



## TRANSPORT BEHAVIOR OF BIOGENIC RESIDUES TESTED ON A COLD GRATE MODEL

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### PURPOSE

Biogenic residues gains increasing interest as feedstock in commercial heating systems. Existing furnaces are inadequate to handle these fuels. Especially the transport behavior of biogenic residues can differ a lot from wood. The transport behavior of moving bulk goods can be influenced by the geometry as well as the movement of the grate. With these parameters it is possible to vary the residence time and take influence on the combustion behavior. Based on the experience from UMSICHT from previous projects a flexible model of a grate was developed to investigate these effects.

### APPROACH

In order to obtain significant results it is necessary to develop a grate model which is able to vary a lot of different values. The parameters which can be tested with the flexible grate model are described below:

- Grate angle / grate bar angle
- Height of grate bar
- Movement of the grate bars (opposite or same direction, velocity and pause time)
- Length of stroke

Parameters which can be influenced by changing the feedstocks:

- Particle size / shape
- Investigations of real bulk goods

Tested feedstocks:

Wood chips, miscanthus, olive pits and corncobs (planned)

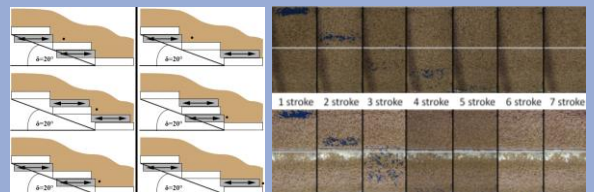
### RESULTS

- Opposite movement causes broader residence time distribution
- Influence of different parameters
- Forming and behavior of dead zones can be investigated
- Data is used for simulation programs to optimize results
- Optimized approach shows more variability depending to the different grate types

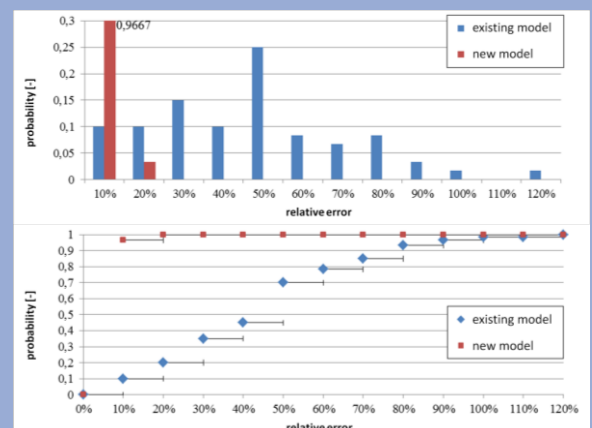
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Model of a flexible cold grate



Different movement of the grate



Improvement of the simulation programs