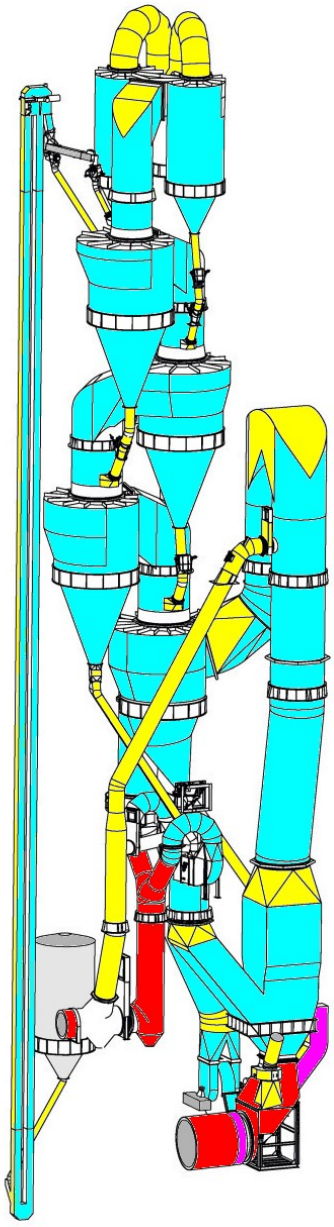
Devices for preparation of coal dust for sintering furnaces of cement plants

Ing. Büro FTT



50% Reduced cost of fuel

20% Reduced cost of cement

PCF-C units are designed for the local preparation of coal dust from raw coal,
it is set "one for one" next to rotating sintering furnaces to produce cement clinker.

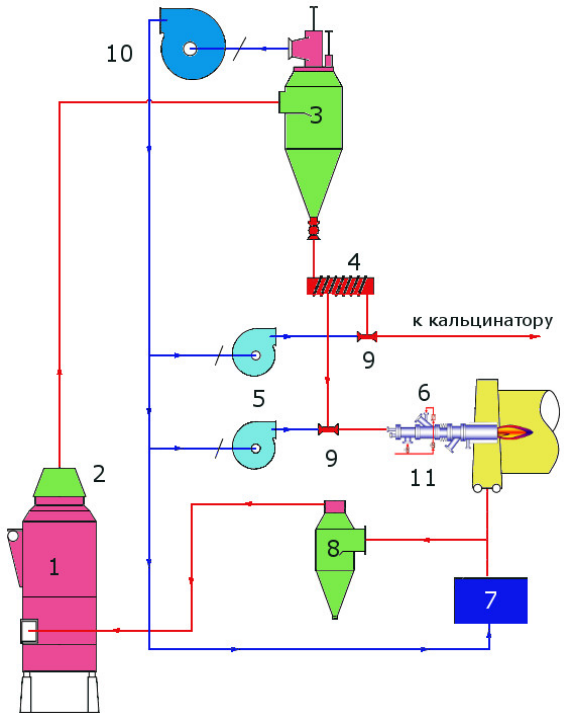
The devices are also used for sintering furnaces similar to the cement furnaces, for example sintering of alumina, lime calcinations, expanded clay and other building materials and for rotary kilns producing iron ore pellets.

PCF-C units offer sintering furnaces to use the cheapest fuel such as brown coal, at the transition from natural gas or liquid fuel for combustion of coal dust.

PCF-C units ensure a basic improvement of the safety of grinding complex as well as simplified maintenance and start and stop.

Device Function Description

It uses the modernized scheme of coal dust preparation with a semi-direct feed to the burner.
A specialty of the technology is the use of heat from sintering furnaces for coal-drying at grinding.
The PCF-C equipment is about 40% cheaper than the equipment of units for coal dust preparation with a "complete scheme" consisting of hot-gas-generator, exhaust fans, bag filter and a big silo for coal dust.
It is at the same time much easier, safer and has no restrictions on the different kinds of used coal.
It provides a safe operation of the plant by burning brown coal with a volatile content of 40-45%, without mixing with black coal.



Device content at preparation of coal dust:

1. Coal Mill
2. Air separator
3. The hub of coal dust
4. Dosage of coal dust to the burners of the sintering furnace and calciner
5. High-pressure blowers or fans
6. Dual-fuel burner for sintering furnace
7. Clinker cooler of sintering furnace
8. Cyclone for cleaning tertiary gases
9. Ejector of pneumatic transport
10. Main exhauster.
11. Second fuel control devices (natural gas, fuel oil)

The PCF-C unit is designed to perform according to the power of the sintering furnace and the kind of coal used

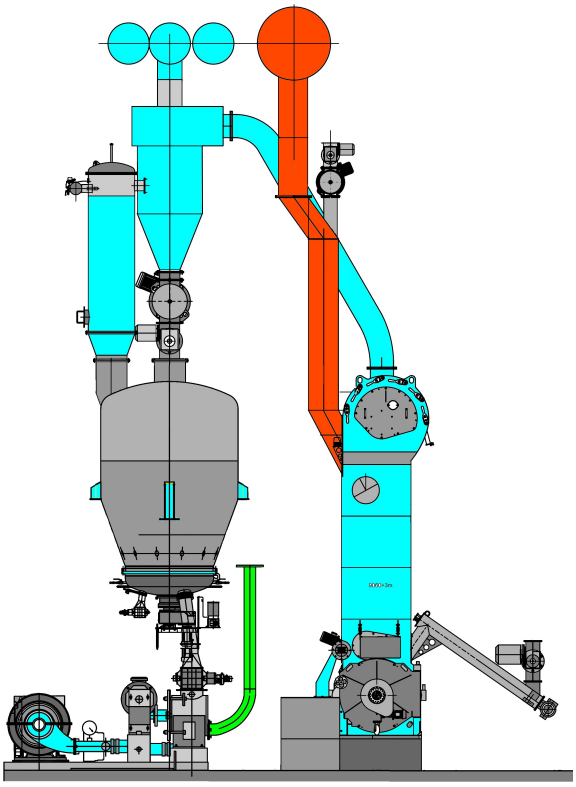
The total thermal power, MW	60	100	120	160	200
Wet method – cement production, ton / h	36	60	72	96	120
Dry method - cement production, ton / h	68	113	135	180	225
Coal consumption (6000 kcal/kg), ton / h	**9**	**14**	**17**	**23**	**29**

Combustion of coal dust

The preparation of coal dust and the supply to the burners is based on adapting the semi-direct way: the burning of coal dust immediately after grinding without intermediate storage in large silos. This is the most simple and least dangerous way of preparation and combustion of coal dust that is used in coal-fired boilers at thermal power plants.

The units include equipment for dust flow concentration, with guidance of low-concentrated flow to the product cooler. When working with high-moisture coals, the coal is partially pre-dried before grinding.

The PCF-C unit is compatible with any modern burners that operate with a coal dust concentration of 3-5 kg /kg air. The total consumption of primary air for combustion and transportation of coal dust is 8-10% of the stoichiometric required volume.



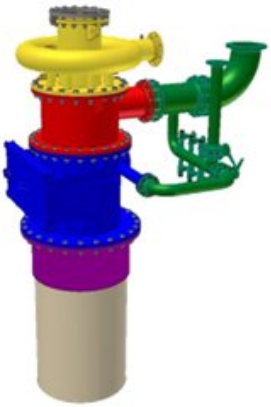
Coal-fired burners can be installed in any existing sintering furnace for "wet", "dry" or mixed cement production method, lime kilns, the production of expanded clay and similar furnaces. The burners are adjusted to the coals typical for the region. Chosen the most are low-value coal mixtures.

In the case of dry cement production method, the PCF-C units ensure a controlled distribution of the concentrated flow of coal dust between the sintering furnace burner and calciner burners.

The ash from coal does not disturb the properties of the final products, it includes the same binder as in cement, improving the basic properties of the sintered products.

Dual-fuel burner of sintering furnace - coal dust / heavy fuel oil capacity of 120 MW. Reinforcement area for the application of refractory protection

PCF-C units provide a high-temperature burner flame when using coal dust, improving economic indicators of cement clinker production.



Dual-fuel burner of calciner cyclone Exchanger.
Dry method of cement production.
Coal dust / liquid or gaseous fuel. Power 40 MW

Return on investment

Example calculations:
Furnace capacity of 100 ton / hour, working with wet method, natural gas flow rate is 179 nm^3 / ton of cement. With the cost of natural gas at 125 dollars / 1000 m^3,
Fuel costs amount to 17.9 million dollars per year.

When transferring the furnace to coal, coal consumption is 230 kg / tons of cement.
At a coal cost of 40 dollars /ton, fuel costs amount to 8 million dollars per year.
A difference in fuel costs of 9.9 million dollars per year.
Return on investment for the use of PCF-C units at the transition from natural gas to coal:
less than one year.

FTT-Engineering Office, Germany designs and sells devices for local coal dust production used in drying concentrates of metal ores, minerals, furnaces producing cement clinker, the production of fertilizers and other technologies;
Adapting technological equipment for coal dust.

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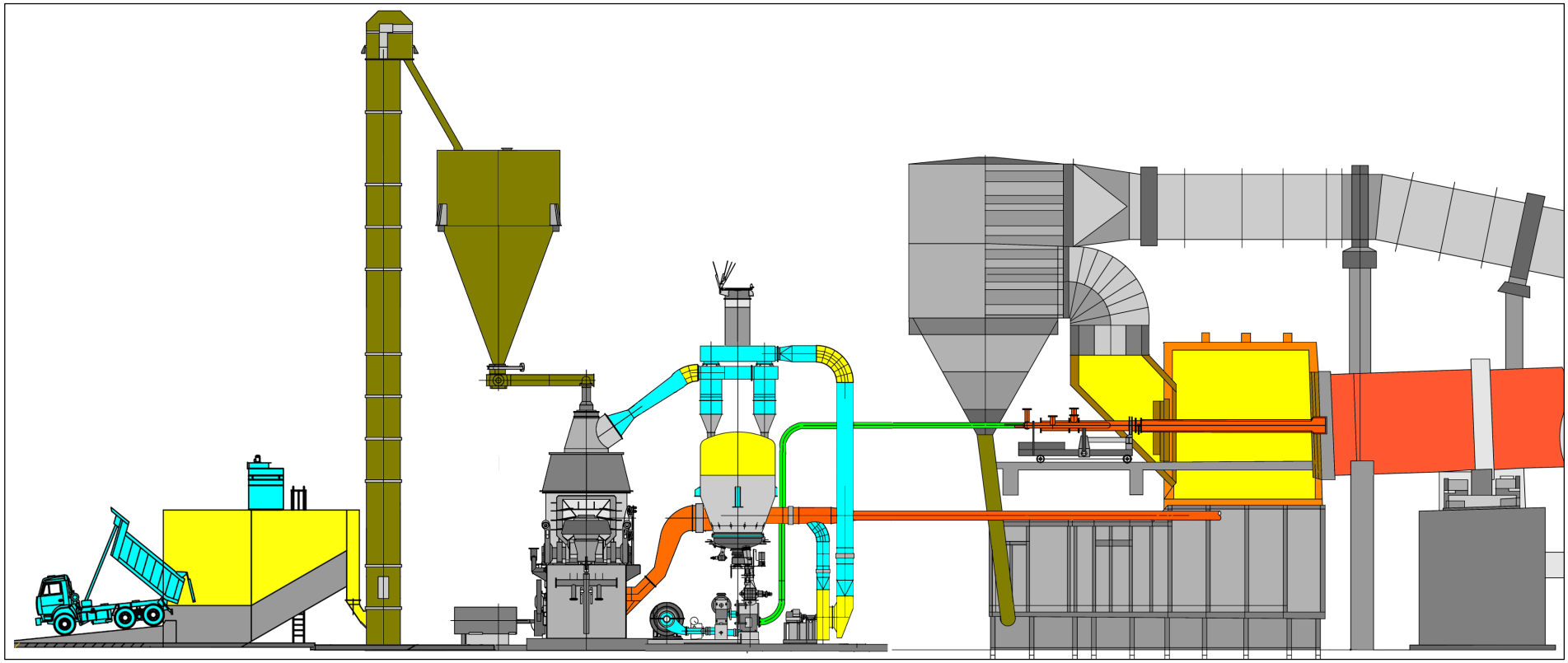
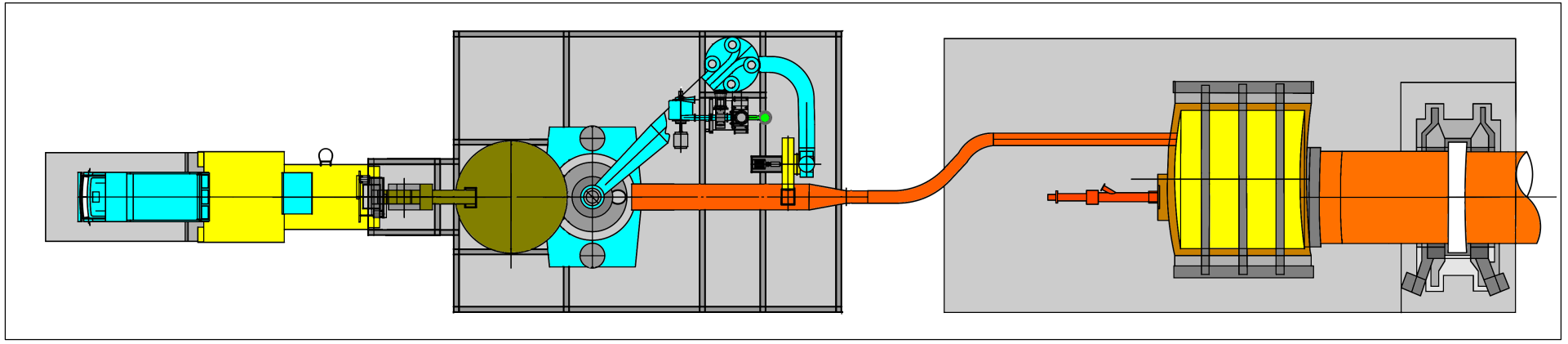
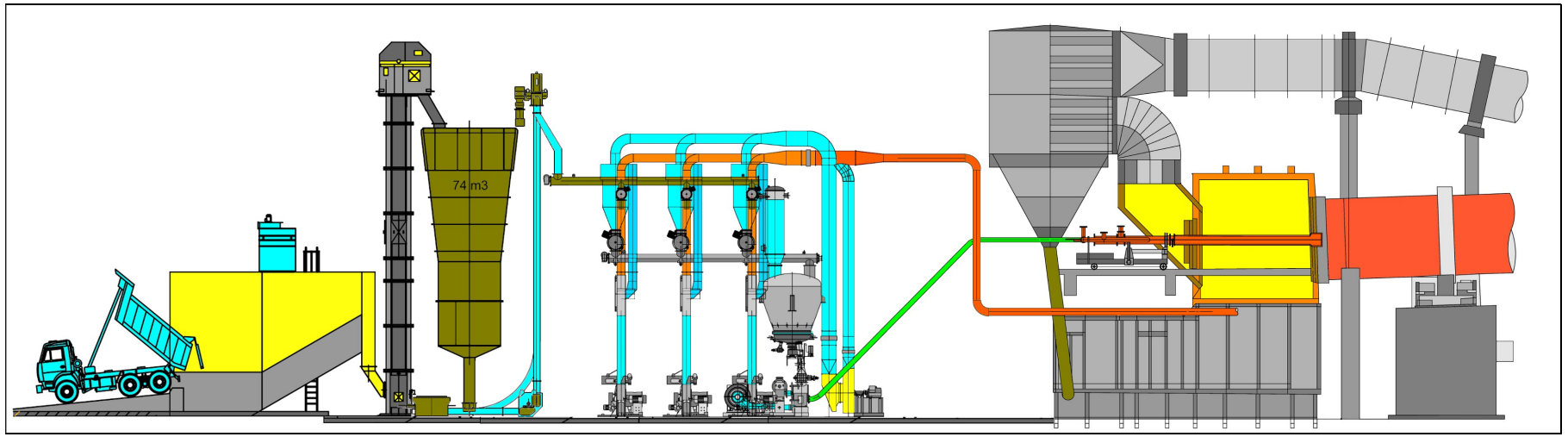
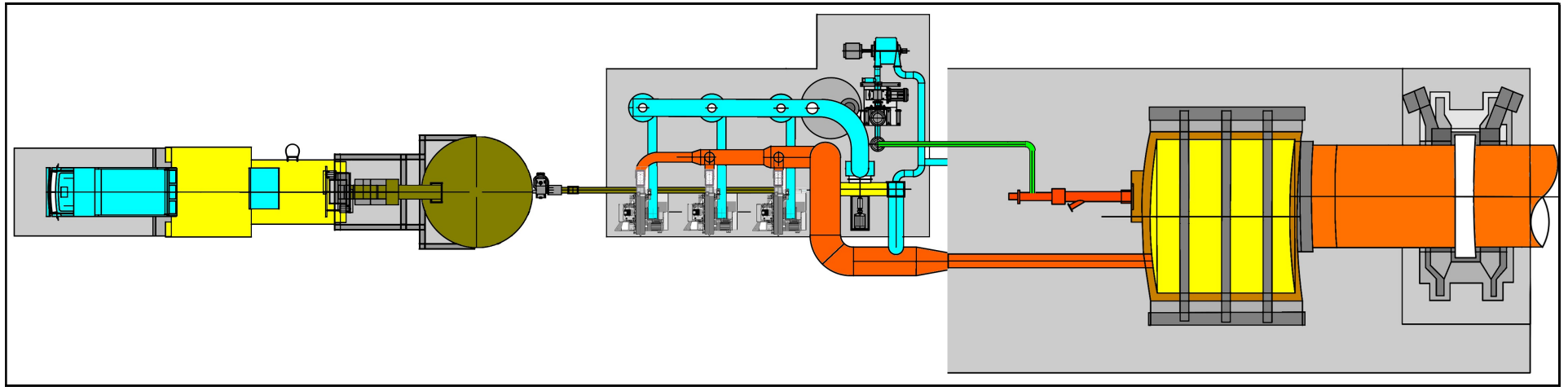




PCF-C unit with roller coal mill for cement sintering furnaces





PCF-C unit with a hammer coal mill for cement sintering kiln at combustion of high-moisture lignite