
Condensing belt-drying line

Company name: **StrojPro s.r.o.**
Czech ID: IČ: 09429450, VAT CZ09429450
Company headquarters: Česká Metuje 91, 549 56 Česká Metuje

The company's specialization

- research and development of technologies for hemp harvest as well as post-harvest processing
- development and production of technologies for hemp harvest processing
- development and production of technologies for industrial processing of commodities

Condensing belt-drying line

This technology is intended for processing agricultural products such as hemp leaves, seeds and flowers, hop cones, various oilseeds, as well as cereals, legumes, pods and other produce or products by means of an efficient drying system that preserves the essential values of the product.

Our technical solution that controls and recycles heat during the condensation and dehydration process is unique. Optimum drying temperatures range from 25 ° C to a maximum of 35 ° C. Within this range, valuable substances contained in any organic matter (such as terpenes) are preserved.

A prototype model drying line built according to these technical descriptions has been set up and is running on the premises of KonoPro s.r.o. **We developed this drying line as a modular system so that it can be assembled in any configuration designed to match clients' requirements.**

Once the harvested material comes in from the field, it is first processed by a bale shredder for hemp flowers or run through a pre-cleaning system for hemp seeds. The output from these processes is then evenly spread-out on the drying belts. The modular drying system starts removing the moisture from the material at once by condensing the humidity and subsequently recycling the heat this process generates. The whole drying process is optimized by a highly advanced control system, which our company has been developing for the past five years.

When the humidity reaches a specific value, the conveyor belts keep turning the raw material until the remaining moisture is removed. This process is programmed accordingly; the material drops down to a lower conveyor belt, or is elevated to a higher one. When the process of dehumidification is completed and the goods are dry, the conveyor belts empty their contents and stop.

This means that all the material has been thoroughly dried out and the hemp can be unloaded from the drying line. This process can be further enhanced by using the mechanical equipment for fragmenting, separating bagging, etc. described below.

Assembly of a model condensation drying conveyer belt line for processing harvested hemp flowers

- **The shredding system module**

The technology behind this assembly line will run smoothly, as long as the material it conveys flows, which means that some materials need to be shredded or fragmented before they can be loaded on the belts.

- **The loading and leveling out system**

Once the fragmented material reaches the drying lines with the help of the conveyer belts, it is spread out into an even layer (according to the type of material being processed).

- **The drying lines**

The model drying line set up on our premises, covers a drying area of 900 sqm. in total.

- **The elevation system**

Material dropped to a lower conveyer belt uses simple gravity, while if the contents need to be hoisted to a higher level, they are shifted to an ascending conveyor belt.

- **The condensing air drying system**

The modular condensing drying system has an absorption capacity of 15,000 liters of water per 24 hours.

- **The power air drying switchboard and drying process control system**

The power switchboard ensures safe operation and control of the entire technological assembly line. The control system monitors the entire drying system ensuring maximum efficiency of the drying process while minimizing energy costs.

- **The control box and operating system for loading and unloading the drying line**

The line operator is able to monitor the entire process following set levels and values and can also intervene and change the parameters.

- **System for unloading the drying line**

Once the material is thoroughly dried, the entire line is emptied automatically. The contents are conveyed directly into the separator.

- **Separation system**

The separator eliminates unwanted elements from the mass (in the case of hemp, remaining stems, for example).

The set was developed and verified during the cannabis harvest in the years 2015-2019.

With an interval of 45-55 days in between harvesting, the assembly line is able to dry and process a harvest of hemp flower grown on an area of 250 to 300 hectares.

Our modular system enables to assemble any tailor-made drying line exactly according to specific customer needs such as parameters of cultivated area, type of material to be dried, material throughput, vegetation period, specific climate conditions, etc.

We successfully tested hemp flowers, hemp seeds, cereal and grass grains as well as wood chips.

Technical parameters of the model technological line:

Voltage	400 V / 50 Hz (480 V / 60 Hz)
Installed electrical power	250 kW
Minimum air temperature (recommended)	25 °C
Maximum air temperature (recommended)	35 °C
Minimum speed of conveyors	1 m / min
Minimum speed of conveyors	10 m / min
The material input moisture	According to the material
Minimum output moisture of the material	According to the material
Water taken*	14.400 l / 24 h

* Nominal power (optimal condition)

Technical parameters of hemp flower model drying line

Average energy consumption	1.000 kW / 24 h
Minimum air temperature (recommended)	30 °C
Maximum air temperature (recommended)	35 °C
The material input moisture *	30 % - 75 %
The material output moisture *	12 % - 14 %
The bulk density * input**	57 kg/m ³ - 160 kg/m ³
Total material volume* one batch	50 – 70 m ³
Total material weight* one batch	up to 8.000 kg
Water taken weight	850 - 6.000 kg
The drying time*** one batch	5 hours - 24 hours

* hemp leaves and flower (cutting cyme at 5 cm, including stem)

** weight of bulk material

*** according to the input humidity

The price of the drying line configured according to the prototype model amounts to EUR 1 200 000
