

A short horizontal line with a teal-to-orange gradient.

Dehumidification Kiln Drying

An Overview

Created and Presented by: Henco Viljoen and Elijah McCarty with Nyle Dry Kilns

Introduction

Henco Viljoen

- Bachelors Degree in Wood Technology - Nelson Mandela University – South Africa
- Advanced Diploma in Industrial Automation – Australia
- Microsoft Certified Systems Engineer
- Started & Co-owned a Timber Drying Consulting Business in South Africa
- Own and run a Small drying plant drying Hardwoods. Research lab where drying systems are tested. (12.5 + 20m3...+-13500BF)
- Have done the Automation, & assisted in the fine tuning & streamlining of Drying processes in about 200 kilns (Steam, Hot water, DH. Pine boards & Poles. Eucalyptus boards & poles, other commercial and non commercial hard & softwoods. ISPM15 HT)

Elijah McCarty

- Grew up around family within the lumber industry, in his third year with Nyle. Has worked on kiln installation crew, in the kiln manufacturing plant, remote customer service, and now kiln sales.



What is Dehumidification Drying?

- What is it?
- How is it done?
- Equipment, what's different?

A decorative horizontal bar consisting of a teal segment on the left and an orange segment on the right.

Solar Kilns vs. Dehumidification Kilns

Compare and Contrast

- Does anyone know a weather person that is always accurate?
- No sun=no dry lumber
- Equipment: What's different?
- Cost of Entry, Cost of Operation

Use of Schedules

User Manual
L200 Series



Never exceed safe drying rates!!

DRY KILN

**OPERATOR'S
MANUAL**



Agriculture Handbook No. 188

by
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FOREST PRODUCTS LABORATORY,
FOREST SERVICE,
U.S. DEPARTMENT OF AGRICULTURE

*(Maintained at Madison, Wisconsin,
in cooperation with the
University of Wisconsin)*

1961
March

Schedule Calc Sheet											
Fill Yellow Block Only Degrees F											
Resulting RH% & EMC % in green blocks											
DB	DB	WB Dep	WB	RH	EMC	h	Mp	K	K1	K2	Dewpoint
'F	'C	'C	'C	%	%						'C
120	48.88889	16.66667	32.22222	31.4	5.8	0.314	444.3333	0.834457	6.00437	3.199471605	27.4
Fahrenheit	120		90							Fahrenheit	81.32

T3-C3 Schedule

Step	MC	DB	WB	EMC	RH
1 >40		110	105	84.2	16.4
2 40-35		110	103	78.4	14.3
3 35-30		110	99	67	11.5
4 30-25		120	101	51.5	8.6
5 25-20		130	95	27.9	5.2
6 20-15		140	90	14.5	2.9
7 15 - Final		160	110	21	3.7

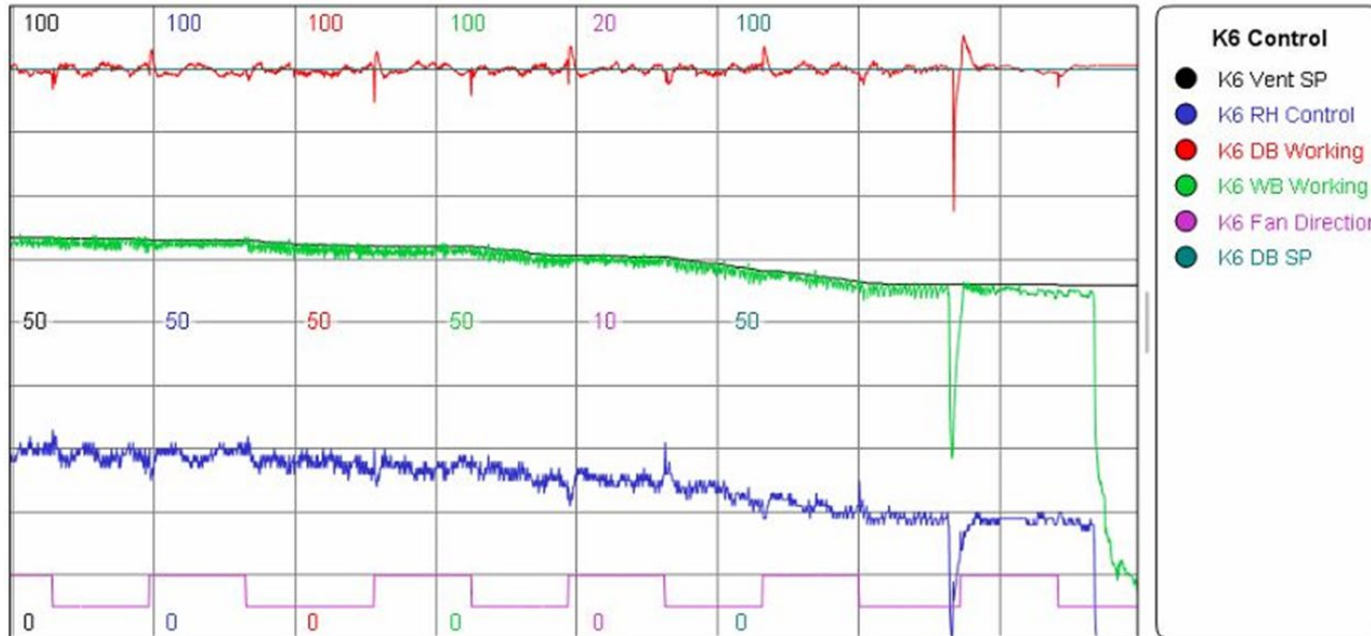
Schedule I ran in a kiln with very low air flow, ± 100 fpm

Step	MC	DB	WB	EMC	RH
1 >40		105	100	83.6	16.3
2 40-35		108	98	69.7	12.1
3 35-30		112	96	55.7	9.4
4 30-25		115	96	50	8.5
5 25-20		120	95	40	7
6 20-15		120	92.5	35.6	6.4
7 15 - Final		120	90	31.4	5.8

Moisture Content	Normal Schedule		Alternate Schedule	
	Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb
Group 2				
Above 45%	90°F	85°F	100°F	97°F
45% - 35%	100°F	87°F	105°F	93°F
35% - 25%	110°F	96°F	110°F	96°F
25% - Final	120°F	90°F	120°F	90°F
Group 3				
Above 45%	90°F	86°F	100°F	97°F
45% - 35%	100°F	96°F	105°F	101°F
35% - 25%	110°F	98°F	110°F	98°F
25% - Final	120°F	98°F	120°F	98°F
Group 4				
Above 50%	90°F	85°F	100°F	97°F
50% - 40%	95°F	89°F	100°F	96°F
40% - 35%	100°F	90°F	105°F	97°F
35% - 30%	110°F	98°F	110°F	98°F
30% - Final	120°F	95°F	120°F	95°F

If you cannot find exact match, look at SG of same family species.

Taking moisture away at the rate the board will
“safely” part with it



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Equalizing and Conditioning in DH Kilns

Always Equalize before conditioning -

- To bring wettest sample down without drying driest out further
- Target - 2%..until wettest is at Target MC

Conditioning - to relieve stress (case hardening) - Add moisture to outer fibres, “relaxing stress”

- HW target MC+4%, SW Target +3% ...until prongs stays straight
- In Small DH kilns....mist spray / atomizing spray...most kiln suppliers sells something similar

Q&A

Thank you for having us!

www.nyle.com

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