

FLUE GAS EMISSIONS DURING THE COMBUSTION OF DIFFERENT NATURAL FUELWOOD QUALITIES

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Wood is considered to be a regenerative and CO₂ neutral fuel. Thus, thermal use of residual wood from forestry, plantation and wood processing industries can replace considerable amounts of fossil fuels. Extensive emission measurements showed that individual wood furnaces are locally responsible for high emissions of aerosols and hydrocarbons caused by poor furnace technique, fail operation and using wrong fuelwood in the wrong furnace. The different fuelwood qualities are under CEN standardization as Technical Specification with the title 'Solid biofuels-Fuel specifications and classes'. The major traded forms are: Briquettes, Pellets, Sawdust, Wood Chips, Hog Fuel and Log Wood. Not all classes can be burned in each type of furnace. For pellets, wood chips and hog fuel grate or underfeed firings are mainly used. The combustion efficiency and completeness and consequently the flue gas emissions depend on the fuel size, its homogeneity and as a main factor on the humidity. Examples of different combustions experiments will be presented. If certain frame conditions are observed the combustion is good and the emissions are low. But, wood of secondary quality like from Pappel and from borck causes lower combustion quality. Log wood is burned in small stoves directly in rooms where the heat is needed or in manually fed central heating boilers. The problem is here the batch operation. In the beginning, after feeding the combustion. During intensive combustion the available air could be too little. Thus VOC, CO and PM pollutants are emitted. At the end the temperature is low again, causing CO emissions. With special types of furnaces the combustion efficiency can be improved. Examples of CO, VOC/PM and NO_x emissions during the combustion of different fuels in different stoves will be presented.