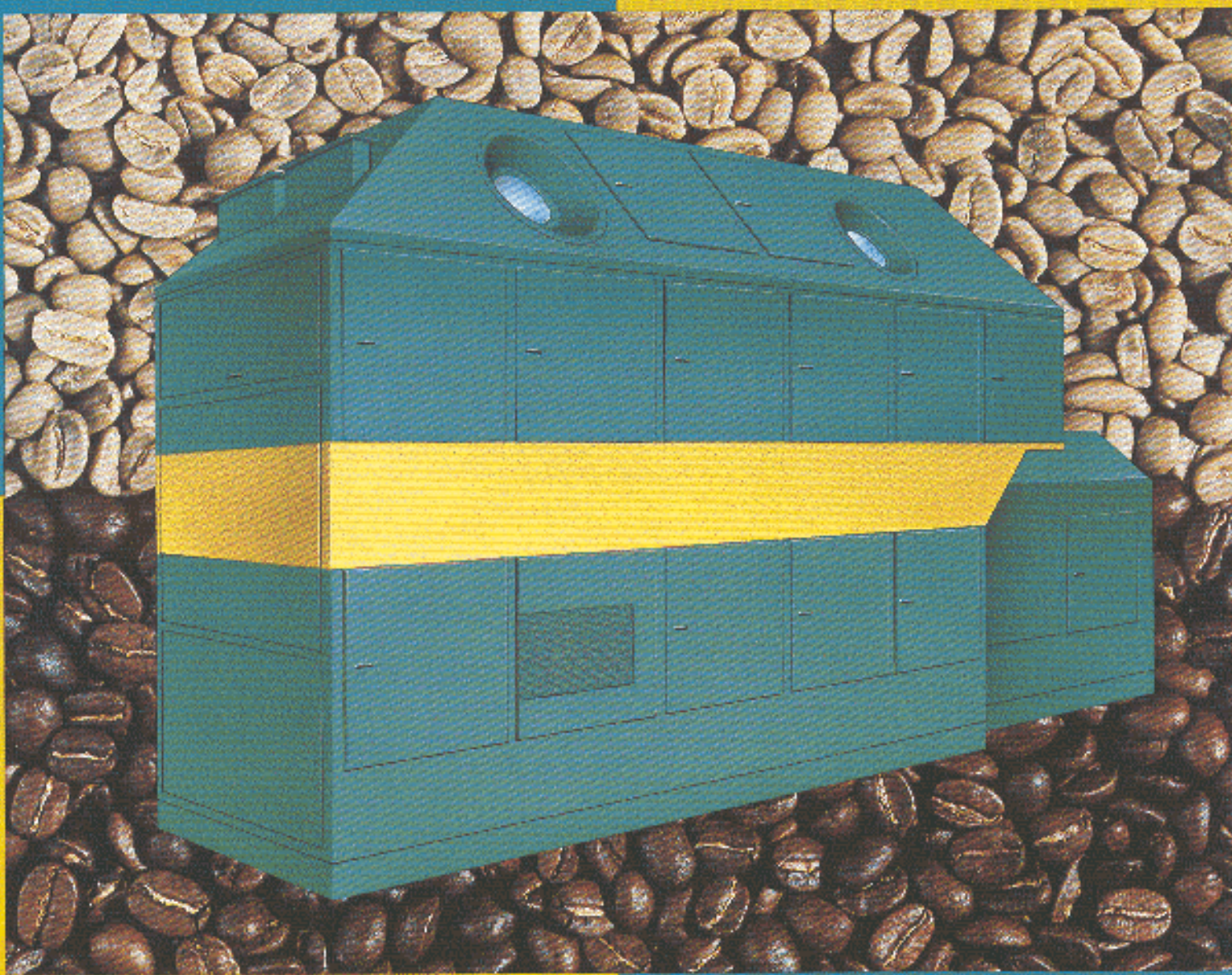


CFB Continuous Fluidized Bed Coffee Roaster



CFB Continuous Fluidized Bed Coffee Roaster

Each bean is gently roasted in a controlled flow of high air-volume, with high velocity and low temperature. Roasting times as short as 90 seconds allow a uniform bean development and even roast.

The simple design of the complete system together with the accepted and well-proven recirculation of heating gases, require little maintenance and permit easy operation. During roasting the coffee beans can be viewed.

CFB Coffee Roaster

The roaster applies the principles of fluidization. Green Coffee, fed to the roaster by a variable rotary valve, travels over a perforated deck, which again is combined with an air flow distribution plate. Simultaneously the heating medium flows crosswise from underneath through the coffee bed. The velocity of the medium is controlled so that fluidization of the entire coffee layer is achieved. To allow a predetermined and controlled retention time as well as a uniform coffee bed, the deck with an airflow manifold vibrates. For oscillation an eccentric motor is installed. A fan provides the required velocity and pressure for the heating medium to fluidize and roast the coffee. A modulating channel burner keeps the desired temperature constant. After the heating medium has transferred thermal energy to the coffee, it passes through a cyclone to separate dust and chaff, following which the gases re-enter the channel burner.

The roaster has two roasting zones to compensate for changes of the coffee bed in the course of the roasting process. Excess gases are let out to atmosphere

through a flue stack. To provide an even pressure in the complete system and a constant volume of excess gases, these are withdrawn by a fan and can be cleaned by optional catalytic after burner systems according to local emission codes, prior to going into atmosphere.

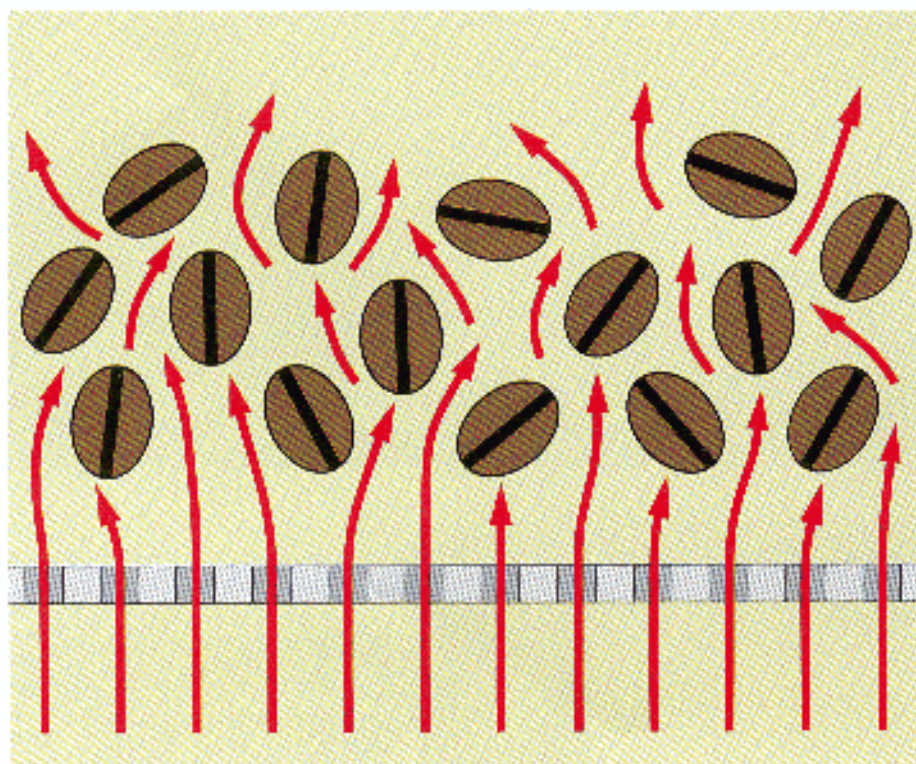
For monitoring of the process all physical parameters are automatically controlled.

Water Quenching

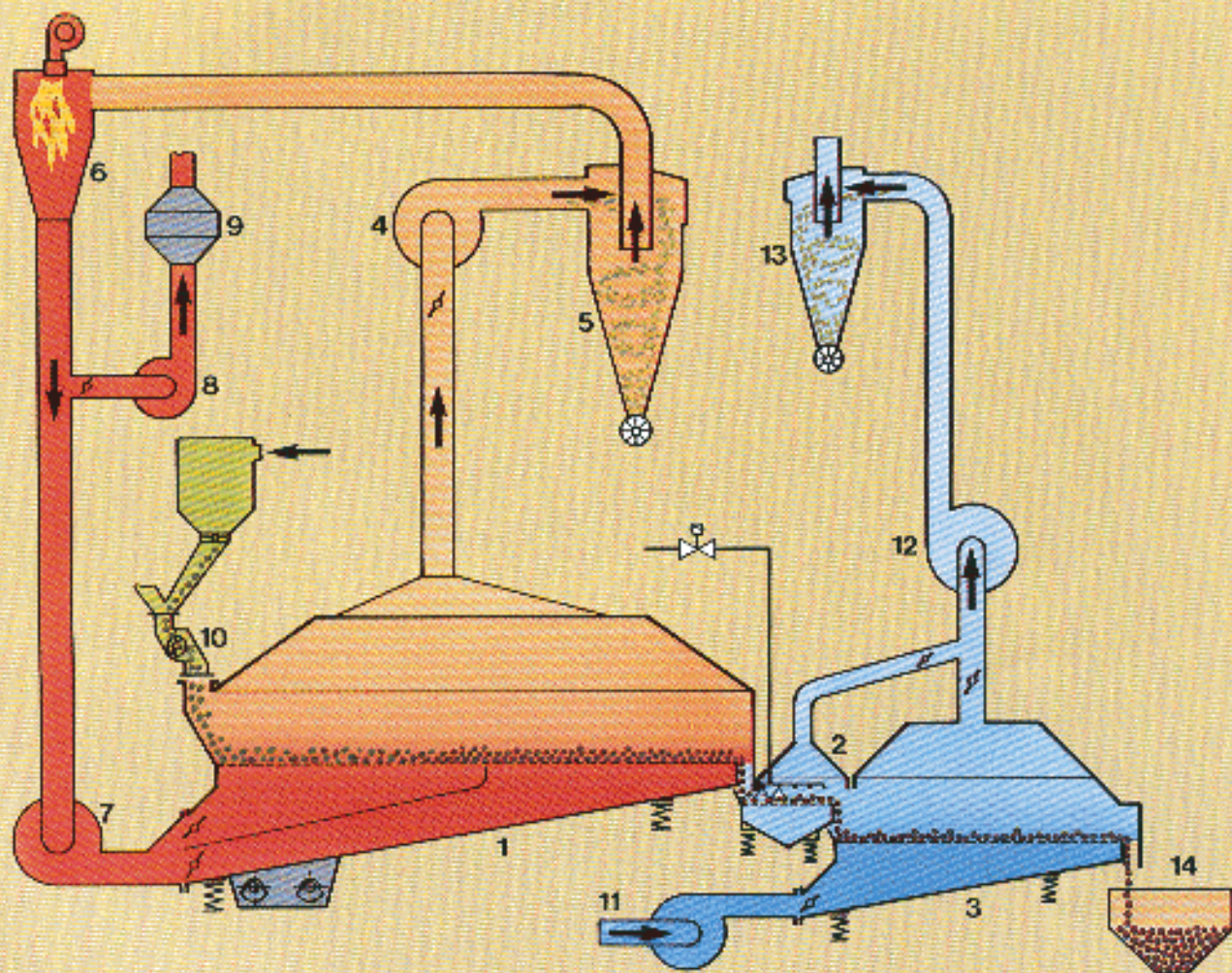
After the coffee has been roasted, it drops into a water quenching zone. This is a separately controlled vibrating sieve with a supply- and exhaust-air system as well as adjustable water spray nozzles. In the area of these nozzles the vibrating sieve provides a bed thickness of roasted coffee beans of less than half an inch or about one centimeter to ensure that each bean is evenly quenched thus securing the immediate termination of the roasting process.

Cooling

Also the cooler applies the principles of fluidization. The roasted coffee travels over a perforated deck, which is combined with an airflow manifold plate. Simultaneously the cooling air flows crosswise from underneath through the coffee bed. The air velocity is set in such a way that fluidization of the entire coffee bed is achieved. To ensure a pre-determined and controlled retention time, the deck with air-flow manifold vibrates, effected by oscillating motors on the deck. The cooler exhaust air passes through a cyclone prior to entering the atmosphere.



CFB Fluidized Coffee Bed
Each individual bean is in suspension and is thoroughly exposed to the heating medium.



CFB Flow diagram

- | | |
|--|-------------------------------------|
| 1 Dryer/Roaster | 8 Exhaust-gas fan |
| 2 Pre-cooler and quench zone | 9 Catalyser |
| 3 Cooler | 10 Product feed valve |
| 4 Exhaust-air fan hot-air recirculation system | 11 Supply-air fan cooler system |
| 5 Cyclone hot-air recirculation system | 12 Exhaust-air fan cooler system |
| 6 Channel burner | 13 Cyclone cooler system |
| 7 Supply-air fan hot-air recirculation system | 14 Roasted/cooled product discharge |

Features:

- Optimum heat transfer in a genuine fluidized bed
- Even, high velocity flow of the heating medium through the coffee bed
- Simple design without jets, little maintenance required
- Low energy requirements due to recirculation of heating medium
- Separate water quenching zone

Technical Data:

- Capacity
5 models from 500 – 4000 kg/h Green Coffee Input
- Roasting Time
90 Seconds to 4 Minutes
- Energy Requirements
thermal 0,288 kWh/kg
electric 0,045 kWh/kg

Technical data are subject to alteration