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COMPARATIVE CHARACTERISTICS OF THE CONSUMER PROPERTIES OF DRYERS FOR THE WOODWORKING INDUSTRY

Over the last 15-20 years there were significant changes in the organization, equipment and technology of wood drying. If before the main volume of wood drying fell on the large woodworking and sawing enterprises where big drying plant were constructed, now 80 % of wood are processed at the small enterprises which needs can be satisfied by one or two chambers in loading capacity of 10 cubic meters.

At the same time, the market makes more and more rigid requirements for the quality of wood products that assumes lack of defects of chamber drying: cracking, buckling and change of wood color.

The presence of these defects leads to lower quality of a lumber and inability to use of the dried-up wood for the production of high-quality furniture and joiner's products. Drying chambers previously created and the majority of newly constructed work with the use of "normal" and "hard" drying modes, which provide wood "average quality" and "ordinary" with change of color, strength and other physical and mechanical properties.

At the moment, the need of the woodworking enterprises for high-quality drying isn't satisfied.

The main reason is the presence of a small amount of drying equipment with a "soft" mode of drying, which provides good drying while preserving the natural physical and mechanical properties of wood, its durability and color.

In connection with the establishment of duties for export on round wood, it becomes profitably to dry at low-temperature "soft" modes. Such technology gives the chance to process wood deeply. If the wood processing is deeper, the higher economic efficiency of the enterprise.

The Ukrainian market of industrial dryers for wood is represented by 3 types of drying technologies:

- convective drying technology;
- condensation drying technology;
- vacuum drying technology.

The convective way of drying is applied in the industry most widely. Mainly this way is used by the medium-sized and big woodworking companies that have a waste for energy production. Dryers of this type are easy to use and don't require special service. Woodworking companies can use waste products as fuel. Convective dryers are much cheaper, easier in design and service than other dryers,

but have big terms of wood drying and the high cost of electricity (in the absence of alternative raw materials). They provide a zero or a third category of wood drying quality. These categories of quality should provide lumber with transport humidity (16-20 %) and mechanical processing of wood for less responsible details (production of joiner's and construction products, container, etc.)

Condensing dryers are used in the absence of a waste in the woodworking process and its boiler room. Term of wood drying increases by 1,5-2 times in comparison with the conventional dryers. Different types of condensing dryers for softwood and hardwood drying are developed. Electricity costs less than for other types of dryers, but increased other operational costs that connected with the maintenance costs. Also these dryers mainly provide the third category of wood drying quality.

Today, on the industrial market of wood drying, only vacuum dryers are able to provide the first and the second category of wood drying quality. It is a high-quality drying. Companies which focus on the individual needs of clients use vacuum dryers. These are companies that produce exclusive furniture and joiner's products from expensive breeds of wood. For these companies is important the quality of the dried-up material, preservation of color and a wood structure, lack of cracks and deformations. Disadvantages of vacuum drying is the high cost of equipment, complexity of its operation and service, high unit cost of electricity that makes the high price of consumption of this equipment.

New technology in the course of drying of wood is infrared dryers which provide high-quality drying of any breeds of wood to the desired final humidity while reducing drying time to 50% in comparison with convective and condensing dryers.

Infrared drying system provides wood drying in a soft low-temperature mode that assumes faultless drying with preservation physical and mechanical properties of wood and its color. Infrared dryers have low unit electricity consumption. They are easy to work with minimal costs for their service. Infrared drying system provides the first and the second categories of wood drying quality, as well as vacuum. Cost of infrared dryers is much lower than cost of vacuum dryers. Therefore, these dryers are able to meet the needs of the woodworking enterprises for high-quality drying of wood in a best way.