

## Press release

Leipzig, 18<sup>th</sup> April 2016

### **DBFZ (“Team Wittus”) wins the US Pellet Stove Design Challenge with the world’s first emission-free stove**

Despite a stricter Federal Emissions Control Act, wood-fired systems remain one of the primary producers of airborne pollutants, like fine dust and soot particles. The state of the art in science and technology was demonstrated and the latest prototypes of pellet ovens were compared at this year’s US wood burning competition, organised by the Alliance for Green Heat and held at the Brookhaven National Laboratory (Upton, New York). The DBFZ triumphed over its competition this year with its almost emission-free “PELLWOOD” model.

At the “Pellet Stove Design Challenge 2016”, “Team Wittus”, led by Dr. Ingo Hartmann (DBFZ/ETE EmTechEngineering GmbH), prevailed against a total of eleven competitors and convinced the jury with a combination of down draft wood log stove and newly developed, two-stage pellet burner. The prototype has a heating capacity of 13 kW and an integrated catalyst so that its extremely low CO and dust values are, for the most part, under the detection limits of measuring equipment. In the course of the competition, participants had to subject their prototypes to a dilution tunnel test based on Environmental Protection Agency (EPA) regulations, undergo a simplified test to demonstrate the stove’s operation, and win over the jury with an oral presentation. Assessment criteria included clean burning (30%), efficiency (20%) and safety (20%), as well as innovation (15%) and market potential (15%). “Our team is extremely happy that our emissions-free “PELLWOOD” model scored points in all jury categories. It was a big success and acknowledges the many years of work we have put in to develop a low-emission stove,” says project leader Dr. Ingo Hartmann, head of DBFZ’s Catalytic Emissions Reduction Focus research Group.

In the three-stage “PELLWOOD” stove, wood pellets are first decomposed by pyrolysis/gasification and converted into burnable gas. In the second stage the burnable gases are combusted. The complete oxidation and heat transfer to the environment takes place in the third stage of the down draft wood log stove, which has an integrated metal oxide catalyst manufactured by ETE that enables carbon monoxide, volatile organic compounds and soot to be total oxidized. The values for fine dust particles are extremely low, at 10 mg/m<sup>3</sup>, and are 20 mg/m<sup>3</sup> for carbon monoxide (CO). The staff at the Brookhaven National Laboratory had never measured such low concentrations in the emissions of a firing system before. The PELLWOOD can even achieve similar emission values when burning cordwood. Dr. Ingo Hartmann’s team first participated in the US competition in Brookhaven in 2014. As part of the “Collaborative Stove Design Workshop”, the world’s most innovative concepts for reducing emissions and optimizing burning were compared. The DBFZ took part with a modified wood log prototype that was produced by Specht and fitted with a NEKO catalyst. Back then “Team Wittus” achieved a very respectable second place.

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### Joining Team Wittus alongside the DBFZ:

Wittus - Fire by Design ([www.wittus.com](http://www.wittus.com))

ETE EmTechEngineering GmbH ([www.ete-ing.de](http://www.ete-ing.de))

Specht Modulare Ofensysteme GmbH & Co. KG ([www.xeooos.de](http://www.xeooos.de))

SL Systemlösung Haustechnik GmbH (<http://www.sl-grossenhain.de>)



Figure 1 Prototype of the PELLWOOD stove (© Specht Modulare Ofensysteme GmbH & Co. KG)

### Smart Bioenergy – innovations for a sustainable future

The DBFZ (German biomass Research Centre) works as a central and independent thinker in the field of energy and material use of biomass on the question of how the limited available biomass resources can contribute to the existing and future energy system with sustainability and high efficiency. As part of the research the DBFZ identifies, develops, accompanies, evaluates and demonstrates the most promising fields of application for bioenergy and the especially positively outstanding examples together with partners from research, industry and public. With the scientific work of the DBFZ, the knowledge of the possibilities and limitations of energy and integrated material use of renewable raw materials in a biobased economy as a whole should be expanded and the outstanding position of the industrial location Germany in this sector permanently secured – [www.dbfz.de](http://www.dbfz.de) [www.dbfz.de](http://www.dbfz.de).

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