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 a list charge. 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, a cut-down charge will be incurred. 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 widest dimension. 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. No minimum on drawer fronts.
- Designs ordered over 26" wide or 48" high will be made with two panels unless specified otherwise by the customer, with the exception of miter designs, 10SQ1 and 10SQ2 MDF doors. 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 oversized single panel doors against warpage, cracking and failed corner joints that will develop.
- Unless otherwise specified by the customer, lower panels on 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.
- The maximum height for a solid wood, single panel product is 113" for all species except Bamboo which is 95-3/4".
- The maximum height for a plywood single panel product is 95-1/2" for all species.
- Conestoga manufactures its products to the nearest 1/16" or 1.6mm. A tolerance of +/-1/32" or +/-0.8mm is considered acceptable.

Bow, Warp and Twist Tolerances

- Allowable tolerances of bow, warp or twist for single panel, multi-panel, frame only and mullion doors are as follows:
  - Single panel up to 26" wide and 48" high = 1/8".
  - Multi-panel up to 26" wide and 48-1/16" to 64-15/16" high = 1/4".
  - Multi-panel up to 26" wide and 65" to 83-15/16" high = 5/16".
  - Single panel, single opening frame only and mullion doors over 26" wide and 48" high will not be warranted (mullion lites not to be included in opening count).
  - Any door exceeding 26" wide or 83-15/16" high will not be warranted.
- Allowable tolerances for contraction, expansion, bowing, warping and twisting for 1-piece products are as follows:
  - 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.
- Allowable tolerances for contraction, expansion, bowing, warping and twisting for 3-piece products are as follows:
  - Up to 44" wide and 14" high = 1/4".
  - Any 3-piece solid product exceeding 44" wide or 14" high will not be warranted.

Mullion and Frame Only Door Specifications

- Frame only doors are constructed as single opening regardless of size. If a mid-rail is desired it must be requested, upcharge applies.
- 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.

Effects of Moisture in Wood

- Any solid wood product will expand or contract over time as moisture and climate conditions change. Wood products need stable moisture conditions in order for the joints to remain tight. Refer to the “Expansion Due to Moisture” Chart in this section.
- 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. For details on what is considered acceptable, see “Tips for Avoiding Moisture Related Problems” in this section.
- 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, including waterfront properties and coastal regions.
- Indoor pools or marine applications such as nautical vessels are considered to be in high humidity conditions regardless of any residential climate control system.
- Wood products located in dry climates are especially susceptible to contraction due to lack of moisture in the air. Conestoga will not warrant product failure caused by excessively dry conditions, such as desert and mountain locations.
- 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, drywall compound, concrete, 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 will not be warranted. All wood products, especially miter doors, need stable moisture conditions in order for the joints to remain tight. Refer to the Expansion Due to Moisture Chart in this section.
- To minimize moisture expansion of wood products, secondary and vacation homes should maintain some form of climate control, even in off season. Conestoga will not warranty products installed in uncontrolled environments.

Preparing Products to be Finished

- As a standard part of our manufacturing process, all non-contoured products are sanded on the face and back, typically using a wide belt sander, finishing with 220 grit prior to packaging and shipping the unfinished products. While this process ensures products that ship from Conestoga are free of surface flaws, upon receipt of the shipment, products can show signs of rub marks, scuffing and minor scratching that can sometimes occur during the shipping process.
- Please note that even when selecting the Cross Grain Removal option, products will not be ready to go directly into the finishing process. To properly prepare for finishing, it is imperative that all products be lightly sanded using automated sanding equipment or palm sanders to remove minor rub and scuff marks, as well as scratches or drag marks. Use 180 grit sandpaper during the final step in the prep-sanding process to ensure the surface of the raw wood is smooth, yet allows the finish to penetrate the wood’s surface.
- Conestoga will not authorize credit requests or process no-charge replacement orders if the customer has failed to properly prepare the product prior to finishing.

Tips for Avoiding Moisture-related Problems

- 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 Representative or Customer Service before purchasing any of these products for use in high humidity environments.
- 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 will be 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. Finished products will also absorb moisture and expand, but at a slower rate. 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 line or halo 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 or 5-piece MDF products to 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 or MDF panel doors to help reduce panel expansion if the kitchen will be in either a high humidity or non-climate controlled location. Please note that even a plywood panel will not inhibit wood movement of the door framing.
- The wider the framing, the greater the chance that the miter joint will open.
- Inset doors are prone to binding inside the cabinet frame as moisture in the environment increases.
- 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 and 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). Wood will increase in width and thickness as it increases in MC, and will decrease in width and thickness as it decreases in MC. Conestoga manufactures its products to an MC of approximately 7%, a level typical in climate-controlled homes.

The graph below indicates how much a 10" wide panel of various species can expand as a result of an increase in moisture content at 10% and 13%. For instance, the chart reveals that a Red Oak panel 10" wide could expand by more than 7/32".

Wood expansion caused by an increase in moisture content

10" wide sample of wood	7%	10%	13%
Bamboo	10.00"	10.06"	10.11"
White Pine	10.00"	10.06"	10.13"
Mahogany	10.00"	10.07"	10.14"
Alder/Cherry/Soft Maple	10.00"	10.08"	10.15"
Walnut	10.00"	10.08"	10.16"
White Birch/Red Birch	10.00"	10.09"	10.18"
Hard Maple	10.00"	10.11"	10.21"
White Oak	10.00"	10.11"	10.22"
Red Oak	10.00"	10.11"	10.22"
Hickory	10.00"	10.12"	10.25"

The chart below shows how the moisture content of wood increases with an increase in relative humidity.
Example: At 70˚F, relative humidity in the room is 23%. This means the wood will stabilize at 5% moisture content.

Moisture Content/Relative Humidity in Wood

Moisture Content	Relative Humidity at 70˚
5%	23%
6%	30%
7%	36%
8%	43%
9%	50%
10%	55%
12%	66%
14%	75%
16%	80%
28%	99.9%

Specie and Grade Characteristics

Why Have Different Grades?

Conestoga has developed different grades of material to utilize our natural resources to the fullest. These distinct material grades have been established, allowing you to choose the best alternative for a particular job or finish.

Premium

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 more uniform 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 Heartwood species, such as Cherry or Red Oak, no sapwood will be seen on the face of the door; in Sapwood species, such as Hard Maple, no heartwood will be seen on the face of the door.

Conestoga recommends Premium grade for natural and light tinted finishes.

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

Standard

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 unique 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 limited in size.

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 hardwoods. Visible glue on the edges of Bamboo product is not considered defective.

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

Conestoga utilizes steamed Walnut. The steaming process turns light colored sapwood to grey. Conestoga's Standard grade Walnut allows a mix of heartwood and grey sapwood throughout both the face and profiled areas of the product. This grade is recommended for medium and dark finishes on Walnut. If no sapwood is desired, order Premium grade Walnut which eliminates all sapwood from the face.

Standard grade works well with most finishes. Light tinted and clear finishes will accentuate the natural characteristics and color differences within the product. Two or more sample doors should be ordered and finished prior to ordering an entire kitchen.

Specie and Grade Characteristics (continued)

Value

Conestoga's "Value" grade material has been developed as an alternative price point product for medium and darker finishes and is only available in Cherry and Red Oak. This grade improves utilization of 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 Standard grade.

This grade works very well with most medium to dark finishes. Light tinted and natural finishes will accentuate the natural color differences within the product. 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 four different species – Hard Maple, Red Birch, Soft Maple and White Birch. This grade allows 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 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 may contain varying amounts of Hard Maple, Red Birch, Soft Maple and White Birch. **This grade is intended for painting only and is also available with an MDF panel option**.

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 the natural color range of Hard Maple including 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. **This grade is intended for painting only and is also available with an MDF panel option.**

Rustic Knotty

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, character marks and other natural characteristics. The knots are of varying size, both sound and unsound. This grade allows the natural color of the specie, wormholes 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.

Quarter Sawn

Conestoga's "Quarter Sawn" grade is specially cut White Oak lumber where logs are quartered and sliced across the grain resulting in a 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 medullary 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 Characteristics (continued)

Rift Cut

Conestoga's "Rift Cut" grade is specially cut White Oak lumber where logs are quartered, then sliced perpendicular to the growth rings of the tree. The result is a grain pattern that is relatively straight, but the spacing between the grain will vary. While maintaining the normal color range of plain sawn White Oak, this method of cutting eliminates cathedral grain, but still allows limited amounts of mineral and pin knots. Rift Cut White Oak material differs from Quarter Sawn White Oak in that only limited amounts of medullary rays or flakes will be present. While the desired overall appearance of Rift Cut is straight grain, angled grain will occasionally be present, especially in longer length boards.

The chart below shows our published specie and grade combinations. Many other species and grades are available with extended lead-times. Contact our Special Designs Department for non-published specie information.

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

* All mouldings will be clear; Knotty Pine, Quarter Sawn, Rift Cut and Rustic Knotty mouldings are not available.

** Bamboo products are limited to 95-3/4" in length and 47-1/4" in width when ordering vertical grain or 47-1/4" in length and 95-3/4" in width when ordering horizontal grain.

Alternative Material Characteristics

Decorative Laminate Veneer (DLV)

Conestoga's Allure DLV program provides an attractive, dimensionally stable and cost effective door, drawer front and accessory offering for the kitchen, bath and closet industries. All products are made with a TSCA/CARB2 compliant MDF substrate that is molded to create the desired framing and moulding profiles. These profiles are then profile wrapped with the same base materials as used with LPL and HPL decorative surfaces, but these wrapping grade materials have been specially treated to make them pliable without danger of fracturing during the wrapping process. DLV materials are extremely durable and in some, but not all cases, contain an anti-microbial agent that lasts for the lifetime of the product. The center panel materials are thermally fused melamine over a TSCA/CARB2 compliant MDF core. DLV materials come in a variety of colors and patterns commonly found across the U.S. market. Our 5-Piece doors and drawer fronts come in textures that will vary from smooth/satin surfaces to matte finishes, to linear textured patterns, to textured, registered and indexed panels. No finishing is necessary; doors can be removed from the packaging, hardware attached and mounted directly onto the cabinetry.

Medium Density Fiberboard (MDF)

Conestoga's MDF offering was developed as an alternative to solid wood panels for high humidity regions. MDF may be manufactured using a combination of softwood and hardwood fibers, adhesive and resins, resulting in materials that may vary in color depending on the wood fiber used. This mixture is inserted into a press and using high pressure and heat is compressed to the desired density and thickness. The end result is a very stable product that resists expansion and contraction as well as eliminating offset stave lines typically found in solid wood. Our MDF is sanded smooth by our suppliers, however, the finished product will require a primer before being painted to obtain a consistent finished appearance. Cutting through the outer surface to create a panel raise, decorative rout or edge profile will expose the board's internal fibers which are coarse and do not finish as consistently as the board's outer surface. To greatly reduce finishing issues associated with fiber raise, Conestoga recommends ordering our MDF Prep & Seal option (see Design Options section), which provides finish ready profiles.

Conestoga offers 1-Piece MDF, 5-Piece MDF, hybrid products (MDF panel with hardwood framing) and 1SGP (One Side Glueable Paintable) MDF. 1SGP MDF consists of a 3/4" thick MDF substrate with a paintable melamine film laminated to the back. The melamine film increases the stability of the routed 1-Piece recessed panel MDF products that use 1SGP MDF. There is a large selection of MDF board available in the market which can vary greatly in overall quality, density, internal bond and stability. Conestoga has tested many brands and grades of MDF and has chosen the material that provides the best quality results for machining and finishing. All MDF products offered by Conestoga are TSCA/CARB2 compliant.

Thermally Textured Surfaces (TTS)

Conestoga's Intrigue, Strata and Vogue TTS programs are designed with the transitional and contemporary markets in mind. These panels are manufactured by some of the world's premier producers of textured panels. The surfaces emulate traditional and rustic woods, rift cut lumber and a variety of other wood replicas in a diverse selection of textures. Textures range from straight grains to registered and indexed wood patterns complete with cathedrals, knots and other natural characteristics. These materials lend themselves to edgebanded Slab, 3-Piece and 5-Piece doors and drawer fronts. The specially treated surfaces are extremely durable and are applied to a TSCA/CARB2 compliant particleboard substrate using intense heat and pressure. Available in a large number of colors and patterns, finishing is not necessary as these products can go from the carton to the hardware table and right onto the cabinet, minimizing internal costs and lead-time.

Alternative Material Characteristics (continued)

High Gloss

Conestoga's Synchronicity High Gloss program features two different gloss materials:

PET (Polyethylene Terephthalate) – a 90° sheen high gloss board manufactured to a finished thickness of 19mm. The PET high gloss products are made by laminating a blended 3mil foil sheet of color and an acrylic topcoat to the surface of a TSCA/CARB2 compliant MDF substrate. The back of each sheet is laminated with a matching color, low texture material. Aggressively priced, PET high gloss surfaces are anti-microbial, food and beverage safe and can be used in kitchens, scholastic, medical and pharmaceutical applications.

UV Lacquer – gloss products consisting of a printed melamine paper applied to the face of a TSCA/CARB2 compliant substrate and a high solids UV (ultraviolet) cured topcoat applied over the melamine paper. The UV topcoat layer dries almost instantaneously and results in a 90° sheen level that is extremely durable. The back of the high gloss board is coated with a low texture, matching color melamine; whether the face is a solid color, wood grain, textile or other pattern.

Super Matte

Conestoga's Synchronicity Super Matte program offers 19mm panels that are composed of a TSCA/CARB2 compliant substrate. The MDF or particle board core (color specific) is bound between 5° sheen matte films on the face of the panel and a matching color melamine on the back. For additional stability and abrasion resistance, the matte films are covered with a layer of polyurethane and transparent primer, a layer of lacquer coating, and topped off with a protective, removable peel coat.