

The main process of the ecoDry system consists in drying in a sealed steam cycle, with a thermal oxidation integrated in the process.

## Process Description

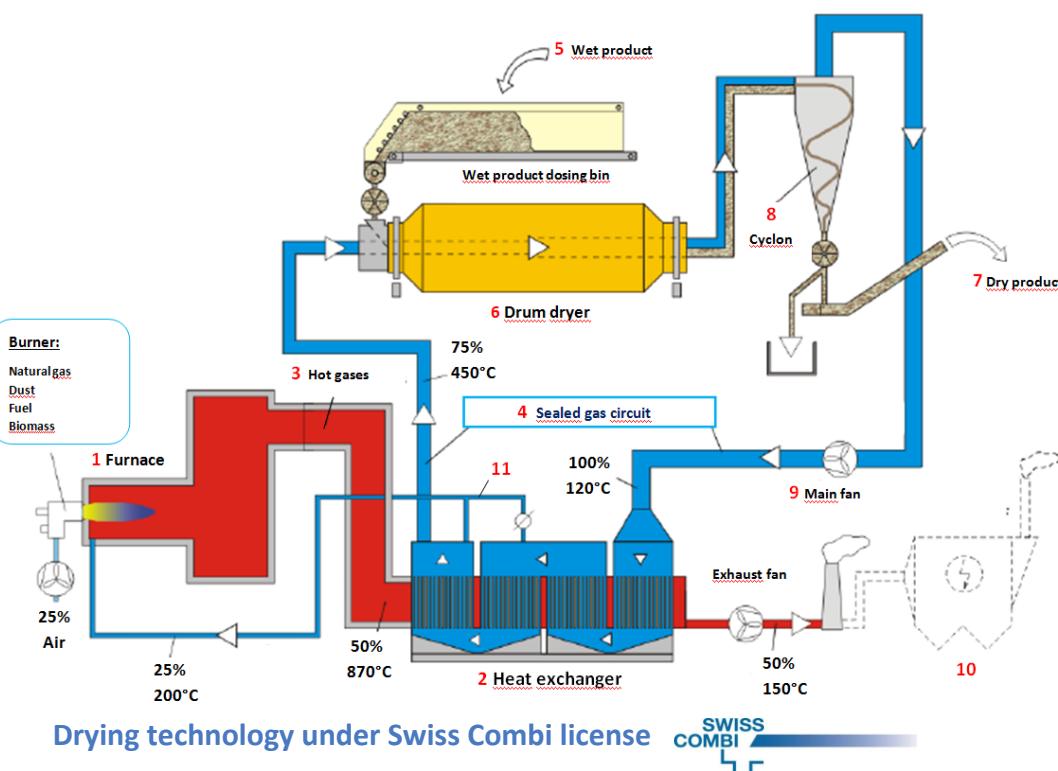
The gases in the sealed steam circuit (**4**) are heated in a gas-gas heat exchanger (**2**), specially designed, by the furnace (**1**) outlet gases (**3**), before entering the drying drum (**6**). In the drum these gases absorb water and other substances evaporated from the wet product (**5**). After the product separation (**7**) in the cyclone (**8**), the gases enter again in the exchanger (**2**) via the main fan (**9**), where they are heated once more. Except for the leakage air at the product entrance, the drum joints and the product outlet at the cyclone, the circuit is completely sealed. This enables working with atmospheric steam superheated at wet bulb temperatures up to 95 °C.

Water and other substances evaporated from the product are drained (**11**) from the sealed circuit (**4**) and introduced in the furnace (**1**) as combustion secondary air. At 850 °C all the polluting substances such as dust, VOCs and CO are thermally oxidized, which yields to emissions almost free from pollutants and odours. The energy released in this oxidation process is used as additional combustion energy in the exchanger for the drying process.

Thanks to the optimum combustion conditions, the high steam content in the sealed gas circuit and the low primary energy consumption, NOx emissions are also reduced. It can be recovered by condensing and cooling the drained gases energy for further processing (**A**), such as predrying, evaporating, etc. Besides, depending on the gases composition, it can also be recovered condensate substances to be valorised.

Eventually, the use of the exchanger outlet gases optimises the installation total efficiency (**B**).

### ENERGY GENERATION AND VOC's OXIDATION



- 1 Furnace
- 2 Heat exchanger
- 3 Hot gases
- 4 Sealed gas circuit
- 5 Wet product
- 6 Drum dryer
- 7 Dry product
- 8 Cyclon
- 9 Main fan
- 10 Dry ESP
- 11 Drain loop

#### Heat recovery alternatives:

- A. Direct steam recycling, low temperature drying, evaporation, hot water, etc.
- B. Low temperature drying, production of non-polluted condensate, etc.

The ecoDry system reduces the emissions of the dehydration installation, which enables the fulfilment of the environmental legislation, not requiring any further VOCs treatment.

Thanks to the low energy consumption and to the recovery potential, the ecoDry process is much more efficient than the conventional drying systems.

Under certain conditions, it is possible to adapt the ecoDry to already existing installations.



Drying technology under Swiss Combi license



## EcoDry Main Advantages

- ✓ Well proven technology
- ✓ Negligible emissions
- ✓ Lack of odours
- ✓ Drying with optimum product quality
- ✓ Minimum energy consumption
- ✓ High energy recovery potential (dew temperature 90–95 °C)
- ✓ Wet product conditioning integrated in the process
- ✓ Possibility of emission reduction in combustion gases from other processes

