

ADA Compliance

All TruStile® doors can be manufactured to meet ADA requirements and guidelines. The information below has been compiled to provide a high level overview of primary ADA requirements for doors.

ADA Requirements Overview:

Width and Height Requirements:

By ADA standards, the clear width of a door opening must be a minimum of 32 inches and a maximum of 48 inches. This clear width measurement is taken between the face of the door and the stop of the frame with the door open to 90 degrees (Figure A).

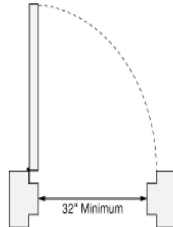


Figure A

The clear height of a door opening must be a minimum of 80 inches (Figure B).

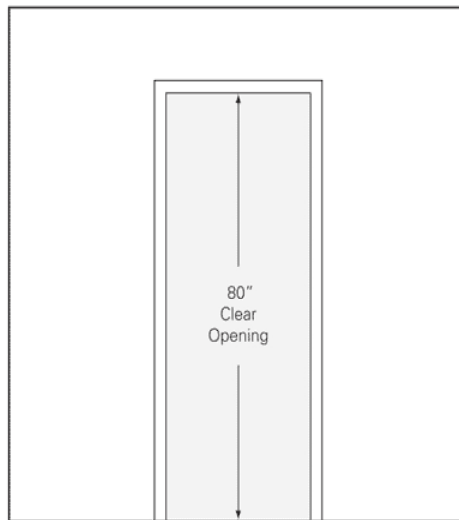


Figure B

Requirements Regarding Door Surface:

If there are any projections on the face of the door, they must be no lower than 34 inches above the floor or ground and must not extend more than 4 inches from the surface of the door (Figure C).

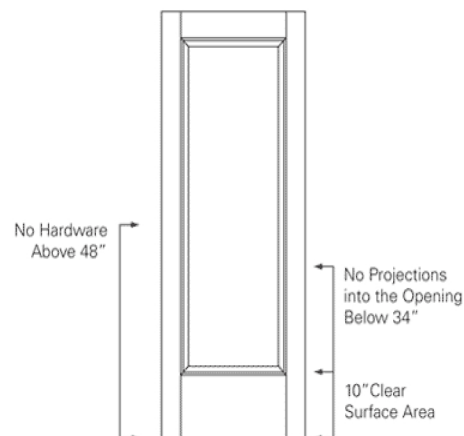


Figure C

Door surfaces within 10 inches of the floor or ground must be a smooth surface on the push side extending the full width of the door. Any parts creating a horizontal or vertical joint on the surface shall be within $\frac{1}{16}$ inch in depth. If cavities are created by added kick plates they must be capped.

Handles, pulls, locks and latches

- Handles, pulls, latches, locks and other operating devices on accessible doors must have a shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist to operate.
- Lever-operated mechanisms, push-type mechanisms, and U-shaped handles are acceptable designs.
- When sliding doors are fully open, the operating hardware must still be exposed and usable from both sides.
- Hardware must be mounted no higher than 48 inches above finished floor.

Thresholds

- Thresholds, if provided at a doorway, must not exceed $\frac{3}{4}$ inch in height for exterior sliding doors or $\frac{1}{2}$ inch for other types of doors.
- Changes in level up to $\frac{1}{4}$ inch can be vertical and do not need an edge treatment.
- Changes in level between $\frac{1}{4}$ inch and $\frac{1}{2}$ inch must have a beveled slope equaling 1:2.
- If the changes in level are greater than $\frac{1}{2}$ inch, the threshold must be equipped with a ramp. The floor or ground surface within the maneuvering clearances at the doorway must not have a slope steeper than 1:48.

Closing Speed (ADA Guidelines 4.13.10)

If a door is equipped with an automatic closing device (door closer), then the sweep range of the closer must be adjusted so that from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the leading edge of the door

For more information on the ADA and ADA Guidelines

ADA Information is available on the Justice Department's ADA home page at www.ada.gov (<http://www.ada.gov/>).

The ADA Accessibility Guideline for Buildings and Facilities can be found at www.access-board.gov (<http://www.access-board.gov/>), or call the **ADA Information Line at (800) 514-0301** for a free copy of the regulations.

Fire Door Ratings

TruStile Fire Door Offering

TruStile offers paint-grade and stain-grade doors in 20- through 90-minute fire ratings. Our positive pressure doors are manufactured with our patented FireWedge (Patent Number: 6,115,976). The FireWedge includes an intumescent strip in our poplar Wedge Edge®, which expands and provides a smoke seal when heated.

	20-minute MDF	20-minute Wood	45- and 60-minute MDF/Wood	90-minute MDF/Wood
Category	Category A Category B Neutral Pressure	Category A Category B Neutral Pressure	Category A Category B	Category A Category B
Thickness	1-3/4" minimum	1-3/4" minimum	1-3/4" minimum	1-3/4" minimum
Maximum width single	4'0"	4'0"	3'6"	3'6"
Maximum width pair	8'0"	8'0"	7'0"	7'0"
Maximum height	8'0"	8'0"	8'0"	8'0"
Fire glass max. area	3,145 sq. inches	3,145 sq. inches	1,248 sq. inches (45 minutes) 1,216 sq. inches (60 minutes)	1,216 sq. inches
Standards	ASTM E-152, NFPA 80, NFPA 252, UL10B, UL10C			

Some door styles and panel profiles are not available in all fire ratings. Verify availability with TruStile. Some ratings require metal vision kit.

Positive Pressure Fire Door Overview

All TruStile fire doors comply with the following standards: UBC7-2-1997, UL 10-C (positive pressure), NFPA 252 (1995), ASTM-252, and UL10-B (neutral pressure).

The standards for the design, testing and certification of fire rated openings changed when the International Building Code adopted the 1997 Uniform Building Code (UBC) 7-2-1997. With the adoption of this code came the requirements for fire rated openings to be tested under positive pressure in accordance with UL 10-C. Positive pressure testing of fire rated openings more accurately reflects the conditions of a real fire. However, the change from neutral pressure to positive pressure significantly impacted the dynamics of the door and hardware which is located above the 40" neutral pressure plane.

In order to successfully pass a fire test under the new positive pressure requirements, it is necessary for wood door manufacturers to provide doors with listed and approved intumescent seals or gasketing. The WDMA (Wood Door Manufacturers Association) describes positive pressure openings in two categories, Category A and Category B.

Category "A"

Category "A" doors have sealing systems built into the door edges and therefore do not require any additional edge sealing systems between the door and frame. The sealing systems can either be visible or concealed within the edge of the door. **All Positive Pressure TruStile Fire Doors are manufactured as Category "A" with concealed sealing systems.**

Category "B"

Category "B" doors do not have sealing systems built into the door edges. These doors do require additional listed and approved edge sealing systems between the door and frame. These sealing systems are generally surface applied to the door and/or frame. Category "G" describes edge sealing systems which meet this listing requirement. In some cases, Category "G" sealing systems might be required on the meeting stiles of pairs of Category "A" doors.

Smoke Seal Labels

In addition to standard fire ratings (A/3 hour, B/90 or 60 minute, C/45 minute and 20 minute), some positive pressure doors may also be required to carry a smoke seal ("S") label. In these cases, the doors and frames will bear two labels. One indicating the fire rating (fire label) in minutes and the other indicating the opening is smoke rated (smoke label). Category "H" describes sealing systems for doors and frames to meet this listing requirement.

Consult NFPA 80 to review requirements for the installation of fire doors and windows.

Please note: it is the responsibility of the door distributor to inform the manufacturers of what the code requirements are for the fire doors and frames on a given project.

Green Building

When it comes to Green building, doors are an essential project detail. When you choose TruStile, you can be sure that your doors are built with environmentally-friendly materials and sustainable manufacturing practices. Whether you choose our high-quality MDF doors for painted applications or require the richness of natural wood, TruStile has 3rd-party certified Green doors that fit your needs and qualify for Green building program credits.



69% Recycled MDF Doors

The majority of TruStile MDF doors are made of post industrial recycled content. This allows you to achieve Green building objectives without compromising quality, style or design flexibility.

- 3rd-party certified by Scientific Certification Systems (<http://www.scsglobalservices.com>) (SCS) to be constructed of a minimum of 69 percent recycled content
- Contributes to LEED (<http://www.usgbc.org/leed>)® credits under the Materials and Resources category
- Manufactured with low-emitting adhesives and primer
- TruStile uses only a very fine grade of super-refined MDF that makes our doors more durable and longer-lasting than lower grade MDF doors and hollow core alternatives



FSC Certified Wood Doors®

If you want to ensure that your wood doors are environmentally-responsible, FSC (Forest Stewardship Council)™ certification is the answer. The Forest Stewardship Council (<https://us.fsc.org>)™ (FSC) is the most widely recognized and accepted global organization that certifies that wood products meet the highest social and environmental standards on the market.

TruStile's wood door product line has undergone an extensive FSC (Forest Stewardship Council)™ audit that verified our doors fulfill all qualifications for the "FSC (Forest Stewardship Council)™ Mixed Sources" certification. This means our product has been verified to contain only raw materials from well-managed forests, controlled sources and recycled wood or fiber. With this certification, 100% of the value of a TruStile door contributes to the certified wood LEED (Leadership in Energy & Environmental Design) credit under the Materials and Resources category. This is a significant advantage for LEED (Leadership in Energy & Environmental Design) buildings seeking to achieve this credit.

TruStile offers most species of doors FSC (Forest Stewardship Council) certified for a small nominal fee that is added to our standard door price. This is a significant value when compared to other manufacturers that either don't offer FSC (Forest Stewardship Council) certified doors or charge over 20% more for FSC (Forest Stewardship Council) certified product

No-Added Formaldehyde MDF

Although TruStile's standard MDF doors are low emitting and meet CARB (<http://www.arb.ca.gov>) (California Air Resources Board) and ANSI (<http://www.ansi.org>) (American National Standards Institute) standards for formaldehyde emissions, some homeowners and building professionals demand no-added formaldehyde products. TruStile answers this demand with a no-added formaldehyde MDF option that contains no urea-formaldehyde resin.

- Manufactured with low-emitting adhesives
- Contributes to LEED credits ([technical-information/leed-credits](http://www.usgbc.org/leed)) for recycled content in the Materials and Resources category

- Contributes to LEED credits (/technical-information/leed-credits) for Low-Emitting Materials in the Indoor Environmental Quality category
- Same superior performance and short lead times as our standard MDF doors
- Available for a reasonable up-charge on any MDF door style

Low VOC Adhesives and Primer

All TruStile doors are built using very low VOC glues that contain less than 5g/L VOCs. This low level of VOC emissions meets all major Green building standards for low VOC interior adhesives. To put this in perspective, [LEED \(Leadership in Energy & Environmental Design\)](#)'s Adhesives and Sealants credit requires that adhesives used in the interior of the building on wood substrates must not exceed 30 g/L. Although doors are not eligible for this specific [LEED \(Leadership in Energy & Environmental Design\)](#) credit, the glue in our doors contains 80% less VOCs than this [LEED \(Leadership in Energy & Environmental Design\)](#) requirement.

All TruStile MDF doors receive a water based prime coat prior to shipment that meets major Green building standards for low VOC primers, with a VOC content of less than 64g/L.



Third Party Certification

In this age of “Green Washing,” TruStile believes it is important that building products manufacturers back up their Green product claims with 3rd-party certification. This can help consumers and building professionals identify companies that are serious about manufacturing environmentally-responsible products versus those that just pay lip service by making unsupported claims.

Scientific Certification Systems (<http://www.scsglobalservices.com>) (SCS) is a global leader in third-party environmental and sustainability certification, auditing and testing. TruStile commissioned [SCS \(Scientific Certification Systems\)](#) to complete the audit that certifies that TruStile MDF doors contain 69% Recycled Content. [SCS \(Scientific Certification Systems\)](#) also performed the audit that resulted in TruStile's Forest Stewardship Council (<https://us.fsc.org>) (FSC) chain of custody certification.

Responsible Manufacturing

TruStile understands that Green is about more than just our product. It is a manufacturing philosophy that influences the way we do business. TruStile utilizes Lean Manufacturing practices to make extremely efficient use of our manufacturing space and our raw materials. This results in a smaller operation that minimizes waste and environmental impact.

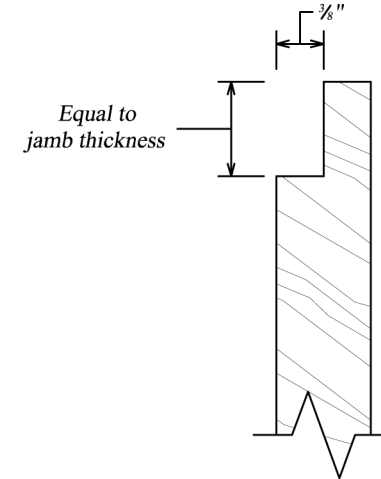
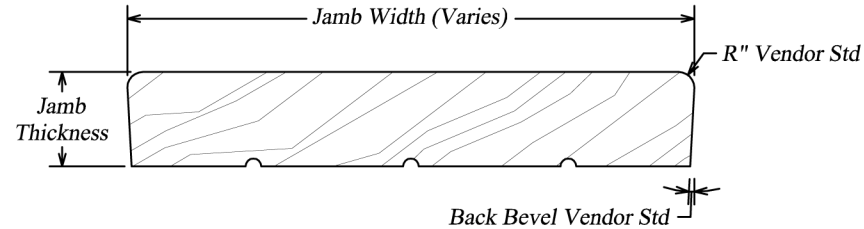
TruStile also recycles our waste and to minimize our landfill impact. The majority of the waste resulting from our operation is ground up into wood chips that are donated to agricultural partners that use it to create energy for their operations. This reclamation process has reduced TruStile's landfill waste by 65 percent and also results in fewer waste pick ups, which means fewer fossil fuel burning trucks on the road.

TruStile is dedicated to the continual search for ways to improve the sustainability of our manufacturing process.

Guaranteed to Last a Lifetime

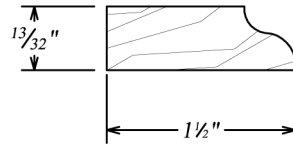
All TruStile MDF and wood doors are manufactured to the highest quality craftsmanship standards and are backed by lifetime warranties (/support/warranties) against defects in workmanship and materials. This guarantees that your doors will last for the lifetime of your home or building and is a true sign of sustainability. It is also a significant advantage over other lower quality door products that usually carry warranties of one year or less.

Flat Interior Jamb

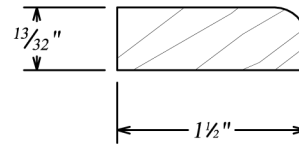


Jamb Leg Notch Detail
(side view)

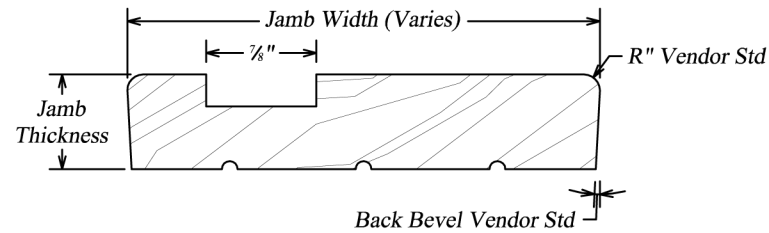
DTS916 (OG Profile)



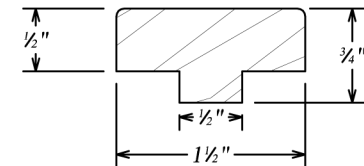
DTS876 (Bullnose Profile)



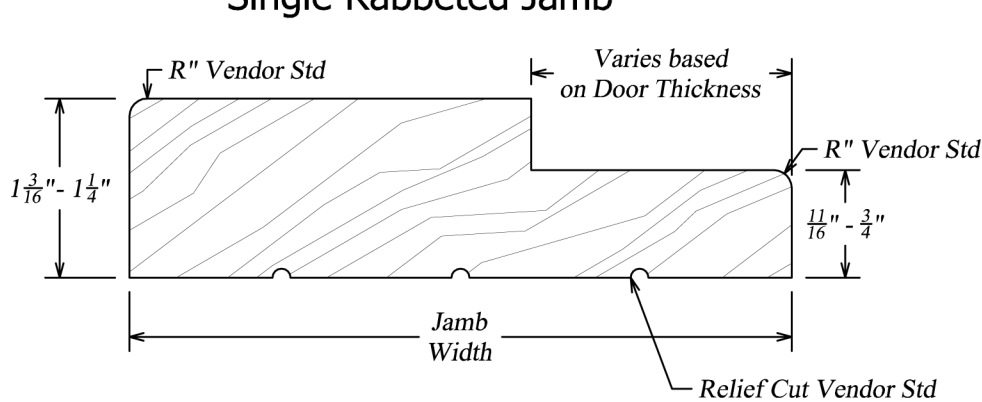
20-Minute Jamb w/T-Stop



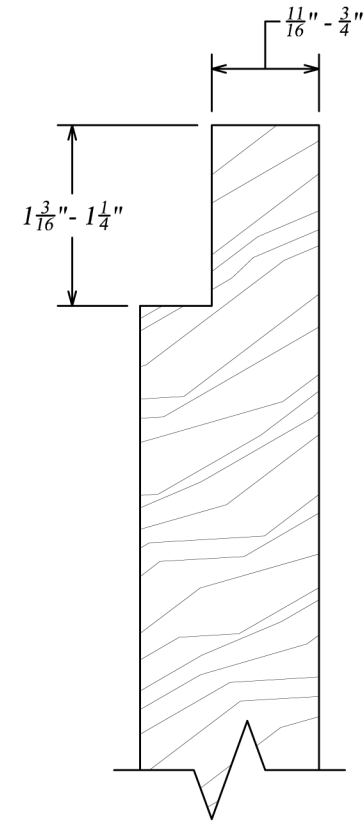
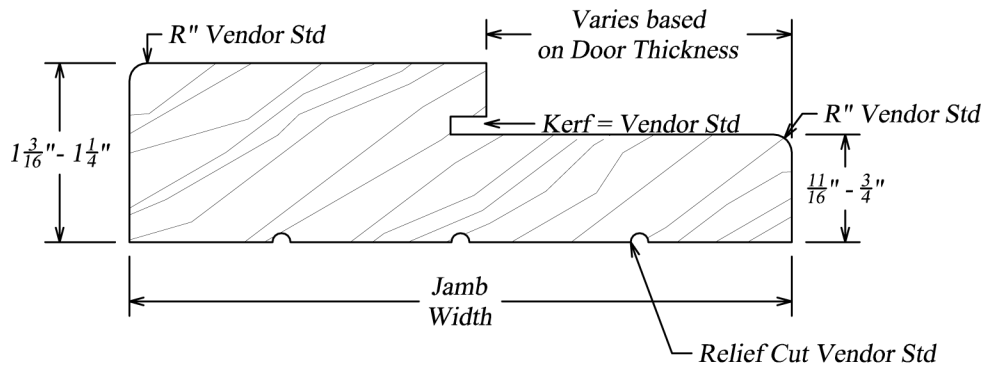
T-Stop (20-Minute)



Single Rabbeted Jamb

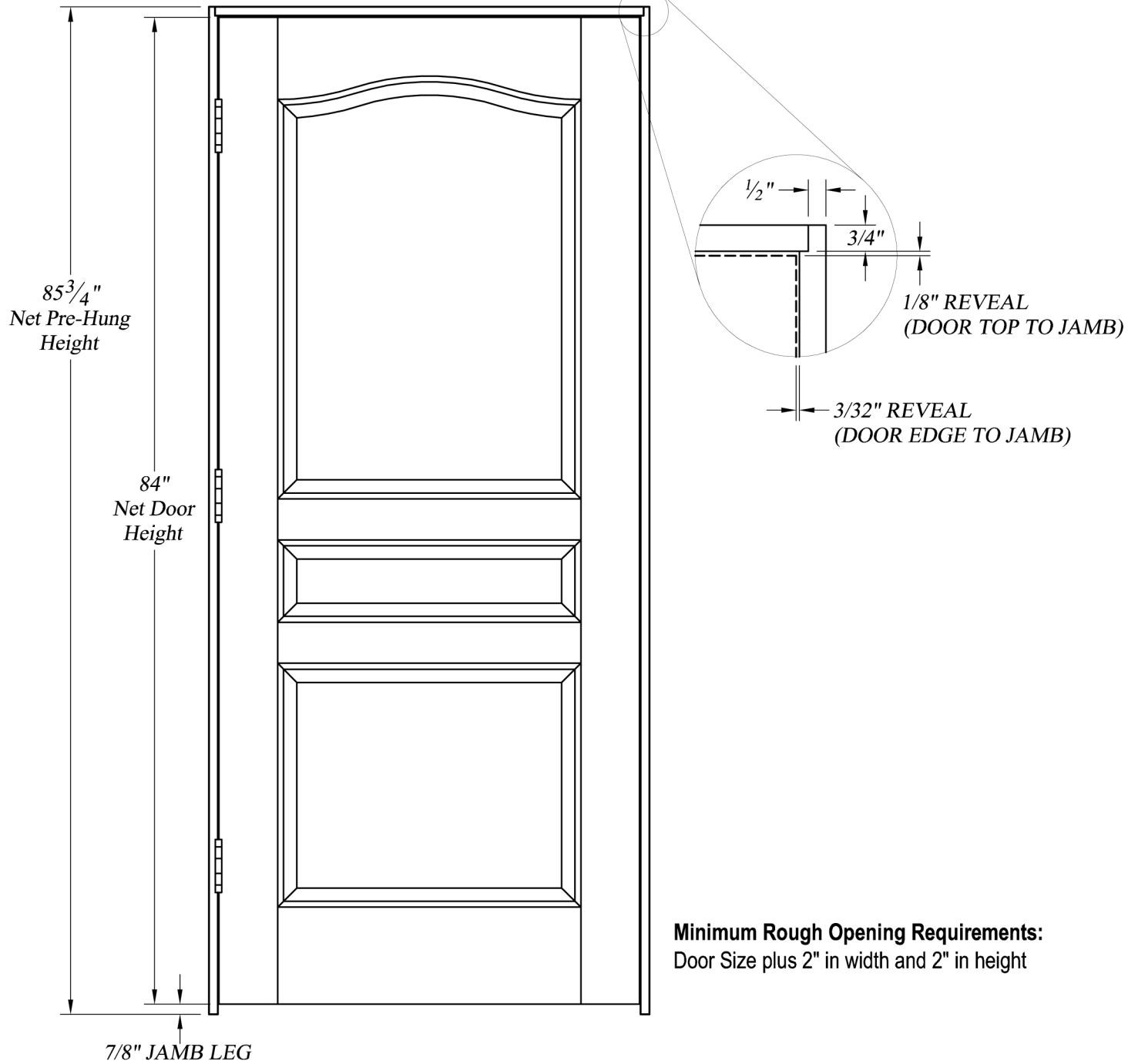


Single Rabbeted Jamb w/Kerf

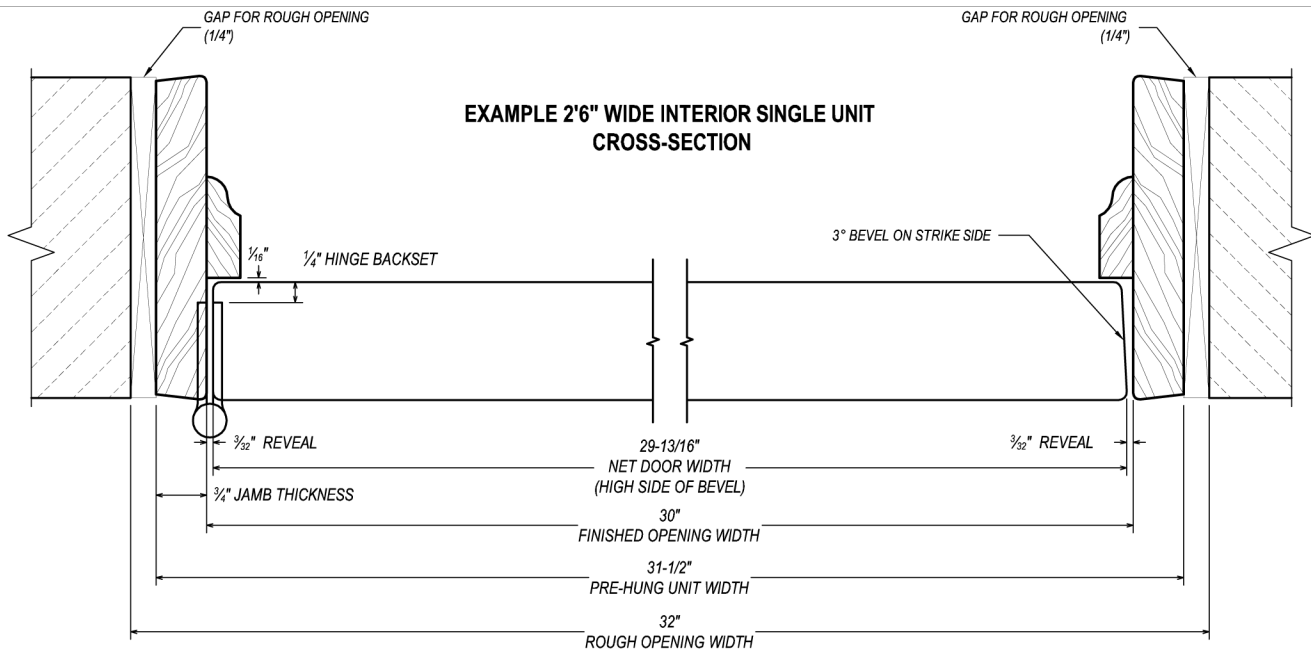


Jamb Leg Notch Detail
(side view)

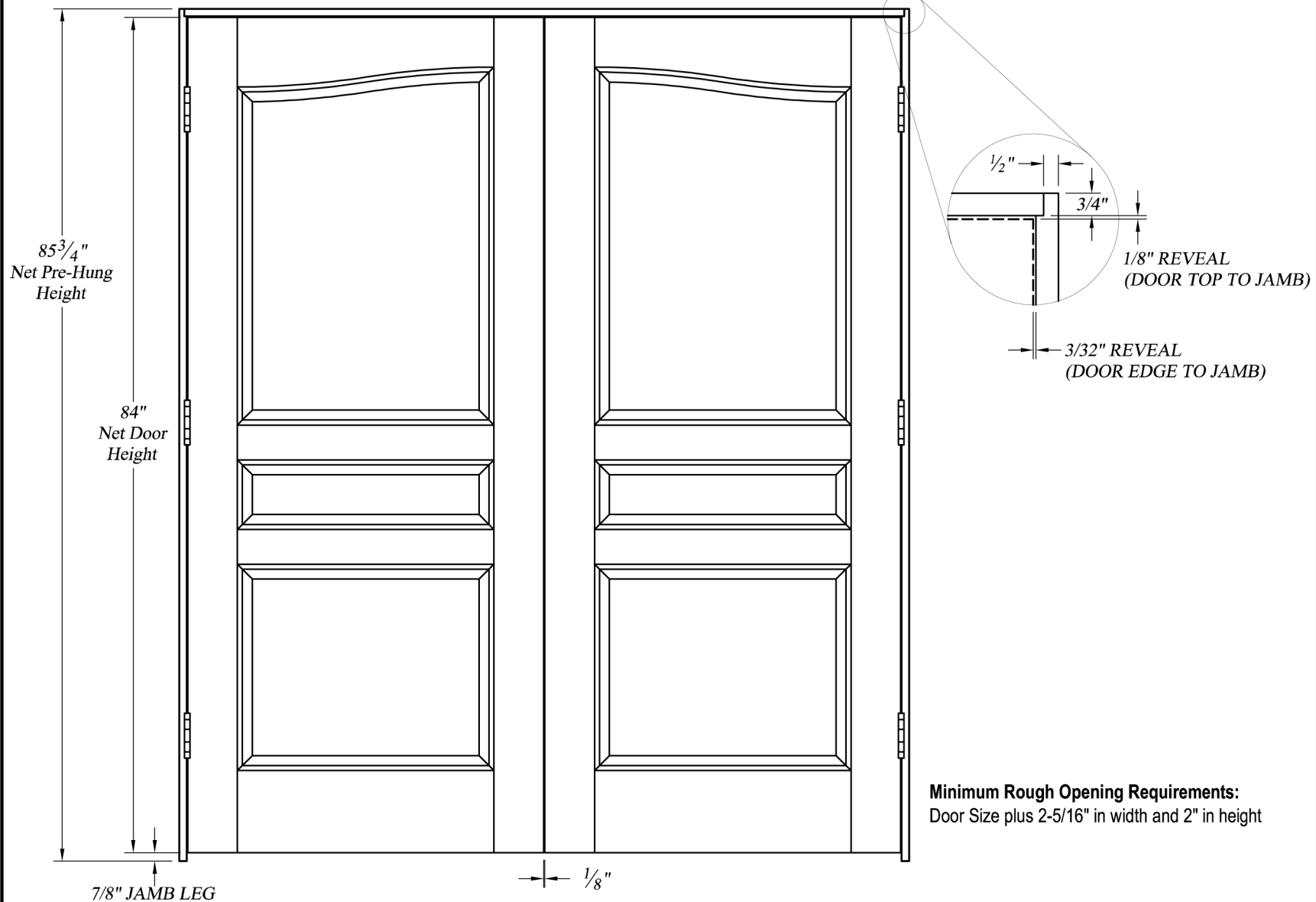
EXAMPLE 7'0" HEIGHT INTERIOR SINGLE UNIT ELEVATION



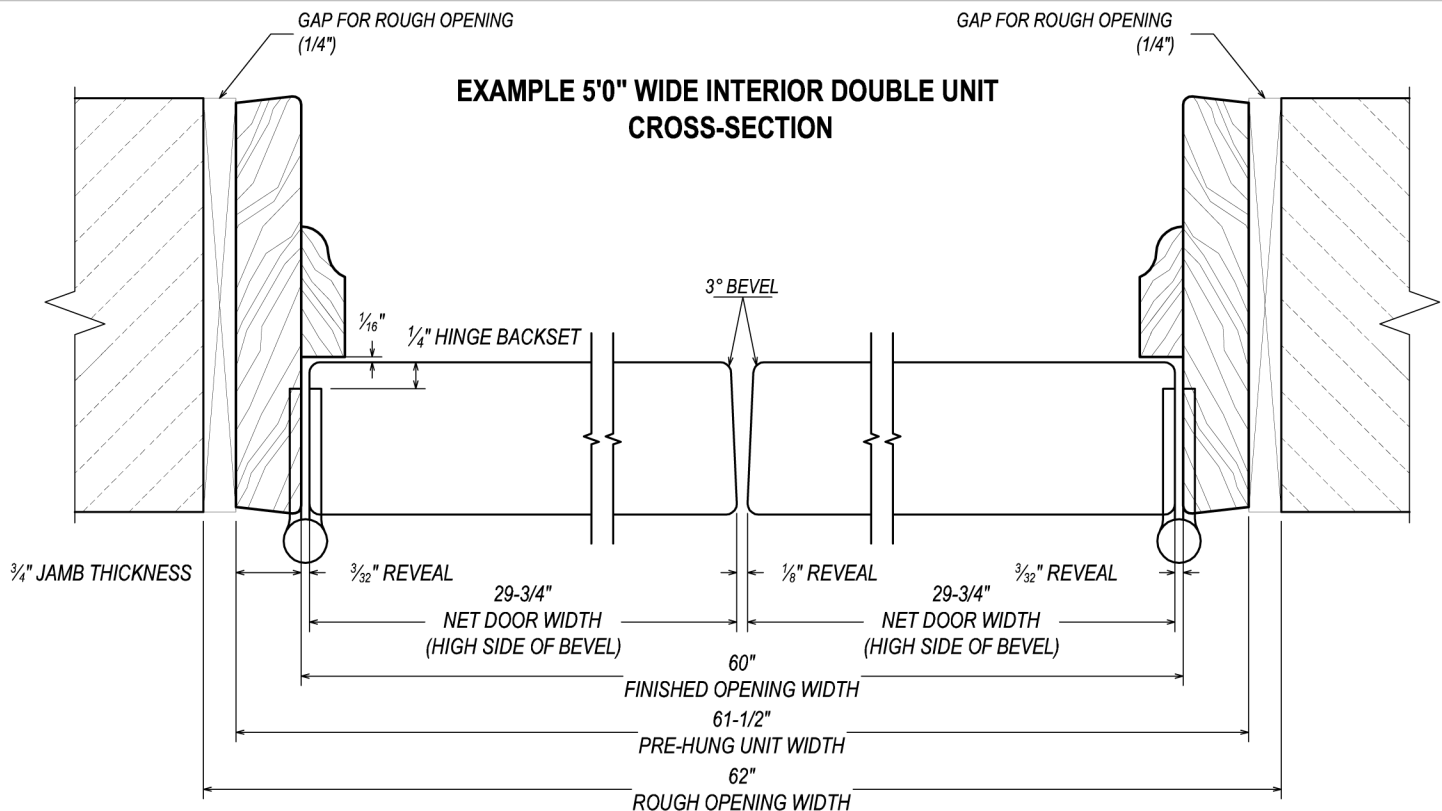
EXAMPLE 2'6" WIDE INTERIOR SINGLE UNIT CROSS-SECTION



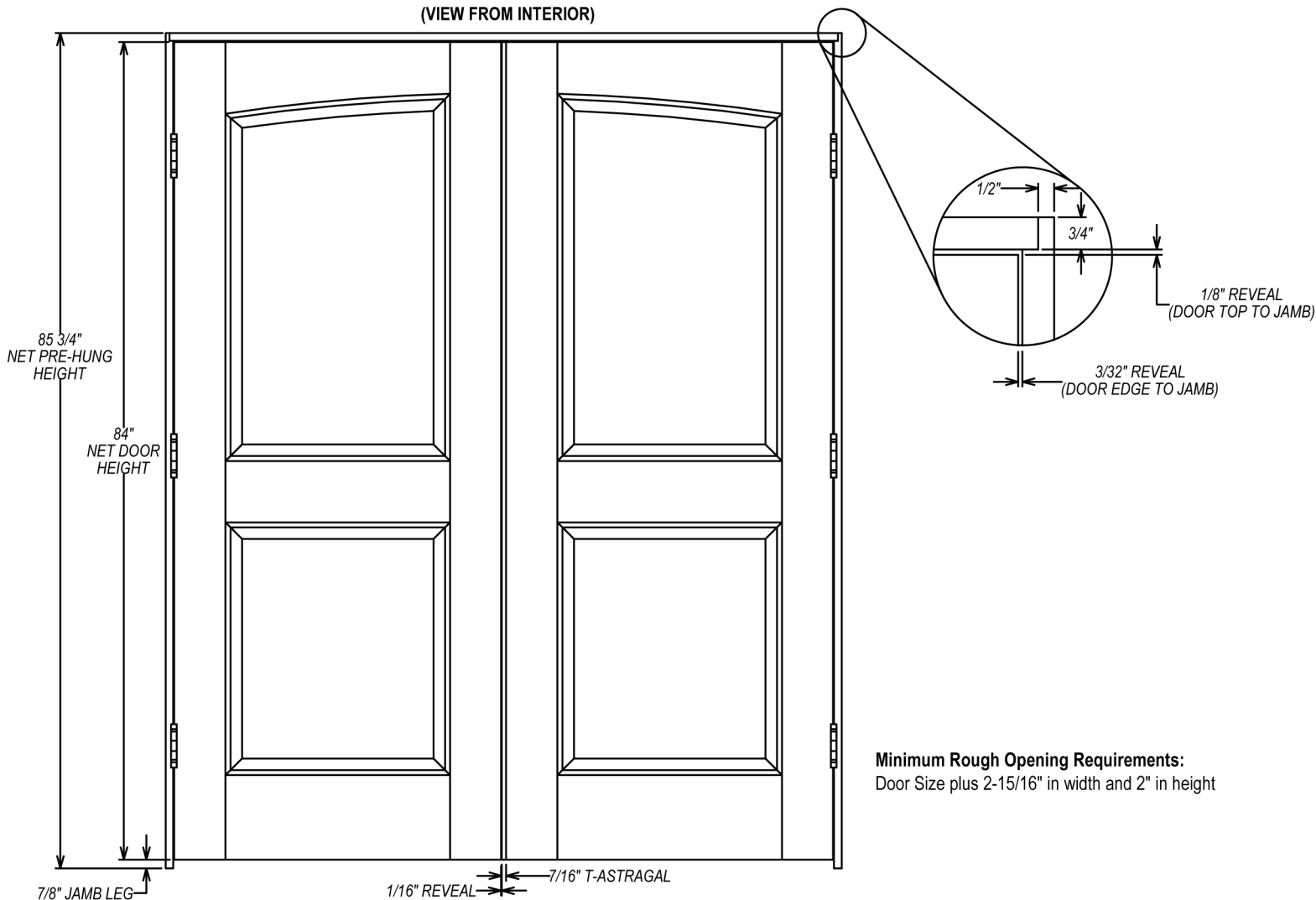
EXAMPLE 7'0" HEIGHT INTERIOR DOUBLE UNIT ELEVATION



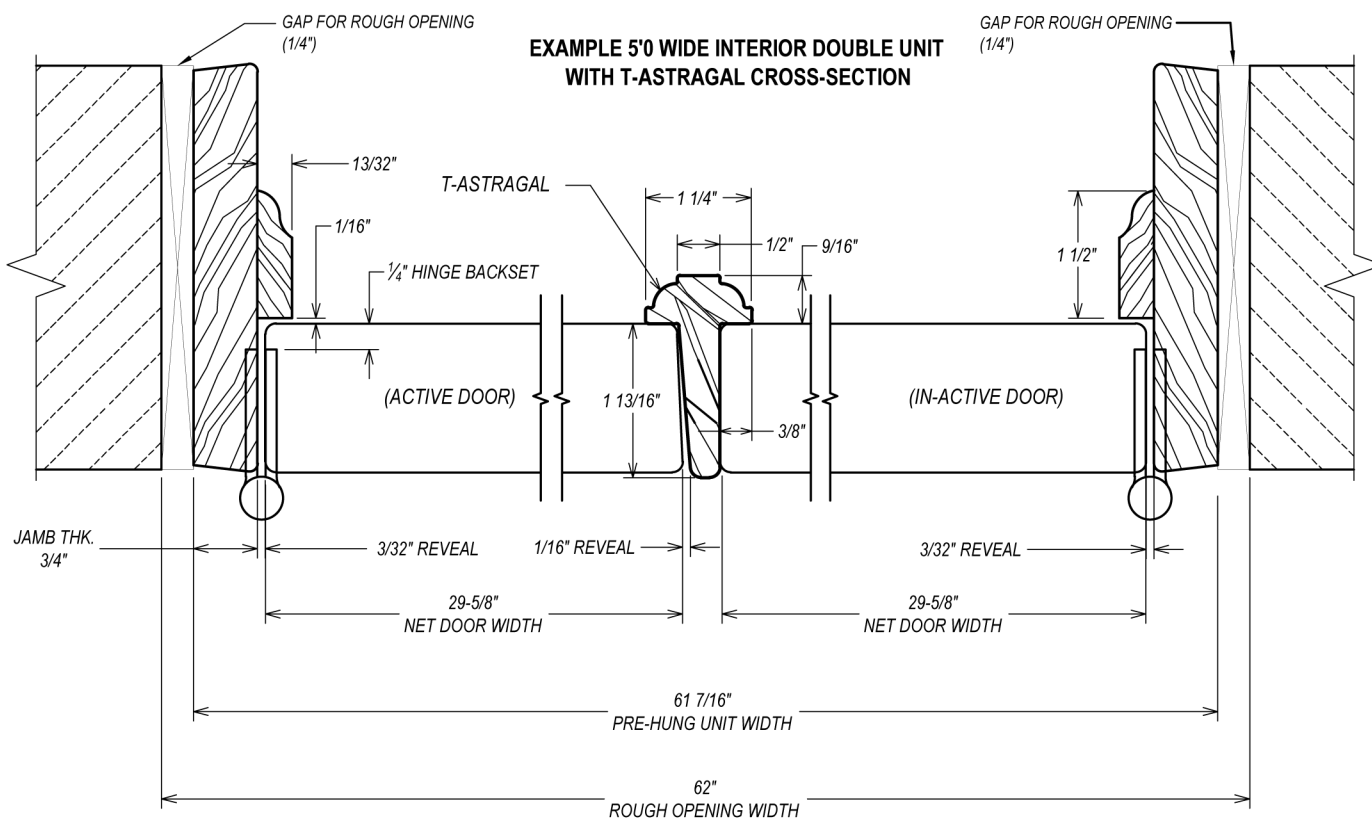
EXAMPLE 5'0" WIDE INTERIOR DOUBLE UNIT CROSS-SECTION



EXAMPLE 7'0" HEIGHT INTERIOR DOUBLE UNIT WITH T-ASTRAGAL ELEVATION
(VIEW FROM INTERIOR)



EXAMPLE 5'0" WIDE INTERIOR DOUBLE UNIT
WITH T-ASTRAGAL CROSS-SECTION





INSTALLATION INSTRUCTIONS

FYREFRAME 45 and FYREFRAME 60 45 AND 60 MINUTE WOOD FIRE DOOR FRAMES

This frame has been labeled for compliance with UBC Std. 7-2 (1997) and does not require the application of an additional edge-sealing system.

Explanation of Listing Categories

Category “A” Doors – No Additional Edge-Sealing System Required

This category includes doors evaluated without an edge-sealing system between the door and frame. It also includes doors evaluated with a sealing system incorporated (concealed or visible) into the edge of the door by the licensed manufacturer or machining distributor. Meeting edges of pairs may require an astragal or an edge-sealing system. Please refer to individual door listing.

These doors are eligible for use in any Category C “Standard” frame. These doors may also be installed in framed listed in Category C, “Proprietary” frame in accordance with the frame manufacturer’s individual listing.

All doors listed in Category A are eligible to bear the “S” (for Smoke & Draft Control assemblies) if a listed Category “H”, “Smoke & Draft Control Gasket” has been applied to the assembly. Please refer to Category H for individual gasket manufacturer’s listings.

Category “B” Doors – Additional Edge-Sealing System Required

This category includes doors evaluated with an edge-sealing system (Category G) field-applied to the labeled frame or door. The application of the edge-sealing system does not require any machining of the frame or door. Please refer to Category G, “Edge-Sealing Systems” for individual manufacturer’s listings.

These assemblies are eligible for use in any Category C “Standard” frame. These doors may also be installed in framed listed in Category C, “Proprietary” frame in accordance with the frame manufacturer’s individual listing.

All doors listed in Category B are eligible to bear the “S” (for Smoke & Draft Control assemblies) if a listed Category “H”, “Smoke & Draft Control Gasket” has been applied to the assembly. Please refer to Category H for individual gasket manufacturer’s listings

Category “C” Proprietary Frames

This category includes frames not based on ANSI-A155.1/UL-63 construction type (such as aluminum, wood, light gage steel, composite, etc.). These listings will reference specific door types for which each frame is qualified. All frames listed in this section may be used in Positive Pressure assemblies per the terms and limitations of the individual listing.

Category “C” Standard Frames

This category includes frames based on ANSI-A155.1/UL-63 and includes sidelight/transom assemblies. These frames are qualified for use in Positive Pressure assemblies, with Category A doors or with Category B doors utilizing Category G, “Edge-Sealing Systems”. These frames, when installed in pairs or in drywall construction, shall have anchors installed in the head section, minimum 24” O.C. These listings will not reference specific door types, as all door types are eligible.

Category “G” Edge-Sealing Systems

This category includes field-applied systems only. Category G, “Edge-Sealing Systems” are for use on Category B doors, or meeting edges (only) of Category A doors. These systems are surface-applied to either the perimeter of the door or frame, or meeting edge of the door. They may be kerf-applied, adhesive backed or mechanically fastened.

Category “H” Smoke & Draft Control Gasketing

This category includes gasket systems that are surface-applied (such as kerf-applied, adhesive-backed, or mechanically fastened) to frames or doors. It includes gasketing for the meeting edges for use in pair and double egress assemblies.

Note: This category covers gasket systems that have been evaluated for use in positive pressure rated assemblies, but do not provide an edge-sealing system to the opening (see Category G). These gasket systems have been evaluated in accordance with UBC-7-2-97, Parts I and II.

Door Requirements:

Consult the door manufacturer to make sure that the doors are qualified for the type of hardware to be installed.

Wall Requirements:

Any rated, masonry wall, steel framed wall or wood framed wall.

Minimum wall thickness : 4-5/8”

Rough opening size for 45 or 60-minute frames (including the wood members listed in notes below).

2” (- 1/2”) wider than net opening width for the door.

1” (- 1/4”) taller than net opening height for the door.

Note: For masonry, a wood lumber buck frame shell is to be attached to masonry with 3/8” expansion masonry anchors, spaced 26” on centers maximum.

Note: For steel framed wall minimum 1/2” plywood to be attached to the steel opening with 1/2” maximum screws. This plywood is installed to provide screw holding capabilities for the frame anchors.

45 and 60 Minute Design Limitations:

Minimum jamb depth: 4-5/8”

Minimum rabbet for door: 1-7/8”

Minimum stop height: 1/2”

Minimum stop width: 1-1/4”

Maximum door size: 42” x 96” (FF45/60 frame core)
 48” x 96” (FFX45/60 frame core)

Hinges: Size and spacing to be in accordance with Table 2-4.3.1 of NFPA 80 1999, mortise type only.

Strikes: Per Templates for labeled latch sets, (including cylindrical, mortise or unit type), rim exit device, vertical rod fire exit devices, flush bolts and/or dead bolts.

45 and 60 Minute Frame Installation:

Obtain any hardware item not supplied with your purchase (but required by these instructions) at your local door/frame hardware or building materials dealer.

If your 45 or 60 minute frame was supplied without casing trim, you may install any wood casing trim obtained from your local dealer.

To ease installation, it is recommended that all holes for fasteners through the frame and stop be pre-drilled before the fastener is inserted. Use 5/32" drill bits for #10 and 3/32" for #8 screws. Pilot holes from 65-70% of the fastener shank diameter are best.

If needed, the bottom of each jamb leg may be trimmed to fit the rough opening.

Align the header section to the top of each jamb section. Drive two 2-1/2" long, #8 screws through pre-drilled holes at each end of the header to the top of each jamb leg.

Line rough opening in masonry wall with a wood buck frame using 3/8" expansion masonry anchors. Line rough opening in steel stud walls with a minimum 1/2" plywood using 1 1/2" maximum steel screws. Align and square the assembled frame within the prepared opening in the wall. Position shims at about 2" from the top and bottom to fill the opening between the hinge jamb and wall framing. Drive a 2-1/2" long, #8 dry wall screw immediately above or below each set of shims behind the stop of the frame. Do not completely tighten these screws until you are sure the shims have been adjusted to have the head within width of the rough opening and the hinge jamb in plumb. Insert shims under top and bottom hinges and install the door to the frame at these locations only. Close the door to check and adjust for alignment of the door from the frame stops and for 1/8" maximum clearance for door. When alignment is satisfactory insert shims under the remaining hinge locations and install hinges. Drive and tighten 1-1/2" long, #8 dry wall screws under stop through head and jambs into framing. Drive one #10 x 3" screw into each hinge passing through the frame leg and into the wall stud. Recheck clearances and re-adjust as necessary.

Stops should be attached with 1-1/2" long finishing nails 12" on center. Preposition the stops on the frame to allow for any required labeled gasketing with the doors in the closed position.

Install flush bolt, deadbolt and latch set strikes with #10 drywall screws passing through the frame and into the wall stud.

Check and adjust hardware to make sure door(s) are self-closing and self-latching.

Break or saw off any shims that extend beyond the frame or wall on each side of the assembly. Fill the area between the frame and wall with either acrylic latex caulk or silicone caulk to a minimum depth of 1/4" (See drawings).

Install the casing trim on each side of the wall to the buck framing or to the jamb using finish nails.

If using the FFX45/60 frame core for 60-minute wood frames then an approved Category "G" edge sealing system must be applied to the frame legs.

Per NFPA 80, job site modifications are restricted to the following:

1. Circular or rectangular function holes for latch bolts.
2. Prepping area around function holes for strike plates.
3. Installing gasketing or seals to the frame if required.

Labeling

Manufacturer's label shall not be removed, covered or painted over. After completion of machining the frame, the Warnock Hersey (WH) certification label shall be applied to the finished frame with screw-type nails with a minimum length of 5/8", or with minimum 18 gage staples with 1/4" crown and 5/8" leg length. If staples are used, two staples (one at each end of the label) shall be applied.

US Patent No.: US 8,097,544 B2



INSTALLATION INSTRUCTIONS

FYREFRAME 90 90 MINUTE WOOD FIRE DOOR FRAMES

This frame has been labeled for compliance with UBC Std. 7-2 (1997) and does not require the application of an additional edge-sealing system.

Explanation of Listing Categories

Category “A” Doors – No Additional Edge-Sealing System Required

This category includes doors evaluated without an edge-sealing system between the door and frame. It also includes doors evaluated with a sealing system incorporated (concealed or visible) into the edge of the door by the licensed manufacturer or machining distributor. Meeting edges of pairs may require an astragal or an edge-sealing system. Please refer to individual door listing.

These doors are eligible for use in any Category C “Standard” frame. These doors may also be installed in framed listed in Category C, “Proprietary” frame in accordance with the frame manufacturer’s individual listing.

All doors listed in Category A are eligible to bear the “S” (for Smoke & Draft Control assemblies) if a listed Category “H”, “Smoke & Draft Control Gasket” has been applied to the assembly. Please refer to Category H for individual gasket manufacturer’s listings.

Category “B” Doors – Additional Edge-Sealing System Required

This category includes doors evaluated with an edge-sealing system (Category G) field-applied to the labeled frame or door. The application of the edge-sealing system does not require any machining of the frame or door. Please refer to Category G, “Edge-Sealing Systems” for individual manufacturer’s listings.

These assemblies are eligible for use in any Category C “Standard” frame. These doors may also be installed in framed listed in Category C, “Proprietary” frame in accordance with the frame manufacturer’s individual listing.

All doors listed in Category B are eligible to bear the “S” (for Smoke & Draft Control assemblies) if a listed Category “H”, “Smoke & Draft Control Gasket” has been applied to the assembly. Please refer to Category H for individual gasket manufacturer’s listings

Category “C” Proprietary Frames

This category includes frames not based on ANSI-A155.1/UL-63 construction type (such as aluminum, wood, light gage steel, composite, etc.). These listings will reference specific door types for which each frame is qualified. All frames listed in this section may be used in Positive Pressure assemblies per the terms and limitations of the individual listing.

Category “C” Standard Frames

This category includes frames based on ANSI-A155.1/UL-63 and includes sidelight/transom assemblies. These frames are qualified for use in Positive Pressure assemblies, with Category A doors or with Category B doors utilizing Category G, “Edge-Sealing Systems”. These frames, when installed in pairs or in drywall construction, shall have anchors installed in the head section, minimum 24” O.C. These listings will not reference specific door types, as all door types are eligible.

Category “G” Edge-Sealing Systems

This category includes field-applied systems only. Category G, “Edge-Sealing Systems” are for use on Category B doors, or meeting edges (only) of Category A doors. These systems are surface-applied to either the perimeter of the door or frame, or meeting edge of the door. They may be kerf-applied, adhesive backed or mechanically fastened.

Category “H” Smoke & Draft Control Gasketing

This category includes gasket systems that are surface-applied (such as kerf-applied, adhesive-backed, or mechanically fastened) to frames or doors. It includes gasketing for the meeting edges for use in pair and double egress assemblies.

Note: This category covers gasket systems that have been evaluated for use in positive pressure rated assemblies, but do not provide an edge-sealing system to the opening (see Category G). These gasket systems have been evaluated in accordance with UBC-7-2-97, Parts I and II.

Door Requirements:

Consult the door manufacturer to make sure that the doors are qualified for the type of hardware to be installed.

Wall Requirements:

Any rated, masonry wall, steel framed wall or wood framed wall.

Minimum wall thickness : 4-5/8”

Rough opening size for 90-minute frames (including the wood members listed in notes below).

2” (- 1/2”) wider than net opening width for the door.

1” (- 1/4”) taller than net opening height for the door.

Note: For masonry, a wood lumber buck frame shell is to be attached to masonry with 3/8” expansion masonry anchors, spaced 26” on centers maximum.

Note: For steel framed wall minimum 1/2” plywood to be attached to the steel opening with 1/2” maximum screws. This plywood is installed to provide screw holding capabilities for the frame anchors.

90 Minute Design Limitations:

Minimum jamb depth: 4-5/8”

Minimum rabbet for door: 1-7/8”

Minimum stop height: 1/2”

Minimum stop width: 1-1/4”

Maximum door size: 48” x 96”

Hinges: Size and spacing to be in accordance with Table 2-4.3.1 of NFPA 80 1999, mortise type only.

Strikes: Per Templates for labeled latch sets, (including cylindrical, mortise or unit type), rim exit device, vertical rod fire exit devices, flush bolts and/or dead bolts.

90 Minute Frame Installation:

Obtain any hardware item not supplied with your purchase (but required by these instructions) at your local door/frame hardware or building materials dealer.

If your 90 minute frame was supplied without casing trim, you may install any wood casing trim obtained from your local dealer.

To ease installation, it is recommended that all holes for fasteners through the frame and stop be pre-drilled before the fastener is inserted. Use 5/32" drill bits for #10 and 3/32" for #8 screws. Pilot holes from 65-70% of the fastener shank diameter are best.

If needed, the bottom of each jamb leg may be trimmed to fit the rough opening.

Align the header section to the top of each jamb section. Drive two 2-1/2" long, #8 screws through pre-drilled holes at each end of the header to the top of each jamb leg.

Line rough opening in masonry wall with a wood buck frame using 3/8" expansion masonry anchors. Line rough opening in steel stud walls with a minimum 1/2" plywood using 1 1/2" maximum steel screws. Align and square the assembled frame within the prepared opening in the wall. Position shims at about 2" from the top and bottom to fill the opening between the hinge jamb and wall framing. Drive a 2-1/2" long, #8 dry wall screw immediately above or below each set of shims behind the stop of the frame. Do not completely tighten these screws until you are sure the shims have been adjusted to have the head within width of the rough opening and the hinge jamb in plumb. Insert shims under top and bottom hinges and install the door to the frame at these locations only. Close the door to check and adjust for alignment of the door from the frame stops and for 1/8" maximum clearance for door. When alignment is satisfactory insert shims under the remaining hinge locations and install hinges. Drive and tighten 1-1/2" long, #8 dry wall screws under stop through head and jambs into framing. Drive one #10 x 3" screw into each hinge passing through the frame leg and into the wall stud. Recheck clearances and re-adjust as necessary.

Stops should be attached with 1-1/2" long finishing nails 12" on center. Preposition the stops on the frame to allow for any required labeled gasketing with the doors in the closed position.

Install flush bolt, deadbolt and latch set strikes with #10 drywall screws passing through the frame and into the wall stud.

Check and adjust hardware to make sure door(s) are self-closing and self-latching.

Break or saw off any shims that extend beyond the frame or wall on each side of the assembly. Fill the area between the frame and wall with either acrylic latex caulk or silicone caulk to a minimum depth of 1/4" (See drawings).

Install the casing trim on each side of the wall to the buck framing or to the jamb using finish nails.

Per NFPA 80, job site modifications are restricted to the following:

1. Circular or rectangular function holes for latch bolts.
2. Prepping area around function holes for strike plates.
3. Installing gasketing or seals to the frame if required.

Labeling

Manufacturer's label shall not be removed, covered or painted over. After completion of machining the frame, the Warnock Hersey (WH) certification label shall be applied to the finished frame with screw-type nails with a minimum length of 5/8", or with minimum 18 gage staples with 1/4" crown and 5/8" leg length. If staples are used, two staples (one at each end of the label) shall be applied.

U.S. Patent No.: US 8,097,544 B2

LEED Credits

TruStile Doors can assist with achieving credits in many Green building rating systems including LEED (<http://www.usgbc.org/leed>) (Leadership in Energy and Environmental Design). LEED is a national standard developed and published by the U.S. Green Building Council (<http://www.usgbc.org>) (USGBC). Its purpose is to promote sustainable building that is environmentally responsible, profitable and healthy.

TruStile doors help achieve LEED credits in the following categories for new commercial construction and major renovation projects:¹

LEED Credit	LEED Criteria	Detailed Requirement	TruStile MDF Doors	TruStile Wood Doors
Materials & Resources				
4.1 (1 point)	Recycled Content: 10% (post-consumer + 1/2 pre-consumer)	Use materials with recycled content such that the sum of post-consumer recycled content plus one-half of the pre-consumer content constitutes at least 10% (based on cost) of the total value of the materials in the project.	Qualify — SCS certified to contain 69% recycled content.	Not eligible
4.2 (1 point)	Recycled Content: 20% (post-consumer + 1/2 pre-consumer)	Use materials with recycled content such that the sum of post-consumer recycled content plus one-half of the pre-consumer content constitutes an additional 10% beyond MR Credit 4.1 (total of 20%, based on cost) of the total value of the materials in the project.	Qualify — SCS certified to contain 69% recycled content.	Not eligible
7 (1 point)	Certified Wood	Use a minimum of 50%, based on cost of wood-based materials and products that are certified in accordance with the Forest Stewardship Council's (FSC) principles and criteria for wood building components.	Not eligible	Qualify — specify FSC Certified Wood Door 100% of door value counts toward credit
Indoor Environmental Quality				
4.4 (1 point)	Low-emitting materials: Composite wood and agrifiber products	Composite wood and agrifiber products used on the interior of the building must contain no added urea-formaldehyde resins.	Qualify — specify NAUF MDF	Qualify — specify NAUF MDF panel core

¹LEED for New Construction & Major Renovations, Version 3 (April 2009).

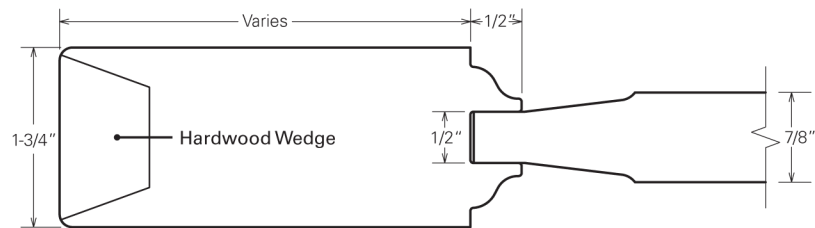
TruStile doors help achieve LEED credits in the following categories for residential home construction projects:²

LEED Credit	LEED Criteria	Detailed Requirement	TruStile MDF Doors	TruStile Wood Doors
Materials & Resources				
2.2 (0.5 point)	Environmentally Preferable Products	Use building component materials that are environmentally preferable in that they either contain minimum of 50% post industrial recycled content, are FSC certified or reclaimed.	Qualify — SCS certified to contain minimum 69% recycled content	Qualify — specify FSC Certified Wood Door 100% of door value counts toward credit

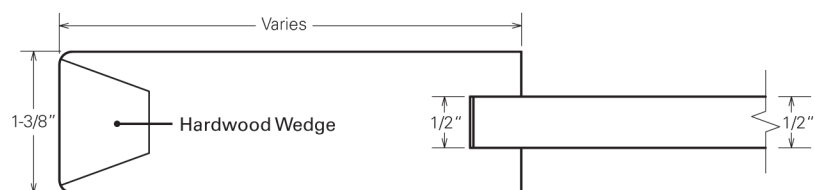
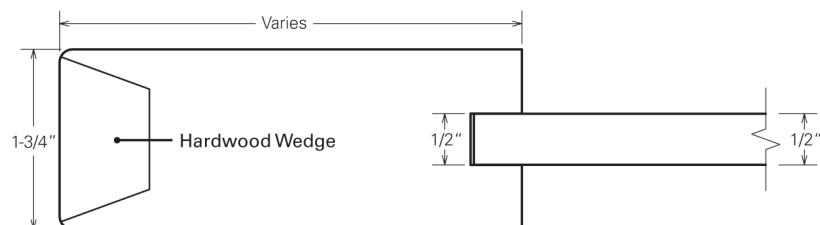
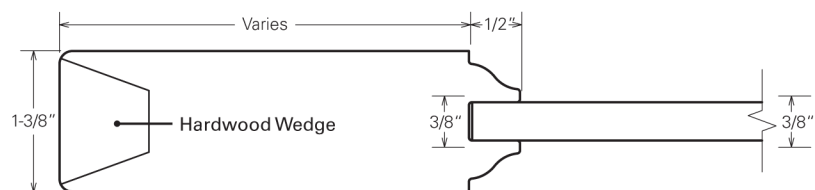
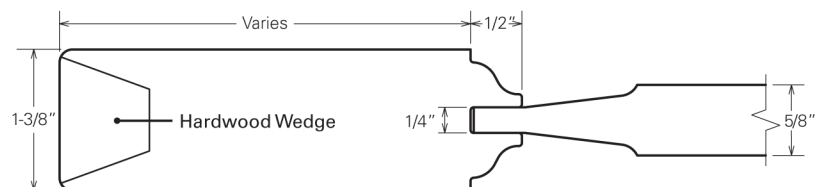
²LEED for Homes Rating System, Version 2008 (January 2008).

Door Construction:

Raised Panel Profile



Flat Panel Profile



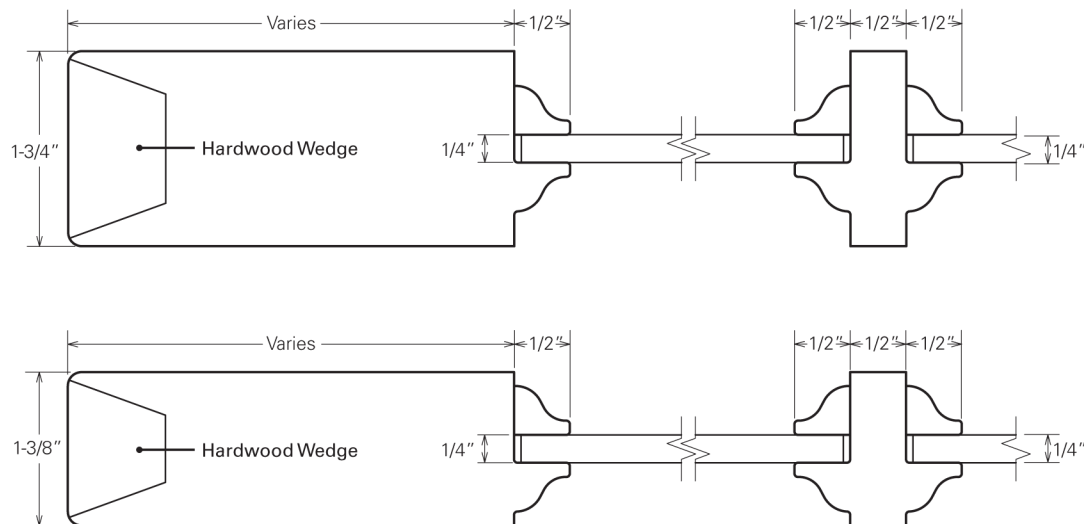
Product Features & Specifications:

Thickness	1-3/8" or 1-3/4"	Panel Size	
Maximum Size	Single: 4'0 x 8'0 Pair: 8'0 x 8'0 <i>Taller sizes available on a custom basis</i>	Minimum Panel Size	No minimum
		Maximum Panel Size	No minimum
Door Material	Solid MDF	Stock Dimensions	
Construction Method	Stile and rail	Top Rail	5"
Finish	Factory Prime	Bottom Rail	8-1/4" <i>Can be built larger to meet ADA requirements</i>
Available Styles	Any standard or custom design that meets the specifications described in this document. <i>See TruStile catalog for all standard styles</i>	Stiles	Varies based on size and style
		Acoustic Rating	Up to 34 STC rating
Available Profiles	10 standard sticking options 4 standard panel options Custom options also available <i>See TruStile catalog for more details</i>	Standards	ASTM E-152, NFPA 80, NFPA 252, UBC7-2-1997/UL10C, UBC7-2-1997/UL10B
		Hardware Configurations	Pursuant to NFPA80, consult factory for approved configurations
Panel Construction		Warranty	Limited lifetime warranty
Raised Panel Thickness	5/8" or 7/8"		
Flat Panel Thickness	3/8" or 1/2"		

* For more information visit the TruStile website at: **www.trustile.com** or call 888.286.3931
Specifications are subject to change. Confirm with TruStile before ordering.

Door Construction:

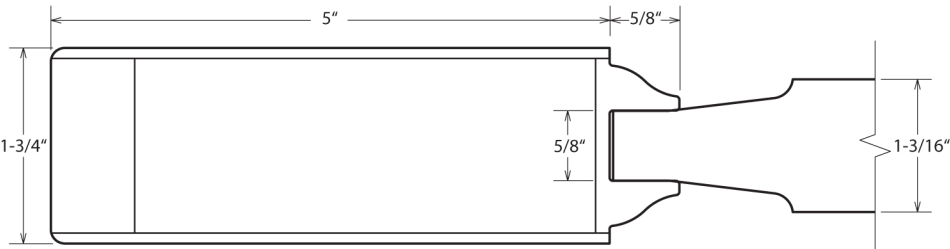
Raised Panel Profile



Product Features & Specifications:

Thickness	1-3/8" or 1-3/4"	Panel Size	
Maximum Size	Single: 4'0 x 8'0 Pair: 8'0 x 8'0 <i>Taller sizes available on a custom basis</i>	<i>doors with combined panel & glass</i>	
Door Material	Solid MDF	Minimum Panel Size	No minimum
Construction Method	Stile and rail	Maximum Panel Size	No minimum
Finish	Factory Prime	Stock Dimensions	
Available Styles	Any standard or custom design that meets the specifications described in this document. <i>See TruStile catalog for all standard styles</i>	Top Rail	5"
Available Profiles	8 standard sticking options 4 standard panel options Custom options also available <i>See TruStile catalog for more details</i>	Bottom Rail	8-1/4" <i>Can be built larger to meet ADA requirements</i>
Maximum Glass Size	Varies based on size and style	Stiles	Varies based on size and style
Panel Construction		Acoustic Rating	N/A
<i>doors with combined panel & glass</i>		Standards	ASTM E-152, NFPA 80, NFPA 252, UBC7-2-1997/UL10C, UBC7-2-1997/UL10B
Raised Panel Thickness	5/8" or 7/8"	Hardware Configurations	Pursuant to NFPA80, consult factory for approved configurations
Flat Panel Thickness	3/8" or 1/2"	Warranty	Limited lifetime warranty

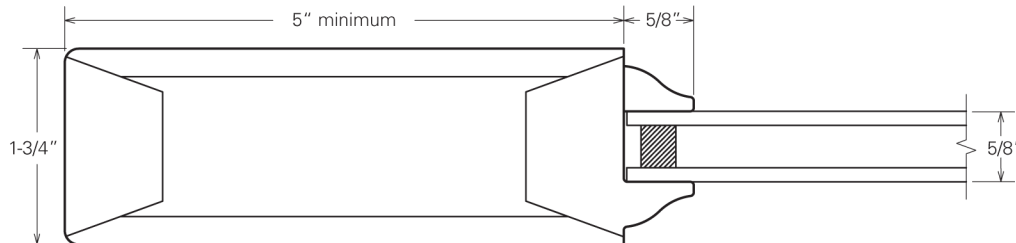
Door Construction:



Product Features & Specifications:

Thickness	1-3/4"	Panel Size	
Maximum Size	Single: 4'0 x 8'0 Pair: 8'0 x 8'0 <i>Taller sizes available on a custom basis</i>	Minimum Panel Size	No minimum
		Maximum Panel Size	No maximum
Door Material	MDF with engineered stiles and rails	Maximum Glass Size	N/A
Construction Method	Stile and rail	Stock Dimensions	
Finish	Factory Prime	Top Rail	5"
		Bottom Rail	8-1/4" <i>Can be built larger to meet ADA requirements</i>
Available Styles	Any standard or custom design that meets the specifications described in this document. <i>See TruStile catalog for all standard styles</i>	Stiles	5" minimum
Available Profiles	10 standard sticking options 4 standard panel options Custom options also available <i>See TruStile catalog for more details</i>	Acoustic Rating	Up to 34 STC rating
Panel Construction		Standards	ASTM E-152, NFPA 80, NFPA 252, UBC7-2-1997/UL10C, UBC7-2-1997/UL10B
<i>doors with combined panel & glass</i>		Hardware Configurations	Pursuant to NFPA80, consult factory for approved configurations
Raised Panel Thickness	1-3/16"	Warranty	Limited lifetime warranty
Flat Panel Thickness	11/16"		

Door Construction:

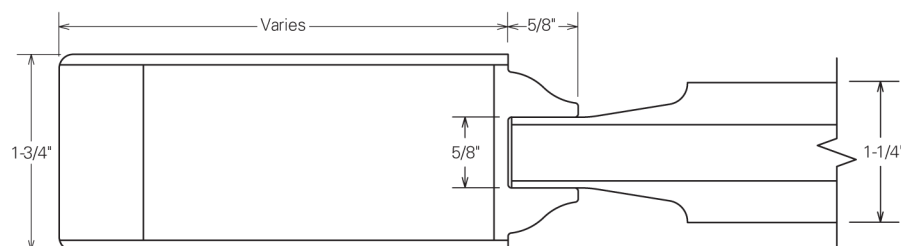


Product Features & Specifications:

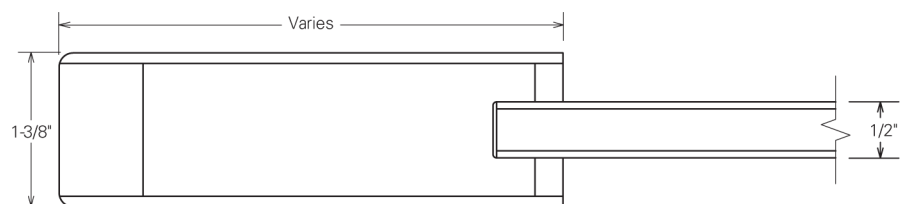
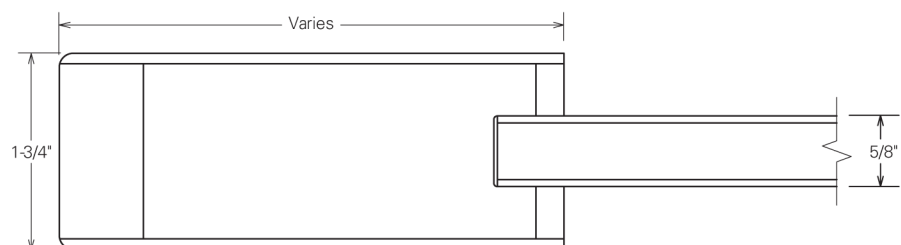
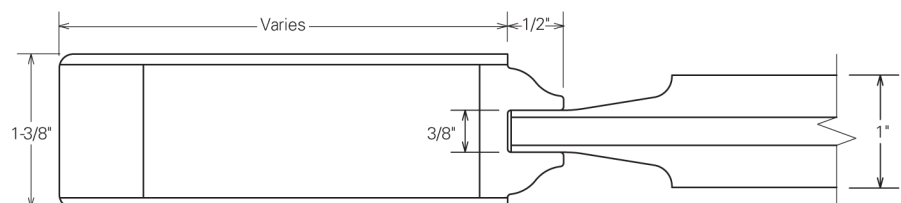
Thickness	1-3/4"	Panel Size	
Maximum Size	Single: 4'0 x 8'0 Pair: 8'0 x 8'0 <i>Taller sizes available on a custom basis</i>	<i>doors with combined panel & glass</i>	
Door Material	MDF with engineered stiles and rails	Minimum Panel Size	No minimum
Construction Method	Stile and rail	Maximum Panel Size	No maximum
Finish	Factory Prime	Maximum Glass Size	N/A
Available Styles	Any standard or custom design that meets the specifications described in this document. <i>See TruStile catalog for all standard styles</i>	Stock Dimensions	
Available Profiles	10 standard sticking options 4 standard panel options Custom options also available <i>See TruStile catalog for more details</i>	Top Rail	5"
Panel Construction		Bottom Rail	8-1/4" <i>Can be built larger to meet ADA requirements</i>
<i>doors with combined panel & glass</i>		Stiles	5"
Raised Panel Thickness	1-3/16"	Acoustic Rating	N/A
Flat Panel Thickness	11/16"	Standards	ASTM E-152, NFPA 80, NFPA 252, UBC7-2-1997/UL10C, UBC7-2-1997/UL10B
		Hardware Configurations	Pursuant to NFPA80, consult factory for approved configurations
		Warranty	Limited lifetime warranty

Door Construction:

Raised Panel Profile



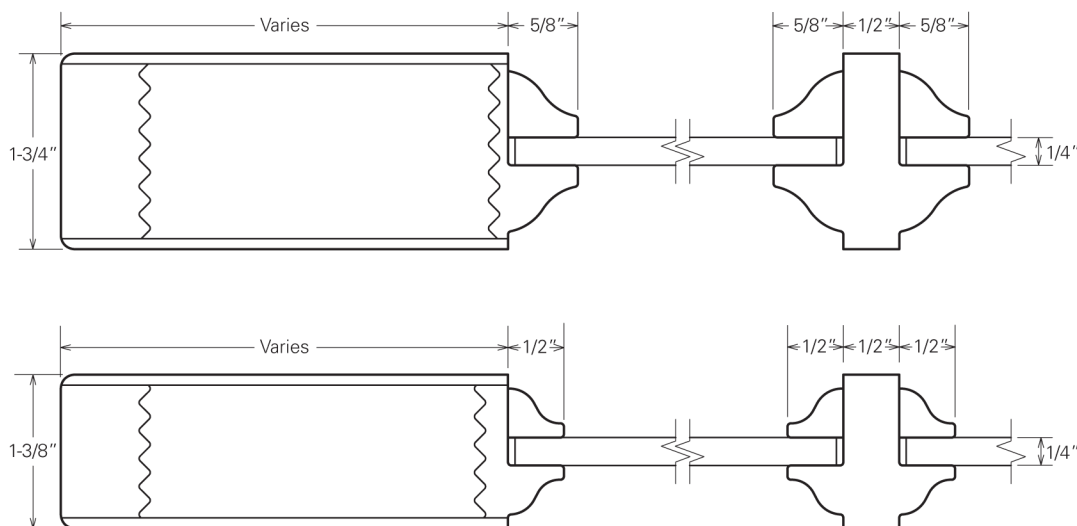
Flat Panel Profile



Product Features & Specifications:

Thickness	1-3/8" or 1-3/4"	Panel Size	
Maximum Size	Single: 4'0 x 8'0 Pair: 8'0 x 8'0 <i>Taller sizes available on a custom basis</i>	Minimum Panel Size	No minimum
Door Material	Wood with engineered stiles and rails	Maximum Panel Size	No minimum
Construction Method	Stile and rail	Stock Dimensions	
Finish	Unfinished	Top Rail	5"
Available Styles	Any standard or custom design that meets the specifications described in this document. <i>See TruStile catalog for all standard styles</i>	Bottom Rail	8-1/4" <i>Can be built larger to meet ADA requirements</i>
Available Profiles	11 standard sticking options 6 standard panel options Custom options also available <i>See TruStile catalog for more details</i>	Stiles	Varies based on size and style
Panel Construction		Acoustic Rating Standards	Up to 32 STC rating ASTM E-152, NFPA 80, NFPA 252, UBC7-2-1997/UL10C, UBC7-2-1997/UL10B
Raised Panel Thickness	1" or 1-1/4"	Hardware Configurations	Pursuant to NFPA80, consult factory for approved configurations
Flat Panel Thickness	1/2" or 5/8"	Warranty	Limited lifetime warranty

Door Construction:



Product Features & Specifications:

Thickness	1-3/8" or 1-3/4"	Panel Size	
Maximum Size	Single: 4'0 x 8'0 Pair: 8'0 x 8'0 <i>Taller sizes available on a custom basis</i>	<i>doors with combined panel & glass</i>	
Door Material	Wood with engineered stiles and rails	Minimum Panel Size	No minimum
Construction Method	Stile and rail	Maximum Panel Size	No minimum
Finish	Unfinished	Stock Dimensions	
Available Styles	Any standard or custom design that meets the specifications described in this document. <i>See TruStile catalog for all standard styles</i>	Top Rail	5"
Available Profiles	8 standard sticking options 4 standard panel options Custom options also available <i>See TruStile catalog for more details</i>	Bottom Rail	8-1/4" <i>Can be built larger to meet ADA requirements</i>
Maximum Glass Size	Varies based on size and style	Stiles	Varies based on size and style
Panel Construction		Acoustic Rating	N/A
<i>doors with combined panel & glass</i>		Standards	ASTM E-152, NFPA 80, NFPA 252, UBC7-2-1997/UL10C, UBC7-2-1997/UL10B
Raised Panel Thickness	3/4"	Hardware Configurations	Pursuant to NFPA80, consult factory for approved configurations
Flat Panel Thickness	1/2" or 5/8"	Warranty	Limited lifetime warranty

20-Minute Fire Door Specifications

20-Minute Positive Pressure Category “A” MDF & Wood Doors

20-Minute Positive Pressure Category “B” MDF & Wood Doors

20-Minute Neutral Pressure MDF & Wood Doors

Maximum Sizes

Singles	4'0 x 8'0
Pairs	8'0 x 8'0
Thickness	1-¾" minimum

Panel Construction

Raised Panel	1-⅛" minimum
Flat Panel	1⅙" minimum

Minimum Panel Size

MDF Doors	2-¾" x 2-¾"
Wood Doors	5" x 5"

Maximum Panel Size

MDF Doors	36-¾" x 82-½"
Wood Doors	32" x 74-¼"

Lite Construction

Maximum Lite Size	38" x 82-¾"
Maximum Lite Area	3,145 in ²
Glass Type	¼" FireGlass 20 (no hosestream) ⅜" FireLite NT (hosestream)

Standard Dimensions

Stile ¹	5" minimum 6" minimum for glass doors
Top Rail ²	5" minimum
Bottom Rail	8-¼" minimum
Intermediate Stile/Rail	2" minimum 3-½" minimum for glass doors

Acoustic Ratings

Consult factory for acoustical ratings

Hardware Machining Options*

Hinges	Per NFPA80
Locksets	½" minimum bolt throw
Cylindrical Lock	2-⅛" bore, 2-¾" backset
Mortise Lock ¹	Listed locks
Dead Bolt	2-⅛" bore, 2-¾" backset (minimum 5" above latch cutout)
Fire Exit Device	Surface mounted vertical rod Rim-type surface mounted exit device Mortise type exit device
Closing Device ²	Surface mounted Concealed arm track
Viewer	Listed viewers
Flush Bolt	Surface mounted manual Mortise manual Automatic
Auto Door Bottom	Surface mounted Mortised
Kick Plate ³	Top maximum 16" from door bottom
Raceway ⁴	Available

* Only hardware listed and labeled for use with 20-minute wood fire doors may be installed. Consult factory for configurations not shown.

¹ Certain mortise locks may require a wider minimum stile

² 6" top rail is recommended for certain closing devices

³ Unless approved by kick plate manufacturer

⁴ Availability and size may vary based on listing



Introducing 20-Minute Fire-Rated Glass Doors

TruStile is pleased to add 20-minute glass doors to its comprehensive lineup of fire-rated door options, which includes 20- through 90-minute ratings.

With TruStile, you never have to sacrifice style for fire door safety. Virtually all of TruStile's stile and rail panel door configurations are available in up to 90-minute ratings. And now, you have the flexibility to specify glass doors in 20-minute ratings.

Fire-rated glass doors are the perfect solution for offices, conference rooms and lobbies where a 20-minute door is required by code but the look of a glass door is preferred.

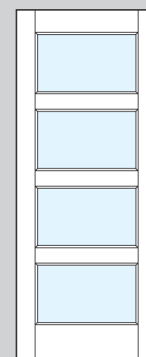


Product Highlights

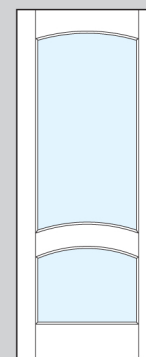
TruStile's 20-minute fire-rated glass doors are built with the same premium construction as TruStile's other stile and rail doors.

- Available to meet Category A and Category B requirements
- Hose stream-approved glass available
- Available with any of TruStile's standard sticking profiles
- Over 120 standard door styles
- Available with arch- or radius-shaped glass
- Custom door styles available
- Maximum glass area over 3,000 square inches

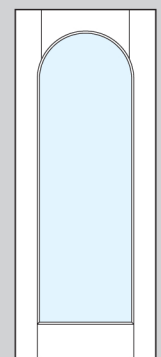
Sample Glass Door Styles



TSL4100



TSL2050



FL103

For more information on TruStile's complete line of fire-rated doors, refer to our fire door product data sheets or visit www.trustile.com.

Available Door Styles

TSL Series	Most TSL door styles
PL Series*	PL100, PL130, PL145, PL146, PL200, PL202, PL220, PL230, PL300, PL330, PL400, PL410
FL Series*	FL100, FL101, FL102, FL103, FL110, FL111, FL112, FL113
Custom	Yes, call your TruStile sales representative to discuss your specific requirements

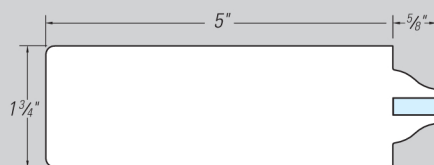
*Not available for divided lite doors.

Specifications

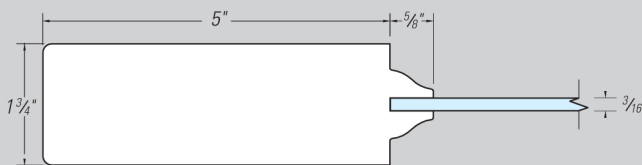
Thickness	1-3/4" minimum
Maximum Size	Single swing: 4'0" wide x 8'0" high
	Pair: 8'0" wide x 8'0" high
	Double Egress: N/A
Panel Construction	
Flat Panel Thickness	1 1/16" thick minimum
Raised Panel Thickness	5/8" thick tongue
Panel Size	
Minimum Panel Size	MDF Doors: 2-3/4" x 2-3/4" Wood Doors: 5" x 5"
Maximum Panel Size	MDF Doors: 36-3/4" x 82-1/2" Wood Doors: 32" x 74-1/4"
Stock Dimensions	
Stile Face Width	5" minimum
Top Rail Face Width	5" minimum
Bottom Rail Face Width	8-1/4" minimum
Intermediate Stiles/Rails	3-1/2" minimum

Material	Paint-grade MDF Stain-grade wood
Glazing	Compression fit only
Maximum Visible Area	3,145 sq. inches
Non Hose Stream	1/4" thick clear tempered glass
Hose Stream Approved	3/16" thick ceramic with 3M safety film applied <i>Hose stream-approved glazing must be specified (requires custom quote)</i>
Fire Label	Neutral Pressure Positive Pressure Category A Positive Pressure Category B Also available "stamp only" for TruStile authorized dealers and distributors.

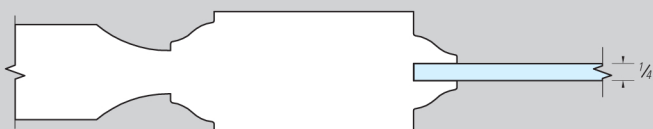
Door Construction



Standard 20-Minute Glass Cross Section



Hose Stream-Approved Glass Cross Section



Typical Partial-Lite Cross Section

45-Minute Fire Door Specifications

45-Minute Positive Pressure Category “A” MDF Doors

45-Minute Positive Pressure Category “A” Wood Doors

Maximum Sizes

Singles	3'6 x 8'0
Pairs	7'0 x 8'0
Thickness	1- ³ / ₄ " minimum

Panel Construction

Raised Panel	
MDF Doors	1- ³ / ₄ " minimum
Wood Doors	1- ¹ / ₄ " minimum
Flat Panel	³ / ₄ " minimum

Standard Dimensions

Stile ¹	5"
Top Rail ²	5"
Bottom Rail	8- ¹ / ₄ "
Intermediate Stile/Rail	2" minimum

Acoustic Rating

Consult factory for accoustical ratings

Hardware Machining Options*

Hinges	Per NFPA80
Locksets	¹ / ₂ " minimum bolt throw
Cylindrical Lock	2- ¹ / ₈ " bore, 2- ³ / ₄ " backset
Mortise Lock ¹	Listed locks
Dead Bolt	2- ¹ / ₈ " bore, 2- ³ / ₄ " backset (minimum 5" above latch cutout)
Fire Exit Device	Surface mounted vertical rod
	Rim-type surface mounted exit device
	Mortise type exit device
Closing Device ²	Surface mounted
	Concealed arm track
Viewer	Listed viewers
Flush Bolt	Surface mounted manual
	Mortise manual
	Mortise automatic (DCI 960/962 Series)
Auto Door Bottom	Surface mounted
	Mortised
Kick Plate ³	Top maximum 16" from door bottom
Raceway ⁴	Available

* Only hardware listed and labeled for use with 45-minute wood fire doors may be installed. Consult factory for configurations not shown.

¹ Certain mortise locks may require a wider minimum stile

² 6" top rail is recommended for certain closing devices

³ Unless approved by kick plate manufacturer

⁴ Availability and size may vary based on listing

60-Minute Fire Door Specifications

60-Minute Positive Pressure Category "A" MDF Doors

60-Minute Positive Pressure Category "A" Wood Doors

Maximum Sizes

Singles	3'6" x 8'0"
Pairs	7'0" x 8'0"
Thickness	1-¾" minimum

Panel Construction

Raised Panel	
MDF Doors	1-¾" minimum
Wood Doors	1-¼" minimum
Flat Panel	¾" minimum

Standard Dimensions

Stile ¹	5"
Top Rail ²	5"
Bottom Rail	8-¼"
Intermediate Stile/Rail	2" minimum

Acoustic Rating

Consult factory for accoustical ratings

Hardware Machining Options*

Hinges	Per NFPA80
Locksets	½" minimum bolt throw
Cylindrical Lock	2-⅛" bore, 2-¾" backset
Mortise Lock ¹	Listed locks
Dead Bolt	2-⅛" bore, 2-¾" backset (minimum 5" above latch cutout)
Fire Exit Device	Surface mounted vertical rod
	Rim-type surface mounted exit device
	Mortise type exit device
Closing Device ²	Surface mounted
	Concealed arm track
Viewer	Listed viewers
Flush Bolt	Surface mounted manual
	Mortise manual
	Mortise automatic (DCI 960/962 Series)
Auto Door Bottom	Surface mounted
	Mortised
Kick Plate ³	Top maximum 16" from door bottom
Raceway ⁴	Available

* Only hardware listed and labeled for use with 60-minute wood fire doors may be installed. Consult factory for configurations not shown.

¹ Certain mortise locks may require a 6" minimum stile

² 6" top rail is recommended for certain closing devices

³ Unless approved by kick plate manufacturer

⁴ Availability and size may vary based on listing

90-Minute Fire Door Specifications

90-Minute Positive Pressure Category “A” MDF Doors

90-Minute Positive Pressure Category “A” Wood Doors

Sizes

Singles	3'6 x 8'0 maximum
Pairs	7'0 x 8'0 maximum
Thickness	1-¾" minimum

Panel Construction

Raised Panel	
MDF Doors	1-¾" minimum
Wood Doors	1-⅝" minimum
	1-⅞" minimum for pairs
Flat Panel	⅞" minimum
	1" minimum for pairs

Standard Dimensions

Stile ¹	5" minimum
Top Rail ²	5" minimum
Bottom Rail	8-¼" minimum
Intermediate Stile/Rail	2" minimum

Accoustic Rating

Consult factory for accoustical ratings

Hardware Machining Options*

Hinges	Per NFPA80
Locksets	½" minimum bolt throw
Cylindrical Lock	2-⅛" bore, 2-¾" backset
Mortise Lock ¹	Listed locks
Dead Bolt	2-⅛" bore, 2-¾" backset (minimum 5" above latch cutout)
Fire Exit Device	Surface mounted vertical rod
	Rim-type surface mounted exit device
	Mortise type exit device
Closing Device ²	Surface mounted
	Concealed arm track
Viewer	Listed viewers
Flush Bolt	Surface mounted manual
	Mortise manual
	Mortise automatic (DCI 960/962 Series)
Auto Door Bottom	Surface mounted
	Mortised ³
Kick Plate ⁴	Top maximum 16" from door bottom
Raceway ⁵	Available

* Only hardware listed and labeled for use with 90-minute wood fire doors may be installed. Consult factory for configurations not shown. Drawings available upon request.

¹ Certain mortise locks may require a 6" minimum stile

² 6" top rail is recommended for certain closing devices

³ Not available on 90-minute pairs

⁴ Unless approved by kick plate manufacturer

⁵ Availability and size may vary based on listing

Sound Doors

The high density and solid nature of TruStile doors gives them very good sound reduction characteristics. However, it is ultimately the hardware gasketing and perimeter sealing package that determines the sound rating that a door achieves. The same style of door can achieve very different sound transmission ratings based on the type of sound control hardware that is used. To learn more about controlling sound through door openings visit “Understanding STC Ratings (/technical-information/understanding-stc-ratings).”

To make ordering STC rated doors from TruStile easier, we have tested our MDF and Wood Doors with hardware packages from Zero International. We display these packages as Package A, B and C in the tables below. All of these ratings are for operable single swing doors with the sound control hardware specified in the right hand side of each table.

High STC ratings

Zero International hardware — Package A

				Zero International Hardware Used:			
STC Rating	Door Material	Door Styles	Door Thickness	Primary Seal	Secondary Seal	Threshold Saddle	Sweep
39	MDF & Wood	45- & 60-Minute Fire Door	2-¼"	#475	#119	#564	#367
38	MDF	90-Minute Fire Door	1-¾"	#188FS	#118B	Flat Surface	#369
34	MDF	TS5000 through TS9000	1-¾"	#475	#119	#564	#367
33	MDF	TS1000 through TS4000	1-¾"	#475	#119	#564	#367
32	Wood	WTS1000 through WTS4000	1-¾"	#475	#119	#564	#367
30	Wood	WTS5000 through WTS9000	1-¾"	#475	#119	#564	#367

Moderate STC Ratings

Zero International hardware — Package B

				Zero International Hardware Used:			
STC Rating	Door Material	Door Styles	Door Thickness	Primary Seal	Secondary Seal	Threshold Saddle	Sweep
32	MDF	TS5000 through TS9000	1-¾"	#475	N/A	#564	N/A
30	MDF	TS1000 through TS4000	1-¾"	#475	N/A	#564	N/A
30	Wood	WTS1000 through WTS4000	1-¾"	#475	N/A	#564	N/A

Low STC Ratings

Zero International hardware — Package C

				Zero International Hardware Used:			
STC Rating	Door Material	Door Styles	Door Thickness	Primary Seal	Secondary Seal	Threshold Saddle	Sweep
21	MDF	TS1000 through TS4000	1-¾"	#188	N/A	#655	#111A
18	Wood	WTS5000 through WTS9000	1-¾"	#188	N/A	#655	#111A

For more information on the hardware specified in the tables above, please visit Zero International (<http://www.zerointernational.com>).

Understanding Sound Ratings

Loud noise hurts everyone and it's especially bad for business. Continued exposure impairs hearing and undermines emotional well-being, exposing employers to potential liabilities. Even at relatively low levels, unwanted noise can be a costly drain on employee morale and productivity.

Sound Pressure Level (dB)	Source	Sensation
130	Jet Aircraft at 100'	Physical Pain
	Bass Drum at 3'	
	Auto Horn at 3'	
120	Thunder, Artillery Nearby Riveter	Deafening
110		
100	Elevated Train Discotheque	Very Loud
90	Loud Street Noise Noisy Factory	
	Truck Unmuffled Police Whistle	
80	Cocktail Party Noisy office Average Street Noise	Loud
70		
60	Average Radio Average Factory	Moderate
50	Noisy Home Inside General Office	
	Conversation Quiet Radio	
40	Quiet Home Private Office	Faint
30		
20	Empty Auditorium Quiet Conversation	Very Faint
10	Rustle of Leaves Whisper	
	Soundproof Room	
0	Threshold of Audibility	

Figure 1

The solutions to the endless list of noise problems and challenges fall into two basic categories. The science of sound-acoustics has yielded corresponding sound management techniques. Their application is determined by the nature of the particular noise problem:

- Absorption is the process of removing sound energy from within a room. Typically, that is accomplished using soft, porous materials exposed to soak up sound.
- Transmission is the movement of sound through a medium. Preventing the transfer of sound through door openings, specifically through clearances and gaps around a door, requires specialized products and techniques.

To define your specific problem, you need a basic understanding of how to quantify both your unwanted noise and the sound level that will be acceptable. The difference between those two values is the degree of sound control you need to achieve with your door opening.

Sound is vibrations in air moving in waves. The rate of sound pulsations measured in cycles per second is called frequency — also known as hertz (Hz).

Sound pressure levels are measured in decibels or dB. The scale of measurement used to simulate sound across the audible frequency range is denoted as dB. The human ear perceives changes in loudness caused by even small changes in those levels. Each 3dB increase doubles the sound reception and the annoyance or discomfort that goes with it.

	Duration Hours Per Day	Sound Level in dB
Federal (OSHA) code prohibits exposure to noise levels which exceed these limits:	8	90
	6	92
	4	95
	3	97
	2	100
	1-½	102
	1	105
	½	110
	¼	115

Figure 2

When sound comes in contact with a barrier, such as a door, some of the energy from the vibrations transfers to the door. The resulting vibrations in the door itself then set the air in motion on the other side of the door, creating more sound vibrations.

The mass, damping and stiffness of the barrier determine its resistance to the passage of sound waves. The greater the mass, the less sound is transmitted through the barrier. Mass is especially important for blocking sound at lower frequencies. MDF, because of its weight and high density, is an excellent sound barrier and TruStile MDF doors provide superior sound barrier characteristics.

The stiffness of the barrier is also a factor in sound transmission. Sound control doors are generally made from very dense, stiff materials. These dense, stiff materials also work well at reflecting sound back to its source.

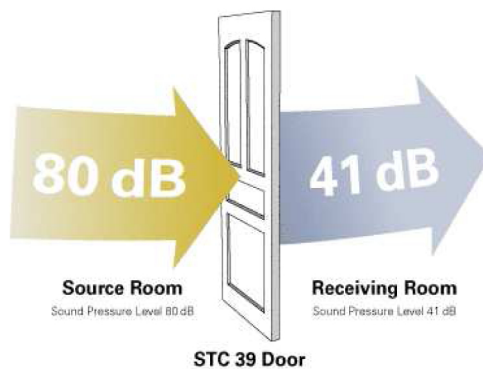


Figure 3

Sound Reduction Ratings:

Sound Transmission Loss (TL);

A door's ability to reduce noise is called its sound transmission loss (TL) effectiveness. TL is a value given in decibels, which is determined by measuring sound pressure levels at a certain frequency in the source and receiving rooms. The calculation also factors in the area of the partition shared by the two rooms, and adjusts for the receiving room's acoustic "liveness" (known as reverberation time). The adjusted difference between the two levels is the TL of the door. The higher the TL, the better the result.

Sound Transmission Class (STC):

TL measurements for a door are taken across a range of frequencies, which makes it difficult to compare the effectiveness of different doors. Sound transmission class (STC) ratings solve that problem by giving a single value to acoustical performance for a door. STC is determined by a weighted average of TL values taken over 16 frequencies, which are fitted to a curve in a method defined by the ASTM E413 Classification Standard for Rating Sound Insulation. The higher the STC

value, the better the rating and the better the performance as shown in Figure 3 and Figure 4.

Sound Transmission Class

	STC	Performance	Description
	50-60	Excellent	Loud sounds heard faintly or not at all
	40-50	Very Good	Loud speech heard faintly
<i>TruStile Doors with Correct Gasketing</i>	35-40	Good	Loud speech heard but hardly intelligible
	30-35	Fair	Loud speech understood fairly well
	25-30	Poor	Normal speech understood easily and distinctly
<i>Typical Hollow Core Door</i>	20-25	Very Poor	Low speech audible

Figure 4

Acoustical Gasketing:

Naturally, the effectiveness of sound control doors varies with different combinations of materials. With so many variables, how can we determine how well a particular door will block sound? The most important thing to remember is that the door's sound rating is only as good as the gasketing and perimeter seal that you incorporate into the opening.