SÖDRA

Date
2009-02-16

Department, administrator
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Test drying with TDS drier in Aurland

TDS drier

During this test, 10m^3 was dried and the energy consumption was registered. After this, the drier was run empty in order to determine the losses, with the same programme as used during the drying process.

A full drier, as per the size in Aurland, can dry 48 m^3 per load and the reference data was scaled up to simulate a full drier load. The loss was split across 48m^3 as this is more or less constant regardless of amount being dried.

The timber was measured for moisture content both before and after the drying process and density was established. The amount of water that had evaporated could then be determined and the energy consumption per kg evaporated moisture was calculated.
The energy consumption turned out to be **0.8kWh/kg evaporated.**

Chamber drying at Södra Timber Värö (STV).

The energy consumption in a progressive drier has been estimated to 80% of the energy consumption of a chamber drier and the production per year for a chamber drier at STV has now been set at 24,000 m^3. Production and energy data from 2007 was used for the calculation.
Inlet moisture content was established at 80% and outlet at 18%. Energy consumption is then **1.1 kWh/kg evaporated**.

Conclusion:

Nearly 30 % less energy per kg evaporated water is used by the TDS drier. A condensate of approximately 85°C is also obtained and if this heat is utilised, the overall efficiency increases even further.

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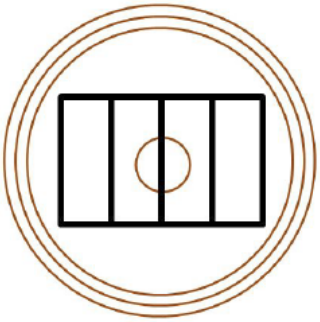
TEMPERATURE PROFILE IN THE TIMBER DURING THE DRYING PROCESS

Time	T centre	T surface
42	52	40
55	63	53
78	78	78
192	103	98
768	115	110
840	116	116
1080	124	121
1090	121	121
1120	69	74

IR-belt dryer



Test drying programme

White pine 47 x 200 [mm], 4-log

Step		Time (min.)	Medium	Moisture content (%)
I.	Heating	0-40	Steam	80
II.	Drying	-840	IR	10
III.	Equal.	-1090	Steam	18
IV.	Cooling	-1120	Air	18

The drying process finishes in step II with an average moisture content of approx. 10%, but with a significant standard deviation as the timber is part of individuals that have grown in soil of varying nutritional value.

In step III we add steam to equalise variations in moisture content.

The driest planks soak up more steam, so that the drying rate gets a standard deviation of 1.