

POLITECHNIKA ŚLĄSKA

Wydział Inżynierii Środowiska i Energetyki

Instytut Techniki Ciepłej

PRACA DOKTORSKA

**BADANIA ENERGETYCZNO-EMISYJNE KOTŁÓW
WSADOWYCH OPALANYCH SŁOMĄ**

Autor

mgr inż. Marcin Jewiarz

Promotor

prof. dr hab. inż. Andrzej Szlęk

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PhD thesis “Investigation on thermal performance and emission factors of batch fired straw boilers” is focused on main problem connected to batch fired biomass boilers.

Combustion in batch fired boilers is quite simple process, but it possess also several inconveniences. First is high emission of carbon monoxide, which should be lowered according to actual standards. Also there is problem with PM emission but it can be lowered by dedusting units. The last very crucial factor is boiler efficiency. In such devices efficiency is normally below 80%, which is not sufficient in comparison to nowadays standards.

Paper presents results of research made on 150kW_{th} batch fired boiler fuelled with straw bales. Studies were taken on the test stand in Olawa, Poland. At the beginning several test have been made to determine main problems, which can cause high emission and low efficiency. Next some improvements were proposed, connected mainly with air distribution and control algorithms. At last part, tests according to EN-303-5 standard were made, to estimate performance and emission factors of improved boiler, and 3,5MW straw boiler with moving grate.

Results obtained during the research shows that it is possible to improve performance as well as decrease emission by means of air distribution and control algorithms in straw fired boilers.

