Walpole Outdoors™

CEDAR CHECKING

WHAT TO EXPECT
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Since 1933, Walpole Outdoors has earned a national reputation for style, quality, and structural integrity through a commitment to our customer's needs. Whether you invest in a Walpole fence, structure, or other outdoor product, you can feel secure in the knowledge that it has been designed and handcrafted to the very highest standards. From manufacturing to fabricating, painting, and installation, Walpole Outdoors is the standard by which others are measured.

Walpole Outdoors™

What to Expect: Cedar Products

WHITE CEDAR

Our cedar products are made of White Cedar, one of the most durable and weather resisting woods known. It contains natural oils which resist mold, moisture, rot and insects, and it's warp-resistant. Care has been used in selecting the stock for all of our cedar products, using only top-of-the-line White Cedar.

It is important to remember that Cedar is a biological material and will eventually decay. Fortunately, White Cedar can take 15 to 30 years to do that, making it an ideal material for outdoor structures.

SEASONING CHECKS

All cedar products are subject to a process called "checking." Seasoning checks are separations of the wood along the grain. The separations occur as the wood dries from the green, or wet, condition. Seasoning checks are not defects. They are common in timbers and can be seen as a single, wide and deep separation, or multiple narrow and shallow separations (it is unusual to find a timber that does not have checks).

Air-dried timbers will dry at the surface more quickly than at the core of the timber. Shrinkage at the surface of a timber is restrained by the core that has not yet dried, resulting in stresses in the wood that are relieved by the formation of the checks. Timbers that are installed in a structure in the green condition can take years to dry to ambient moisture conditions and develop checks over the first several years of service, after which the check is considered essentially stable, unless subjected to significant changes in the moisture environment (much lower or higher relative humidity for an extended period of time).

Seasoning checks are sometimes misidentified as fractures or an indicator of structural failure. This can lead to erroneous conclusions about the suitability of using timber with checks, or the performance of timbers that have been installed in a structure for years.

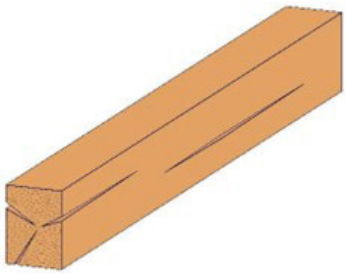

Figure 1 **The width of seasoning checks reduces as the check approaches the pith. Multiple checks may meet at the pinth, but this is not considered a split.**

IDENTIFYING CHECKS

Seasoning checks typically form along the grain of a timber, except in juvenile wood where they can develop across the wood fibers due to weaknesses in the wood from the rapid growth early in the life of the tree. Unlike a split, which extends through the timber from one face to another, a check is widest at the outer surface and diminishes in width as it approaches the pith, or heart, of the timber. A single check does not extend beyond the pith, although multiple checks can meet at the pith as shown in Figure 1 (much lower or higher relative humidity for an extended period of time).

The rate of drying affects the frequency and size of checks and depends on (1) the moisture content of the timber, or, more specifically, the moisture gradient across the cross section of the timber, and (2) the relative humidity in the air. Drying occurs much more rapidly at the exposed end grain than along the length of the timber. This is why end checks develop quickly as timbers dry. Often timbers for a project are initially longer than needed to allow for cutting the checked end grain from the timber before installation, once it is closer to being in equilibrium with the humidity in the environment. Checks are also impacted by the cut of the timber. The tangential face (plain sawn) exhibits the greatest shrinkage and typically a single wide check will develop, as shown in Figure 2. The radial face (vertical grain or quarter-sawn) will often have multiple narrow checks due to the lower radial shrinkage. Multiple short checks will also develop near the pith, as shown in Figure 3.

Figure 2 **A single wide check on one tangential surface of a timber**

Figure 3 **Multiple short, discontinuous checks near the pith that extends along the length of two adjacent timbers**

STRUCTURAL CONSIDERATIONS

The grading rules for new structural timbers have restrictions on the depth of seasoning checks. For all species (except Southern Pine), Beams and Stringers, Select Structural and No. 1 grades, are allowed checks with a depth that shall not exceed ¼ the thickness of the timber. For Posts and Timbers, Select Structural and No. 1 grade, the depth of a check shall not exceed ½ the thickness of the timber. For Southern Pine timbers, Select Structural and No. 1 timbers are allowed checks with a depth that shall not exceed 1/3 the thickness of the timber. For No. 2 Southern Pine timbers, checks shall not be deeper than ½ the thickness of the timber. There are no limitations on the depth of a check for No. 2 grade. These limitations apply only to the grading of green timbers because they have not yet been installed in a structure and the final moisture environment is unknown. Subsequent seasoning and checking are not cause for re-grading the timbers. Additionally, since checks run parallel with the grain of the wood, they are a useful indicator of slope of grain when evaluating the grade of a timber in situ for strength purposes.

The presence of seasoning checking in a timber typically does not impair the structural performance of a timber. Checks do not result in any reduction in a timber's ability to resist axial tension or compression stresses since the cross-sectional area is unchanged. An 8-inch by 10-inch post has 80 square inches of cross section without checks. It also has 80 square inches of cross section with the checks. No wood is lost to resist the axial loads.

Figure 4
Applying a dark stain to green timbers will make checks appear more pronounced.

The presence of seasoning checks can influence the ability of a timber to resist shear stress parallel to the grain. Since the presence of checking is expected, the tabulated allowable shear stresses published in the supplement to the *National Design Specification for Wood Construction (NDS)* are based on the conservative assumption of the most severe checks, shake, or splits possible, as if the timber were split through its full thickness for its full length. Prior to the 2001 edition of the NDS, there were provisions in the standard that allowed for an increase in the allowable shear stress by a factor of 2.0 if you could verify that there were no splits or checks present at the end of the timber.

For timber that has come into equilibrium with the ambient moisture conditions, checks are not a structural concern unless a check near the end of a member is large enough (in width and length) and in line with connectors so as to cause them to lose fastener-holding capacity. In such instances, the connection should be evaluated to determine if the check has adversely impacted the performance of the connection.

SUMMARY

In summary, seasoning checks in timbers are natural characteristics of the wood that develop as wood dries from green to ambient conditions. The rate of drying, or more specifically, the moisture gradient across the cross section as the wood dries, affects the frequency and size of the checks that develop. Most checks do not impact the strength of the timber, and only in rare circumstances is consideration of the shear stress warranted. Consequently, the presence of seasoning checks in a timber does not, typically, necessitate any adjustment to the calculated load resistance of the structure and is not cause for implementing any reinforcement or remedial action on the timber.

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