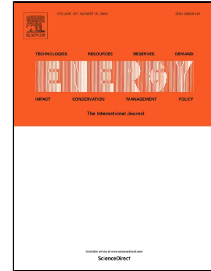


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Air manifolds for straw-fired batch boilers – experimental and numerical methods for improvement of selected operation parameters

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1 **Air manifolds for straw-fired batch boilers – experimental and numerical**
2 **methods for improvement of selected operation parameters**

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9 **ABSTRACT**

10 Air manifolds are used in straw-fired batch boilers to provide appropriate excess air as well as
11 homogeneous air distribution in the primary and secondary combustion chambers.

12 The paper presents the results of variant analysis of operation of the air manifold responsible
13 for providing air for the combustion process in a biomass-fired batch boiler. An experimental
14 stand consisting of a set of velocity sensors has been constructed to analyse the operation of
15 the air manifold. The results of the experimental studies were implemented in a computational
16 fluid dynamics model, which allowed to determine the elements of the manifold construction
17 which are crucial from the point of view of the efficient combustion and acceptable low level
18 of the fan's energy consumption. As a next stage of the studies, a new design of the manifold
19 has been developed and modelled. The results of the studies and the recommendations for
20 designing air manifolds have been presented.

21 **KEYWORDS**

22 Boilers, biomass, validation, air manifolds, CFD, parametric analysis

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