Institute for Technical Chemistry, (ITC)
Combustion Technology

Fixed-bed reactor KLEAA

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KLEEA

KLEAA (Karlsruher Laboranlage zur Ermittlung des Abbrandverhaltens von Abfällen) was designed to characterise the combustion properties of fuels for grate firings and fix bed furnaces (figure 1).
The procedures used by KLEAA are described exemplary in the standard CEN/TR 15716:2008 (E).

Combined heat and power plants (CHP plants) are challenged, especially by the amendment of the Renewable Energy Sources Act (EEG), to find new market models for power generation und new fuels, in order to detect economic alternatives to the previously subsidized operation of the plants. Therefore, plant operators are looking for waste biomasses at attractive prices for an economically profitable operation of the plant.
Along with the challenge of closing nutrient cycles, tests with many different biomasses are carried out to characterise the thermal behaviour on the one hand and to determine the nutrients available for plants on the other hand.
In Combination with the service FuBe®, KLEAA is used to determine operating figures, which describe the thermal process. The service is especially interesting for companies, which are interested in using biomass as fuel for their own purposes.
According to prior agreement, KLEAA can be used for additional studies and with other experimental setups.

Figure 1: Fixed-bed reactor KLEAA
Source: KIT

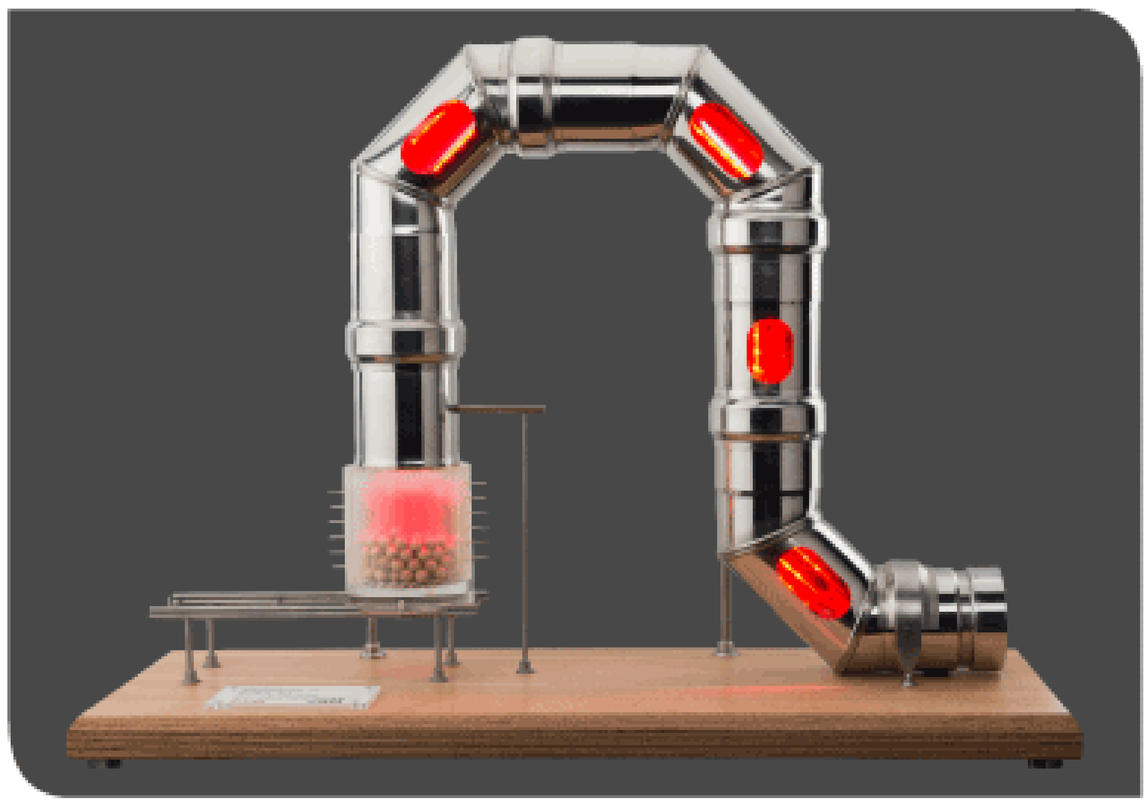

Figure 2: exhibit of KLEAA, simplified version of the reactor
Source: KIT

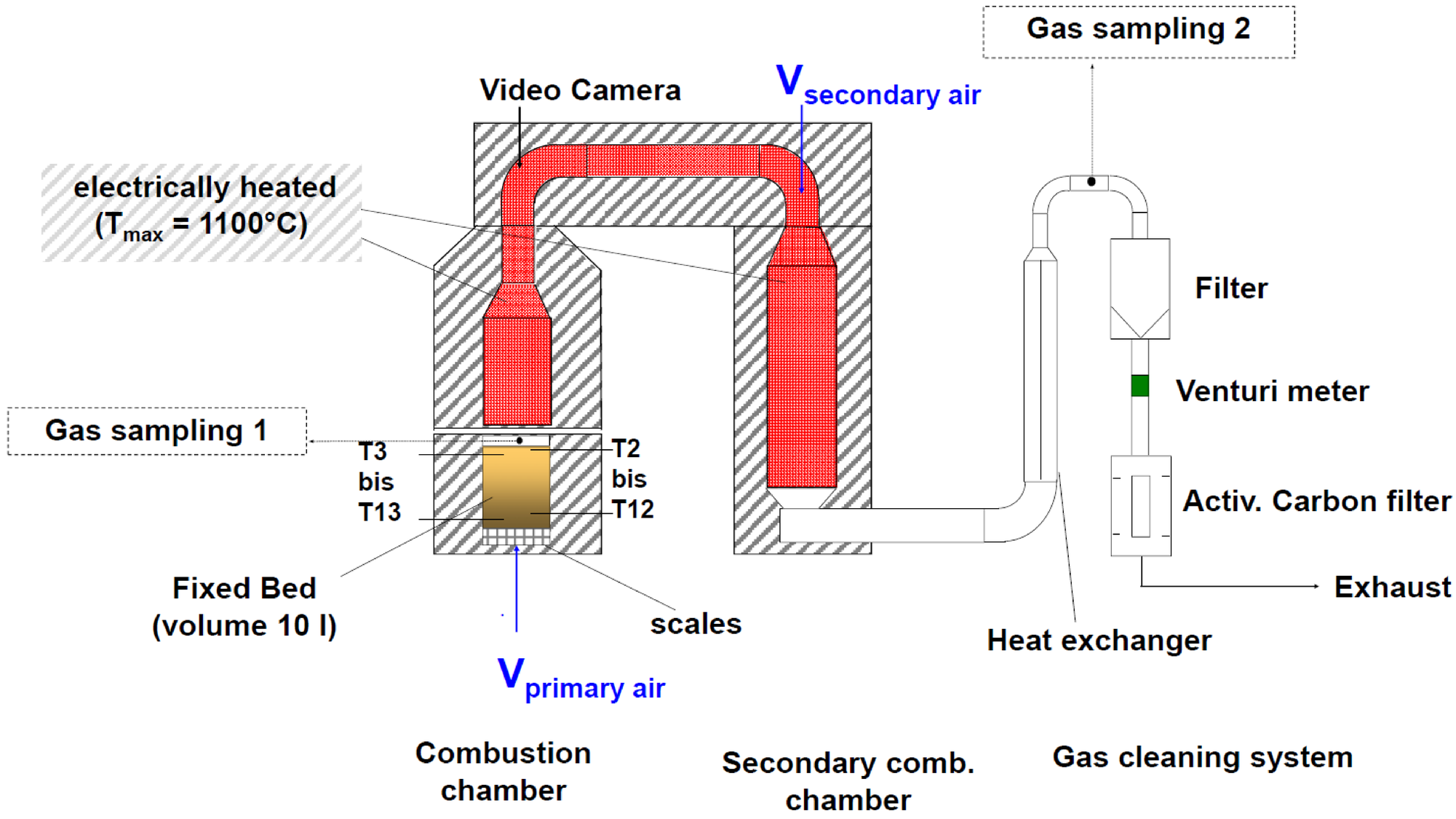

Figure 3: Principle of KLEAA

Source: KIT

Performance data KLEAA

Isothermal reactor	
Total thermal output	40 kW
Volume of fixed bed (furnace)	10 l
Height of fixed bed (furnace)	25 cm
Diameter of fixed bed (furnace)	23 cm
Weight of sample taken	up to 5 kg
Maximum particle size	8 cm
Description of the combustion behavior via load cell, temperature measurement, gas concentration and video camera	
Flue gas treatment with steam boiler, baghouse filter and activated coke filter	

For further information go to:
https://www.itc.kit.edu/

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