DEPARTMENT OF FOREST PRODUCTS

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Larry Swan
Winema National Forest
2819 Dahlia Street
Klamath Falls, OR 97601-9937

Dear Larry,

We have completed the work specified in the memorandum of understanding FP-818-P112-U, steaming of juniper. This letter and the attached graph summarize the results. I've also attached a copy of the memorandum and study plan for reference rather than repeating the procedures here.

We were not successful in identifying a temperature at which juniper will soften and deflect. As can be seen from the graph, the deflection was greater as the temperature increased; however, there was no point at which deflection increased dramatically. We steamed at temperatures as high as 240°F, rather than 220°F as originally planned. There does not appear to be a temperature (normally used in kilns) that would be optimum for relieving the stress inherent in the wood. From a practical standpoint, very few mills, particularly small producers, could attain conditions greater than 200°F.

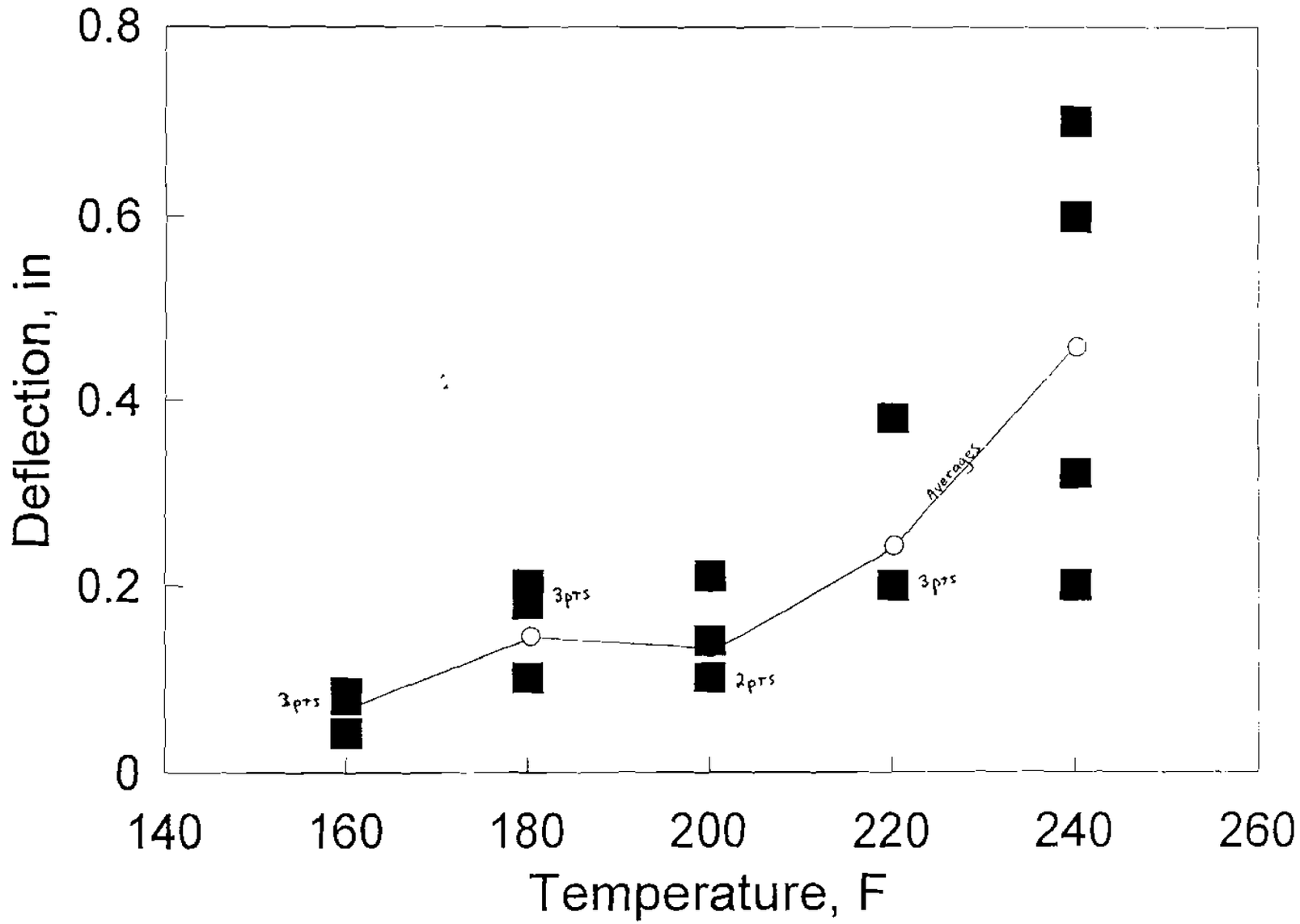
Per our phone discussion, we did not do the replications and instead compared the deflection of juniper at 200°F to Douglas-fir. We measured an average deflection of 0.01 inches in the two Douglas-fir boards compared to 0.26 inches in the juniper. Basically, the Douglas-fir did not sustain any permanent deflection. It probably has an E value almost twice juniper (if juniper is similar to Eastern red cedar) which would result in less deflection.

We did a total of six charges instead of the seven planned originally. We will bill accordingly.

Sincerely,

Mike

Michael R. Milota
Associate Professor


0.8
0.6
0.4
0.2
0
Deflection, in
140
160
180
200
220
240
260
Temperature, F
3pts
3pts
2pts
3pts
Averages