

# Cold Mist in Dry Kilns

## ENVIRONMENTAL CONCEPTS 360-253-4453



### KEY

#### BENEFITS

- Reduced Energy Costs
- Reduced Cycle times
- Improved Lumber Grade
- Consistent EMC
- Less boiler treatment chemicals
- Less heat loss between loads
- Eliminated tendency of dry bulb temperature to rise uncontrollably
- Excellent Payback

### ADVANTAGES OF COLD FOG VERSUS STEAM IN DRY KILNS

A misting system is ideal for use in lumber dry kilns. It can be used with lumber of any species and thickness and can be installed in both conventional and dehumidification dry kilns. A misting system provides solutions to many problems experienced during conditioning and equalization. First, it eliminates the tendency of the dry bulb temperature to rise uncontrollably. This rise in temperature decreases the relative humidity in the kiln, reduces the effectiveness of the conditioning process, and lengthens the time required for equalization/conditioning. This temperature rise is due largely to an enthalpy decrease when high-temperature, high-pressure steam is released

into the kiln interior. A smaller heating effect results from the temperature change undergone by the steam as it leaves the spray line. It is estimated that the combined effect of these two factors result in a release of 1,270 BTU each for pound of water vapor absorbed into the lumber.

If a cool water spray were to be used in place of steam, approximately 1,112 BTU/lb of spray would be used in raising the temperature of the water droplets to the kiln interior temperature. This would largely offset the 1,270 BTU/lb released when the vapor entered the wood surfaces, thereby significantly reducing the heat problem. Another advantage

of using a high pressure misting system with conventional kilns is the steam savings. Take the case of a mill with several kilns which are heated by a waste wood boiler. When the mill was constructed, the boiler was oversized to allow for future kilns. As these were added, the excess heat capacity of the boiler decreased to the point that the output of the boiler would not support additional kilns. By replacing the steam spray systems in all kilns attached to the boiler with the misting system, enough energy can be saved to permit the construction of additional kilns without an expensive boiler upgrade.

### A COMPARISON BETWEEN COLD WATER AND STEAM FOR SPF LUMBER CONDITIONING

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#### **FORINTEK** Softwood Seasoning Test Summary

Conditioning is an effective method to release drying stresses and improve final moisture content (MC) distribution for spruce-pine-subalpine fir (SPF) lumber during drying. There are currently two methods used in the industry to add moisture to lumber during conditioning, namely low-pressure

steam spray and cold water spray. Sixteen kiln drying runs were carried out in a laboratory kiln. Two types of conditioning treatment were investigated: cold water spray and steam spray. Temperature profiles, final MC distribution and drying stresses obtained for lumber conditioned by the two methods were evaluated and then compared. Results indicated that there were no significant differences on drying temperature profiles and lumber

quality between the two humidification systems. Therefore, both humidification systems can be used for controlling humidity during kiln drying and for conditioning treatments.

*The complete report can be obtained from: [jan@van.forintek.ca](mailto:jan@van.forintek.ca) for \$100 for non-members of the Forintek Association.*

## “MIST” APPLICATIONS IN THE LUMBER INDUSTRY

In today's environment, ambient dust has become more of a concern. Usually



**Dusty environment**

this is health related both for workers and surrounding communities.

Dust can be a significant risk factor in fire and explosion potential areas of the plant. Depending on the nature of the dust (like ash for example) it can



**Dust everywhere**



even be classified as a potential hazardous contaminate.

The most effective strategy is to control



**Band saw dust controlled**

the dust as close to the source as possible. When that cannot be done, all is not

lost. Misting systems of various configurations can reduce dust both at its source and ambient dust.



**Logs to chipper dust free**



**BEFORE: Ash Dust just drifting**

**AFTER: Ash contained with mist**



Hollow blade fan emits a light mist to keep ambient dust down in a planer facility



Dust being suppressed as chips fall to conveyor belt before heading to the storage bin.

Click here to see a video of the hollow blade fan running at its maximum fog generation capability:

<http://video.yahoo.com/video/play?vid=49ad05599b3426d84116fa7f9e4050b1.1839717&fr=yymf>

## MIST HELPS DELIVER ODOR CONTROL

Pulp waste odor is being abated using Ecosorb® odor neutralizer in the mist being applied thru a hollow blade fan.



Odor from clarifier being reduced using mist containing Ecosorb® Odor Neutralizer inserted at the high pressure mist pump.