

Comparison of Tangential (Plain Sawn) to Radial (Quarter Sawn) Dimensional Change when Moisture is Added or Removed

Subject(s): Industrial Arts

Grade Level: 9th - 12th

Activity author: William Perry, Gooding High School

Time Required: 2 hours

Lesson Objectives:

Compare plain sawn vs. quarter sawn dimensional change in wood when moisture is added or removed.

Materials Needed:

Vacuum chamber, oven, 3 pieces (4" long x $\frac{3}{4}$ " x $\frac{1}{4}$ ") each of alder, oak, maple, 1 piece quarter sawn, 1 piece plain sawn, 1 piece radial annular ring pattern

Procedure

1. Dry all samples for 12 hours at 220° F
2. Measure sample accurately
3. Introduce samples into vacuum chamber filled with water – remove air in samples and replace with water
4. Remove samples and measure accurately
5. Compare pre- and post-vacuum measurements
6. Observe the physical change in shape of the samples
7. Place samples back in oven for 12 hours at 220°F
8. Measure samples again and compare measurements

Discussion:

1. What happened shape and size-wise to each sample?
2. Compare each sample (shape and size).
3. Is one type of wood cut better for cabinetry than another?
4. Pros and cons of using plain sawn versus quarter sawn.
5. List advantages and disadvantages of plain sawn and quarter sawn material.