



Larson Packaging Company Material Grades for High End Crates

Larson Packaging Company and its partners strive to define and **control** naturally occurring defects and **eliminate** manufacturing defects to assure highest quality packaging/crate performance and durability.

Natural materials like lumber and plywood are never "perfect." The challenge is to define acceptable "grades" and/or allowable/acceptable "defects"... Our crating standards are derived from US Mil-Spec packaging and our rack crate experience.

General Workmanship

1. Lumber shall be free of jagged edges and defects that may cause injury.
2. Boxes shall be freed of cracked, damaged or broken fasteners that affect the points or heads, point of fastener projecting beyond the surface, or fasteners in the wrong location.
3. The box shall be assembled with sides of panel boards butted, cleats flush with edge of end of panels plus or minus 1/8 inch, and side panels not projecting more than 1/8 inch beyond the end of the box. Gaps between butted joints of cleats shall not exceed 1/8 inch. The top panel shall be flush with the outside edges of the end and side panels plus 1/8 inch or minus 1/8 inch. Subsequent shrinkage due to loss of moisture content may result in spaces appearing between panel boards, but in no case should these exceed 1/4 inch.
4. Wood components shall vary no more than permitted tolerance.
5. Nails shall not be bent and shall be driven so as not to cause splitting. Adjacent boards in a panel shall be matched in thickness within a maximum tolerance of 1/8 inch.
6. Discolorations to any degree shall be permitted.

Our Approach to Natutal Defects

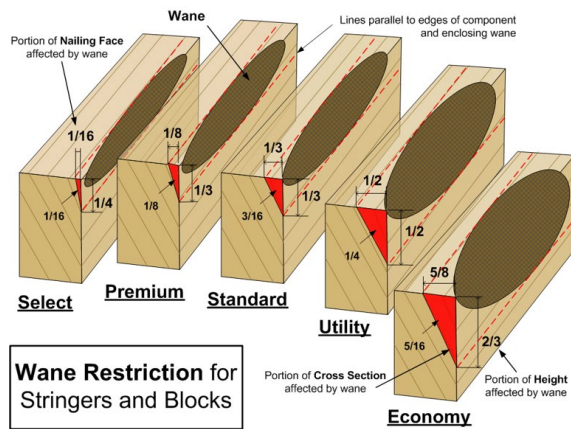
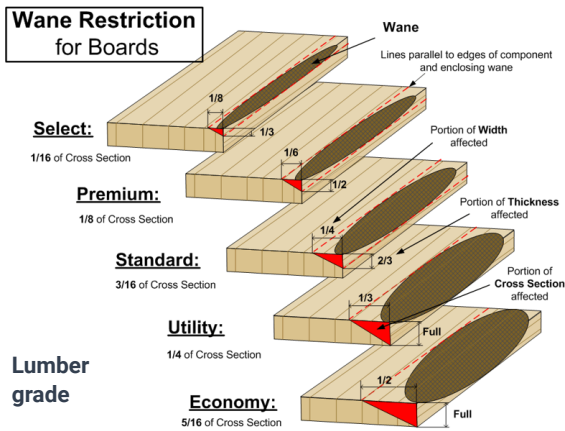


Defect	Description	Action
Wane	<ul style="list-style-type: none"> • Wood is bark or lack of wood from any cause on the edge or corner of a piece of wood 	LPC Manage
Splits, checks, and shakes	<ul style="list-style-type: none"> • Checks, splits, and shakes are lengthwise grain separations in the wood • Checks usually result from stresses set up during seasoning. Through checks extend the full thickness of the members. • Splits extend through the full thickness of the members and often take a radial direction • Shakes are separations between rings of annual growth that extend through the full thickness of the members 	LPC Manage
Knots	<ul style="list-style-type: none"> • Knots are cross sections of branches visible on the surface of a piece of wood • Sound knots are solid across their faces, are at least as hard as the surrounding wood and show no indication of decay • Loose knots because of growth conditions or moisture changes are separated from the surrounding wood and cannot be relied upon to remain in place • Knotholes are holes in wood from which knots have fallen 	LPC Manage
Discoloration	<ul style="list-style-type: none"> • Stain and discoloration are often caused by fungi, but normal color variations in healthy wood are often confused with decay. • Other discolorations are chemical stains during seasoning, oxidation, or purplish stain from contact with iron 	Accept
Decay	<ul style="list-style-type: none"> • Decay is disintegration of wood due to action of fungi 	Eliminate

Lumber grades and acceptable tolerances

A. Wane

Wane shall be permitted on one edge only and shall be restricted to $\frac{3}{4}$ of the thickness and $\frac{1}{3}$ of the width with no limit on the length, although less than $\frac{1}{2}$ is preferred.



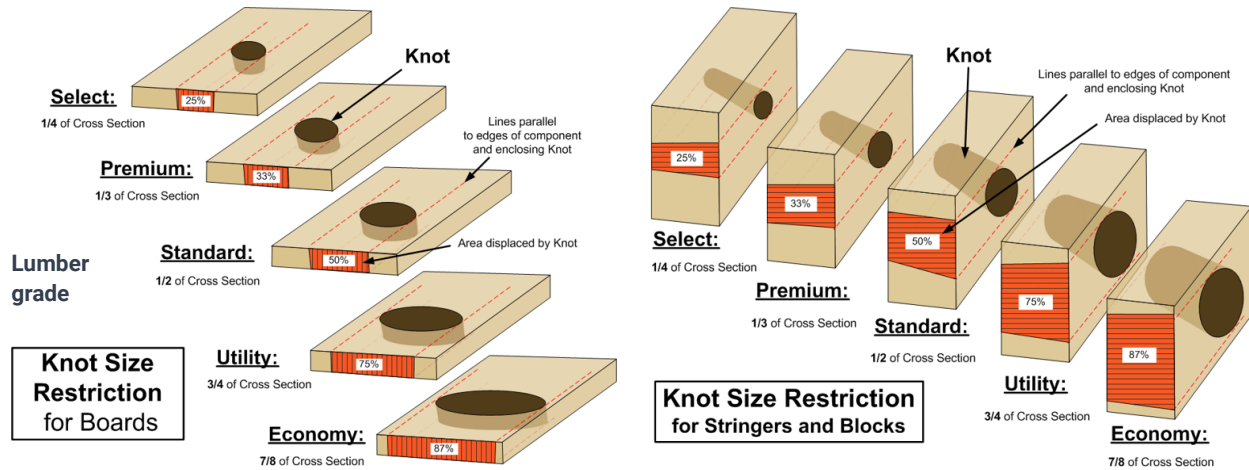
B. Splits, Checks and Shakes

Seasoning checks that do not extend through the full thickness of the member are permitted, of any length splits that are all the way through are allowed if less than $\frac{1}{6}$ the length of the member. However, if longer than $1\frac{1}{2}$ times the width of the piece they should be reinforced with corrugated fasteners. Splits that occur in nailing or after usage can be repaired with corrugated fasteners.



C. Knots

Sound knots, loose knots, knotholes, knot clusters and knots containing decay shall be measured and restricted. Knots should be less than 2/3 of the width of the wood member.



Borderline in size, but NOT ACCEPTABLE visually



ACCEPTABLE knot holes

D. Plywood veneer splits

Interior plywood faces, blemishes and splits are allowed. Splits in the outer plywood veneer are allowable up to 3/8" in width if they do not interfere with the product's caster wheels. All knots in line with casters are to be filled with Bondo. Glue blobs and paint marks should be kept inside and or sanded off.



NOT ACCEPTABLE splits (caster location with no metal)



ACCEPTABLE splits (side panel)

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ISO 9001:2015 Certified Quality Management System



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