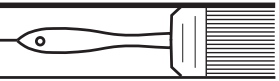


# The finish line

A Forest Products Laboratory finishing factsheet



## The Bark-Side/Pith-Side Debate

Is there any value to placing exterior wood bark-side up, or does the common practice encourage “barking up the wrong side?” The bark-side/pith-side quandary arises when flat-grained lumber—that is, lumber cut tangential to the grain—is used for decking or siding (Fig. 1).

The usual reason given for placing deck boards bark-side up or siding bark-side out is to reduce cupping, a form of warp. Cupping results from the shrinking of the top and swelling of the bottom of the wood, which are caused by exposure to moisture and drying by the sun. These changes do not occur evenly throughout the wood.

The amount of initial cupping depends on the difference between the moisture content of the wood at the time it is cut compared to the moisture content in service. As the boards weather and continue to experience wetting and drying cycles, cupping continues to increase. The boards take on increased “set.”

Even during periods of rain, when the moisture content rises in the surfaces, boards remain cupped because the surfaces undergo a permanent set. During periods of increased moisture content, the surface cells are slightly crushed; during drying periods, small cracks (checking) appear in the

wood because the surface cells remain crushed.

Vertical-grained lumber tends to have fewer problems with cupping than does flat-grained lumber, but both kinds of wood will cup when the top or outside of the wood is lower in moisture content than the opposite side. In the case of decking, the top of the board dries much faster than the bottom; in fact, water may be driven down by the drying process. Water-repellent

treatment also helps to keep the wood dry. In tests at the Forest Products Laboratory, the bottom of deck boards was about 2% wetter than the top. The better the water repellent, the greater the difference.

Contrary to popular notion, there is only a small advantage to placing boards bark-side up with regard to cupping. However, it is advisable to place the bark-side up for other reasons. The pith side is more prone to a severe type of raised grain, called shelling, particularly in species that have dense latewood growth rings, such as southern pine (Fig. 2).

The second advantage to placing deck boards bark-side up relates only to wood that has been pressure-treated with preservatives and not incised. Pressure treatment does not penetrate the heartwood of unincised wood very well. In a flat-grained board, the bark side may consist of 100% sapwood and therefore be fully penetrated with treatment, whereas the pith side may contain a portion of poorly penetrated heartwood. When the deck is exposed to the weather, checking of the heartwood surfaces can expose the untreated heartwood to attack by decay fungi. The bottom of the deck is not prone to checking because its moisture

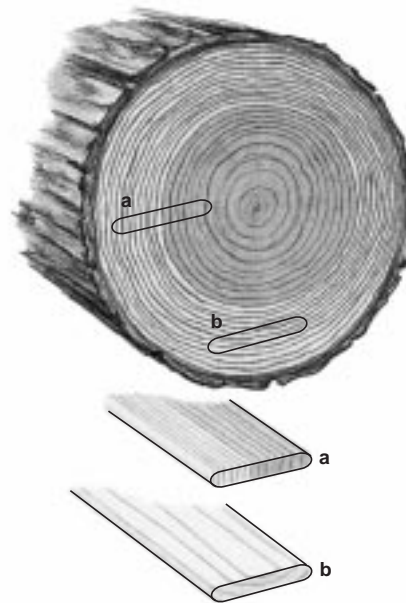


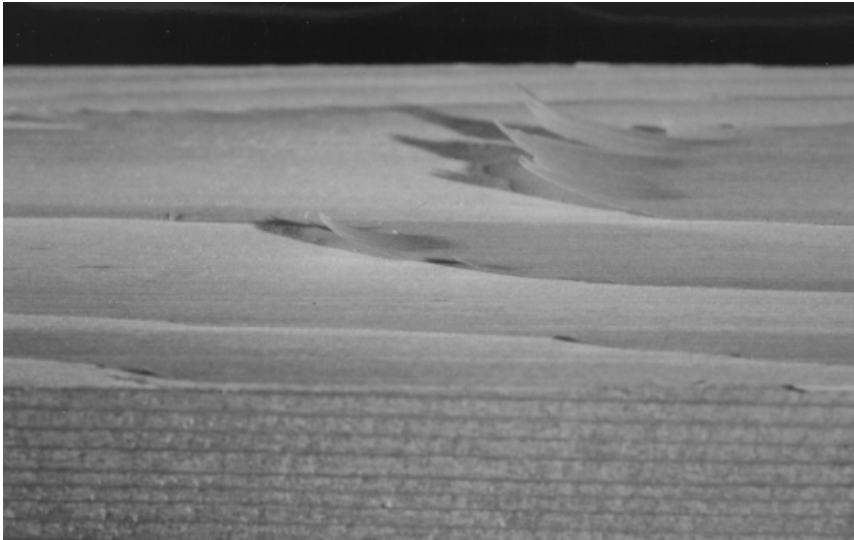
Figure 1. The grain of wood is determined by how the log is sawn: (a) vertical- or edge-grained lumber; (b) flat-grained lumber.



United States  
Department of  
Agriculture

**Forest  
Service**

Forest  
Products  
Laboratory



*Figure 2. The pith side of lumber is prone to shelling, a severe type of raised grain.*

content is less changeable than that of the surface.

These factors, although important, can be overridden by a third factor—the quality of the pith side compared to that of the bark side. If the pith side is clearly better, place this side up.

Which side to place up is not an issue when applying resawn bevel siding. When a single board is resawn into two pieces, each has a rough side and a smooth side;

one half of the rough side will be pith and the other, bark. This is why paint often peels on only half the siding on a building.

---

*R. Sam Williams and Mark Knaebe are researchers in Wood Surface Chemistry at the USDA Forest Service, Forest Products Laboratory, One Gifford Pinchot Drive, Madison, WI 53705-2398*

*December 1995*