Method A)
	% Ash		0.98%	1.08%						ASTM D1102
	Gross Calorific Value		7,790 BTU/lb 18.12 GJ/t	7,790 BTU/lb 18.12 GJ/t						ASTM D3286
	% Volatile Matter		72.36%							ASTM D3175
	% Fixed Carbon		19.79%	46.39%						ASTM D3172 (calc.)
	% Sulfur		0.03%	0.05%						ASTM D4239 (Method C)
Ash Analysis:	**Analyte**									**Method**
	Silicon dioxide	SiO2	25.50%	24.97%	20.28%				32.90%	ASTM D3682
	Aluminum oxide	Al2O3	5.51%	5.94%	4.08%				3.51%	ASTM D3682
	Titanim dioxide	TiO2	3.40%	3.78%	1.33%				0.30%	ASTM D3682
	Iron oxide	Fe2O3	1.53%	2.06%	1.58%				4.42%	ASTM D3682
	Calcium oxide	CaO	16.91%	17.56%	16.69%				32.97%	ASTM D3682
	Magnesium oxide	MgO	4.33%	4.82%	4.15%				5.03%	ASTM D3682
	Potassium oxide	K2O	10.67%	9.00%	5.17%				5.33%	ASTM D3682
	Sodium oxide	Na2O	6.52%	8.58%	9.97%				9.54%	ASTM D3682
	Sulfur trioxide	SO3	13.58%	2.78%	2.05%				3.00%	ASTM D3682
	Phosphorus pentoxide	P2O5	1.89%	2.05%	1.56%				3.11%	ASTM D3682
	Strontium oxide	SrO	0.10%	0.11%	0.12%					ASTM D3682
	Barium oxide	BaO	0.72%	0.80%	0.87%					ASTM D3682
	Manganese oxide	MnxOy	1.13%	1.17%	1.04%					ASTM D3682
	MAA T250		2079°F	2,097 °F	2,182 °F					ASTM D3682
	MAA Sum		91.80%	83.62%	68.89%					ASTM D3682
	Undetermined		8.20%	16.38%	31.11%					ASTM D3682
	MAA Basis		ignited	ignited	ignited					ASTM D3682
	MAA Type of Ash		LIGNITIC	LIGNITIC	LIGNITIC					ASTM D3682
	MAA silica Value		52.84%	50.54%	47.49%					ASTM D3682
	MAA Base Acid Ratio		1.16%	1.12%	1.46%					ASTM D3682
	Fouling Index		6.52%	8.58%	9.97%					ASTM D3682
	Specific Na2O + K2O content		0.22	0.24					lb/MBTU	
			0.11	0.07					kg/GJ	
	Specific Alkali & Earth Alkali cont		0.48	0.55					lb/MBTU	
			0.19	0.15					kg/GJ	
	ratio of K2O to SiO2		42%	36%	25%					
			1 : 2.4	1 : 2.8	1 : 3.9	**eutectic mixture!**				
	amount SiO2 per kg		2.50	2.70	0.00				g/kg	

	MFP	from silo #1	pure particle board	MFP with 1% sand	MFP with 4% sand	MFP	as comparison	
	Jan 18 - sample #1	March 7 - sample #1	March 7 - sample #2	March 14 - sample #1	March 14 - sample #1	March 14 - sample #2	MDF (from Internet)	Method
FUSION TEMPERATURE OF ASH, REDUCING								
Initial Deformation	1,500 °F 816 °C	1,300 °F 704 °C	impact of sand	1,660 °F 904 °C	>2,700 °F >1,482 °C	1,420 °F 771 °C		ASTM D1857
Softening	1,540 °F 838 °C	1,355 °F 735 °C		1,740 °F 949 °C	>2,700 °F >1,482 °C	1,460 °F 793 °C		ASTM D1857
Hemispherical	1,590 °F 866 °C	1,410 °F 766 °C		1,820 °F 993 °C	>2,700 °F >1,482 °C	1,530 °F 832 °C		ASTM D1857
Fluid	1,630 °F 888 °C	1,530 °F 832 °C		1,960 °F 1,071 °C	>2,700 °F >1,482 °C	1,580 °F 860 °C		ASTM D1857
current amount of ash	0.98%	1.08%	0.00%				of total wet fuel weight	
current amount of SiO2:	25.50%	24.97%	20.28%				of ash weight	
	0.25%	0.27%	0.00%				of total wet fuel weight	
current amount of K2O:	10.67%	9.00%	5.17%				of ash weight	
	0.03%	0.02%	0.00%				of total wet fuel weight	
current ratio of K2O to SiO2	1 : 2.4	1 : 2.8	1 : 3.9					
required ratio of K2O to SiO2	1 : 7.0	1 : 7.0	1 : 7.0					
required amount of SiO2:	74.69%	63.00%	36.19%				of ash weight	
	0.73%	0.68%	0.00%				of total wet fuel weight	
amount of SiO2 to be added to fi	0.48%	0.41%	0.00%				of total fuel weight	
	4.8	4.1	0.0				g of SiO2 per kg of wet wood fuel	
	2.2	1.9	0.0				g of SiO2 per lb of wet wood fuel	
	0.08	0.07	0.00				oz of SiO2 per lb of wet wood fuel	
	33.7	28.8	0.0				grain of SiO2 per lb of wet wood fuel	
	172.8							