

Increasing Efficiency and Reducing Pollutants Emissions from the Residential Cooker Burning Wood Biomass

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Abstract

Commission Delegated Regulation (EU) 2015/1185 defines eco-design requirements to solid fuel local space heaters in terms of the seasonal space heating efficiency and pollutants emissions of dust, organic gaseous compounds (OGC), CO and NO_x. The related new series of standards EN 16510 specifies more strict requirements on the pollutant emissions compared to the previous standards. Complying with these requirements entails adaption of the common design solutions of furnaces and other heat exchange parts of space heaters.

This paper describes design measures applied to the residential cooker burning wood biomass in order to satisfy mentioned requirements on the thermal efficiency and pollutant emissions. An influence of primary and secondary air flow rate, as well as position of the air supply within the furnace is investigated in terms of CO and dust emission reduction. The experimental results showed a significant decrease of pollutants with an appropriate flow rate and position of secondary air supply can be achieved, provided the burning rate is adequately adjusted via primary air flow rate. Also, the wood briquettes composition and quality has been proved by tests to greatly affect the dust emissions.

Keywords: *thermal efficiency, pollutants emissions, residential cooker, wood biomass*