

Established in 1949, RAFAKO Boiler Engineering Company is the leading producer of power generation and environment protection equipment in Europe. With its almost 60 years of experience and a long reference list including more than 700 complete boiler units RAFAKO S.A. is recognized in Europe and in other parts of the world as one of the world's major and the biggest European boiler manufacturer. Roughly 90% of all large utility boilers operating in Poland had been made by RAFAKO. RAFAKO S.A. is the leader on the FGD market in Poland. Plants based on wet lime and semi-dry methods were delivered to both lignite and bituminous coal fired units in Poland.

During the past few years RAFAKO S.A. has developed its production and engineering capacity acquiring or establishing two workshops in Poland (in Radomsko and Wry) and three design offices (Rybnik and Częstochowa in Poland, and Belgrade in Serbia).

RAFAKO Boiler Engineering Company and its ESP Division in Pszczyna carry on design and production of electrostatic precipitators and bag filters.

The Company offer:

- general contracting within the field of thermal power plants, including complete power generation units,
- power generation boilers for sub- and supercritical steam parameters,
- circulating fluidized bed boilers,
- stoker fired boilers,
- heat recovery steam generators for gas turbines,
- boilers for thermal waste treatment and biomass combustion,
- flue gas desulfurization plants based on absorption methods, including wet lime and semidry methods,
- diagnostics, repairs and modernization of boilers, boiler auxiliaries as well as FGD plants,
- **electrostatic precipitators and bag filters,**
- design and production of boiler components and auxiliaries, including mills, grates, rotary air heaters, **ash removal systems** as well as other equipment and plants.

RAFAKO S.A. design and delivers ESPs and Fabric Filters for many of industrial applications such as:

- Power and Thermal Plants
- Waste incinerating Plants
- Biomass Fired Plants
- Cement Plants
- Metallurgical Industry
- Soda Boilers

Electrostatic precipitators

Generally, two types of ESP are used:

Compact ESP – for gas flows 20,000 to 2,000,000 m³/h in normal conditions at dust content 1 to 80 g/m³.

Modular ESP – for so called small sources and gas flows 3 to 20,000 m³/h in normal conditions at dust content 1 to 25 g/m³.

Electrostatic Precipitators delivered by RAFAKO S.A. enable to keep the outlet dust content at the level of 30 to 50 mg/m³, and in special cases down to 10 mg/m³.



Pneumatical ash handling system in Power Plant Kozenice Unit no 10



PP Kozenice - ESP of Unit no. 10 - 560 MW



Tuzla Power Plant, Bosnia and Herzegovina. 3 boilers OB-650, units 200 MW



PP Obrenovac - ESP of Unit no. A6 - 350 MW

Modern dust removal equipment – compact electrostatic precipitators are used at so called „small dust sources” – boilers of 5 to 50 MW thermal capacity fired with bituminous coal, biomass or coal and biomass mix, which are basic heat generators in municipal district heating systems or industrial steam generators.

The equipment is applied for dust removal from gas flows within the scope of 10,000 – 40,000 m³/h and dust content level 1 to 10 g/m³ at normal conditions.



Erection of Unit A6 ESP in Obrenovac



Boxberg Unit no. R – 670 MW – manufacturing, delivery, erection and commissioning

Bag filters

Bag filters are used in cases, where ESP application is not feasible or technically impossible. Bag filters offer high dust removal efficiency and possibility of flue gas

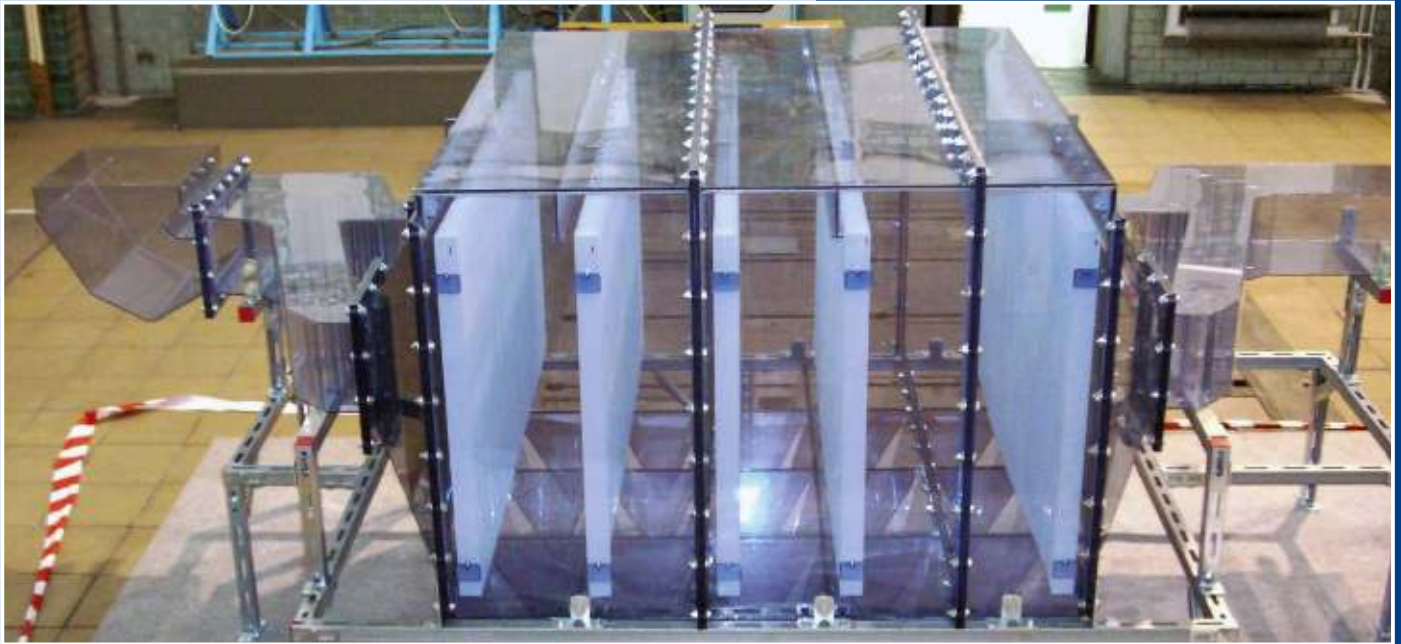
desulfurization on filtrating fabric at sorbent presence. Bag filter is indispensable part of FGD plant based on semi-dry method.



Łódź 4 CHP Plant. Bag filter erection at FGD Plant based on semi-dry method

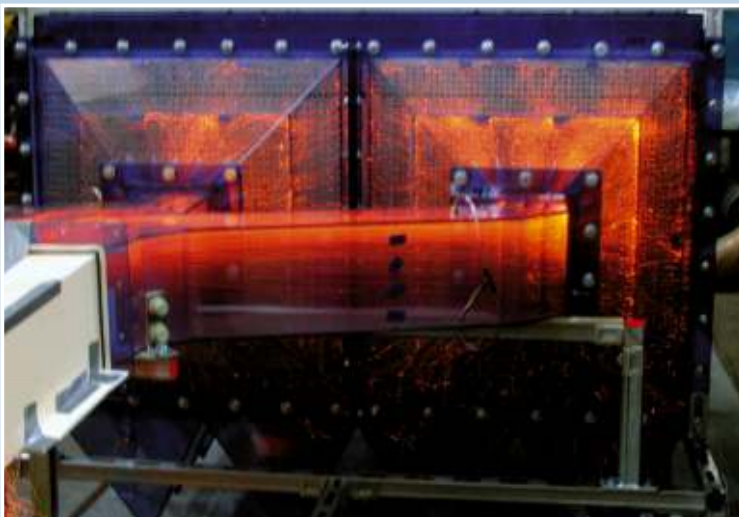


Łódź 4 CHP Plant. FGD Plant based on semi-dry method



ESP Model at Wrocław University of Technology

Our R&D activity within the scope of model testing is conducted in co-operation with Wrocław University of Technology. The testing enables plant optimization within the scope of gas flow distribution and aerodynamics in order to achieve high dust removal efficiency for various fuels. Keeping the desired outlet parameters at wide fuel range with variable dust content is of particular importance.



Gas flow at the inlet of the Model ESP

References

Our reference list includes a number of applications in Poland and other countries. Following list of shortly commissioned objects:

- PGE TPP Bydgoszcz, Poland
Boiler no 3 OP-230 – year 2010
- PP Kozienice, Poland
Boiler no 10 – 560 MW – year 2010
- EPS– PP Obrenovac Tent A, Serbia
Boiler no 6 – 350 MW – year 2010

Currently, the following projects are under realization:

- Vattenfall Europe Generation, Boxberg Power Plant, Germany, Unit R 670 MW
- Hitachi Power Europe GmbH RWE AG, Westfalen Power Plant, Germany Unit D and E – 2 x 800 MW
- Hitachi Power Europe GmbH RWE AG, Eemshaven Power Plant, Netherlands Unit A and B – 2 x 800 MW
- EPS– PP Obrenovac Tent B, Serbia
Boiler no 2 – 670 MW
- EUAS PP Soma, Turkey
Boiler 3 and 4 – 2 x 165 MW
- PP Kozienice, Poland – Boiler no 4 – 200 MW
- PGE PP Bełchatów, Poland
Boiler no 5 and 6 - 2 x 360 MW
- PKE PP Jaworzno II, Poland
Biomass Fired Boiler