



## In-Flame Characterization of a 30 MWth Bio-Dust Flame

**Johansen, Joakim Myung; Jensen, Peter Arendt; Clausen, Sønnik; Fateev, Alexander; Nielsen, K.L. ; Wadenback, Johan; Glarborg, Peter**

*Publication date:*  
2016

*Document Version*  
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

*Citation (APA):*  
Johansen, J. M., Jensen, P. A., Clausen, S., Fateev, A., Nielsen, K. L., Wadenback, J., & Glarborg, P. (2016). *In-Flame Characterization of a 30 MWth Bio-Dust Flame*. Abstract from 24th European Biomass Conference & Exhibition, Amsterdam, Netherlands.

---

### General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

## In-Flame Characterization of a 30 MWth Bio-Dust Flame

Short introductive summary:

This work presents a comprehensive flame characterization campaign on an operating full-scale Dan-ish power plant. Amagerværket Unit 1 (AMV1, 350 MWth, 12 identical burners on 3 burner levels) is 100 % fuelled with wood dust burned in suspension and stabilized by swirling flows in a triple concentric low-NO<sub>x</sub> configuration. The measurements focus on a single 30 MWth flame and include: Quantification of the gas temperature, the gas phase composition: O<sub>2</sub>, CO, CO<sub>2</sub>, H<sub>2</sub>O, and light hydrocarbons by intrusive probe measurements. It also includes both seeded and unseeded 2D laser doppler anem-ometry (LDA) velocity measurements, flame shape observations by video imaging, and particle en-trainment by high speed infrared (IR) imaging. The flame is characterized along the geometrical cen-treline as well as in the horizontal and vertical plane of the flame. The results shed light on the flame anatomy of a full-scale burner and provide a comprehensive data set that quantifies key parameters: Gas phase temperature, composition, and flow field required in order to evaluate the performance of CFD simulations of complex combustion systems.

Presenter: **Joakim M. JOHANSEN, Technical University of Denmark, Chemical and Biochemical Engineering, Kongens Lyngby, DENMARK**

Presenter's biography:

I work to aid the development of improved combustion systems. The problems are approach a combination of experimental characterization and CFD simulations across scales from laboratory and bench-scale equipment to full-scale power plants.

*Biographies and Short introductive summaries are supplied directly by presenters and are published here unedited*

Co-authors:

J.M. Johansen, Technical University of Denmark, Lyngby, DENMARK  
P.A. Jensen, Technical University of Denmark, Lyngby, DENMARK  
S. Clausen, Technical University of Denmark, Roskilde, DENMARK  
A. Fateev, Technical University of Denmark, Roskilde, DENMARK  
K.L. Nielsen, Technical University of Denmark, Roskilde, DENMARK  
J. Wadenbäck, HOFOR, København S, DENMARK  
P. Glarborg, Technical University of Denmark, Lyngby, DENMARK

Session reference: 2AO.8.3

Subtopic: 2.3 Biomass combustion in large utilities

Topic: 2. BIOMASS CONVERSION TECHNOLOGIES FOR HEATING, COOLING AND ELECTRICITY