The SWISS COMBI belt dryer sets the benchmark in wood pellet industry

The availability of dry wood wastes for manufacturing wood pellets is limited. Therefore, for industrial manufacturing of wood pellets, the overall process must be extended by a drying step with associated energy generation. For successful wood pellet production, beside the pellet press station as an essential factor, among others, location, raw material logistics, energy concept, availability of sawdust as well as the correct drying process have to be considered.

Wood pelletizing

Wood pellets, an ecologically and economically valuable biomass fuel, are manufactured from untreated wood wastes, mostly sawdust and shavings, without addition of chemical binding agent. Substantially, dry saw dust is compressed under high pressure in a pellet press. Before delivery to the end customer, the raw pellets pass through various purification stages (reduction of breakage, wear debris, dust), before they are employed as high-quality biomass fuel. Since the availability of dry wood wastes is limited, for industrial manufacturing of wood pellets from wet raw products the overall process must be extended by a drying step with associated energy generation.

Figure 1 **The 2nd KUVO belt dryer at the premises of the company Pfeifer in Kundl, installed above the first dryer, right before completion**

Sawdust as most important wet raw material for wood pellet manufacturing naturally accumulates in sawmills. Likewise accumulates bark as fuel and inexpensive byproduct, well suitable for heat generation. For large sawmills, on account of the attractive power supply tariffs it suggests itself to build a power station fueled with bark. The power generated normally can be sold as eco-power at interesting prices. The condensation energy is ideally and all year round used for heating lumber kilns and sawdust dryer. On-site utilization and refinement of the sawmill byproducts additionally reduces their removal, which has further ecological advantages.

Beside the pellet press station, the location, raw material logistics for heat generation and pellet manufacturing, energy concept and the correct drying process are essential assessment criteria for a successful wood pellet production.

Concrete example

In 1997, the first SWISS COMBI belt dryer of type KUVO was put into operation at the premises of the company Pfeifer in Kundl, Austria. It is a sawmill as well, which in a cogeneration plant uses the own bark wastes for steam generation with power generation. The exhaust steam of the turbine heats the lumber kilns and saw dust dryer.
In 2003, the pellet production of this plant was extended with an expansion stage.

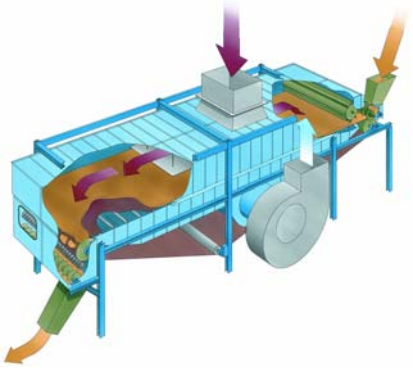

Figure 2 **Layout of the KUVO belt dryer**

In order to not have to additionally provide floor space for the new dryer, it was installed above the existing one in running operation. Because only little energy was left available from steam condensation of the power station, a flue gas economizer was fitted into the exhaust gas stream of the power station. Especially in winter, about 2/3 of the required energy for the new dryer is generated from the previously unused fumes of the power station.

Figure 3 The complete 2nd KUVO dryer in Kundl

Process principle SWISS COMBI KUVO belt dryer (Fig. 2)

By a special feed system the wet sawdust is distributed in a even layer onto a belt. The heated drying gas flows through the product layer and the drying belt. Thus the hot drying gas is cooled and saturated by absorbing water from the product. Via one or several fans, depending on the plant size, the now moist drying gas is exhausted at the stack(s).
At the belt end, the product layer is discharged from the dryer.
The drying plant automatically adapts to the available amount of heat with the belt speed controlled by the continuously measured dry saw dust moisture. With the speed adjustment of the exhaust fan according to the energy available, the dryer is permanently operated with the least possible power consumption.

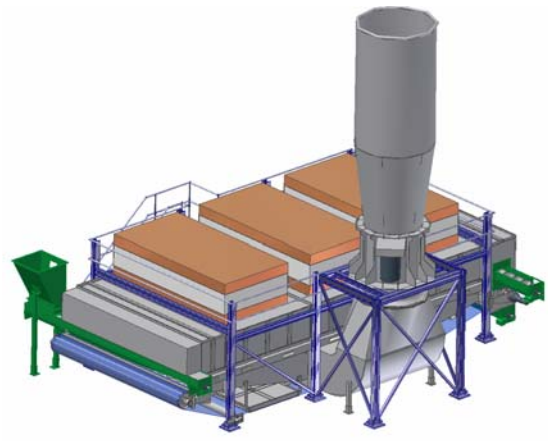

Figure 4 **3-D drawing KUVO with 2-stage hot air generation**

Figure 4 shows a 3-D representation of a KUVO belt dryer with 2-stage air heating. At first, ambient air is heated with waste heat from the flue gas economizer, and then further heated in the second, lower stage with energy from power generation. Another possibility is to directly supply the dryer with warm air, generated with a fume gas economizer, e.g. via plate or glass tube heat exchangers

Advantages of low-temperature drying KUVO:

- Low electrical energy consumption
- Low emission values (no additional emission reduction processes necessary)
- Utilization of low-temperature energy
- Gentle drying for optimal product quality
- Automatic operation
- Low maintenance costs
- High operational reliability

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