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## CLASSEN

Classen Apparatebau Wiesloch is a global operating and leading manufacturer and supplier of industrial high temperature process heating systems. The majority of the heating plants are operated by applying organic heat carriers ("thermal oils") as the heat transfer agent. These offer significant benefits, including a broad temperature application range up to temperatures of 350°C, an operation without significant vapour pressures. For temperatures exceeding this and up to 400°C, special heat transfer oils are required which are often also used in vapour phase. For feed line temperatures of up to 550°C molten salts are applied—these are binary and tertiary blends of  $KNO_3$ ,  $NaNO_2$  und  $NaNO_3$ .

The company designs and fabricates gaseous, liquid and solid waste incinerators as well as their own solid fuel firing systems with the related combustion chambers. These biomass/wood waste firing systems have been a major part of classen's business. Throughout many years a broad experience with the thermal utilization of all the wood waste arising from the wood industries such as particleboard, MDF/HDF, OSB, veneer, LVL and plywood production as well as with the thermal utilization of any biomass in general has been gained.

The state-of-the-art reciprocating grate firing system—from approx. 3,500 up to 35,000 kW as single-line systems; duplex grates can be installed inside the combustion chambers in order to reach capacities up to 60,000 kW—has successfully proven to be a very versatile and reliable solution to match with the current demands and requirements determined by the industries. It is very tolerant to a variety of fuel qualities in terms of size and physical moisture content and performs excellent burnout and minimum emissions at the same time.

Long before the current discussions on limited resources, ballooning prices for fossil fuels and climate changes, classen's heating plants have been designed for maximum efficiency and minimum environmental impact. Besides the continuous optimization of the combustion parameters and the consequent application of low- $NO_x$  firing systems, waste heat recovery systems (so-called

Economisers) and combustion air pre-heaters have been introduced as a pioneering approach. Even though these technologies are going along with an increased investment, the return is usually achieved within short operational periods due to the significant fuel savings. Moreover, by connecting the versatile combustion and thermal oil heating plants to de-central and modular power stations based on the organic Rankine-cycle (ORC turbo generators), there was another way developed for the industries to not only solve their disposal issues but to turn their waste-streams into profit.

The scope of supply and services ranges from pre-contractual engineering and feasibility studies through single plant components and up to turnkey energy centers. The modern KONTAKTOMAT-thermal oil heaters are designed, fabricated and tested according to the applicable German/European standards and guidelines. In addition, heaters are fabricated according to the ASME-Code as well as according to the SINO/ML-requirements of the People's Republic of China. Moreover, the company holds long-term licenses/certificates of GOST and Rostechnadzors (formerly Gosgortechnadzors) as well as of Promatomnadzors for the delivery of thermal oil heater systems on the territory of the Russian Federation as well as to Belarusia.

With decades of knowledge and experience in the field of combustion engineering and heat transfer technology, the company is well prepared to successfully co-operate with clients all over the world. The highly skilled and experienced professionals are classen's strongest asset to develop and apply customized heat plants to clients in almost all industries.

Hall 27, Stand H18.



Classen biomass-fired heating plant in combination with a ORC-cycle based de-centralized power station