

THE BAUER MOISTURE CONTENT CONTROL

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To meet present day demands for lumber products, we must supply the best. To do this requires teamwork from the woods to the car. The dry kiln has an important place in this sequence, but the quality of the kiln's products depends greatly on the methods and quality of the lumber processing before it enters the kilns. To get the best results: logging high quality timber should be "hot"; lumber manufacture should be efficient and accurate; and segregation and stacking should be done very carefully.

One mill doing such a job is the Alexander-Stewart Lumber Company of Prineville, Oregon which cuts about thirty-seven million board feet a year-- mostly ponderosa pine from the Central Oregon country. This timber is fairly uniform and the well manufactured lumber is carefully separated by grades and moisture content at the green chain onto carrier loads. These loads are piled by modified Hilke high-pilers into well built dry kiln cribs, averaging about ten thousand feet per crib. The kilns have overhead fans, which provide good cross-circulation. There are eight tracks of four cribs each.

Their former method of calculating the moisture content was by carrying sample boards and taking core samples from selected boards in the cribs. During the cold eastern Oregon winters, this became a very disagreeable task. About three years ago, Mr. Leo Bauer, the Plant Superintendent, started to work on a moisture meter that could be operated from outside the kiln and read at any time without shutting down the kiln.

This idea has been developed into "The Bauer Moisture Content Control," which gives in a few minutes a moisture content reading for a sample board in each crib and an average button reading for several or all the sample boards.

This instrument is a calibrated megometer which is connected to each sample board by copper sheathed, mineral insulated cables, which terminate in the kiln, opposite the center of each crib at a junction box. From each box insulated wires run to two steel electrodes which are driven about eight feet apart into the edge of the sample board of that crib. The points of the electrodes are small and do not materially damage the lumber as much as core and oven samples. When the lumber is dry, the electrodes are unscrewed and hung on the junction box brackets.

Due to the difficulties of operating electrical equipment in the high humidities and high temperatures present in dry kilns, Mr. Bauer and his co-workers, Mr. Blackwood and Mr. Jordan, tested this installation under various circumstances from January 1954 to January 1955. Since that time it has been used at the Alexander-Stewart Lumber Company with little change. The schedules used at this plant are low temperature-low humidity schedules. When the instrument readings indicate that the fibre saturation point has been reached, the temperature is increased to the 160° maximum and the drying continues until the instrument shows the desired moisture content has been reached. Various schedules and conditions in the kiln produce different results on the meter so that any given condition must have its correction factor to give a true reading. These factors have been worked out most carefully for the Alexander-Stewart operation.

The results show that "The Bauer Moisture Content Control" has improved working conditions for the kiln operators and has also greatly helped in producing a more uniformly dried product. Kiln production has been increased 9% and degrade from overdrying and underdrying has been reduced. To make the final moisture content even more uniform, the lumber is not unstacked immediately, but allowed to cool for 24 hours, or its equivalent, after drying.

The following data show the uniformity of the moisture contents and of the car weights. These examples were taken from over 3 million feet of 5/4 and 6/4 shop run between June 10 and October 24, 1955.

Cool-: M.C. : M.C. : M.C.: Dry- : Moisture content distribution
 ing : crib : kiln : dry : ing :
 time : avge.: avge.:chain: time : Number of pieces with moisture content of--
 (hrs.): (%) : (%) : (%) : (hrs.): 8.5 : 9.5 : 11 : 12 : 13 : 14.5 : 15.5 : 16.5 : Total

<u>6/4 Shop</u>												
90	12.2	11.5	10.5	95	11	45	39	35	1			131
62	10.6	11.5	9.5	107½	35	43	20	3				101
24	10.6	9.6	9.1	112	46	57						103
20	10.3	9.7	9.6	105	39	48	25	26				118
<u>5/4 Shop</u>												
96	12.0	11.5	9.8	80	23	83	28	10				144
60	11.4	10.7	9.7	96	27	59	25	6	1			118
24	11.0	9.5	9.0	79	96	31		17				144
19	11.5	11.0	10.9	82½	25		30	35	5			95
<u>4/4 Heart common</u>												
21	12.0	12.6	12.1	26		158	104	32	23	18	7	342
18	13.0	13.1	12.8	26½		59	137	98	64	10	15	383
11	13.0	13.5	13.6	23½			184	181	89	55	9	518

: M.C. : M.C. : M.C.at:Wts. per: Lumber grade distribution
 No.of: crib : kiln : dry : MBM from:
 cars: avge.: avge.: chain : car wts.: Percent by grade--
 : (%) : (%) : (%) : (Lbs.) : #1 Shop #2 Shop #3 Shop

<u>Moisture content, weights per MBM, and grade percentages, 6/4 shop</u>								
33	10.0	10.5	10.1	2221	18.0	56.0	26.0	
2	10.0	11.5	10.2	2269	17.0	41.0	42.0	
2	10.1	10.2	9.6	2225	18.0	68.0	14.0	
2	10.4	10.6	9.9	2196	24.0	50.0	26.0	
<u>Moisture content, weights per MBM, and grade percentages, 5/4 shop</u>								
52	10.7	10.0	10.0	2155	23.6	48.6	27.8	
2	----	10.7	10.3	2186	26.0	40.0	34.0	
3	11.0	9.6	9.8	2159	24.0	46.0	30.0	
2	10.2	10.5	9.7	2135	26.0	49.0	25.0	

Mr. Bauer has a patent pending on this instrument. It is now available in an attractive black meter case which can be connected to multiple push button units, so that one or more kiln tracks can be serviced from the one meter box. Additional installations have been made at the J. E. Higgins Lumber Company, San Francisco; the J. Herbert Bate Lumber Company, Wallowa, Oregon; and the McCloud River Lumber Company, McCloud, California.