EFFECT OF TEMPERATURE AND MOISTURE ON CCA FIXATION

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Subject The influence of temperature and moisture on accelerating the fixation of CCA in sawnwood is investigated.

Method Hem-fir (a commercial mixture of Tsuga heterophylla and Abies amabilis) 100 x 100 mm sections, 30 cm in length were end-sealed with epoxy resin, pressure treated with CCA type C (2.09% w/w on an oxide basis) using a full cell process. After treatment the sections were immediately placed in a conditioning chamber, where the temperature and humidity were controlled. The air velocity was 2 m/s. At selected time intervals, cores were removed from each section for examination of the conversion of the hexavalent chromium to the insoluble trivalent form. The split cores were placed on filter paper and a few drops of a 0.5% solution of the disodium salt of 5-dihydroxy-2.7-naphthalene disulphonic acid in sulphuric acid were applied to the wood surface. A purple colour transferring to the paper indicated the presence of hexavalent chromium.

Results

1. Accelerated fixation of CCA can be achieved in 24 hours or less at relatively low temperatures of approximately 50°C (wet bulb).

2. The wet bulb temperature is more important than the dry bulb temperature, in determining the time required to fix the CCA.

3. The surface moisture content is a key parameter in determining the CCA fixation rate, in that if it is allowed to fall too low (less than approximately 10%), the time required to convert the hexavalent chromium will greatly extend.

4. Even at high dry bulb temperatures of 80°C, fixation may not be achieved in 24 hours, due to low surface equilibrium moisture contents.

Reference

Peek, R.D. and H. Willeitner. 1988. Internat. Res. Gp. Wood Preserv. Nineteenth Annual Meeting, Madrid Doc. No. IRG/WP/3483. 12pp.

Results

----- Fixation Conditions -----				
Dry Bulb (°C)	Wet Bulb (°C)	Relative Humidity (%)	Surface Equilibrium Moisture Content (%)	Time to Fixation (h)
49	39.5	55	9	>120
55	54.0	92	19	16-30
55	47.8	67	10	> 30
55	43.5	50	7.8	> 48
80	77.5	90	15.2	4-6
80	65.0	50	6.3	> 24*

* indicates trace observable

NOVEL PRESSURE PROCESSES FOR TREATING WOOD WITH PRESERVATIVES

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