

Combustion performance at SP



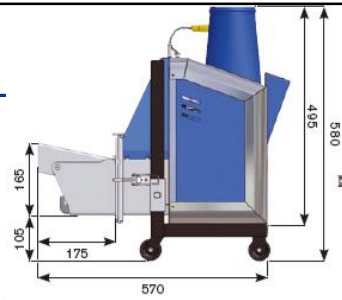
Janfire NH

Tests based on
EN 303-5



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ERA-Net Evaluation of technology for small scale combustion of pellet from new ash rich biomasses



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Test plan (1)



	Measured parameter	Comments
Fuel	Moisture content	All fuels before combustion
Flue gas measurements		
Instruments on-line	CO/CO ₂ (NDIR), O ₂ (paramagnetic), OGC (FID), NO _x (chemiluminescence)	Nominal load and minimum load Average of 6 hours
Absorption	SO ₂ (absorption), HCl (absorption)	Nominal load
Filter sampling	Total dust	Nominal load and minimum load
Particle mass- and size distribution	ELPI, DLPI	Nominal load

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Test plan (2)



Other observations		
Influence of high ash content	Sintering in fuel bed and in bottom ash, foaling of heat exchange surfaces, automatic ash removal, etc	Visual observation after 6 h SEE "SINTERING" BELOW
Ignition of cold boiler	Ignition technique, length of ignition period, number of failed ignitions, etc	Observations are noted
Load control	Observation of technique, (modulation or on off control)	Observations are noted
Control systems	Are there control systems? Lambda sensor? Flue gas temperature control? Influence of these systems?	Observations are noted

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Test plan (3)



Analyses		
In total dust	Carbon in total dust	Nominal load
Dust from ELPI, six particle sizes	Main elements (Na, K, Ca, Mg, Zn, Al, Si, Fe, Mn, Ba, P, S, Cl)	Nominal load
Bottom ash	Main elements (Na, K, Ca, Mg, Zn, Al, Si, Fe, Mn, Ba, P, S, Cl) (XRF if we have money)	Nominal load
Additional Temperature measurements	In glow bed (thermocouple type N)	

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Performed tests



Shorter test were made with three fuels
Tricky: to clean the burner from ash especially Reed Canary Grass formed an “ash-skeleton” that suffocated the combustion

Bark pellet, nominal load

Power	16	kW
CO	418	mg/Nm3 at 10 % O₂
THC	3	mg/Nm3 at 10 % O₂
NOx	413	mg/Nm3 at 10 % O₂
Total dust	126	mg/Nm3 at 10 % O₂

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