



Custom Products Manual

Specifications

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Size Specifications

- A minimum size dimension is listed for each door and drawer front. When ordering, one of the minimums must be exceeded by at least 3". For example, if a door minimum is listed at 10" x 10", the door must be ordered as either 10" x 13" or 13" x 10". A door ordered under the minimum listed will incur an \$18.44 list charge. Any raised panel product requiring a panel size of less than 3" x 3" will be manufactured using 1/4" plywood. Our minimums are designed to protect our employees by making sure there is always enough material to run through a given piece of equipment.
- If a door is ordered under the stated minimum, Conestoga can cut the framing down, and a cut-down charge will be incurred. For pricing see the Design Options section. Up to 1" of material may be trimmed from each stile and 3/4" trimmed from each rail, depending on design. Miter doors will not be cut down.
- Conestoga measures all door framing by its full width. When specifying wider framing, be sure to provide full framing width calculations including edge profile and framing bead.
- When calculating material costs, there is a one square foot minimum on doors only.
- With the exception of miter designs, 10SQ1 and 10SQ2 MDF doors, designs ordered over 26" wide or 48" high will be made with two panels unless specified otherwise by the customer. One panel will be added for every 26" wide or 48" high. For example, a door measuring 27" x 49" will receive four panels. Conestoga will not warranty oversize single panel doors against warpage that will develop. Miter, 10SQ1 and 10SQ2 doors will be made with one panel regardless of size unless specified by the customer. Call your Customer Service Representative for pricing of multiple panel miter, CRP-10751MT, CRP-1389MT, Presidential and Madison designs.
- Unless otherwise specified by the customer, lower panels on most multiple panel doors will be made with a square panel regardless of the design ordered. Exceptions include doors with matching top and bottom rails, such as a CRP-2020.
- Conestoga manufactures its products to the nearest 1/16". A tolerance of +/- 1/32" is considered acceptable.

Warpage Tolerances

- Allowable tolerances for warpage and twist for five piece doors are:
 - ❖ Up to 25-15/16" wide and 47-15/16" high – 1/8"
 - ❖ Up to 25-15/16" wide and 48" to 64-15/16" high – 1/4"
 - ❖ Up to 25-15/16" wide and 65" to 83-15/16" high – 5/16"
 - ❖ Any door exceeding 25-15/16" wide or 83-15/16" high will not be warranted.
- Allowable tolerances for contraction, expansion and warpage for one piece products are:
 - ❖ Up to 12" wide and 21-15/16" high – 1/8"
 - ❖ 12-1/16" to 22" wide or 22" to 43-15/16" high – 1/4"
 - ❖ Any one piece product exceeding 22" wide or 43-15/16" high will not be warranted.
- All three piece products over 30" wide and 14" high are not warranted.



Mullion and Frame Only Door Specifications

- When ordering any mullion door design, always specify the number of lites desired.
- All custom mullion doors are constructed using wooden splines at each mullion joint.
- Mullion and frame only doors ordered with our #52 retainer molding require that the moulding and framing be pre-drilled to avoid cracking.
- The visual appeal of any Quarter Circle Mullion door is greatly affected by the number of lites. To help determine the ideal number of lites, refer to the chart on Quarter Circle doors in the Wood Doors and Drawer Front section.

Effects of Moisture in Wood

- Any solid wood product will expand or contract over time as moisture and climate conditions change. Miter doors need low, stable moisture conditions in order for the joints to remain tight.
- Effects of moisture (addition to/loss of) may include panel expansion, panel contraction, joint expansion or opening (especially on miter doors), stile bowing, stile/rail expansion and stave to stave lines becoming visible in panels. Contraction of finished panels may also produce an effect called white line, in which a narrow strip of unfinished wood becomes visible at the point where the panel inserts into the framing. Conestoga has specifications on most of these conditions. For details on what is considered acceptable, refer to the following pages.
- Wood products located in humid climates are especially susceptible to expansion due to moisture. Conestoga will not warrant product failure caused by excessively humid conditions. Such locations include waterfront properties and coastal regions.
- Cabinetry installed in new construction prior to climate control being activated will result in absorption of moisture from other building materials. These materials can include paints, dry wall compound, cement, stucco and wood framing material with high moisture content. Each of these construction materials releases high amounts of moisture into the home during the drying/curing process.
- Wood products installed in non-air conditioned homes, regardless of location, are very susceptible to expansion due to moisture and may not be warranted. All products, especially miter doors, need low, stable moisture conditions in order for the joints to remain tight. Refer to the Expansion Due to Moisture chart in this section.
- Marine applications such as nautical vessels are considered to be in high humidity conditions regardless of any resident climate control system.
- To minimize moisture expansion of wood products, winter and vacation homes should maintain some form of climate control, even in off season. Conestoga will not warranty products installed in uncontrolled environments.

Tips for Avoiding Moisture-related Problems

- All species, especially Hard Maple, tend to expand when exposed to moisture. For details on how species are affected by moisture, refer to the Expansion Due to Moisture chart in this section.
- Many of Conestoga's products possess miter joint applications beyond the listed miter door offering. Examples include Presidential doors and applied moulding doors. Consult your Sales or Customer Service Representative before purchasing any of these products for use in high humidity environments.



Tips for Avoiding Moisture-related Problems (continued)

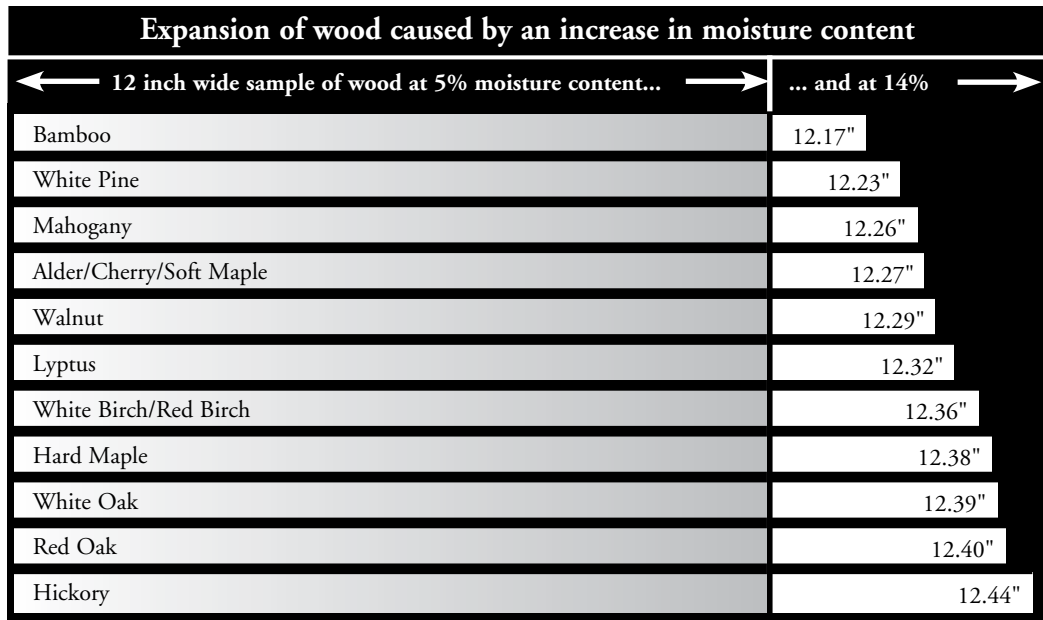
- Door expansion experienced prior to installation on the cabinet box will usually recede once the kitchen has been installed in an air conditioned environment. For this reason, we do not recommend trimming or “shaving” the edges of the doors, because once they return to original sizing, the doors may appear too narrow. Conestoga will not warrant doors that have been trimmed by the customer.
- Unfinished doors exposed to humid conditions will absorb moisture rapidly and expand in as little as 2 days. Finished products will also absorb moisture, but may not expand for as long as 10 days. Be aware of these conditions when storing, installing or finishing products.
- Always go to extra lengths to ensure that all wood products are being stored in the proper environment. Conestoga will assume no responsibility for improper storage, handling, packaging, finishing or installation of its products in high moisture/humidity conditions.
- Doors that have been exposed to high moisture conditions and then finished by the customer have an increased chance of white lines developing around the panels after the doors have contracted to their original size. We recommend doors be finished in their non-expanded state as soon after delivery as possible.
- Conestoga doors are engineered with a back bevel on all our framing beads. This back bevel allows stains to penetrate the panel raise/framing bead area, helping to reduce the possibility of white line.
- Because the individual staves of the panel continue to contract and expand, lines may appear on solid wood panels and offsets may develop from one stave to another. These stave lines will not be considered defective. Utilize Conestoga’s hybrid doors to reduce or eliminate stave offset.
- Conestoga’s miter doors feature one of the most durable joint construction methods available. However, panel expansion in high humidity climates will put pressure on any joint, regardless of construction. Therefore, we strongly urge the use of plywood panel doors to help reduce panel expansion, if the kitchen will be in either a high humidity or non-climate controlled location. Please note, however, that even a plywood panel will not inhibit wood movement in the door framing.
- The wider the framing, the greater the chance that the miter joint will open.
- Inset doors will most likely bind inside the cabinet frame when their panels expand.
- Allow room for expansion when boring for hinges. Hinges must be placed at least 3/4" away from the framing bead. Conestoga will not be liable for improperly bored products.
- Joint failure will result if panels are glued, pinned, stapled or secured to the framing on any wood door. Conestoga will not be held liable in these instances.

Expansion Due to Moisture

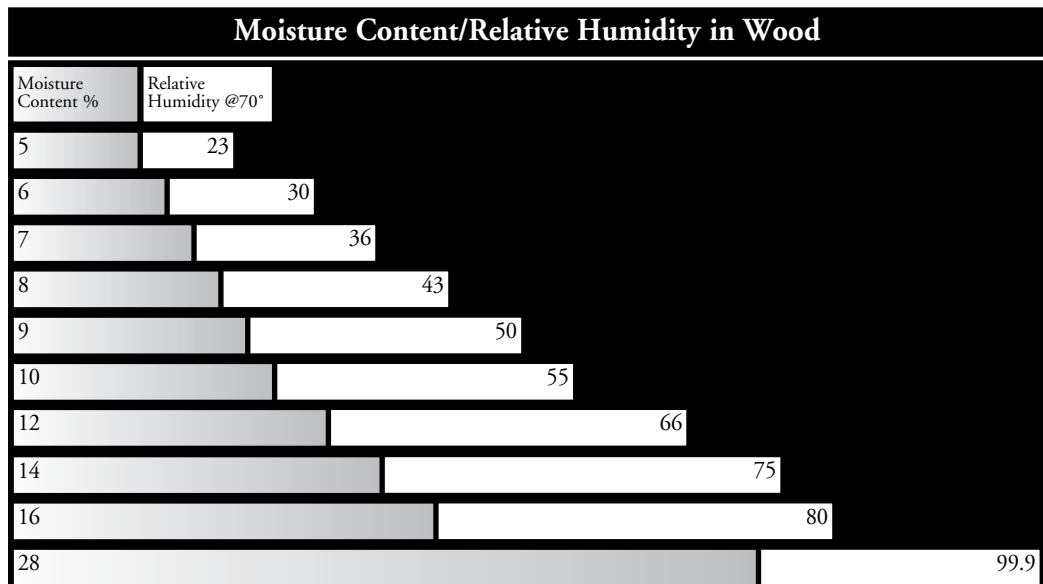
How moisture levels effect movement in wood

Wood is a hygroscopic material, meaning that it will absorb or release moisture until it is in equilibrium with the moisture in the air. This is true of all wood, whether it is raw or finished. Finishing will tend to slow down this process, but will not eliminate it. When wood is exposed to a constant humidity, it will achieve a constant moisture content (MC). This MC numerical value is called the equilibrium moisture content (EMC). Wood will increase in width and thickness as it increases in MC, and will decrease in width and thickness as it decreases in MC. The chart below shows how the moisture content of wood increases with an increase in relative humidity.

Conestoga manufactures its products to an EMC of approximately 7%, a level typical in climate-controlled homes.



The graph above indicates how much a 12" wide panel of various species can expand as a result of an increase in moisture content from 5% to 14%. For instance, the chart reveals that a Red Oak panel 12" wide could expand by more than 3/8".



Example: At 70°F, relative humidity in the room is 23%. This means the wood will stabilize at 5% moisture content.



Specie and Grade Characteristics

Why Have Different Grades?

Conestoga has developed different grades of material in order to utilize our natural resources to the fullest. Individual material grades give you the ability to fulfill your customer's expectations. These distinct material grades have been established allowing you to choose the best alternative for a particular job or finish.

Premium Grade

Conestoga's "Premium" grade has been developed for those jobs where a more uniform look is needed. This grade contains less of the natural material characteristics and is produced within a much narrower color range.

Premium orders will be matched to obtain a look that is as uniform as possible. However, since each board is different, there may be slight differences in appearance and color between pieces. Premium products will contain fewer and smaller mineral streaks and pin knots than "Standard" grade. A Premium grade order will give you a job that is consistent throughout for color and material characteristics.

In the "Heartwood" species, such as Red Oak or Cherry, no sapwood will be seen on the face of the door; in the "Sapwood" species, such as Maple, no heartwood will be seen on the face. This includes machined areas from a normal viewpoint after installation.

Conestoga recommends Premium grade for natural and transparent finishes.

Pecan/Hickory is an exception to our normal Premium grade guidelines in that the color variations and lack of uniformity are a characteristic of Pecan/Hickory. A Premium grade of this specie will include a narrower range of variation, but will not be uniform in heartwood or sapwood color.

Standard Grade

Conestoga's "Standard" grade has been developed to meet a wide variety of applications and will provide a very versatile product at a reasonable cost. Standard grade material allows for many of the natural characteristics of the wood to be present in the product while limiting or eliminating the most objectionable. This material grade allows Conestoga to utilize as much of the natural resource as possible while still producing a product that meets the needs of our customers.

Even though each board has its own individual appearance regarding color and grain, staves will be matched for a pleasing appearance. Colors will be blended within each door. Character marks such as pin knots and mineral streaks are strictly limited in size and amount in most species.

At times, vertical cuts will cross glue lines and may leave exposed glue on the edges of the product. While this is common in all species, the glue used in the production of Bamboo is dark in color and may be more apparent than is typical on other hardwoods. Visible glue on the edges of Bamboo product is not considered defective.

In "Heartwood" species, such as Red Oak or Cherry, the amount of sapwood that is present on the face of a door is strictly limited and will only be present in the machined areas. "Sapwood" species, such as Maple, limit heartwood to the machined areas.

Alder has little or no distinction between sap and heartwood and is an excellent choice for light or natural finishes.

Standard grade works well with most finishes. Lighter and clear finishes may tend to accentuate the natural color differences within the product and may not be pleasing to some people. If unsure of the appearance that will be obtained with the required finish, two or more sample doors should be ordered and finished prior to ordering an entire kitchen.



Specie and Grade Characteristics (continued)

Value Grade

Conestoga's "Value" grade material has been developed as an alternative price point product for medium and darker finishes and is only available in Red Oak and Cherry. This grade increases utilization of our natural resources by allowing more color variation and other natural characteristics than our Standard grade.

While each board has its own individual appearance in color and grain pattern, staves will be moderately matched for color. Sapwood may be present on the face. Character marks such as pin knots and mineral streaks, although limited in size and amount, will be more prevalent and numerous than in Conestoga's Standard grade.

This grade works very well with most medium to dark finishes. Light and natural finishes will accentuate the natural color differences within the product and may not be pleasing to some people. If unsure about the appearance being acceptable, two or more sample doors should be ordered and finished prior to ordering an entire kitchen.

Paint Grade

Conestoga's "Paint Grade" was developed for paint applications and will be comprised of a random mix of three different species – Hard Maple, Soft Maple and White Birch. This grade will allow all of the natural color range of the wood as well as some stain and mineral. This product will not be matched for color and will have heartwood and sapwood present in varying amounts. Knots, wormholes, and other defects that would cause voids are strictly limited, providing a smooth paintable surface.

Individual components of each product will be comprised of a mix of Paint Grade species. Products within the same order will also contain varying amounts of Hard Maple, Soft Maple and White Birch. **This grade is intended for painting only.**

Paint Grade Hard Maple

Conestoga's "Paint Grade Hard Maple" was developed specifically for those customers that prefer to use only Hard Maple components for paint applications. This grade will allow all the natural color range of Hard Maple, as well as moderate amounts of stain and mineral. Products made from this grade will not be matched for color, with heartwood and sapwood present in varying amounts. Knots, wormholes and other defects that would cause voids are limited, providing a smooth paintable surface.

Rustic Knotty Grade

Conestoga's "Rustic Knotty" grade is available in Alder, Cherry, Hard Maple, Hickory and Red Oak. This grade was developed to provide our customers with a material that allows knots, split knots, ingrown bark and other character marks and defects. The knots are of varying size, both sound and unsound. This material will allow all of the natural color characteristics of the specie, worm holes and any other naturally occurring defects that may be present in wood. This product will not be matched for color and may have both sapwood and heartwood present in varying amounts. Voids will not be puttied.



Specie and Grade Characteristics (continued)

Quarter Sawn

Conestoga's "Quarter Sawn" grade is specially cut Red Oak and White Oak lumber where logs are quartered and sliced across the grain resulting in a tight, straight grain pattern. While maintaining the normal color range of flat cut oak, this method of cutting eliminates cathedral grain, but still allows limited amounts of mineral and pin knots. Quarter Sawn lumber also contains a distinct characteristic called medullar wood rays or "flake". These flakes are clearly noticeable and will appear in a variety of sizes, patterns and directions that become more pronounced after finish is applied. Flakes will be present on the door panels, however, framing will consist of straight grain material that may or may not contain flakes.

Specie and Grade Availability

Specie	Grade Availability					
	Premium	Standard	Value	Paint Grade	Rustic Knotty	Quarter Sawn
Alder	No	Yes	No	No	Yes*	No
Bamboo**	No	Yes	No	No	No	No
Birch, Red	No	Yes	No	No	No	No
Birch, White	Yes	Yes	No	Yes	No	No
Cherry	Yes	Yes	Yes	No	Yes*	No
Hickory	Yes	Yes	No	No	Yes*	No
Lyptus	No	Yes	No	No	No	No
Mahogany	No	Yes	No	No	No	No
Maple, Hard	Yes	Yes	No	Yes	Yes*	No
Maple, Soft	No	Yes	No	Yes	No	No
Oak, Red	Yes	Yes	Yes	No	Yes*	Yes*
Oak, White	Yes	Yes	No	No	No	Yes*
Pine, Clear	No	Yes	No	No	No	No
Pine, Knotty	No	Yes*	No	No	No	No
Walnut	Yes	Yes	No	No	No	No

* All mouldings will be clear; rustic knotty, Knotty Pine and quarter sawn mouldings are not available.

**Bamboo products are limited to 95-3/4" in length and 47-3/4" in width when ordering vertical grain or 47-3/4" in length and 95-3/4" in width when ordering horizontal grain.

Many other species and grades are available with extended lead-times. Contact our Special Designs Department for non-published specie information.

Specie Characteristics

Standard Grade Characteristics				
Specie	Color Range	Natural Characteristics	Profile	Face
Red Alder	pale yellow to medium reddish brown	modular ray markings parallel to and across the grain pronounced contrast between end and surface grain porous end grain on panel raise and edge profile	x x x	x x x
Bamboo (caramelized)	light tan to brown shades	tight grain appearance narrow staves scattered color specks and nodes (look like burls) exposed glue may be present on framing profiles	x x x x x	x x x x
Red Birch	pink, reddish brown, purple	tight indistinct grain streaky colors common, figured or curly grain contrasting shades of red and brown	x x x	x x x
White Birch	off-white to light brown	fleck, glass worm occasional mineral and pin knots possible light heartwood	x x x	x x
Cherry	pink to reddish brown to deep red	gum, mineral streaks, pin knots sapwood may appear	x x	x
Pecan/Hickory	off-white to gray to dark brown	unlimited mineral and small peck marks contrasting sapwood and heartwood	x x	x x
Lyptus	pink to reddish brown	tight indistinct grain color streaks in the grain variable straight to cross figured grain contrasting shades of red and brown	x x x x	x x x x
Sapele (Mahogany)	reddish brown to dark brown	tight indistinct grain color streaks in the grain contrasting shades of reddish brown	x x x	x x x
Hard Maple	off-white to light brown	curly grain, sugar streaks occasional mineral and pin knots possible light heartwood	x x x	x x
Soft Maple	off-white to gray to reddish brown	curly grain, sugar streaks occasional mineral and pin knots possible light heartwood	x x x	x x
Red Oak	tan to reddish brown	grain pattern is prominent limited mineral and pin knots sapwood may appear	x x x	x x



Specie Characteristics (continued)

Standard Grade Characteristics				
Specie	Color Range	Natural Characteristics	Profile	Face
Quarter Sawn Red Oak	tan to reddish brown	limited mineral and pin knots heavy to light quarter sawn flakes sapwood may appear	x x x	x x x
White Oak	tan to greenish red to brown	limited mineral and pin knots sapwood may appear	x x	x
Quarter Sawn White Oak	tan to greenish red to brown	limited mineral and pin knots heavy to light quarter sawn flakes sapwood may appear	x x x	x x x
Clear Pine	off-white to yellow light brown to reddish brown	indistinct grain, contrasting color, clear face occasional sap specks and streaks occasional small tight knots on back	x x x	x
Knotty Pine	off-white to yellow to light brown reddish brown	possible sap streaks possible sound whole and cut knots, cracks across knots possible well-matched narrow boards	x x x	x x x
Walnut	off-white to gray to medium brown	curly grain, streaky color occasional mineral and pin knots light sapwood	x x x	x x x



Notes