

# Multi-faceted Firing Technology

Körting Realises Oxyfuel Test Firing Facility for BTU Cottbus

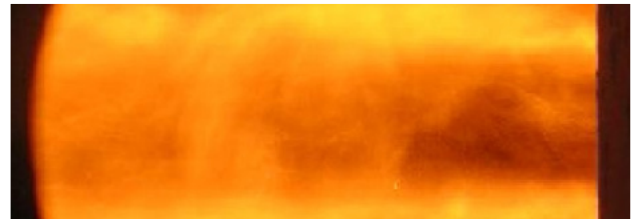
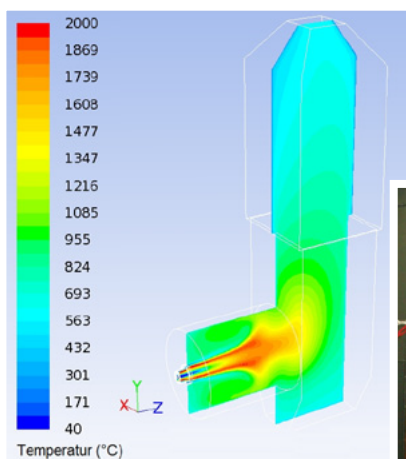


Körting has realised a test facility for the firing of fossil solid fuels at the Brandenburg Technische Universität Cottbus (BTU), Chair for Power Plant Technology. It was contracted by the Centre for Energy Technology Brandenburg GmbH, (CEBra).

“This plant can fire solid fuels as follows: with air as oxygen carrier, with air as oxygen carrier and flue gas recirculation and with flue gas recirculation in Oxyfuel operation mode”, explained Marco Meyer, Project Manager at Körting Hannover AG. The test facility was planned in collaboration with CEBra and BTU Cottbus. Körting then fabricated and supplied the main equipment. The step-wise commissioning of the test facility, financed by the Bundesministerium für Bildung und Forschung (BMBF) (Federal Ministry for Education and Research) was effected as from March 2011 and carries the project name VVS400.

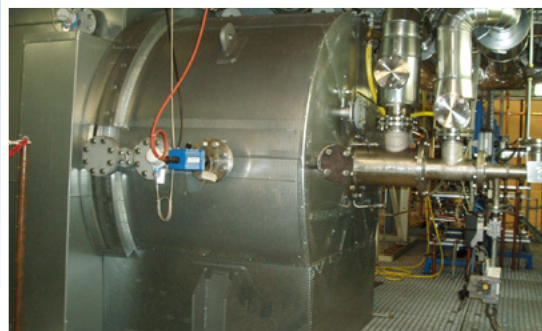
As the press office of the BTU Cottbus stated, “The decisive factor for placing the order with Körting was primarily their high competence in the firing technology sector as well as the convincing concept and their practical presentation of the new in-house burner test facility.”

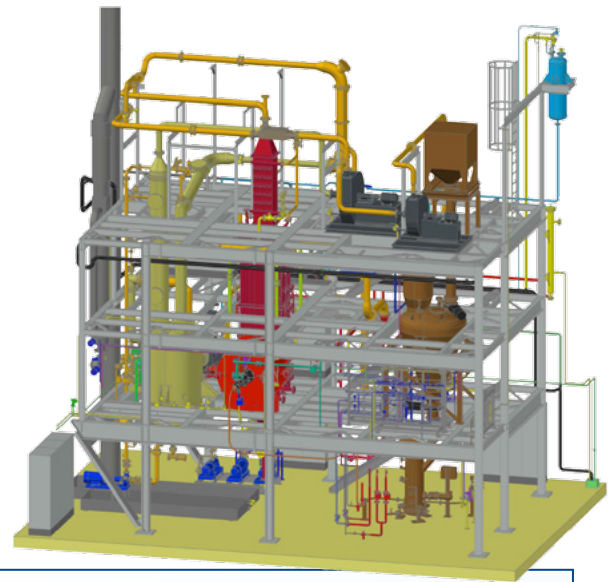
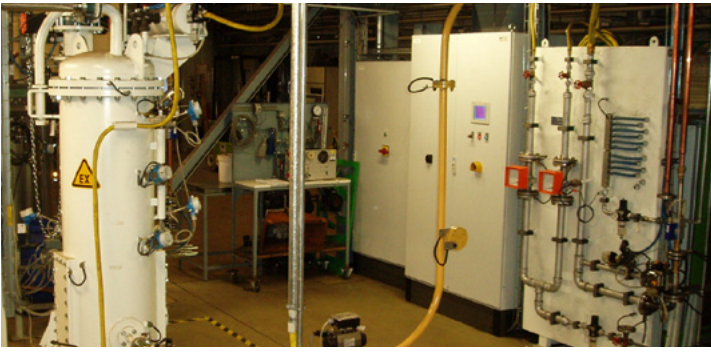
After concluding the test and optimisation phase the VVS400 plant now serves to promote BTU's research work on the firing of lignite dust (BKS), primarily under Oxyfuel atmosphere, amongst others, for:



- Analysis/Study of the altered burn-out and firing behaviour of lignite dusts in comparison to previous theoretical firing calculations and models.
- Analysis/Study of the influence of the changed (altered) flue gas atmospheres on the corrosion behaviour of materials, particularly those of the combustion chamber (boiler) as well as after-connected system components on the flue gas side and the connecting pipelines.
- Modelling of data for the description of flow and heat transfer processes in existing large boiler plants. These compiled modelling projections are validated by determining temperature profiles, flue gas compositions, flow profiles and radiation intensities.
- Analysis/Study of the influence of diverse burner geometries on a low NO<sub>x</sub> operation mode and optimisation of the firing.
- Analysis/Study of the direct ignition of BKS without the application of a secondary fuel.

“When in Oxyfuel operation mode lignite dust fuel is fired in the VVS400 plant with pure oxygen – in contrast to the usual firing mode with air”, as Michael Branzke, responsible for developing the project at Körting, explained. “This takes place under the inter-mixing of returned flue gas i.e., re-circulated flue gas with the purpose of influencing the flame and the flame temperature.” A partial flow of the flue





gas emerging during the firing is then delivered again to the burner/boiler system.

A modified CK Körting burner is applied as a burner in the plant. This was developed primarily for burning BKS dust in the output range up to 400 kW thermal firing output. "On designing this burner system particular value was placed on a modular, multi-functional and easy conversion with many variation possibilities", as Michael Branzke reported. When in BKS operation mode the burner is supplied with BKS via a metering disk dosing unit with fluidiser bed. In the applied CK burner system it is also possible to utilise gaseous fuels of natural gas quality type H. Above all, gas operation mode is required for ignition and heating up/cooling phases. On the flue gas side, thermal heat released via the burner is passed on to a hot water circulation system 190/170 °C via a hot water boiler with economiser and subsequently discharged via a secondary cooling water system. To clean the exhaust gas a Körting wet flue gas cleaning system (Venturi scrubber) has been positioned after the air pre-heater (Luvo).

On the flue gas side the whole plant is operated under low pressure provided by means of an ID fan. Controlling of the whole plant is effected by means of primary control technology via a CEBra/BTU side developed control software. "In this way the plant offers the university diverse possibilities of carrying out interesting trials", as Michael Branzke explained.

## At a glance

### Modified Körting CK Burner

Firing output	up to 400 kW
Fuels	Natural gas / diverse lignite dusts

### Operation modes:

- Firing with air
- Firing with air under flue gas recirculation
- Firing with O<sub>2</sub> under flue gas recirculation / Oxyfuel operation mode
- Flue gas Venturi scrubber with ID fan for low pressure operation mode
- Flue gas recirculation fan
- Air pre-heater (Luvo) for combustion air resp. for O<sub>2</sub>/CO<sub>2</sub> mix
- Combustion air blower (for operation mode firing with air)
- Supplying of utilities - CO, O<sub>2</sub>, air, N<sub>2</sub> - via special gas racks
- BKS dosing and transport system incl. storage container/docking station for a fuel dust container
- Hot water boiler 190/170 °C, max. flue gas outlet temperature 350 °C



## Further information and contact:

**Dipl.-Ing. Marco Meyer**  
 Manager for Order Processing/  
 Engineering Technology  
 Körting Hannover AG  
 +49 511 2129 259

**Dipl.-Ing. Michael Branzke**  
 Technical Order Processing  
 Process Heat / Firing Technology  
 Körting Hannover AG  
 +49 511 2129 398

[www.koerting.de](http://www.koerting.de)

