FORTINA™

TECHNICAL SPECS

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B+N Industries

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Fortina Quick Ship

Timeless Design, Fast Turnaround
Fortina's Quick Ship program delivers the same timeless beauty of natural wood and unmatched durability of aluminum but with the speed and convenience needed for tight timelines. Manufactured and assembled in the United States, Quick Ship profiles ship in as little at 72 hours, ensuring your project stays on track without the compromise of quality or design.

Finishes

Wood Grain

TAR-758
Vent Walnut N

TAR-004
Rokko Cedar

TAR-647
Earl Walnut M

TAR-005
Rican Oak

TAR-532
Cherry Line M

TAR-028
Pacific Gray

TAR-775
Carina Elm D

TAR-021
Criollo Elm

TAR-2122
Lunta Elm

TAR-2035
Axis Oak

Anodized

AB1010
Silver

AB1020
Champagne

AA1090
Rose Gold

AB1100
Light Gold

AB1030
Golden Bronze

AB1040
Light Bronze

AB1050
Medium Bronze

AB1060
Dark Bronze

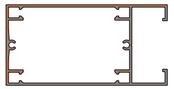
AB1070
Deep Bronze

AB1080
Black

Profiles

TLKS-5050
50mm x 50mm (~2" x 2")

THS-3010
30mm x 100mm (~1.2" x 4")



THS-5010
50mm x 100mm (~2" x 4")

THS-5015
50mm x 150mm (~2" x 6")

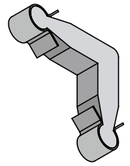
THS-50250
50mm x 250mm (~2" x 10")

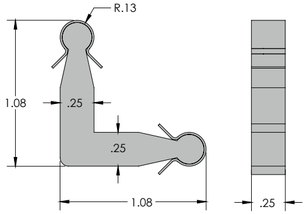
Why choose Fortina Quick Ship?

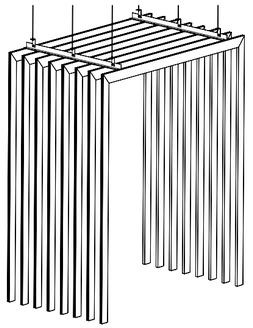
- **Made in the USA**
  Profiles and finishes are manufactured and assembled domestically for faster availability and a reduced carbon footprint.
- **Fast Shipping**
  Select profiles and finishes ship in just 72 hours.
- **Wide Range of Options**
  Choose from multiple profiles and finishes to fit any design vision.
- **Integrated Lighting**
  Quick Ship profiles are available with energy-efficient, integrated lighting to add functional ambiance.
- **Built to Last**
  Lightweight, weather-resistant, and easy to maintain, Fortina is designed to perform in demanding environments.

Mitered Joints: The Corner Key

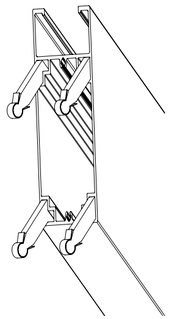
Square corner keys allow compatible battens to be miter cut and joined at 90 , resulting in a cleaner aesthetic than traditional butt joints. B+N's Quick Ship program offers THS- Type Battens (Pictured) with integral pockets that allow corner keys to be hammered in for a secure connection*.





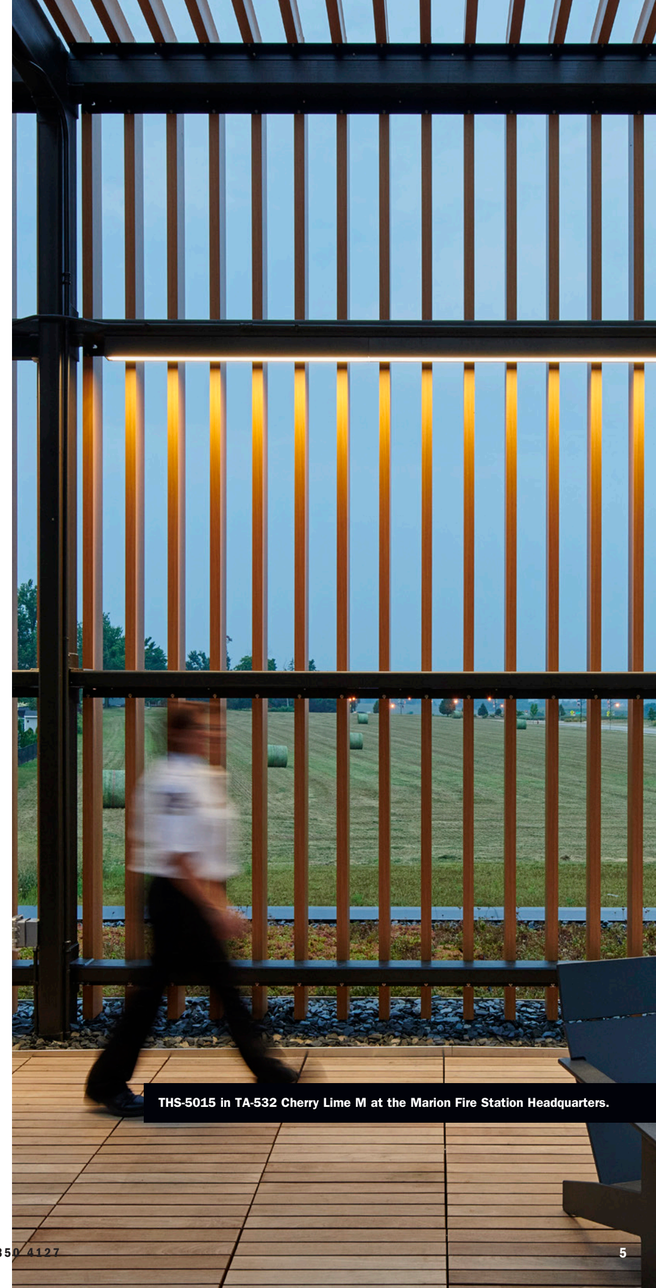


Archways or overhangs are one way to use the Corner Keys with mitered Battens.



Batten with Corner Keys installed.

*Corner Keys are not suitable for structural applications.



THS-5015 in TA-532 Cherry Lime M at the Marion Fire Station Headquarters.

Fortina QuickStick

Fortina QuickStick remarkable new product that looks and feels like real wood, but easier in many dimensions – a hyper-realistic, non-PVC roll featuring an eco-friendly, high-performance ultra-adhesive backing, it seamlessly matches our Fortina Battens for a flawless finish. Ideal for panels, millwork, and furniture, QuickStick is available in 100+ wood finishes for interior applications, some available in QuickShip.

Fortina QuickStick

Stock Finishes*

Please note that the color in the brochure may vary from the actual product. Each design collection is subject to change periodically without notice.

*Any of our wood grain finishes can be Special Ordered in QuickStick. Lead times and MOQ's apply to Special Orders.

TAR-2122
Lunta Elm

TAR-2035
Axis Oak

TE-SN2035*
Axis Oak N

TAR-004
Rokko Cedar

TAR-758
Vent Walnut N

TAR-647
Earl Walnut M

TAR-005
Rican Oak

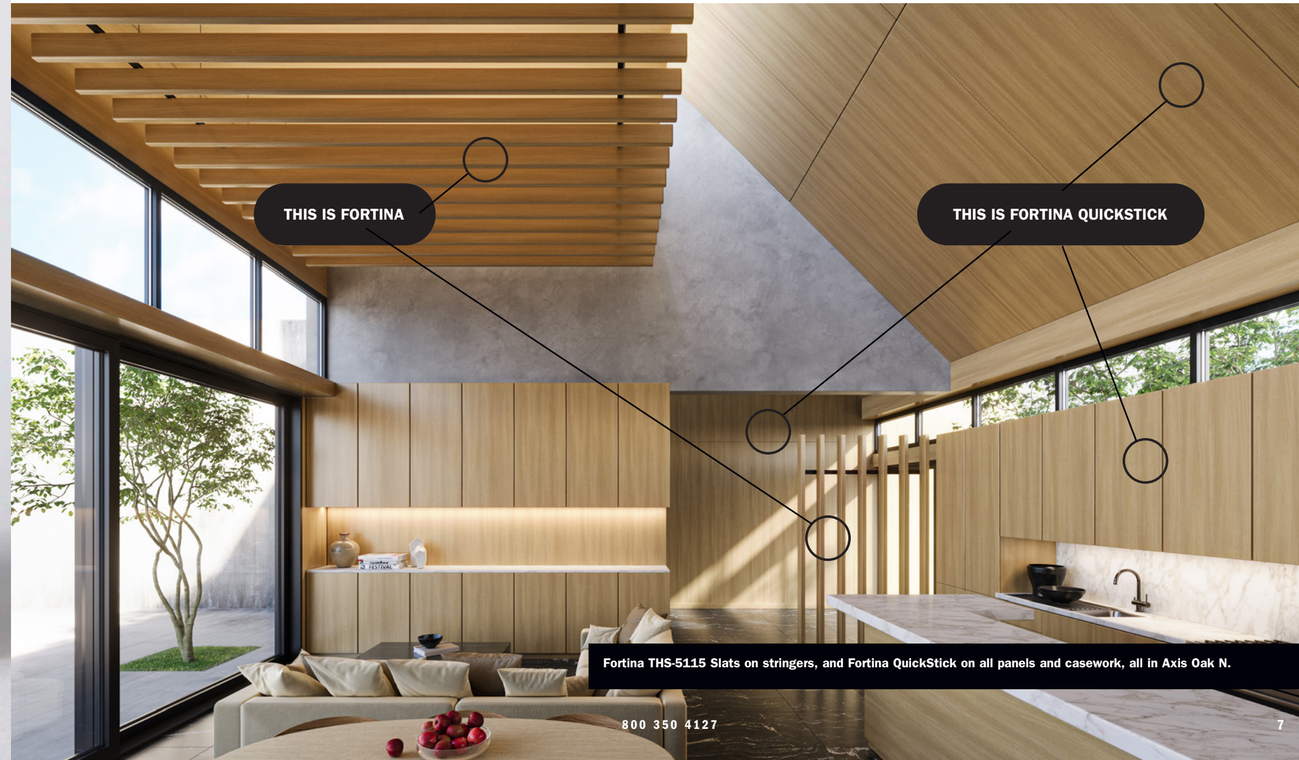
TAR-532
Cherry Line M

TAR-028
Pacific Gray

TAR-775
Carina Elm D

TAR-021
Criollo Elm

Note: All finishes come in 4 ft-wide/25 meter (82-ft long) ft rolls
***TE-SN2035 Axis Oak N comes only in 3 ft-wide/25 meter (82-ft) long rolls**



Fortina THS-5115 Slats on stringers, and Fortina QuickStick on all panels and casework, all in Axis Oak N.

Interior Finishes

Please note that the color in the brochure may vary from the actual product. Each design collection is subject to change periodically without notice.

TE-SN2122
Lunta Elm WG

TE-SN2107
Farine Ash W

TE-SN2015
Crema Chestnut CW

TE-SN2108
Nuage Chestnuts W

TE-SN2063
Brilas Wood W

TE-SN2065
Sklira Ash W

TE-SN2080
Marble Wood W

TE-SN947
Madras Walnut W

TE-SN2117
Bonamana Ash WG

TE-SN2113
Ravin Oak N

TE-SN2084
Brook Willow W

TE-SN2114
Chrome Ash WG

TE-SN2025
Maquillage Elm TG

TE-SN2073
Pulito Oak N

TE-SN2124
Nocturne Walnut G

TE-SN2087
Thermos Oak LG

TE-SN2123
Limber Oak N

TE-SN2055
Revlon Wall W

TE-SN2074
Pulito Oak L

TE-SN2118
Elg Oak N

TE-SN2035
Axis Oak N

TE-SN882
Norte Oak L

TE-SN2053
Frettare Oak N

TE-SN2058
Legacy Ash G

TE-SN2060
Tendre Walnut LG

TE-SN2109
Nuage Chestnuts BG

TE-SN2115
Fresco Teak BG

TE-SN2095
Saloon Eucalyptus G

TE-SN2119
Tinta Oak G

TE-SN2066
Sklira Ash G

TE-SN2099
Humming Elm G

TE-SN2100
Diera Oak N

TE-SN2104 å
Sieg Birch N

TE-SN2039
English Walnut G

TE-SN2069
Lindo Acacia G

TE-SN883
Norte Oak G

TE-SN2110
River Ash M

TE-SN2121
Savor Bokote DB

TE-SN2116
Fresco Teak G

TE-SN2091
Allegro Cherry G

TE-SN2092
Agile Walnut M

TE-SN2064
Brilas Wood DG

TE-SN2059
Legacy Ash DG

TE-SN2061
Tendre Walnut MG

TE-SN2125
Petra Ash M

TE-SN2120
Dusk Walnut M

TE-SN2067
Lindo Acacia M

TE-SN2056
Revlon Wall M.

TE-SN2057
Revlon Wall B

TE-SN2068
Lindo Acacia LB

TE-SN2050
Symphony Walnut B

TE-SN2103
Ars Cherry M

TE-SN902
Bliss Walnut B

TE-SN2102
Flag Cheek M

TE-SN948
Madras Walnut DG

TE-SN2051
Symphony Walnut D

TE-SN2062
Noir Imbuia D

TE-SN2112
Nouvelle Castillo D

TE-SN2070
Lindo Acacia BL

TE-SN2040
English Walnut BL

Interior Finishes

Please note that the color in the brochure may vary from the actual product. Each design collection is subject to change periodically without notice.


TE-SN2081
Marble Wood DG


TE-SN2106
Plage Tineo B


TE-SN2111
Nouvelle Castillo G


TE-SN2089
Thermos Oak D


TE-SN2097
Stella Elm BL

TE-SN7105
Mode Metal W

TE-SN7003
Pure Mist


TE-SN7106
Minerva Stucco W


TE-SN7100
Reflet Cloth W


TE-SN7101
Reflet Cloth G


TE-SN7110
Belladonna Marble G

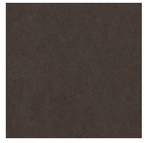

TE-SN7102
Mode Metal LG


TE-SN7001
Pure Gray


TE-SN7107
Minerva Stucco DG


TE-SN7109
Coco Sand LG


TE-SN7108
Mode Metal BG


TE-SN7103
Mode Metal B


TE-SN7104
Mode Metal BL


TE-SN7002
Pure Black

Exterior Anodized Finishes (QuickShip)

Please note that the color in the brochure may vary from the actual product. Each design collection is subject to change periodically without notice.


AB1010
Silver


AB1020
Champagne


AA1090
Rose Gold


AB1100
Light Gold


AB1030
Golden Bronze


AB1040
Light Bronze


AB1050
Medium Bronze


AB1060
Dark Bronze


AB1070
Deep Bronze


AB1080
Black

Exterior Finishes

Please note that the color in the brochure may vary from the actual product. Each design collection is subject to change periodically without notice.


TAR-012
Bamboo


TAR-005
Rican Oak


TAR-758
Vent Walnut N


TAR-004
Rokko Cedar


TAR-028
Pacific Gray


TAR-647
Earl Walnut M


TAR-030
Machilus


TAR-532
Cherry Line M


TAR-021
Criollo Elm


TAR-014
Antique Cedar RB


TAR-602
Vintage Walnut

TAR-605
Blossom Birch

TAR-760
Vent Walnut D

TAR-013
Antique Cedar G

TAR-808 Vent
Walnut BL

TAR-775
Carina Elm D

TAR-001
Terra Cotta Clay

TAR-002
Terra Cotta Arrosto

TQ-093*
Win White *Semi-Exterior

TAR-2035
Axis Oak

Exterior Anodized Finishes (Special Order)

Please note that the color in the brochure may vary from the actual product. Each design collection is subject to change periodically without notice.

SN
Silver

RB-5N
Stain Color

RB-4N
Light Bronze

RB-3N
Bronze

RB-2N
Dark Bronze

RB-1N
Black

NS-SN
Silver Matte

NS-5N
Stain Color Matte

NS-4N
Light Bronze Matte

NS-3N
Bronze Matte

NS-2N
Dark Bronze Matte

NS-1N
Black Matte

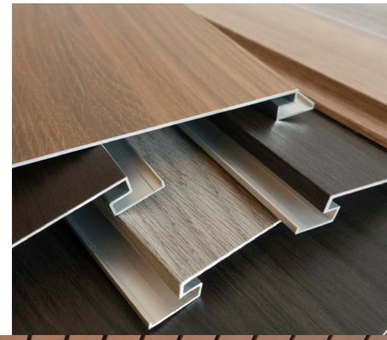
What is a Batten and what is a Slat?

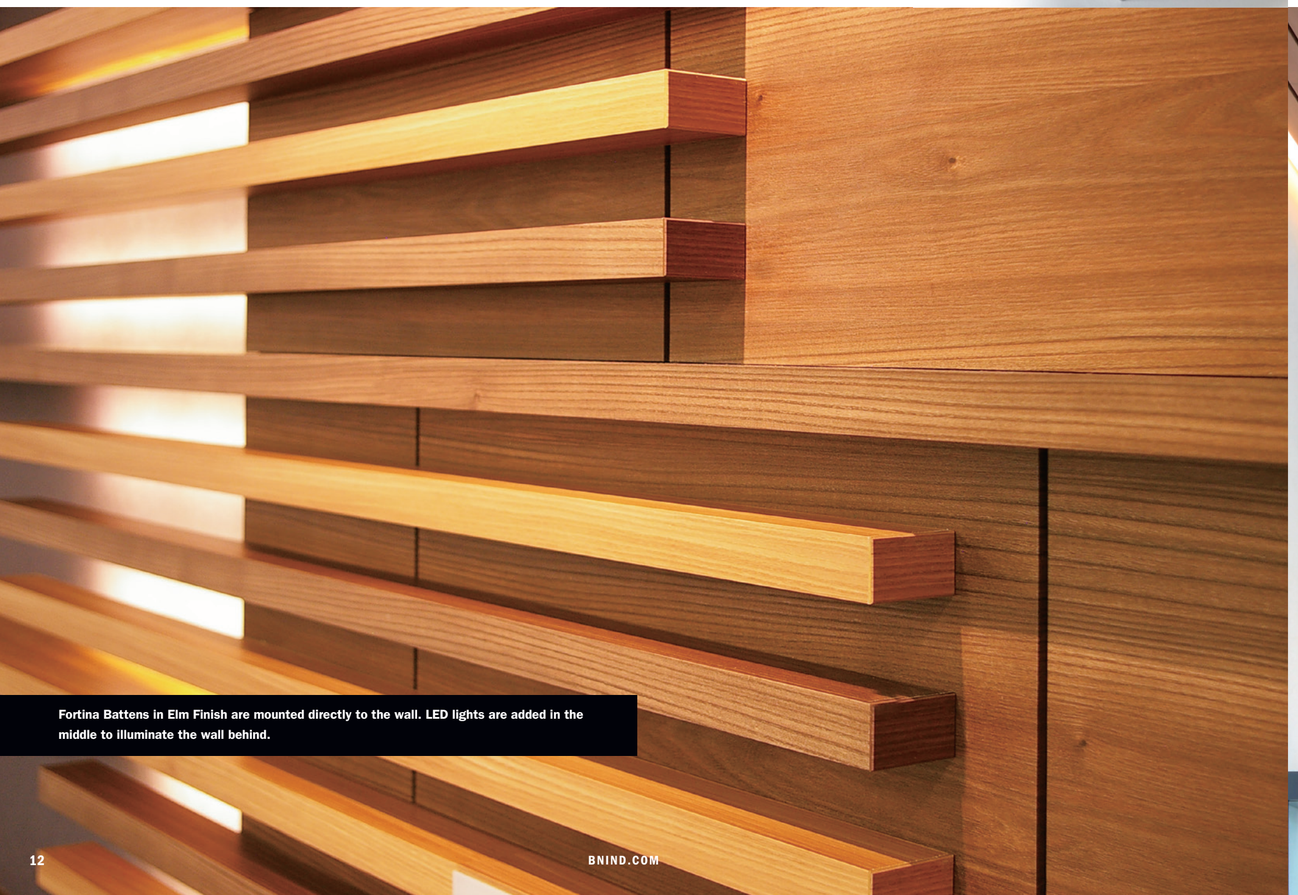
Battens

Battens, originally used for blinds to create shade and ventilation, are now seen increasingly as a design component both for interior and exterior applications.
Fortina Batten is an aluminum extrusion wrapped in a non-PVC film. They come in over 50 profiles and can be covered in 100 films. They are lightweight, incombustible, weather resistant and quick and cost efficient to install.
Fortina Battens are mounted on walls and ceilings with Direct Application or with Stringers to create visual interest and add extra dimension.

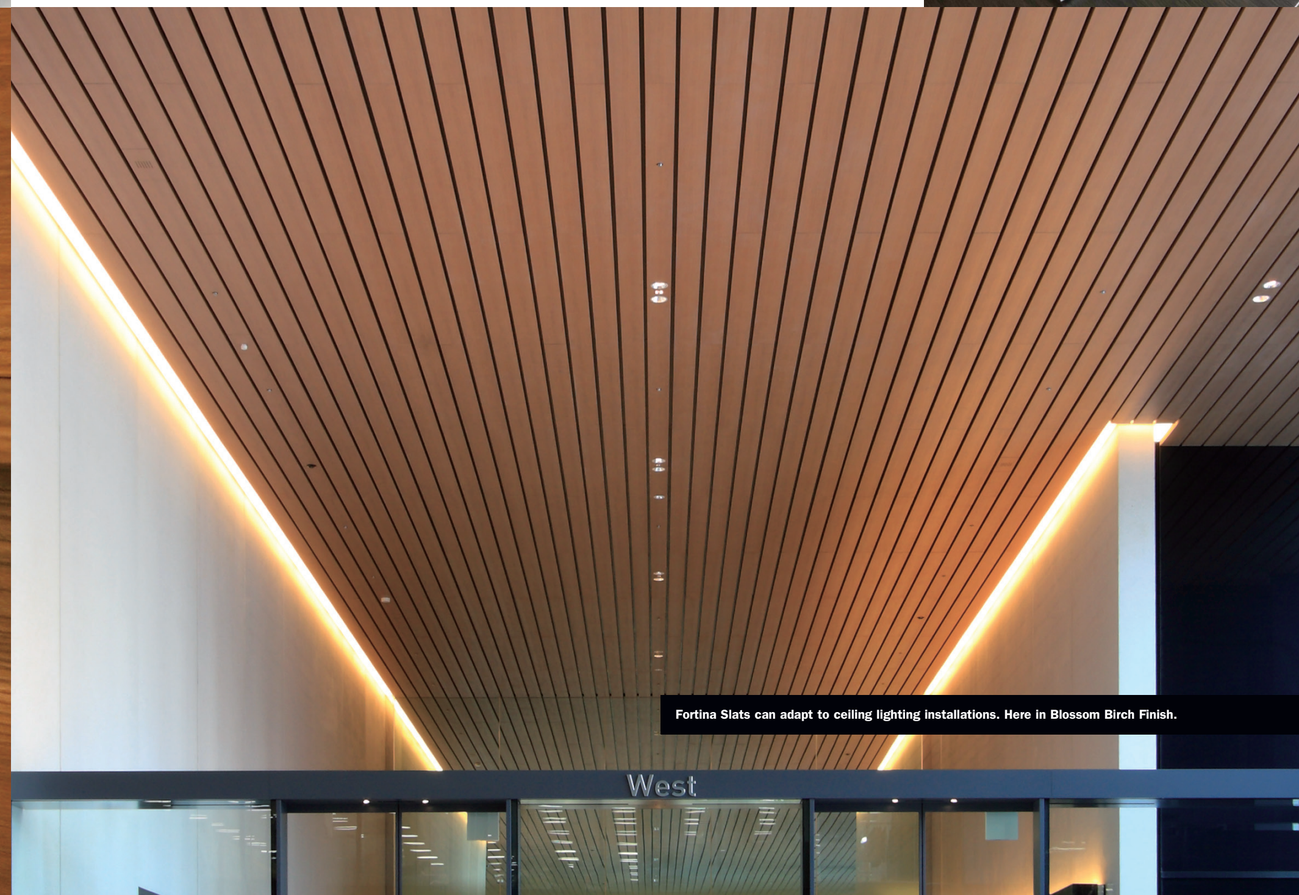
SLATS

Lightweight interlocking Fortina Slats are used on walls and ceilings. The extruded slats come in a wide choice of finishes using decorative film to create an individual custom look that coordinates with Fortina Battens. Slats are available with or without a reveal in several widths.





Fortina Battens in Elm Finish are mounted directly to the wall. LED lights are added in the middle to illuminate the wall behind.



Fortina Slats can adapt to ceiling lighting installations. Here in Blossom Birch Finish.

LightStrip Overview

Fortina's authentic wood-like finishes are now complemented by seamlessly embedded, energy-efficient LED lights. This innovation not only amplifies the visual warmth and texture of our versatile Battens but also offers a practical solution for ambient lighting.

LIGHTING APPLICATIONS:

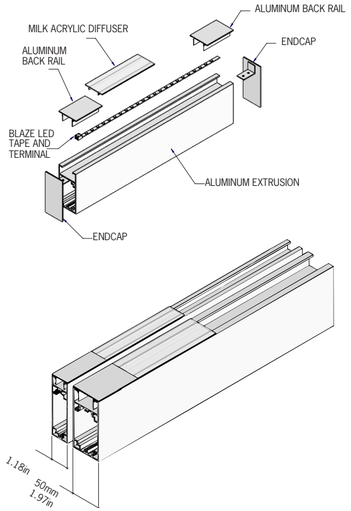
Direct Lighting: The light is integrated into the Fortina Batten and shown through our LED diffuser back rails that clip on seamlessly to the Fortina Batten. This causes the light to shine directly at the viewer, producing concentrated strips of light that create a sleek and modern look.

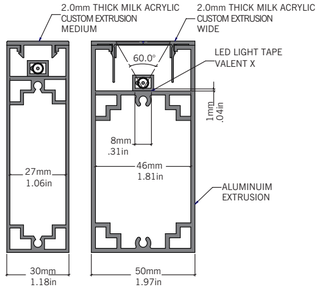
Indirect Lighting: The light is integrated into the Fortina Batten but does not face the viewer directly. Instead, the light illuminates from the back of the Fortina Batten, creating a soft glow around the Batten that helps reduce glare and shadows within a space.

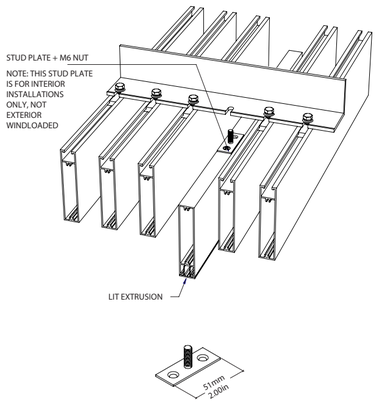
Light Grazing: This is a lighting technique that uses light strips positioned at an angle against a vertical wall. When lights are illuminated against a wall that contains Fortina, our Fortina Battens benefit from the dramatic play between light and shadow.

LIGHTING BENEFITS:

- Fully integrated LED lighting within the Fortina Batten
- Light applications customized to your project
- Fully diffused and uninterrupted linear lighting
- Indoor & outdoor options
- Wide range of lumen output options
- Color (CCT) Range: 2000K-6300K
- 95+ CRI: Superior color rendering with high R9-R13 values
- Tunable White, RGBW, and Dim to Warm options available
- Dimming compatible with a wide range of wall dimmers and control systems
- IP65 Rating for outdoor applications







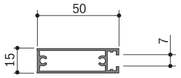
EIT Benefit Funds lobby with a massive waterfall of Fortina Battens and Lighting. Finish: TA-647 Earl Walnut M

Interior and Exterior Wall And Ceiling Applications With Stringers > Batten Profiles

Note: all dimensions are in mm. See Finishes Guide for finishes.

SQUARE 15

TLBS-1550



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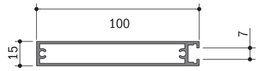

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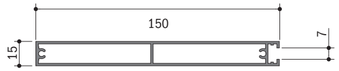
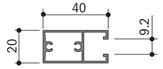


SQUARE 20

THS-2040



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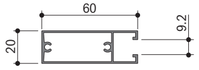

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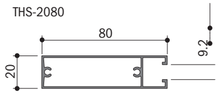

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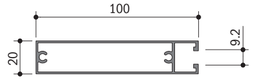

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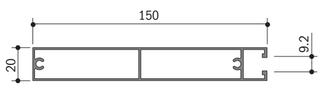
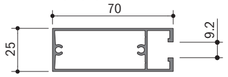


SQUARE 25

THS-2570



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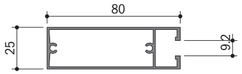
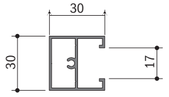


SQUARE 30

THSN-3030



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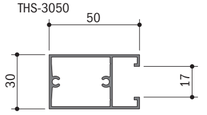

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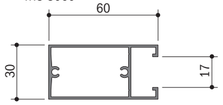

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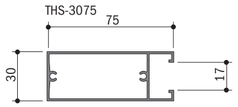

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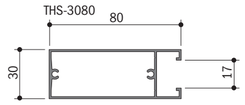
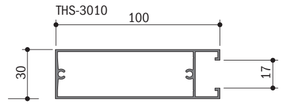


THS-3010



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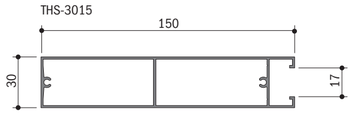
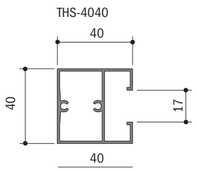
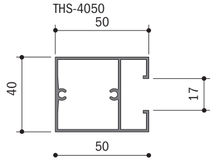


SQUARE 40

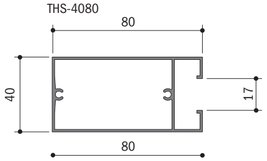
THS-4040



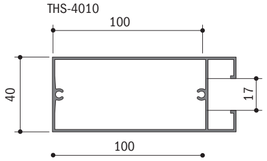
THS-4050



THS-4080

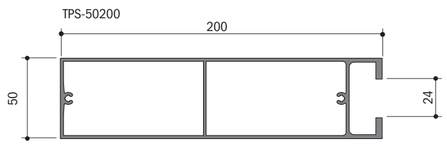


THS-4010

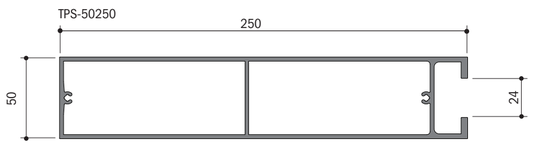


SQUARE 50

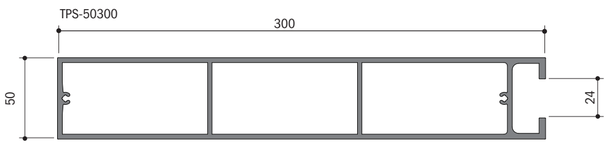
TPS-50200



TPS-50250



TPS-50300

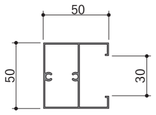


Interior and Exterior Wall And Ceiling Applications With Stringers > Batten Profiles and End Caps

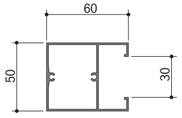
Note: all dimensions are in mm. See Finishes Guide for finishes.

SQUARE 50

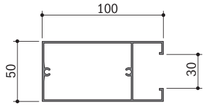
THSN-5050



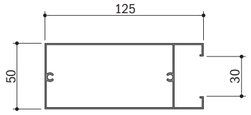
THS-5060



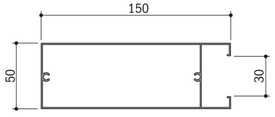
THSN-5010



THS-50125

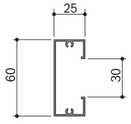


THS-5015

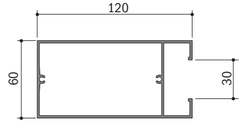


SQUARE 60

THS-6025

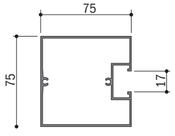


THS-6012



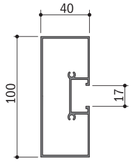
SQUARE 75

THS-7575



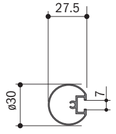
SQUARE 100

THS-1040

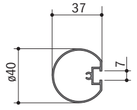


ROUND

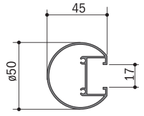
THC-30



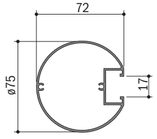
THC-40



THC-50



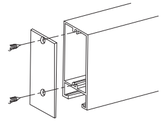
THC-75



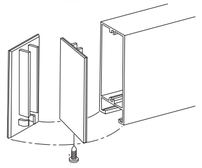
END CAPS

Materials: Aluminum Plate. Sold in sets of 20.

SCREW-ON END CAP



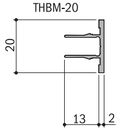
SNAP-ON END CAP



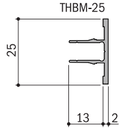
Interior and Exterior Wall And Ceiling Applications With Stringers > Decorative Backrails

Note: all dimensions are in mm. See Finishes Guide for finishes.

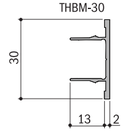
THBM-20



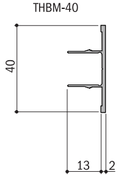
THBM-25



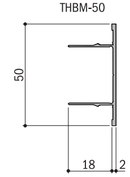
THBM-30



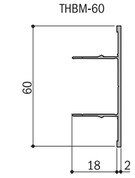
THBM-40



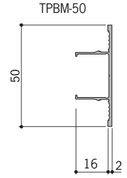
THBM-50



THBM-60



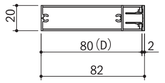
TPBM-50



EXAMPLES OF PROFILES WITH DECORATIVE BACKRAILS INSTALLED

THBM-20

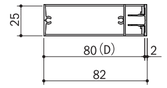
THS-2080 + THBM-20



(D) : 40/60/80/100/150

THBM-25

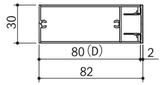
THS-2580 + THBM-25



(D) : 70/80

THBM-30

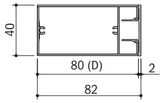
THS-3080 + THBM-30



(D) : 30/50/60/75/80/100/150

THBM-40

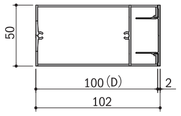
THS-4080 + THBM-40



(D) : 40/50/80

THBM-50

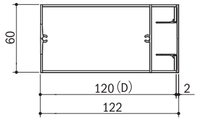
THSN-5010 + THBM-50



(D) : 50/60/100/125/150

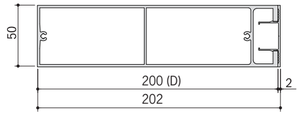
THBM-60

THS-6012 + THBM-60



(D) : 25/120

TPBM-50

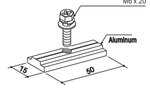


Interior and Exterior Wall And Ceiling Applications With Stringers > Accessories

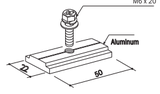
Note: all dimensions are in mm. See Finishes Guide for finishes.

CLIPS FOR ATTACHING BATTENS TO STRINGERS (SOLD IN SETS OF 20)

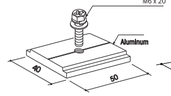
BTP-09



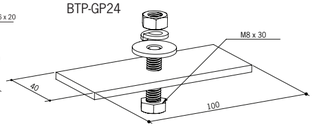
BTP-17



BTP-30

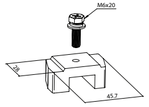


BTP-GP24



BTP-M620

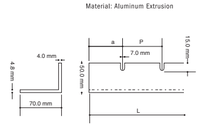
BTP-30HD



STRINGERS

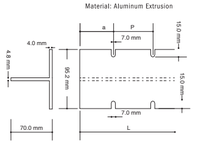
STAL-5

Material: Aluminum Extrusion



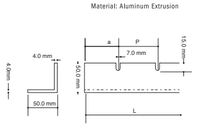
STAL-6

Material: Aluminum Extrusion



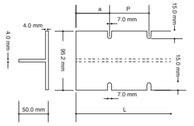
STAL-7

Material: Aluminum Extrusion



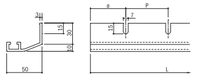
STAL-8

Material: Aluminum Extrusion



STCL-1

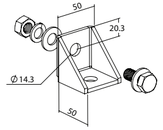
Only for Interior
Ceiling Application
Material: Aluminum Extrusion



STRINGER FITTINGS (SOLD IN SETS OF 10)

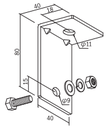
BTS-5050 WELDED GUSSET

Material: A607-50 High Strength Steel 4.1mm
Black Powder Coat Finish
Used with STAL-7/8 Stringer



BTS-4080ST

Material: Polished Chrome Finish
ST = 3.2mm
Used with STCL-1 Stringer



Interior Wall And Ceiling Direct Applications > Batten Profiles and Endcaps

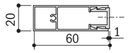
Note: all dimensions are in mm. See Finishes Guide for finishes.

Attachment 20

TLKS-2040

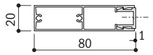
Backrail CLKU-20

TLKS-2060



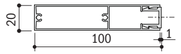
Backrail CLKU-20

TLKS-2080



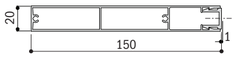
Backrail CLKU-20

TLKS-2010



Backrail CLKU-20

TLKS-2015



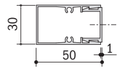
Backrail CLKU-20

Attachment 30

TLKS-3030

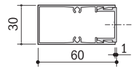
Backrail CLKU-30

TLKS-3050



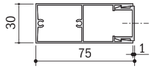
Backrail CLKU-30

TLKS-3060



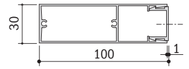
Backrail CLKU-30

TLKS-3075



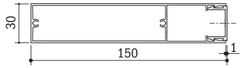
Backrail CLKU-30

TLKS-3010



Backrail CLKU-30

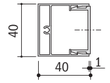
TLKS-3015



Backrail CLKU-30

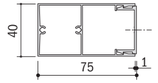
Attachment 40

TLKS-4040



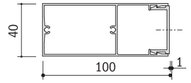
Backrail CLKU-40

TLKS-4075



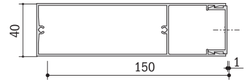
Backrail CLKU-40

TLKS-4010



Backrail CLKU-40

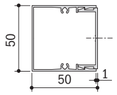
TLKS-4015



Backrail CLKU-40

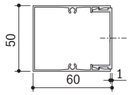
Attachment 50

TLKS-5050



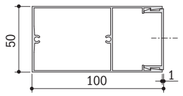
Backrail CLKU-50

TLKS-5060



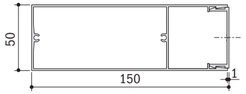
Backrail CLKU-50

TLKS-5010



Backrail CLKU-50

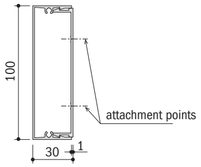
TLKS-5015



Backrail CLKU-50

Attachment 100

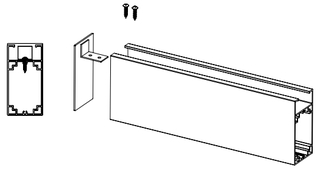
TLKS-1030



Backrail CLKU-100 2x

END CAPS

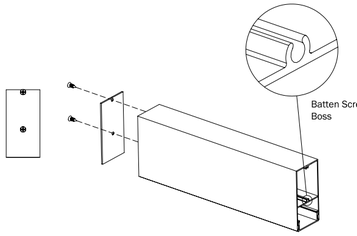
Materials: Aluminum Plate or ABS. Sold in sets of 20.



Bracketed

Used on: Domestic THS 3010/5010/5015 Battens
Material: Steel
Finish: Powder Coat to Match Batten Finish

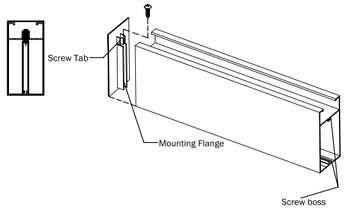
Installation: Align end cap to batten face and pre-drill 1/8" pilot holes. Firmly hold the cap in place and install two #8 sheet metal screws (not included) as shown.



Screw-On

Used on: TLKS (Direct-Attach) Battens
Material: Aluminum
Finish: Powder Coat match or Wood Grain

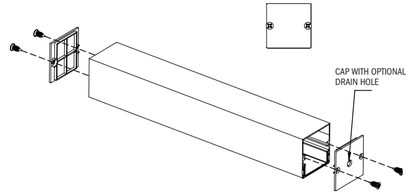
Installation: Align the cap mounting holes with the integral screw bosses in the Batten. Install the included sheet metal screw with a #3 small Phillips drive.



Snap-on

Used on: THS (Stringer-Attach) Battens
Material: Aluminum
Finish: Powder Coat match or Wood Grain

Installation: Align the mounting flanges on either side of the screw boss with the screw tab facing the open back channel as shown. Tap the end cap with a soft mallet to press-fit it in place and screw a #10 sheet metal screw (not included) onto the tab for added retention.



Screw-On Plastic

Used on: Domestic TLKS-5050 Battens
Material: ABS
Finish: Color to Match Wood Grain

Installation: Align the cap mounting holes with the integral screw bosses in the batten. Install
the included sheet metal screw with
a #3 small Phillips drive.

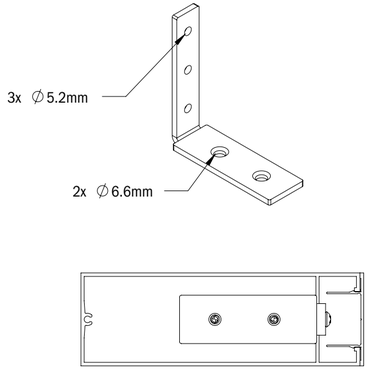
Floor-To-Ceiling Applications > L-Brackets

Note: all dimensions are in mm

TBF HD L-BRACKET

ITEM #1142588
Finish: Black Powder Coat

Compatible with:
THS-6012
THS-5015/50125/5010
THS-3015/3010

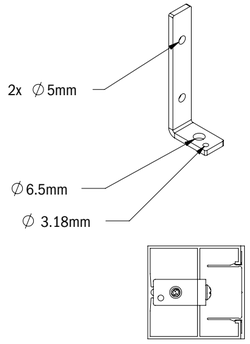


THS-5015 Shown for Reference

TBF L-BRACKET LITE

ITEM #1142584
Finish: Black Powder Coat

Compatible with:
THS-5060/THSN-5050
THS-4080/4050/4040
THS-3080/3075/3060/3050
THS-2580/2570
THS-2015/2010/2080/2060/2040



THSN-5050 Shown for Reference

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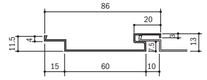
Interior And Exterior Slats > Profiles

Note: all dimensions are in mm. See Finishes Guide for finishes.

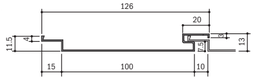
13mm height/thickness Profile Selection

Standard Style With 10mm Reveal

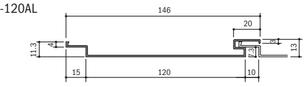
TRA-60ST t =1.0mm
TRA-60AL



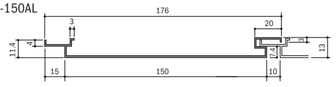
TRA-100ST t =1.0mm
TRA-100AL



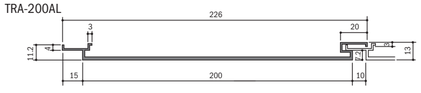
TRA-120ST t =1.2mm
TRA-120AL



TRA-150ST t =1.3mm
TRA-150AL



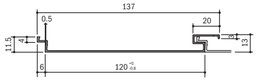
TRA-200ST t =2.3mm
TRA-200AL



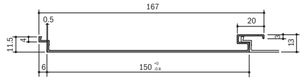
Flat Style With No Reveal

TRA-100MF t =1.0mm

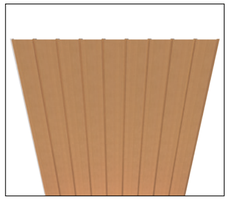
TRA-120MF t =1.2mm



TRA-150MF t =1.3mm

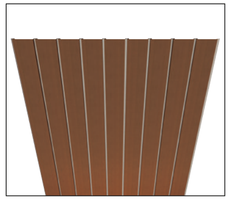


STANDARD STYLE
WITH WOODGRAIN INSIDE REVEAL



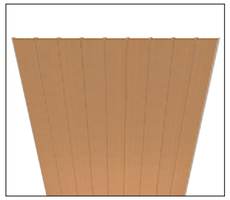
TRA-xxxST

STANDARD STYLE
WITH ALUMINUM INSIDE REVEAL



TRA-xxxAL

FLAT STYLE



TRA-xxxMF

Interior And Exterior Slats > Accessories

Note: all dimensions are in mm. Finish on a Slat Trims and Accessories is anodized or powder coated.

13mm

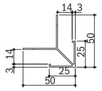
Trims /Edge Treatment

M-16 t=1.2

M-19-1 t=1.2

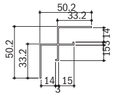
Exterior Corner Trim

M-70 t=1.2



Interior Corner Trim

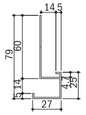
M-78 t=1.2



H Joints

M-64 t=1.2

M-71 t=1.3



13mm/23mm

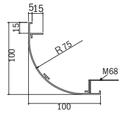
Corner Trims

M-6 t=1.5

M-67 t=1.2

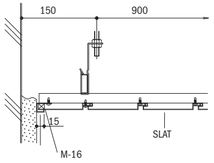
M-68 t=1.2

M-69 t=1.5

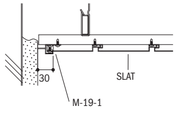


Slat > Installation Examples

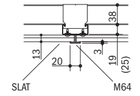
LONGITUDINAL SECTION USING M-16



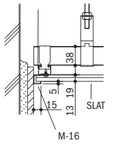
LONGITUDINAL SECTION USING M-19-1



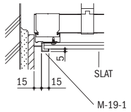
JOINT DETAIL USING M-64



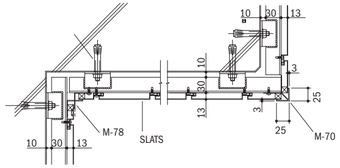
CROSS SECTION USING M-16



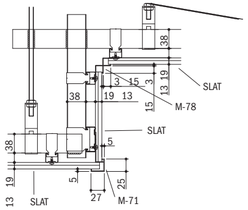
CROSS SECTION USING M-19-1



INSIDE AND OUTSIDE CORNER USING M-70• 78



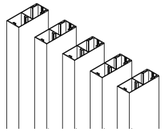
DROP CEILING DETAIL USING M-71 • 78



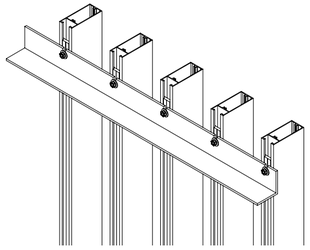
Interior Applications

Vertical On Wall

Direct Attachment with interlocking Batten and back rail. Screw back rails at desired locations vertically to the wall and lock Batten into it. It is recommended that you secure the back rail with small screw on side at top and bottom. Add end caps if needed.

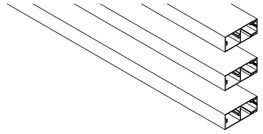


Stringer Mounted Battens Attach Stringers horizontally to the wall structure with L-brackets, Unistrut, L-angles or similar. Stringers will be pre-notched to create the desired Batten spacing. Secure Battens to the Stringers with special Fortina clips. Add end caps if needed.

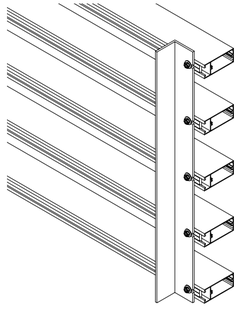


Horizontal On Wall

Direct Attachment with interlocking Batten and back rail. Screw back rails at desired locations horizontally into the wall and lock Batten into it. It is recommended that you secure the back rail with small screw on side at top and bottom. Add end caps if needed.

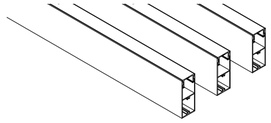


Stringer Mounted Battens Attach Stringers vertically to the wall structure with L-brackets, Unistrut, L-angles or similar. Stringers will be pre-notched to create the desired Batten spacing. Secure Battens to the Stringers with special Fortina clips. Add end caps if needed.

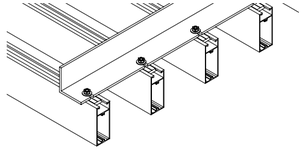


Ceiling

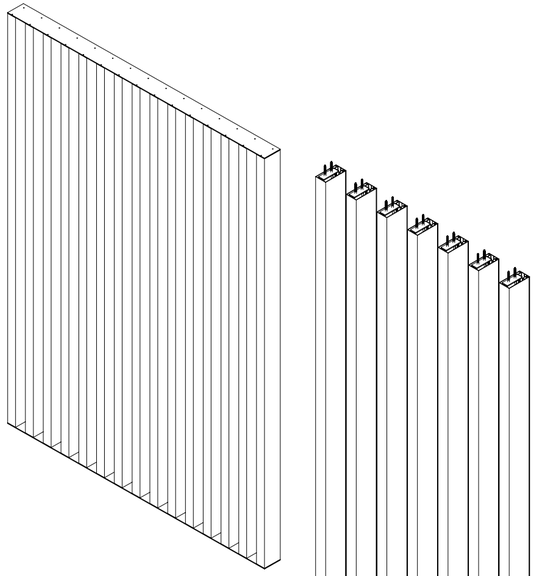
Direct Attachment with interlocking Batten and back rail. Screw back rails at desired locations into the ceiling and lock Batten into it. It is recommended that you secure the back rail with small screw on side at each end. Add end caps if needed.



Stringer Mounted Battens Hang Stringers from the ceiling structure with rods, Unistrut or L-brackets. Stringers will be pre-notched to create the desired Batten spacing.

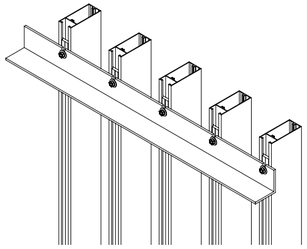


Floor-To-Ceiling Below left, Fortina screen end plates are used to mount arrays of decorative aluminum extrusions creating floor-to-ceiling screens. They are ideal for tight clearance applications such as in front of glazing where access to the back of the batten is limited. Below right, Fortina floor to ceiling screens are vertically oriented decorative hollow aluminum battens individually mounted with attachment brackets at the floor and ceiling.

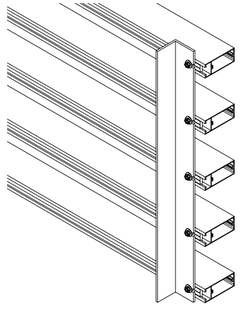


Exterior Applications

Stringer Mounted Vertical Battens Attach Stringers horizontally to the wall structure with L-brackets, Unistrut, L-angles or similar. Stringers will be pre-notched to create the desired Batten spacing. Secure Battens to the Stringers with special Fortina clips. If adding end caps, drill a small drain hole in each end cap.



Stringer Mounted Horizontal Battens Attach Stringers vertically to the wall structure with L-brackets, Unistrut, L-angles or similar. Stringers will be pre-notched to create the desired Batten spacing. Secure Battens to the Stringers with special Fortina clips. Add end caps if needed.

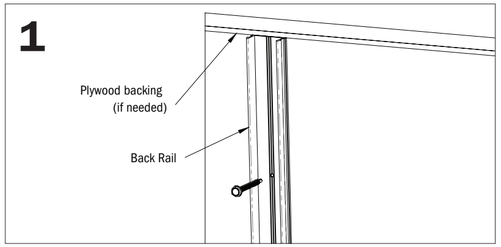


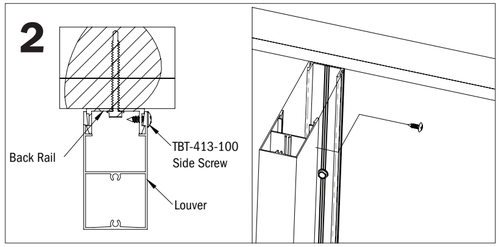
Fortina Battens > Wall and Ceiling > Direct Attachment > Interior/Exterior

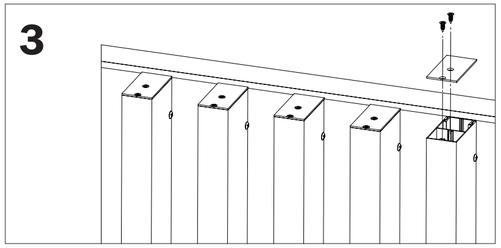
STEP 1: Screw the back rail to the wall using appropriate mounting hardware. Screws should be located every 24" o.c. (Drill pilot holes as necessary).

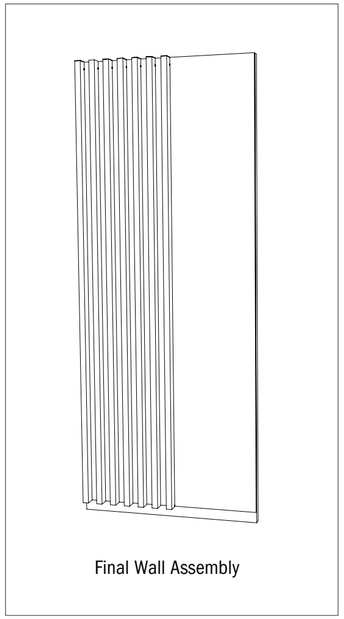
STEP 2: Snap the louver onto the back rail and screw at least one side screw through the louver and back rail to prevent sliding (depending on spacing only one side of the louver may be accessible).

STEP 3: Attach the end caps and repeat previous steps to progressively install the wall.









Final Wall Assembly

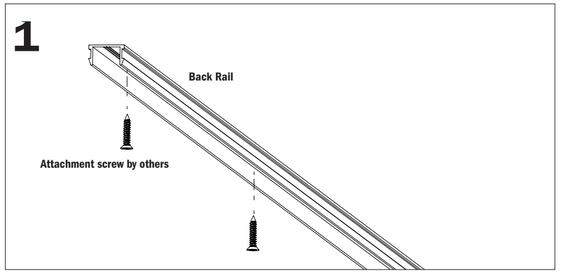
Fortina Battens > Ceiling (Soffit)

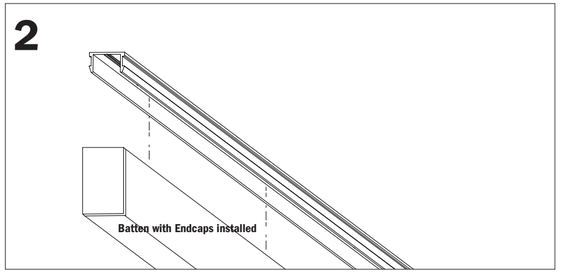
STEP 1: Attaching the Back Rail: Measure and mark the position of your Battens on the ceiling. Mark and drill pilot holes in the Back Rail in a diameter smaller than the screw you are using. Attach to ceiling at pre-marked locations.

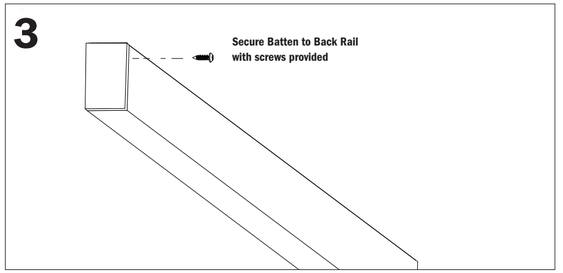
Attach Endcaps to the Battens with screws provided, as shown on the next page, before installing the Battens.

STEP 2: Install the Batten by snapping into the Back Rail.

STEP 3: Secure the Batten to the Back Rail with a screw through the side.







Fortina Battens > Wall and Ceiling > Direct Attachment > Exterior High Velocity Hurricane Zone (HVHZ) TLKS-5050 only

GENERAL SCOPE: With proper installation, Fortina direct-attached battens can be mounted on exterior walls in high-wind areas, including Florida's High Velocity Hurricane Zone (HVHZ).

PROVIDED: Fortina TLKS-5050 Battens with Exterior Film Fortina CLKU-50 Anodized Back Rails for direct attachment. #8 (4mm) side screws

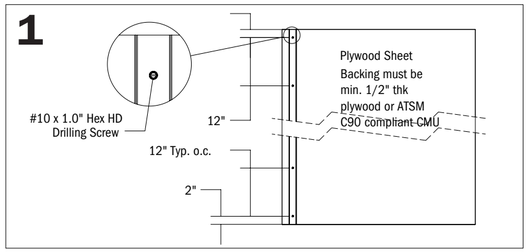
NOT PROVIDED: #10 Screws to attach back rail to wall. 1/2" min. Plywood sheet for blocking.

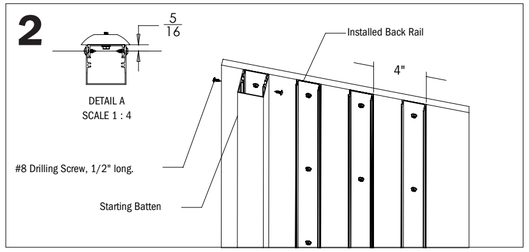
TOOLS NEEDED: Drill Phillips head tight clearance drill bit Angle driver designed to operate with 2" clearance.

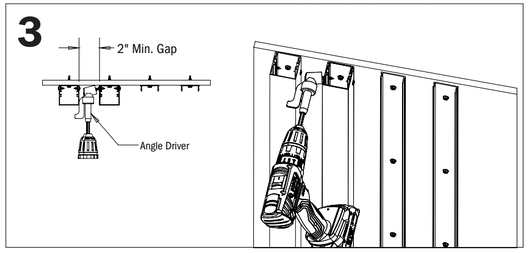
STEP 1: Screw the back rail to the installed plywood using the #10 screws with the first screw no more than 2" from the top edge, and subsequent screws spaced 12" apart or less. The bottom screw should be no more than 2" from the bottom edge of the back rail. Subsequent back rails should be spaced at 4" o.c. to allow at least 2" of clearance between battens.

STEP 2: Snap the starting batten onto the first back rail and screw #8 screws through the batten and rail on both sides 2" from the top and bottom of the batten (total of 4 screws per batten, see detail).

STEP 3: Snap the next batten on to the second back rail. Use the angle driver as shown to screw the inside face of the batten to the back rail. Continue installing the direct-attached battens using the angle driver as needed for tight spaces.







Example: EazyPower angle driver:

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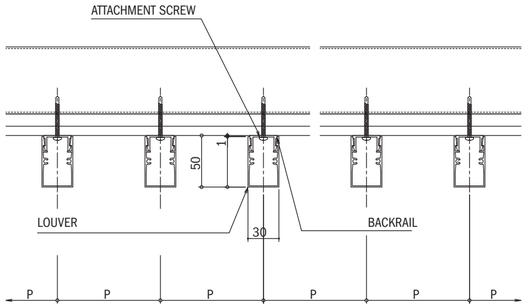
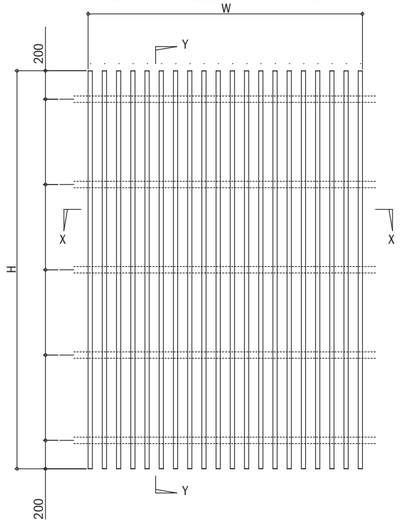
Interior Wall And Ceiling Direct Applications > Installation Examples

CROSS SECTION X - X



PLAN OR ELEVATION VIEW



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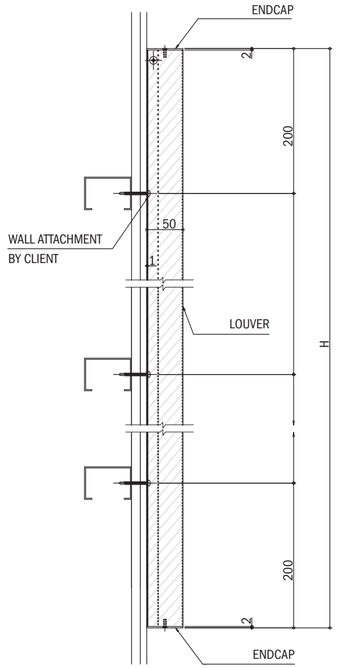

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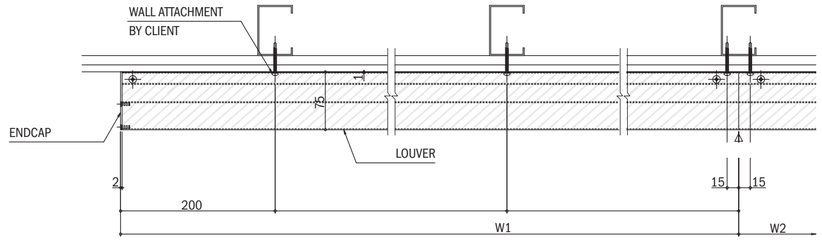
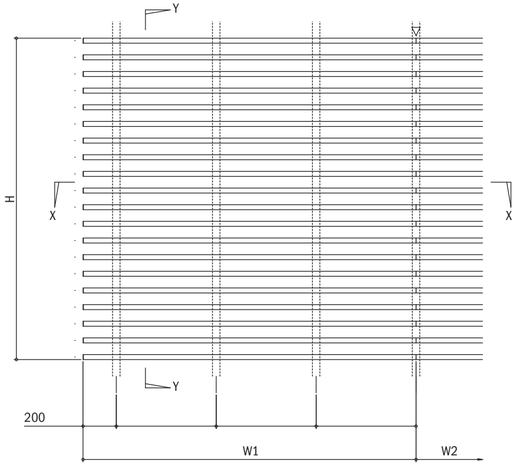


PLAN OR ELEVATION VIEW



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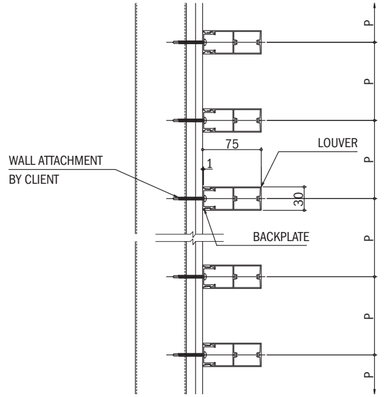
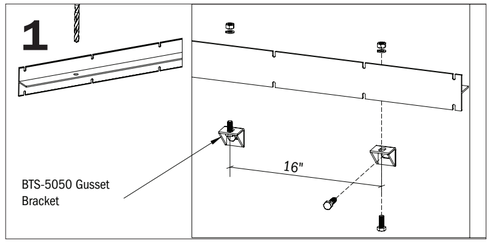


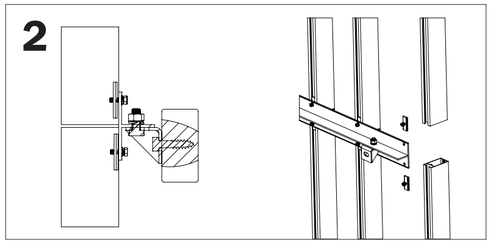
Fortina Battens > Wall > Stringer Mounted > Interior/Exterior

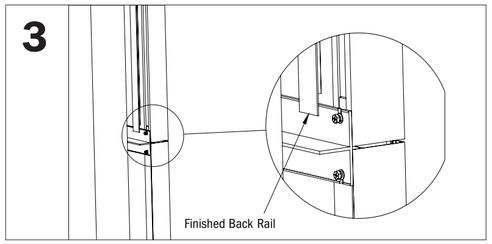
STEP 1: Locate the BTS-5050 Gusset brackets at 16" on center along the stringer length. Drill clearance holes in the stringer for Ø1/2" bolts to mount to the BTS-5050 Gusset Brackets. Secure the brackets to the wall using anchor hardware appropriate to the wall material (Brackets fit Ø1/2" bolt maximum). Repeat process until all required stringer support has been installed on walls according to elevations.

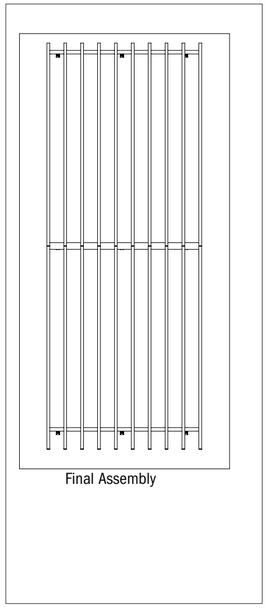
STEP 2: Install the louvers by positioning them at the correct height and spacing as dictated by the pre-notched stringers. Slot the BTP clip into the open channel at the back of the louver, and seat it into the notch in the louver. Fully tightening the bolt on the T-Nut will engage the thread locking compound.

STEP 3: Finish the installation by snapping or screwing on end caps and pressing back rails into the open back channel if the back side of the louver is visible. The back rail mounting flanges may need to be trimmed to avoid the BTP Clips.



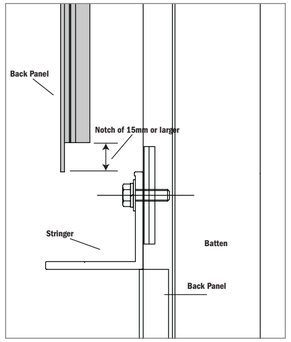


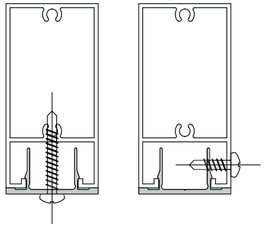


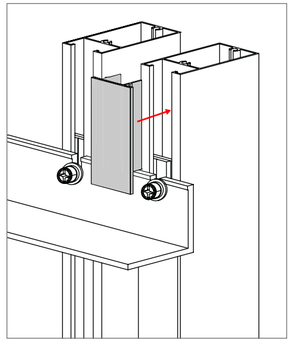

Final Assembly

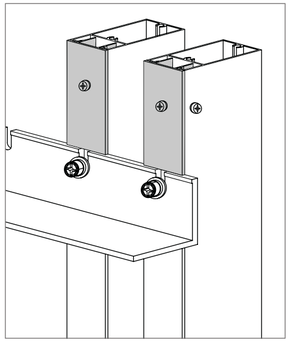
INSTALLATION INSTRUCTIONS

Fortina Battens > Wall > Stringer Mounted > Interior/Exterior









Follow instructions mounting Battens to Stringers.

Cut a 15 mm or larger notch at Back Rail to clear installed BTP clip.

Secure Back Rails to Battens with screws through back or sides, as shown at left.

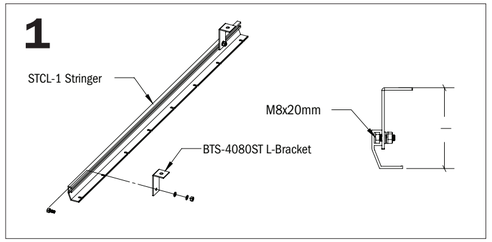
Attach Endcaps to the Battens with screws provided, as shown on the next page.

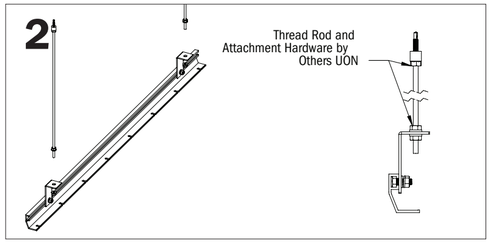
Fortina Battens > Ceiling > Stringer Mounted > Interior Only

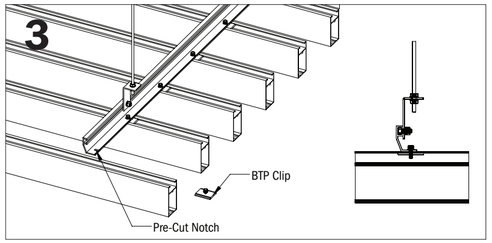
STEP 1: Slide the included M8 Bolt into the C-shaped track of the stringer so that the head is in the track and the threads stick out. Attach the L-Brackets as shown no more than 36" apart along the length of the stringer.

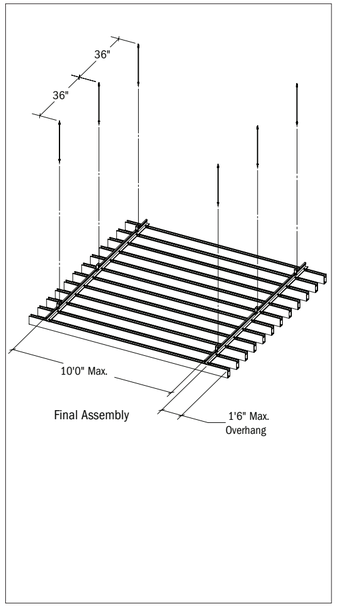
STEP 2: Locate threaded rod supports in the ceiling blocking every 36". The L-Bracket supports up to Ø3/8" rod. Guide the thread rod through the hole in the bracket and thread on a nut/washer from underneath to support it.

STEP 3: Starting at one end of the stringer, attach the louvers by sliding the BTP T-Nut into the open channel of the louver, aligning the bolt with the pre-cut notch. Note that the panels may also be pre-assembled on the ground and hoisted up to supporting rods.









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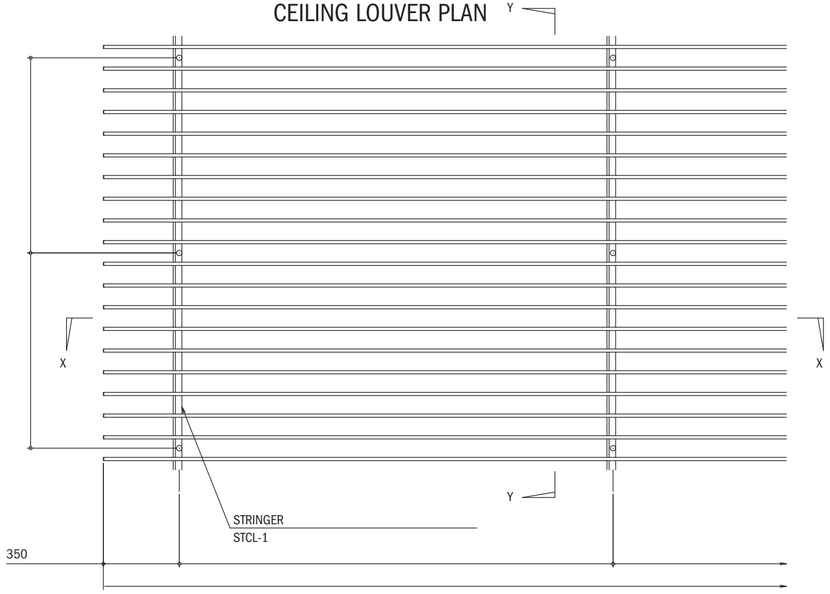
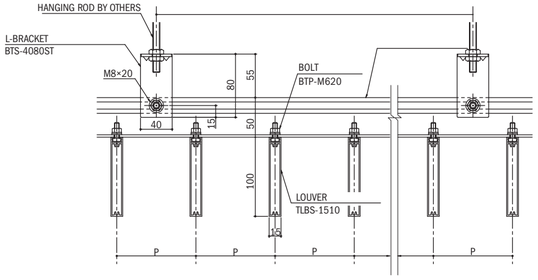
Interior Ceiling Applications With Stringers > Installation Examples

Interior Ceiling Installation With STCL Stringer

CEILING LOUVER PLAN



CROSS SECTION Y - Y



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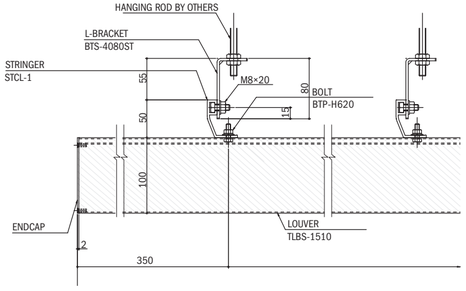
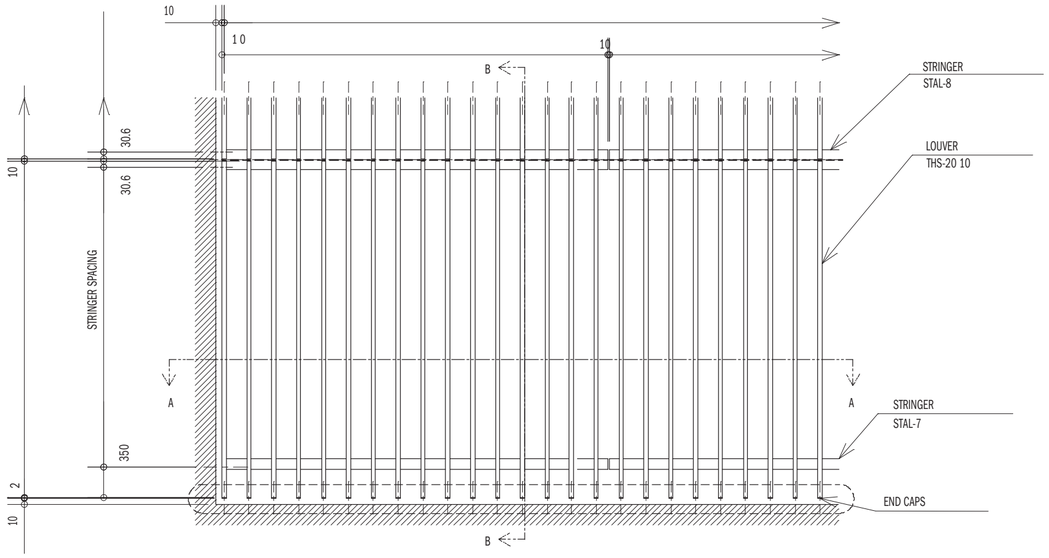


Interior Ceiling Installation With STAL Stringer

CEILING LOUVER PLAN



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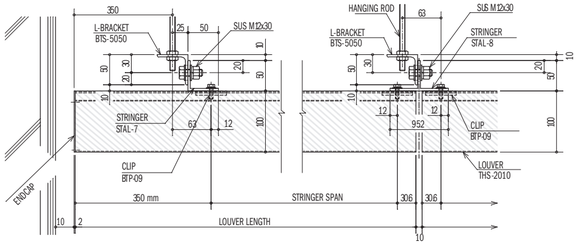

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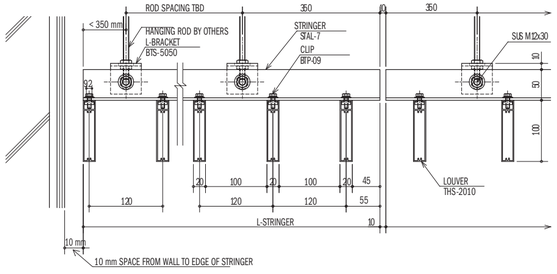


Fortina Battens > Inline Splice > Interior/Exterior

GENERAL SCOPE: Splice pins allow battens to be joined end-to-end for long continuous runs with no gaps. They are non-load bearing, and primarily used for interior applications where thermal expansion of the battens is minimal.

PROVIDED: Fortina film-wrapped battens and attachment hardware (based on the type of installation) 5/32" dia. Splice Pin

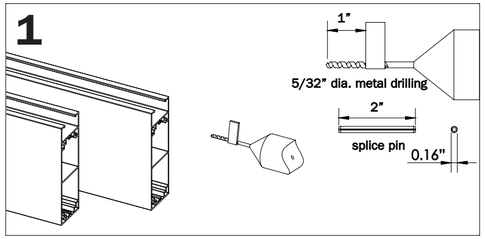
NOT PROVIDED: 5/32" dia. Metal-Drilling Bit

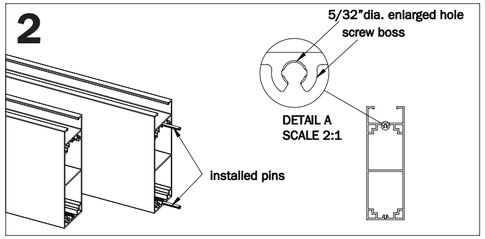
TOOLS NEEDED: Drill with 5/32" dia. Metal-Drilling Bit Hammer Painters tape or marker to control drill depth

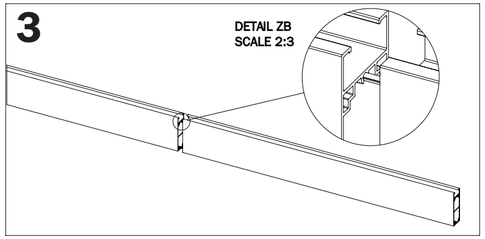
STEP 1: Use 5/32" dia. Drill bit to enlarge the screw holes in the two extrusions that will be butt-joined together. Tape the drill bit to mark a depth that is 1/2 the length of the splice pin.

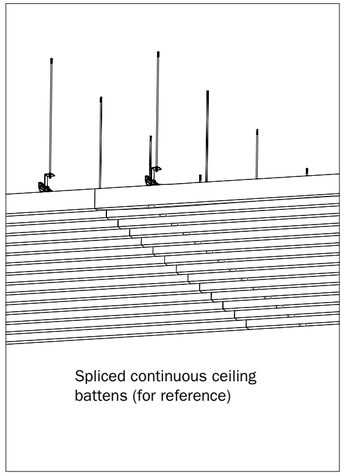
STEP 2: Use a hammer to tap in spring pins until they hit the bottom of the enlarged holes in the first batten.

STEP 3: Align the enlarged holes of the second louver with the pins in the first louver and use a hammer to gently tap the two battens together. Use a block of wood between the batten and the hammer to avoid damage and always work on a piece of cardboard or other smooth, clean surface to avoid damaging batten finish. FORTINA INLINE SPLICE INSTRUCTIONS B
*Corner Keys are not suitable for structural applications









Spliced continuous ceiling battens (for reference)

Fortina Battens > Mitered Corners > Corner Key Installation > Interior/Exterior

GENERAL SCOPE: Square corner keys allow compatible battens to be miter cut and joined at 90 , resulting in a cleaner aesthetic than traditional butt joints. B+N's Quick Ship program offers THS- Type Battens (Pictured) with integral pockets that allow corner keys to be hammered in for a secure connection*.

PROVIDED: Battens with corner key pockets Finished Back Rails, if needed Square 90-degree corner keys

NOT PROVIDED: Anchors Blocking Non-Fortina Hardware required for support

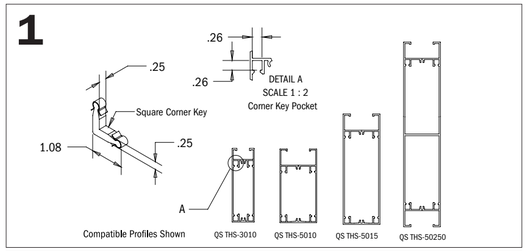
TOOLS NEEDED: Miter Saw Blade for Cutting Aluminum (do not use dull/ worn blades) Hammer

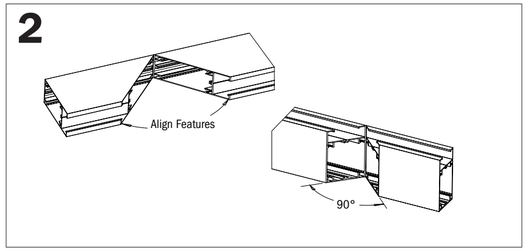
STEP 1: Specify one of the batten shapes that meets your project requirements. Note that mitered corner keys only work when the joined battens are the same size.

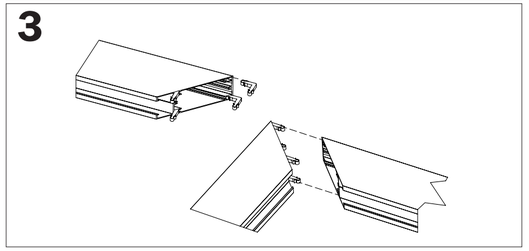
STEP 2: Miter cut 2 battens intended to be joined at 90 . Make sure to note the orientation of the cuts as the battens are not symmetric.

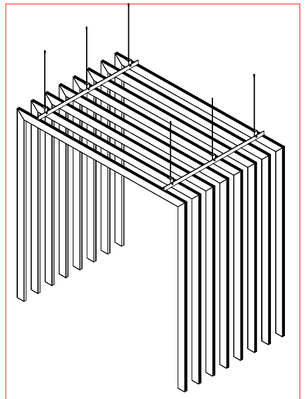
STEP 3: Align corner keys in the pockets on one extrusion and gently tap them in with a hammer (install in all 4 corners). Align corner pocket of the second miter-cut batten with the exposed legs of the 4 corner keys. Gently tap the two battens together, using a square jig if needed to guide in the corner keys.

*Corner Keys are not suitable for structural applications









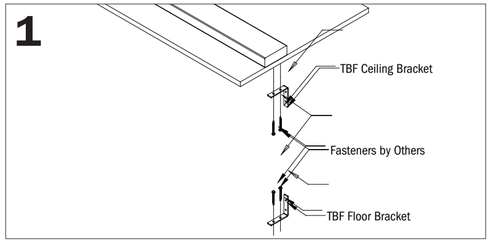
Example of mitered batten installation

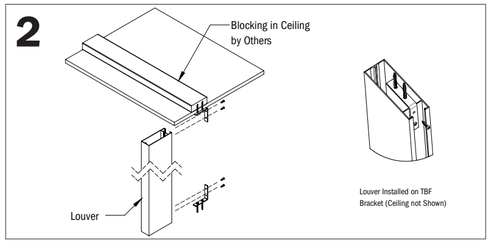
Fortina Battens > Floor To Ceiling > Interior Only

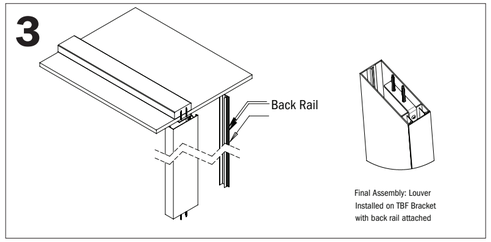
STEP 1: Mount TBF Brackets to floor and ceiling with appropriate blocking and hardware.

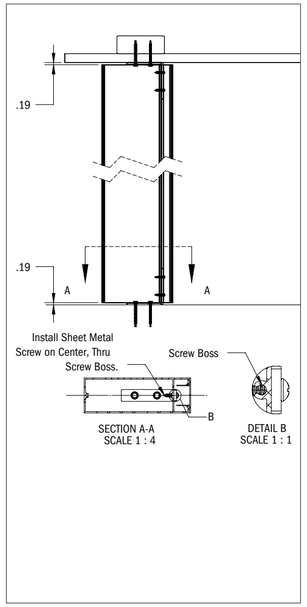
STEP 2: Slide the open channel of the louver over the brackets. The louver should be 3/8" shorter than the measured floor to ceiling height to allow clearance for the brackets. Using the brackets as a guide, drill pilot holes centered on the louver going through the screw boss. Use two #8 sheet metal screws to secure the louver to the bracket at both the ceiling and the floor.

STEP 3: Once the louver is securely fastened, the back rail may be snapped into place by hand.



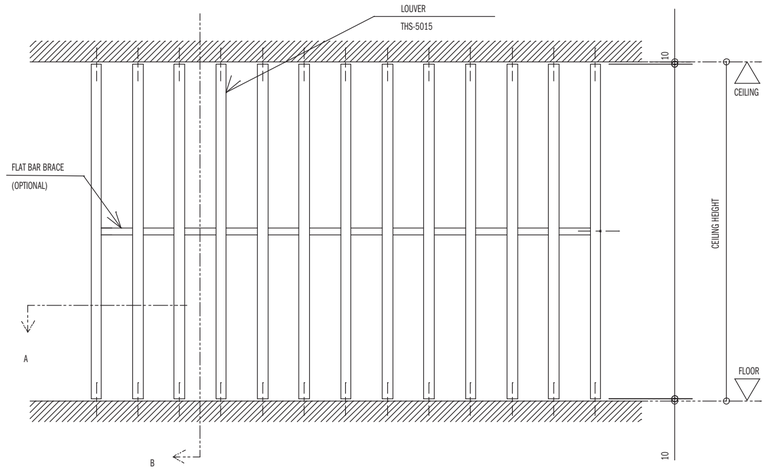




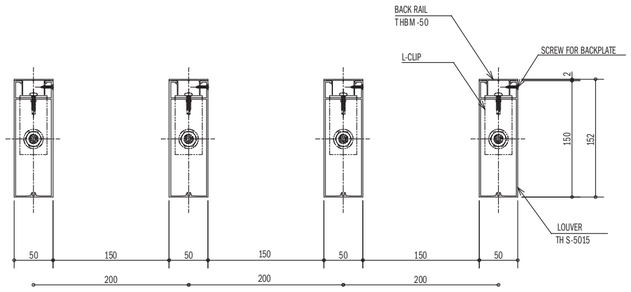


Fortina Battens > Floor To Ceiling > Interior/Exterior> Installation Examples

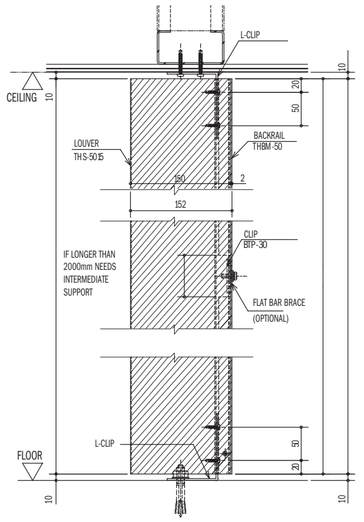
WALL ELEVATION



SECTION A - A



SECTION B - B



NOTE: 10MM SPACE TOP AND BOTTOM
FOR L-CLIP THICKNESS.

Fortina Battens > Floor To Ceiling > End Plate Screen Installation > Interior/Exterior

GENERAL SCOPE: Fortina screen end plates are used to mount arrays of decorative aluminum extrusions creating floor-to-ceiling screens. They are ideal for tight clearance applications such as in front of glazing where access to the back of the batten is limited.

PROVIDED: Fortina Film-wrapped aluminum battens Fortina Film-wrapped back rails (if needed). Pre-fabricated end plates with customer-defined mounting hole pattern (1/8" steel UON).

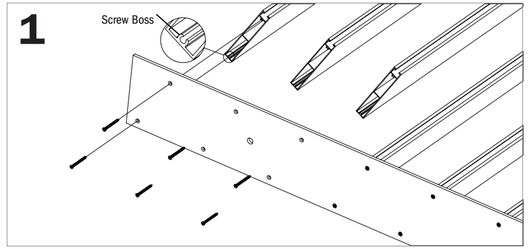
NOT PROVIDED: Screws Shims Anchor Bolts Blocking (if needed)

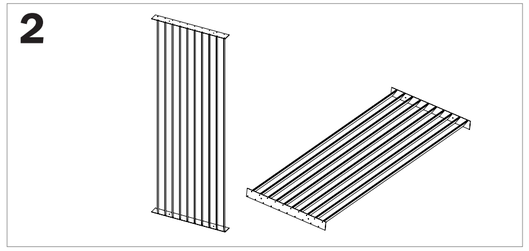
TOOLS NEEDED: Drill/drivers Socket wrench Ladder

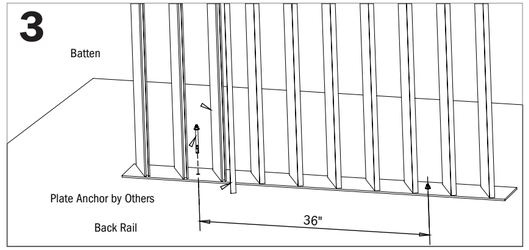
STEP 1: Align the batten screw bosses with the counter-sunk holes in the end plate. Be sure to note which way the open channel at the back of the batten is facing. Install two #8 sheet metal screws per side on each batten.

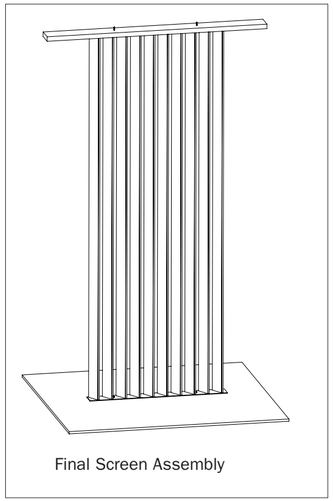
STEP 2: Repeat the process with the second end plate to create the screen panel. Back rail covers may be installed at this point, or one the screen is mounted, as long as the back side is accessible.

STEP 3: Position the screen panel and install shims as needed. Anchor the screen to the floor and ceiling with suitable anchors spaced no more than 36" apart for each plate. If not already installed, press on finished back rails to complete the assembly.








Final Screen Assembly

Fortina Battens > Trellis Installation Guide

GENERAL SCOPE: Fortina trellises are arrays of hollow aluminum extrusions mounted to a steel support frame by others to create a shade structure. Battens are spaced and panelized using aluminum angle cross members ("stringers").

PROVIDED: Fortina Film-wrapped aluminum battens Pre-notched STAL-7 Stringers BTP Clips Back Rails (if needed) End Caps (If needed)

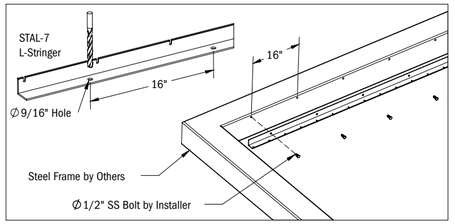
NOT PROVIDED: Steel support frame Bolts to attach stringers to steel frame

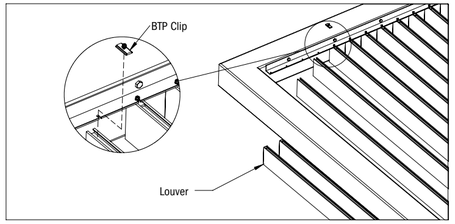
TOOLS NEEDED: Drill/Drivers Socket Wrench Metal cutting saw to trim battens Ladder or scissor lift (depending on size and application)

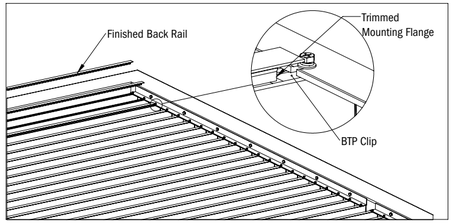
STEP 1: Determine which trellis mounting conditions apply for your specific installation, as corresponding bolt type and length will vary. Drill holes in the aluminum stringer to accommodate a min. 1/2" bolt every 16" along the length. Coordinate bolt holes in the steel to have the same 16" o.c. spacing. Repeat as necessary to attach all stringers to the steel frame per architectural plans.

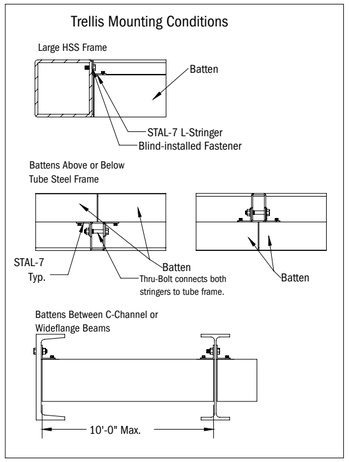
STEP 2: Install the battens, positioning them as dictated by the steel frame and pre-notched stringers. Slot the BTP clip into the open channel at the back of the batten, and seat it into the notch in the batten. Fully tightening the bolt on the T-Nut will engage the thread locking compound.

STEP 3: Finish the installation by snapping or screwing on end caps and pressing back rails into the open back channel if the back side of the louver is visible. The back rail mounting flanges may need to be trimmed to avoid the BTP Clip.









Fortina Slats > Wall > Interior/Exterior

GENERAL SCOPE: Fortina slat siding is a "tongue and groove" interlocking system made from extruded aluminum and wrapped in a proprietary film. It is suitable for interior and exterior wall and ceiling applications.

PROVIDED: Film-wrapped aluminum slats Powder-coated aluminum trim pieces .

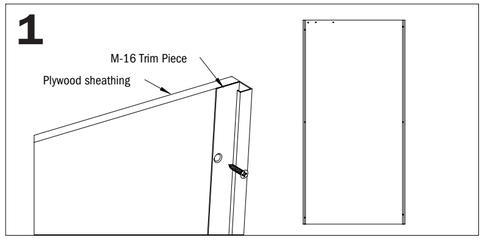
NOT PROVIDED: Screws Plywood sheathing Shimming or blocking materials.

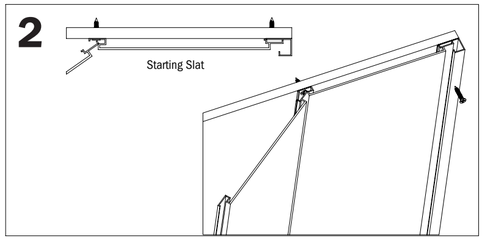
TOOLS NEEDED: Drill, drill bits and drivers Metal cutting saw to rip-cut slats Ladder or scissor lift.

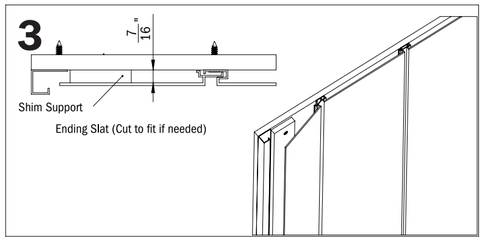
STEP 1: Ensure that the mounting surface for the slats is as flat and smooth as possible. Establish the starting side by screwing the edge trim to the wall to create a finished edge.

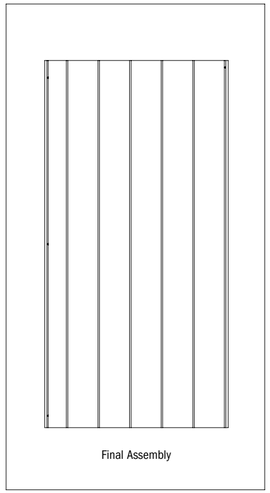
STEP 2: Install the first slat as shown, using low-profile screws to secure the groove side every 24" along the slat length. Rotate the "tongue" side of the next slat into the groove of the previous and screw the groove side into place. Slats are installed progressively in this manner.

STEP 3: Often the last slat in the sequence will need to be cut lengthwise (rip-cut) to fit, and a shim piece will be needed to support it. Screw the shim to the wall and secure the slat to the shim with double-stick tape or discrete screws.









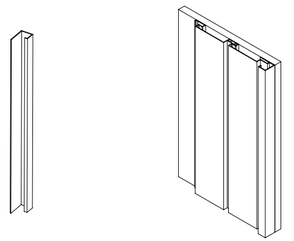
INSTALLATION INSTRUCTIONS

Fortina Slats > Wall > Interior/Exterior

M-16 SLAT TRIM

Edge Trim

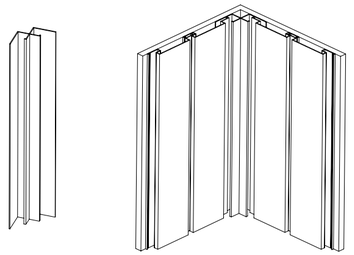
Toppan ITEM #M-16
Material: Aluminum
Finish: Powder Coat
Max. L: 9'-10"



M-78 Slat Inside Corner Trim

Interior Edge Trim

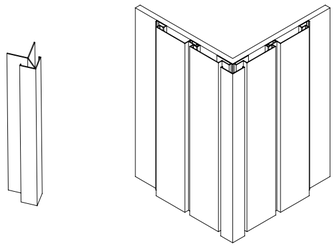
Toppan ITEM #M-78
Material: Aluminum
Finish: Powder Coat
Max. L: 9'-10"



M-70 Slat Outside Corner Trim

Exterior Corner Trim

Toppan ITEM #M-70
Material: Aluminum
Finish: Powder Coat
Max. L: 9'-10"



FAQ

GENERAL QUESTIONS:

1. What is Fortina?
Fortina is a decorative wood alternative unlike anything on the market; aluminum Battens and slats are wrapped in a non-PVC film that mimics woodgrain colors and textures. It is lightweight, easily customizable, durable, quick to install, effortless to maintain, and, most importantly, beautiful.

2. What are the attributes of Fortina?
Fortina has been widely used in interiors and exteriors of commercial and residential buildings since its inception in Japan in 2009. Fortina's lightweight dimensional stability, uniform coloration, and incombustible material allow for a clean and quick installation.

3. How many sizes are there?
Our Battens come in 36 sizes, offered in square, rectangular, triangular, and round shapes. The smallest profile is 20mm x 40mm (3/4" x 1 1/2") and the largest is 50mm x 300mm (2" x 11.8").

Our slats come in 5 sizes with a 10mm reveal (ranging from 60mm to 200mm wide), and 3 sizes with no reveal (ranging from 100mm to 150mm wide).

All profile dimensions are in metric.

4. What is the longest Batten/slat length available?
16'-0" is the longest length for ocean shipping. 9'-6" is the longest length for air freight – additional charges will apply for any length exceeding 9'-6".

FINISHES:

5. How many finishes are there?
A total of 109 films are available in interior and exterior grade. Anodized and painted options are also available. Finish codes start with TE for interior finishes and TA for exterior finishes.

6. Are all the finishes the same price?
Exterior finishes are slightly more expensive than interior finishes. Please request a quote for more specific pricing.

7. Can the Exterior spec be used indoors? Is it more durable? Can an indoor spec be used outdoors if it is UV coated?
Exterior finishes can be used for indoors, and durability is the same.

Interior grade finishes cannot be used outdoors even with the UV coat, because the printed ink specification is different

TEST RESULTS

8. What is the fire rating?
Fortina has passed these certifications for non flammability.
- ASTM E84 CLASS A Fire Rating (FSI10/ SDI10)
- NM2239 and 2244
- European Standard CLASS B (French M1)

9. How does the product hold up in hot/humid climates and near "water"?
Film used for Fortina have passed two year exposure test (EMMAQUA) in New River, Arizona.

WARRANTY / CARE AND MAINTENANCE

10. What is the warranty?
We offer a 10-year limited warranty. Please visit our Warranty page for more information.

11. Will the Battens withstand power washing?
We do not recommend power washing the Battens/slats.

FAQ

12. Do the Battens scratch easily? What can we do about scratches?
Scratch test result 2B. Touch up paint is the most convenient way to hide scratches, but it's not perfect. A 10% overage is highly recommended for the purpose of having extra components to cover any damages beyond touch up. A touch up pen matching the HD1 paper can be provided upon request.

13. Is there any type of care/maintenance required?
Wipe with a wet soft cloth or wet sponge, then wipe with a dry cloth. Do not brush with steel brush, steel wool or sandpaper. Do not handle the Battens on surfaces with grit or gravel as it will cause scratches. Do not use organic solvent such as alcohol for cleaning. Check bolts, nuts or screws in a timely manner. More maintenance may be required in industrial areas or near the ocean.

14. Can the Battens get wet?
While it's not ideal for interior grade finishes, our exterior grade finishes can get wet as they are designed to be outside.

INSTALLATION

15. What is the best way to cut the Battens on site?
Aluminum cutting saw is required along with long table. A new blade is recommended.

16. Is there an explanation on how the joint between the Battens (and spandrels) works for a very long ceiling?
We recommend leaving an expansion gap of 1-2 mm (1/8" max) between Battens/slats.

17. Do the Stringers and brackets come in a variety of sizes and finishes?
Stringers come in different sizes depending on the application. anodized aluminum is the standard finish, but they can also be powder coated.

18. How much does the "average" THS-4080 Batten weigh per foot?
As an example, THS-4080 weighs 0.688 lbs per linear foot. Batten weights vary based on profile size.

19. What is the lead-time?
Fortina is made to order. Our typical lead time is 12-15 weeks.

20. Is there any hardware to hang/merchandise products from the Battens?
No, Battens are only decorative.

21. Can the Battens be curved?
No, the Battens cannot be curved.

PURCHASING FORTINA

22. Do you have local reps?
All Fortina inquiries are handled from our Head Office in California. Please call (800) 350-4127.

23. What is the square footage price of Fortina?
Pricing is not based on square footage. It varies based on profile size and quantity ordered. Please call (800) 350-4127 or request a quote on our website.

24. How can I get samples?
Click "Order Samples" on the Fortina website or call (800) 350-4127.

25. Do you offer an expedited option?
The production time is set, but shipping can be expedited via air freight.

Fortina Care and Maintenance

Cleaning

– Wipe with dry cloth.
– If necessary soap and water is fine to clean.
– No harsh chemicals are recommended.
– Do not use organic solvent such as alcohol for cleaning.
– Do not brush with steel brush, steel wool, or sandpaper.
– Do not handle Battens on surfaces with grit or gravel.
– More maintenance required in industrial areas or near ocean.

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Date: Feb. 13, 2015
Reference number: SBR-0284

To:B+N Industries,Inc.

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product name	FORTINA (Interior Type)
Name of manufacturer	Toppan Cosmo, Inc.
Address	3-19-26 Shibaura, Minato-ku, Tokyo, Japan Toppan Shibaura Building
Telephone No.	03-5418-3500
Emergency contact	03-5418-3680 (Product Engineering Group, Product Manufacturing Department, Development Division)
Fax No.	03-5418-3676

2. HAZARDS IDENTIFICATION

GHS classification	Not applicable.
Hazard statement	(1) Non-hazardous material and risk is low. (2) Prolonged inhalation of dust generated by cutting may affect the respiratory organs. (3) If dust generated by cutting gets into the eyes, the eyeballs may be damaged. (4) Some pigments and stabilizers contain heavy metals, Cr (trivalent), Sb and Ni.
Effect to environment	None known.

3. COMPOSITION / INFORMATION ON INGRDEDIENTS

Classification of single product or mixture	Mixture (Printed film, adhesive and aluminum)
Chemical name (Product name)	Aluminum material coated with polyolefin resin sheet
Ingredients and contents	Polyolefin resin, ink pigment, polyurethane resin, acrylic resin and aluminum
Chemical formula or structural formula	Not applicable since it is a mixture
Reference Number in Gazetted List in Japan	Not applicable because it is a mixture
UN classification and UN number	Not applicable because it is a mixture

4. FIRST AID MEASURES

IF IN EYES	Wash in running water without rubbing because dust and fragments generated when cutting may damage the eyeballs. Consult with a medical specialist.
IF ON SKIN	Prolonged contact of dust generated by cutting with skin may cause rough skin. If skin inflammation occurs, consult with a medical specialist.
IF INHALED	If any discomfort is experienced, immediately remove to fresh air.
IF SWALLOWED	After vomiting, immediately get medical attention.

Date: Feb. 13, 2015
Reference number: SBR-0284

	Minister of Land, Infrastructure, Transport and Tourism, take measures such as evacuating upwind and wearing protective equipment in the event of fire because toxic substances such as black smoke and carbon monoxide may be generated in case the product is exposed to high temperature and the decorative surface layer burns.
Extinguishing media	Water spray, dry chemical, foam

6. ACCIDENTAL RELEASE MEASURES

Not applicable.

7. HANDRING AND STORAGE

Handling	Wear protective gloves (cotton gloves, etc.) when handling. Wear protective glasses and dust protective mask when cutting or fabricating. Sufficiently ventilate the workplace. Provide dust collectors. Take care not to cut your hands on edges of the product.
STORAGE	Store in packaged state in indoor general warehouse avoiding direct sunlight. Be careful to keep dry. Avoid falling, dropping and friction.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

[Exposure control]
None

[Personal protection]	Equipment countermeasure None
Respiratory protective equipment	Wear appropriate protective equipment (dust protective mask, etc.) when performing work that generates dust.
Protective glasses	Wear appropriate protective equipment (goggles, full-surface shield, etc.) when performing work that generates dust.
Protective gloves	Wear appropriate protective equipment (synthetic rubber gloves, arm covers, etc.).
Protective clothes	Wear appropriate protective clothes when performing work that generates dust.

9. PHYSICAL AND CHEMICAL PROPERETIES

Appearance, etc.	Bar-type solid form
Boiling point	Not applicable.
Vapor pressure	Not applicable.
Volatility	Not applicable.
Melting point	Not applicable.
Specific gravity	2.7 g/m^2
Initial boiling point	Not applicable.
Solubility in water	Not applicable.
Others	Not applicable.

Date: Feb. 13, 2015
Reference number: SBR-0284

10. SAFETY AND REACTIVITY

Flash point	Decorative surface layer: Approx. 300℃ .
Ignition point	Decorative surface layer: Approx. 400℃.
Explosion limit	Upper limit: No data. Lower limit: No data.
Combustibility	Decorative surface layer: Combustible
Ignitability (pyrophoricity, reactivity with water)	None known.
Oxidizability	Contact with chemical substances, such as acid, may generate harmful gas.
Autoreactivity, explosiveness	None.
Dust explosiveness	Lower explosive limit: 45g/㎥
Stability, reactivity	Decorative surface layer: Relatively weak against alkali
Others	None known.

11. TOXICOLOGICAL INFORMATION (Including case with people and epidemiological information)

Skin corrosivity	None known.
Irritation (skin, eyes)	Prolonged contact of dust generated by cutting with skin may cause rough skin.
Sensitizing potential	None known.
Acute toxicity	None known.
Subacute toxicity	None known.
Chronic toxicity	None known.
Carcinogenicity	None known.
Mutagenicity	None known.
Reproductive toxicity	None known.
Teratogenicity	None known.
Others (Including generation of toxic gas by reaction with water, etc.)	None known.
Others	None known.

12. ECOLOGICAL INFORMATION

Degradability	None known.
Accumulative property	None known.
Fish toxicity	None known.

13. DISPOSAL CONSIDERATIONS

This product and its cut pieces can be classified as “scrap metal” specified by law.
Ask an appropriate recovery company to dispose them of.

14. TRANSPORT INFORMATION

Load in a manner to prevent falling, dropping, abrasion, etc. during transportation and provide reliable measures to prevent load shifting.
Keep dry.

15. REGULATORY INFORMATION

None

Date: Feb. 13, 2015
Reference number: SBR-0284

Tourism, MFN-0717 F☆☆☆☆
Materials containing asbestos are not used.

The contents of this sheet are based on reference materials, information and data that are available at present and may be revised according to revision of laws and regulations as well as due to new findings. In addition, the precautions described in this document are intended for use under normal conditions. In case of special handling is required, provide appropriate safety measures for the application and usage.
The contents of this sheet are for provision of information and are not guaranteed.

Date: Jan. 21, 2015
Reference number: SBR-0281

To:
Property name:

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product name	FORTINA: Exterior Type
Name of manufacturer	Toppan Cosmo, Inc.
Address	3-19-26 Shibaura, Minato-ku, Tokyo, Japan Toppan Shibaura Building
Telephone No.	03-5418-3500
Emergency contact	03-5418-3680 (Product Engineering Group, Product Manufacturing Department, Development Division)
Fax No.	03-5418-3676

2. HAZARDS IDENTIFICATION

GHS classification	Not applicable.
Hazard statement	(1) Non-hazardous material and risk is low. (2) Prolonged inhalation of dust generated by cutting may affect the respiratory organs. (3) If dust generated by cutting gets into the eyes, the eyeballs may be damaged.
Effect to environment	None known.

3. COMPOSITION / INFORMATION ON INGRDEDIENTS

Classification of single product or mixture	Mixture (Aluminum, printed film and adhesive)
Chemical name (Product name)	Composite material of laminated aluminum and resin sheets
Ingredients and contents	Aluminum, polyolefin resin, ink pigment, polyvinylidene fluoride, methacrylic acid alkyl ester/acrylic acid alkyl ester copolymer, etc.
Chemical formula or structural formula	Not applicable because it is a mixture
Reference Number in Gazetted List in Japan	Not applicable because it is a mixture
UN classification and UN number	Not applicable because it is a mixture

4. FIRST AID MEASURES

IF IN EYES	Wash in running water without rubbing because dust and fragments generated when cutting may damage the eyeballs. Consult with a medical specialist.
IF ON SKIN	Prolonged contact of dust generated by cutting with skin may cause rough skin. If skin inflammation occurs, consult with a medical specialist.
IF INHALED	If any discomfort is experienced, immediately remove to fresh air.
IF SWALLOWED	After vomiting, immediately get medical attention.

Date: Jan. 21, 2015
Reference number: SBR-0281

	Minister of Land, Infrastructure, Transport and Tourism, take measures such as wearing protective equipment according to the situation because toxic and corrosive fluorine-containing substances can be generated in case the product is exposed to high temperature and the decorative surface layer burns.
Extinguishing media	Water spray, dry chemical, foam, carbon dioxide

6. ACCIDENTAL RELEASE MEASURES

Not applicable.

7. HANDRING AND STORAGE

Handling	Wear protective gloves (cotton gloves, etc.) when handling. Wear protective glasses and dust protective mask when cutting or fabricating. Sufficiently ventilate the workplace. Provide dust collectors. Take care not to cut your hands on edges of the product.
STORAGE	Store in packaged state in indoor general warehouse avoiding direct sunlight. Be careful to keep dry. Avoid falling, dropping and friction.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

[Exposure control]	None
[Personal protection]	Equipment countermeasure None
Respiratory protective equipment	Wear appropriate protective equipment (dust protective mask, etc.) when performing work that generates dust.
Protective glasses	Wear appropriate protective equipment (goggles, full-surface shield, etc.) when performing work that generates dust.
Protective gloves	Wear appropriate protective equipment (synthetic rubber gloves, arm covers, etc.).
Protective clothes	Wear appropriate protective clothes when performing work that generates dust.

9. PHYSICAL AND CHEMICAL PROPERETIES

Appearance, etc.	Bar-type solid form
Boiling point	Not applicable.
Vapor pressure	Not applicable.
Volatility	Not applicable.
Melting point	Not applicable.
Specific gravity	2.7 g/m^2
Initial boiling point	Not applicable.
Solubility in water	Not applicable.
Others	Not applicable.

Date: Jan. 21, 2015
Reference number: SBR-0281

10. SAFETY AND REACTIVITY

Flash point	Decorative surface layer: No data
Ignition point	Decorative surface layer: No data
Explosion limit	Upper limit: No data. Lower limit: No data.
Combustibility	Decorative surface layer: Combustible
Ignitability (pyrophoricity, reactivity with water)	None known.
Oxidizability	None under normal handling conditions
Flammability	Toxic gas (hydrogen fluoride, carbon oxide, etc.) may be generated.
Autoreactivity, explosiveness	None known.
Dust explosiveness	Lower explosive limit: 45g/m^3
Stability, reactivity	Decorative surface layer: May react with strong oxidizers.
Others	None known.

11. TOXICOLOGICAL INFORMATION (Including case with people and epidemiological information)

Skin corrosivity	None known.
Irritation (skin, eyes)	Prolonged contact of dust generated by cutting with skin may cause rough skin.
Sensitizing potential	None known.
Acute toxicity	None known.
Subacute toxicity	None known.
Chronic toxicity	None known.
Carcinogenicity	None known.
Mutagenicity	None known.
Reproductive toxicity	None known.
Teratogenicity	None known.
Others (Including generation of toxic gas by reaction with water, etc.)	None known.
Others	None known.

12. ECOLOGICAL INFORMATION

Degradability	None known.
Accumulative property	None known.
Fish toxicity	None known.

13. DISPOSAL CONSIDERATIONS

This product and its cut pieces can be classified as “scrap metal” specified by law.
Ask an appropriate recovery company to dispose them of.

14. TRANSPORT INFORMATION

Load in a manner to prevent falling, dropping, abrasion, etc. during transportation and provide reliable measures to prevent load shifting.
Keep dry.

15. REGULATORY INFORMATION

None

TECHNICAL INFORMATION
Fortina MSDS > Exterior

Date: Jan. 21, 2015
Reference number: SBR-0281

Tourism, MFN-0717 F☆☆☆☆.
Materials containing asbestos are not used.

The contents of this sheet are based on reference materials, information and data that are available at present and may be revised according to revision of laws and regulations as well as due to new findings. In addition, the precautions described in this document are intended for use under normal conditions. In case of special handling is required, provide appropriate safety measures for the application and usage.
The contents of this sheet are for provision of information and are not guaranteed.

Toppan Cosmo, Inc.

Fortina Anodized Data > QuickShip

204-R1 Anodized Finishes

General Information
- Conventional sulfuric acid anodizing (MIL-8625 Type 2)
- Anodic coating thickness range is 0.4 mil to 0.7 mil (AAMA Class 2)
- Aluminum Association Designation is AA-M12C22A31
- M12 – As Extruded (no mechanical finishing required)
- C22 – Medium Matte Etch (standard sodium hydroxide solution
- A31 – Anodic Coating Thickness ranges from 0.4 mil to 0.7 mil with natural color (nondyed)

Specification Compliance
- AAMA 611 Class 2 (Type A3)
- MIL-8625 Type 2 Class 1

Tests Conducted
- Salt Spray per ASTM B117 – tested monthly
- Anodic Coating Weight per ASTM B137 – tested monthly
- Anodic Coating Thickness per ASTM B244 – tested every load
- Anodic Seal Quality per ASTM B136 – tested daily
- Anodic Seal Quality per ASTM B680 & ISO 3210 – tested twice a day with dye stain every load
- Bath parameters are tested and controlled using instruments or chemistries calibrated with NIST certified standards

Fortina Anodized Data > All Other

Surface Treatment: Anodized Coating Composite Film (Anodizing + Clear Coating)

The performance of the anodized coating composite film (equivalent to Type A1) is shown in the table below.

Category			Performance
Thickness of Anodized Coating (Average Film Thickness)			The thickness must be at least 5 μm, and the film thickness at all measurement points must be no less than 80% of the average film thickness.
CASS Corrosion Resistance (120h)			RN 9.5 or higher
Coating Adhesion	Cross-Cut Test		25/25
	Boiling Water Cross-Cut Test	Boiling Water Test (5h)	Appearance: The coating must not exhibit wrinkles, cracks, blistering, or significant discoloration.
		Cross-Cut Test After Boiling Water Test	25/25
Coating Solvent Resistance			The decrease in pencil hardness of the coating before and after the test must be within one unit on the hardness scale.
Alkali Resistance (24h)			RN 9.5 or higher
Composite Corrosion Resistance	UV Fluorescent Lamp Accelerated Weathering Test (240h)		RN 9 or higher
	CASS Test (120h)		RN 9 or higher
Accelerated Weathering Resistance	Xenon Lamp Accelerated Weathering Test		Appearance: Significant discoloration or chalking must not occur.
	4000h		Gloss Retention: 75% or higher
	Sunshine Carbon Arc Lamp Method		Appearance: Significant fading or chalking must not occur.
	3000h		Gloss Retention: 75% or higher

Both combined corrosion resistance and weather resistance performance requirements must be satisfied.
Weather resistance shall be evaluated using either the Xenon Lamp Accelerated Weathering Test or the Sunshine Carbon Arc Lamp Accelerated Weathering Test.
The combined corrosion resistance test shall be conducted by performing the CASS test after the UV fluorescent lamp accelerated weathering test.

Fortina Warranty

1. Limited Warranty:
For Toppan Products used according to the "Conditions of Use" specified in Section 2 of this Exhibit B, Toppan shall warrant the below during the limited warranty period set forth in this Section 1 (the "Warranty") except as specified in Section 3 of this Exhibit B as exclusions or limitations.

i. No significant blister and peel for the Warranty Period; and
*It is intended for the defects that have peeled off in their natural condition after installation.
ii. No color fading in excess of the second grade of grey scale defined in ISO 105-A03
*Grey scale evaluation should be done by Toppan.

Warranty Period: Ten (10) years from the date of delivery of the Product from Toppan or the manufacturer on behalf thereof.
In case of breach of this warranty (the "Breach" or "Breaching"), B&N has a right to obtain certain remedy pursuant to Section 4 and Section 5 in this Exhibit B from Toppan.

Except to the extent prohibited by applicable law, the warranty is made in lieu of all other warranties, rights or conditions, express or implied, including, but not limited to, any implied warranty of merchantability, satisfactory quality, fitness for a particular purpose and those arising from a course of dealing, custom or usage of trade. B+N is responsible for determining if a product is suitable for its particular purpose and application methods. the warranty set forth herein constitutes the sole remedy of B+N and of the sole responsibility of the Toppan for Toppan products.

2. Conditions of Use:
i. Toppan Products dedicated for exterior application are suitable for using exterior decoration except for horizontal area or in extreme weather conditions.
ii. Toppan Products dedicated for interior application are designed for interior decoration and shall not be used in a place exposed to direct sunlight, strong artificial light such as mercury lamp or floodlight etc.
iii. Toppan Products should be treated with the requirements of proper instructions thereof.
iv. Toppan Products operation should be done complying with any local, state, municipal, provincial, or federal laws pertaining to the use, storage, processing, application, distribution, and disposal of Toppan Products.

Fortina Warranty > p. 2

3. Exclusions and Limitations:
Disclaimer: When the Toppan Product falls under the following cases, it shall be handled for a fee even during the above Warranty Period. Toppan is not responsible for any breach of the Warranty not reported during the Warranty Period. The Warranty also does not apply to any Toppan Products ordered by B&N before the date of this Agreement.

i. Defects that occur intentionally or accidentally, or during processing or installation.
ii. Defects attributable to fabrication, processing, assembling, operation, management, or maintenance conducted by a third party employed without regular arrangement.
iii. Defects such as deterioration of Toppan Products caused by members or auxiliary materials not involved in use of Toppan Products.
iv. Defects caused by the use of Toppan Products installed in an environment other than the specified and reasonably recognized service environment and operated beyond the prescribed level of performance.
v. Defects of Toppan Products caused by external factors like attributable to deformation of the building structure.
vi. Aging change of Toppan Products or any of its components such as wear and tear, aging deterioration, such as denaturation or discoloration, or rusting, molding or other defects associated with these.
vii. Defects attributable to rust.
viii. Damage due to location of a special environment such as a hot spring, incineration plant, or swimming pool facility or industrial area where special gas, heat, acid, alkali, or salt is used or generated. Area where salt damage occurs or area where water splash constantly occurs because of proximity to a lake or river area where flue dust or chemicals such as metallic powder, stone powder, or agricultural chemicals are attached or accumulated, and damage by environmental pollution.
ix. Damage by natural disasters such as typhoon, flood, earthquake, lightning, or icicle.
x. Defects attributable to phenomena technically unforeseeable in commercialization of Toppan Products.
xi. Defects attributable to animals such as dogs, cats, birds, or mice.
xii. Defects attributable to relocation, repair or remodeling of Toppan Products conducted by the Purchase.
xiii. Defects caused by repaired area like touch-up paint has been applied.
xiv. Damage caused by cleaning with inappropriate tools such as scrubbers or brushes or with chemicals.
xv. Damage aggravated as a result of initial damage or defects left unattended for a long time.
xvi. Defects caused by the failure of appropriate maintenance after delivery.
xvii. Defects caused by use of Toppan Products for purposes other than the originally intended use or defects caused by a method of use different from the intended use.
xviii. Defects caused by no use of authentic accessories or members or by use of members other than our own.
xix. Defects including damage attributable to illegal conduct such as crime.
xx. Defects due to improper storage after product delivery (for example high-temperature and humidity at storage in a place, long-term storage that exceeds the Warranty Period, and defects due to water, stacking, exposure to direct sunlight, extremely low temperatures and etc.).
xxi. Problems caused by condensation due to natural phenomena or living environment, expansion and cracking or breakage due to freezing, expansion and contraction due to temperature difference, twisting, etc.
xxii. The loss by delivery delays or nonfulfillment of this product due to natural disasters, wars, riots, transportation accidents, epidemics, and other sudden matters.
xxiii. Defects due to operational errors, improper adjustments, or improper maintenance after product delivery.
xxiv. Defects caused by electrical equipment such as heat generated from lighting equipment, air conditioners etc.
xxv. Defects caused by the installation that doesn't follow the Fortina standard installation methods or proper settlement.
xxvi. Defects caused by thermal elongation of aluminum substrate due to temperature changes.

Fortina Warranty > p. 3

4. Claims Procedure:
If B&N discovers an alleged Breach of the Warranty in a Toppan Products, and notify Toppan of such in writing with (i) sufficient details of such alleged Breach; (ii) the related purchase order number; (iii) the address of the installed product and date of installation; and (iv) other detailed information regarding the allegedly Breaching Toppan Products within thirty (30) days of the discovery and during the Warranty Period, Toppan shall investigate whether there is any Breach in such Products. B&N shall return the subject allegedly Breaching Toppan Products for investigation together with the notification above, and shall allow Toppan to inspect them at the installed site.

5. Remedies
5.1 If Toppan confirms that there is Breach on the Toppan Products upon the investigation set forth in Section 4 of this Exhibit B, Toppan shall, at its discretion:

i. repair the Breaching product;
ii. replace the Breaching product; or
iii. refund the price paid to Toppan for the delivery of the subject Breaching product pursuant to the refund policy set forth herein.

In case of replacement, Toppan shall deliver, at Toppan's sole cost and expense, the replacement to B&N at the location to be agreed between the Parties within Territory. In case of refund, the refund price shall decrease in accordance with the following schedule:

Elapsed time from the beginning of the warranty period	Percentage of the price to be refunded
Within 2 years	100%
More than 2 years within 4 years	80%
More than 4 years within 6 years	50%
More than 6 years within 8 years	30%
More than 8 years within 10 years	10%

5.2 The Toppan Products replaced pursuant to Section 5.1 of this Exhibit B shall be subject to the same warranties, the same conditions and the same remedies as the original Toppan Products, provided that the Warranty Period therefore shall be the balance of the applicable Warranty Period relating to the replaced Toppan Products.

Fortina Fire Rating Documentation

FORTINA ASTM E84 CLASS A PASSED CIRT R16045.01.024h

SOUTHWEST RESEARCH INSTITUTE®

6220 CULEBRA RD. 78238-5166 • P.O. DRAWER 28510 78228-0510 • SAN ANTONIO, TEXAS, USA • (210) 684-5111 • WWW.SWRI.ORG

CHEMISTRY AND CHEMICAL ENGINEERING DIVISION
FIRE TECHNOLOGY DEPARTMENT
WWW.FIRE.SWRI.ORG
FAX (210) 522-3377

ASTM E 84 - 10
INVESTIGATION OF THE SURFACE BURNING CHARACTERISTICS OF A NOMINAL 0.13-MM THICK PRINTED DECORATIVE FOIL, LAMINATED ONTO AN ALUMINUM C-CHANNEL RAIL
TRADE NAME: TOPPAN FORTINA (TIA008)

FINAL REPORT
Consisting of 5 Pages
SwRI® Project No.: 01.16045.01.024h

Test Date: October 19, 2010
Report Date: November 10, 2010

Prepared for:

TOPPAN INTERAMERICA, INC.
1131 HWY 155 SOUTH
MCDONOUGH, GA 30253

Prepared by:
Anthony L. Sauceda
Group Leader
Material Flammability Section

Approved by:
Matthew S. Blais, Ph.D.
Director
Fire Technology Department

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Fortina Fire Rating Documentation

FORTINA ASTM E84 CLASS A PASSED CIRT R16045.01.024h

INTRODUCTION

This report presents the test results for a specimen submitted by Toppan Interamerica, Inc., located in McDonough, GA, and tested at Southwest Research Institute's (SwRI's) Fire Technology Department, located in San Antonio, Texas. The test is conducted in accordance with the procedure outlined in ASTM E 84 - 10, *Standard Test Method for Surface Burning Characteristics of Building Materials* (NFPA 255, ANSI/UL 723 and UBC 8-1).

This test method is applicable to exposed surfaces, such as ceilings or walls, provided that the material or assembly of materials, by its own structural quality or the manner in which it is tested and intended for use, is capable of supporting itself in position or being supported during the test period. The test is conducted with the material in the ceiling position.

The purpose of this test method is to determine the relative burning behavior of the material by observing the flame spread along the specimen. Flame Spread and Smoke Developed index are reported. However, there is not necessarily a relationship between these two measurements.

This standard should be used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled conditions and should not be used to describe or appraise the fire-hazard or fire-risk of materials, products, or assemblies under actual fire conditions. However, results of the test may be used as elements of a fire-hazard assessment or a fire-risk assessment which takes into account all of the factors which are pertinent to an assessment of the fire hazard or fire risk of a particular end use.

Test specimens are conditioned as appropriate in an atmosphere maintained between 68 and 78 °F and 45 to 55% relative humidity. Immediately prior to the test, the specimen is mounted in the furnace with the side to be tested facing the test flame. Cement board is placed on the unexposed side of the specimen to protect the furnace lid assembly. Sometimes, because of the nature of the material undergoing testing, additional support (e.g. wire, wire and rods, rods, and/or bars) is used to ensure that the specimen will remain in position during the test. The use of supporting materials on the underside of the test specimen may lower the Flame Spread Index from that which might be obtained if the specimen could be tested without such support, and the test results do not necessarily relate to indices obtained by testing materials without such support.

The flame front position and light obscuration are recorded throughout the 10-minute test and used to calculate the Flame Spread and Smoke Developed indices. The temperature at 23 ft is also recorded. The Flame Spread and Smoke Developed indices reported herein are relative to the results obtained for mineral fiber-reinforced cement board and select grade red oak (moisture content between 6 and 8%). The mineral fiber-reinforced cement board is the calibration material used to obtain 0 values for Flame Spread and Smoke; red oak decks are used to obtain 100 values for Flame Spread and Smoke.

The results apply specifically to the specimens tested, in the manner tested, and not to the entire production of these or similar materials, nor to the performance when used in combination with other materials.

Two model building codes (2009 International Building Code®, Chapter 8 *Interior Finishes*, Section 803 *Wall and Ceiling Finishes*; NFPA 5000, Chapter 10 *Interior Finish*, Section 10.3 *Interior Wall or Ceiling Finish Testing and Classification*) classify materials based on the Flame Spread and Smoke Developed indices. For reference purposes, the classification criteria are listed below:

Classification	Flame Spread Index	Smoke Developed Index
A	0 – 25	0 – 450
B	26 – 75	0 – 450
C	76 – 200	0 – 450

TECHNICAL INFORMATION

Fortina Fire Rating Documentation

FORTINA ASTM E84 CLASS A PASSED CIRT R16045.01.024h

ASTM E 84 - 10 REPORT

CLIENT: TOPPAN INTERAMERICA, INC.
SWRI PROJECT NO.: 01.16045.01.024h
TEST DATE: OCTOBER 19, 2010
DAILY TEST NO.: 2

DESCRIPTION OF SPECIMEN

DATE RECEIVED:	October 13, 2010 (received ready-to-test)
MATERIAL ID:*	Fortina
TRADE NAME:*	Toppan Fortina (TIA008)
DESCRIPTION:*	Printed decorative foil laminated onto aluminum C-channel rails
COMPOSITION:*	Poly-olefin foil laminated onto aluminum
THICKNESS:	1.58-in. O.D. square C-channel (nominal) 0.047-in. wall (nominal) *0.13-in. foil (nominal)
UNIT WEIGHT:	0.7 lbs per rail (nominal)
COLOR:	Natural
SPECIMEN SIZE:	One hundred eighty-two, 1.58-in. square C-channels × 20.5-in. long rails placed side by side, and end to end, down the length of the chamber (flat wood grain decorative side to burner)
CONDITIONING TIME:	5 days at 70 °F and 50% relative humidity
WITNESSED BY:	Messrs. Nickie Fukuyama and Trey Nakamura representing, Toppan Interamerica, Inc.

* From Client's material description and/or instructions

Fortina Fire Rating Documentation

FORTINA ASTM E84 CLASS A PASSED CIRT R16045.01.024h

ASTM E 84 - 10 REPORT

CLIENT: TOPPAN INTERAMERICA, INC.
SWRI PROJECT NO.: 01.16045.01.024h
TEST DATE: OCTOBER 19, 2010
DAILY TEST NO.: 2

TEST RESULTS

FLAME SPREAD INDEX (FSI):	10
SMOKE DEVELOPED INDEX (SDI):	10

TEST DATA

UNROUNDED FSI:	12.5
UNROUNDED SDI:	10.2
FS*TIME AREA (Ft*Min):	24.2
SMOKE AREA (%*Min):	12.8
FUEL AREA (°F*Min):	5059.3

OBSERVATIONS DURING TEST

IGNITION TIME (Min:Sec):	02:39
MAXIMUM FLAME FRONT ADVANCE (Ft.):	4.5
TIME TO MAXIMUM ADVANCE (Min:Sec):	6:18
MAXIMUM TEMP. AT EXPOSED TC (°F):	577
TIME TO MAXIMUM TEMP. (Min:Sec):	9:15
TOTAL FUEL BURNED (Cu. Ft.):	53.0
DRIPPING (Min:Sec):	None
FLAMING ON FLOOR (Min:Sec):	None
AFTERFLAME TOP (Min:Sec):	01:12
AFTERFLAME FLOOR (Min:Sec):	None
SAGGING (Min:Sec):	None
DELAMINATION (Min:Sec):	None
SHRINKAGE (Min:Sec):	None
FALLOUT (Min:Sec):	None

CALIBRATION DATA

RED OAK SMOKE AREA (%*Min):	76.9
RED OAK FUEL AREA (°F*Min):	8376
GRC BOARD FUEL AREA (°F*Min):	5407

Toppan Interamerica, Inc. 4 SwRI Project No: 01.16045.01.024h

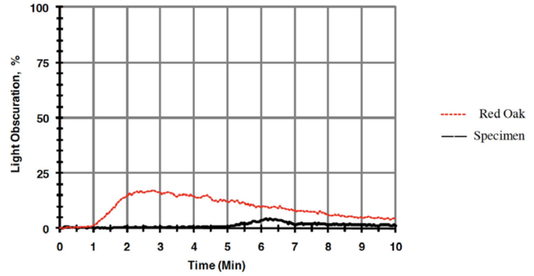
Fortina Fire Rating Documentation

FORTINA ASTM E84 CLASS A PASSED CIRT R16045.01.024h

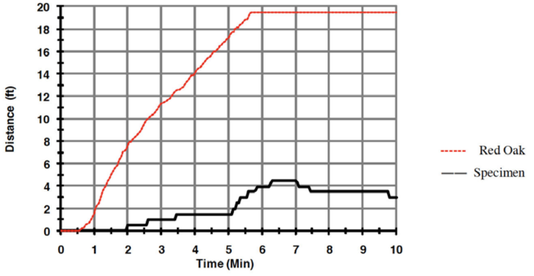
ASTM E 84 - 10 REPORT

CLIENT: TOPPAN INTERAMERICA, INC.
SWRI PROJECT NO.: 01.16045.01.024h
TEST DATE: OCTOBER 19, 2010
DAILY TEST NO.:2

LIGHT OBSCURATION



FLAMESPREAD



Toppan Interamerica, Inc. 5 SwRI Project No: 01.16045.01.024h

Fortina Performance Data > Exterior Film

Decorative Sheet Adhesion Performance Data (Exterior Specification)

Evaluation Items		Test items	Test method		Test result
1	Dimensional stability	Heat resistance test	Put a cross-cut measuring 100 mm x 100 mm at the center of a specimen, leave it at a temperature of 65°C for two days, and check the clearance at the cross-cut part.		No remarkable clearance
2	Weather resistance	Accelerated weathering test	Apply a light beam to the specimen with a sunshine carbon arc weather meter for 15,000 hours and check the appearance.		No remarkable change
3	Heat resistance	Long-term heat resistance test	Leave the specimen in each oven for 1,000 hours and check the appearance.	60°C	No remarkable change
				80°C	No remarkable change
4	Heat cycle resistance	Heat-cold repeating test	Conduct 100 cycles, with each cycle consisting of 80°C for two hours switched to -20°C for two hours, and observe the appearance.		No remarkable change
5	Dry/wet cycle resistance	Dry/wet cycle test	Conduct 20 cycles, with each cycle consisting of 40°C and 30% RH for 8 hours switched to 40°C and 90%RH for 16 hours, and observe the appearance.		No remarkable change
6	Humidity resistance	Long-term humidity resistance test	Leave the specimen in a high humidity tank at a constant temperature of 40°C and 90%RH and observe the appearance.		No remarkable change
7	Scratch resistance	Pencil scratch resistance (based on JIS H8602)	Apply the core of the pencil to the specimen while applying a load of 1 kg to the angle of about 45° and scratch the surface toward the front at a constant speed.		2B
8	Abrasion resistance	Abrasion resistance test	Rotate the specimen 7,000 times with a taper abrasion tester (abrasion wheel: CS-17; and load: 1 kg) and observe the appearance.		Slight loss of pattern occurred
		Falling sand abrasion resistance test (based on JIS H8602)	Let a grinding material fall through a guiding tube of 20 mm in inner diameter to the specimen at an angle of 45° at a falling rate of 320 g/min. and measure the time when the base material begins to be exposed and the abrasion depth.		Abrasion end point: 5,100 sec. Abrasion depth: -0.06 mm
9	Low temperature impact resistance	Dupont impact test	Let a 1 kg weight fall from a height of 30 cm to the specimen at 5°C and observe the appearance.		No cracking
10	Pollution resistance	Pollution resistance test (1)	Immerse dry cotton in a solvent, rub the surface of the specimen with the cotton for 20 strokes and observe the appearance.	Petroleum benzine	No remarkable change
				Methyl ethyl ketone	↓
				Ethyl acetate	↓
				Ethanol	↓
		Pollution resistance test (2)	Apply each pollutant, wipe it off with water or ethanol after a lapse of 24 hours and observe the appearance.	Blue ink	No remarkable change
				Black shoe cream	↓
				Black marker	↓
				Red crayon	↓
		Oil and solvent resistance test	Apply each oil and solvent, wipe it off with water after a lapse of 24 hours and observe the appearance.	Heating oil	No remarkable change
				CRC556	↓
				Ethanol	↓
				Petroleum benzine	↓
11	Acid resistance	Acid resistance test	Immerse the specimen in a 1% sulfuric acid aqueous solution for one hour and observe the appearance.		No remarkable change
12	Alkali resistance	Alkali resistance test (based on JIS H8602)	Put a drop of 5 g/l sodium hydrate aqueous solution to the surface, leave it for 24 hours, wash the solution off with water, and observe the appearance.		No remarkable change
13	Corrosion resistance	CASS corrosion resistance test (based on JIS H8602)	Put the specimen in a test tank, spray a sodium chloride solution of a 50 g/l concentration to the specimen for 48 hours, and observe the appearance.		No remarkable change
14	Adhesiveness	Cross-cut peel test (based on JIS H8602)	Scratch the surface at an interval of 2 mm in both the longitudinal and transverse directions to the depth that reaches the base material, make 100 grids with those scratches, apply cellophane tape over the grids, and peel it off.		100/100 No delamination of grids
15	Adhesive strength	Normal state adhesiveness test	Pull the sheet in a 180 degree direction at a rate of 200 mm/min. relative to the base material under a normal room temperature and measure the adhesive strength.		20.0 N/25 mm or more
		Heat creep resistance test	Apply a load at a rate of 500 g/25 mm to the sheet at a 90 degree direction relative to the base material at 60°C and measure the peeling distance 30 min. later.		<5 mm
		Cold creep resistance test	Apply a load at a rate of 500 g/25 mm to the sheet at a 90 degree direction relative to the base material at -20°C and measure the peeling distance 30 min. later.		<5 mm

* These data are based on our own test results. We do not guarantee those results.

Fortina Performance Data > Interior Film

Decorative Sheet Adhesion Performance Data (Interior Specification)

Evaluation Items		Test items	Test method	Test result
1	Weather resistance	Accelerated weathering test	Apply light beam for a certain duration of time with a sunshine carbon arc weather meter.	No remarkable change after irradiation of 2,000 hours
2	Heat resistance	Heat resistance test (company standard)	Leave the specimen in an oven at a temperature of 60 ± 5°C for 48 hours.	No remarkable change
3	Water resistance	Water resistance test (company standard)	Immerse the specimen in room temperature water for 24 hours and then dry it.	No remarkable change
4	Humidity resistance	Humidity resistance test (company standard)	Leave the specimen in a tank at a constant temperature and humidity of 40 ± 2°C and 90 ± % RH for 48 hours.	No remarkable change
5	Heat cycle resistance	Heat-cold repeating test (based on JAS heat-cold repeating C test)	Put a specimen measuring 150 x 150 mm in an oven at a temperature of 60 ± 3°C, leave it there for two hours, and leave it in a low-temperature tank at - 20 ± 3°C for two hours. Repeat this for two cycles.	No remarkable change
6	Chemical resistance	Chemical resistance (company standard)	Apply (a) 2% sodium hydrate, (b) 5% acetate solution, and (c) petroleum benzine to the specimen, leave it for six hours and wipe them off.	No remarkable change
		Chlorine resistance test (company standard)	Apply chlorine of 1.0 mg/L, which is the sanitation criterion for a swimming pool, and chlorine of 10.0 mg/L, 10 times higher concentration of the above, to the specimen, leave it for 24 hours, 48 hours, and 72 hours, and wipe it off. However, change chlorine water every six hours considering the decomposition rate of chlorine.	No remarkable change
			• Sanitation criterion of a swimming pool: The residual free chlorine concentration of water in a swimming pool shall be 0.4 mg/L or more. The desired concentration is 1.0 mg/L (according to the notification of the Director-General, Environmental Health Bureau, Ministry of Health and Welfare).	No remarkable change
7	Pollution resistance	Pollution resistance test (1)	Apply each detergent (weak alkali, neutral, and weak acid), insecticide, and heating oil to each specimen, leave them for six hours, and wipe them off.	No remarkable pollution
		Pollution resistance test (2)	Draw a 10 mm wide line with a permanent marker and a crayon, leave it for two hours, and wipe it off with a solvent or a detergent.	No remarkable pollution ▲
8	Abrasion resistance	Abrasion resistance test (pattern loss) (based on JAS abrasion C test)	Conduct a test on a 120 x 120 mm specimen with a taber abrasion tester and calculate the rotational value when the loss of pattern reaches 50%.	Over 200 times
9	Scratch resistance	Scratch resistance test (company standard)	Pencil hardness test based on JIS K 5400 (load of 500 g)	B~2B

* These data are based on our own test results. We do not guarantee those results.

Fortina LEED Data

Materials and Resources:
Credit 2. Construction Waste Management (prefabricated Fortina components are cut to size, reducing field cutting and scrap. Also, packaging is efficient and minimal)
Credit 3. Material RE-use. Fortina aluminum is recyclable

Indoor Environmental Quality:
Prereq. 1 / Credit 2 Increased Ventilation
Fortina Louvered ceilings
Credit. 3.1 Construction IAQ Management: During Construction:
Credit. 3.2 Construction IAQ Management: Before Occupancy:
Minimum cutting of Fortina is required, so there is no indoor air quality contamination as it does not contain materials that release fibers or dust.
Credit 4.1 Low- emitting materials: Adhesives and Sealants
Credit 4.2 Low- emitting materials: Paints
Fortina is prefabricated and does not release and VOC's at project site
Credit 8.1 Daylight & Views: Daylight 75 % spaces
Credit 8.1 Daylight & Views: Views for 90% spaces
Fortina can be used to maximize daylight and views in spaces.

Innovation in Design
Credit 1.1
The main thing to remember is that
1. Fortina aluminum is not recycled material, so it does not qualify for Recycled content
2. Fortina is made and shipped from Japan, so it does not qualify for Local / Regional Materials.

Fortina Wind Load Data

AL-FAROOQ CORPORATION
CONSULTING ENGINEERS & PRODUCT DEVELOPMENT

January 23, 2023

Product Approval Administrator
Building Codes & Standards Section
Department of Business & Professional Regulations
1940 North Monroe Street, Suite 90
Tallahassee, FL 32399-2100

To whom it may concern,

As the design engineer retained to prepare the product approval(s) associated with this letter as shown below on this same web page, I do hereby declare that I do not have and will not have any financial interest in any company manufacturing or distributing the referenced product(s), nor do I have or will have any financial interest with any other entity involved in the approval process of the referenced product(s).

Sincerely,

Jalal Farooq, P.E.
CFO

Sealed: 1/23/2023

9360 Sunset Drive, Suite 220 | Miami, FL 33173 | T: 305.264.8100 | F: 305.262.6978 | www.afceng.com | alfarooq@afceng.com

Fortina Wind Load Data

AL-FAROOQ CORPORATION

CONSULTING ENGINEERS & PRODUCT DEVELOPMENT

PRODUCT APPROVAL EVALUATION
RULE CHAPTER #61G20-3 • METHOD 1 OPTION D

FL 46716
Date: 04/23/2024

Detailed Product Description:
Manufacturer: B+N Industries, Inc.
Manufacturer Address: 1409 Chapin Ave. 3rd Floor, Burlingame, CA 94010
Model Name: TLKS-5050 Wall-Mounted Louver Siding System
Maximum Design Load: +75 PSF, -75 PSF
Installation Drawings # 23-13F

This product complies with the High Velocity Hurricane Zone (HVHZ) testing requirements.

For maximum sizes, uplift pressure, spacing and anchor type refer to installation drawings.

Comparative analysis used __ Yes __X__ No

Tested in accordance with AAMA 101/I.S.2/NAFS/TAS-202

TEST	DESCRIPTION	TEST LOCATION	TEST REPORT DATE	TEST REPORT #	Test Sealed by
TAS-202	Uniform Static Air Press.	Intertek	3/16/2023	P0688.01-119-18	Tanya A. Dolby, PE

Under the limitations of the attached installation drawings, to the best of my knowledge and ability, the above product conforms to the requirements of the 2023 Florida Building Code.

Evaluation Report Engineer:

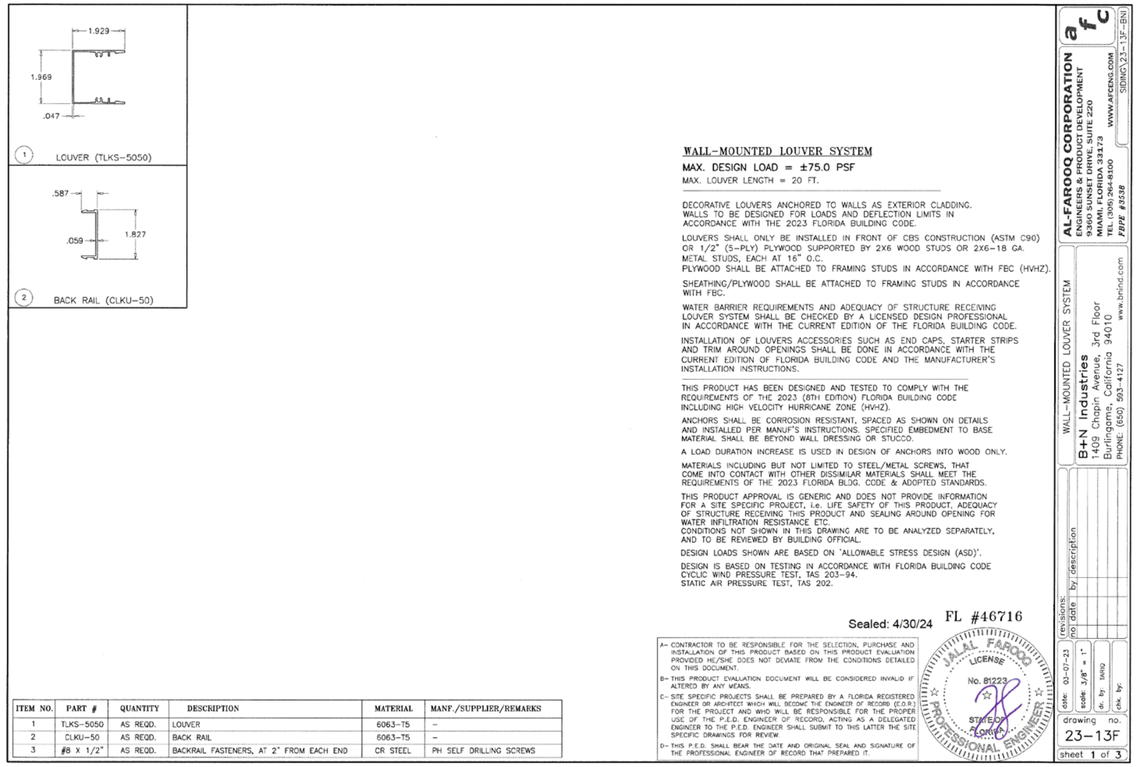
Jalal Farooq PE # 81223
Al-Farooq Corporation EB # 3538

JALAL FAROOQ LICENSE No. 81223 STATE OF FLORIDA PROFESSIONAL ENGINEER

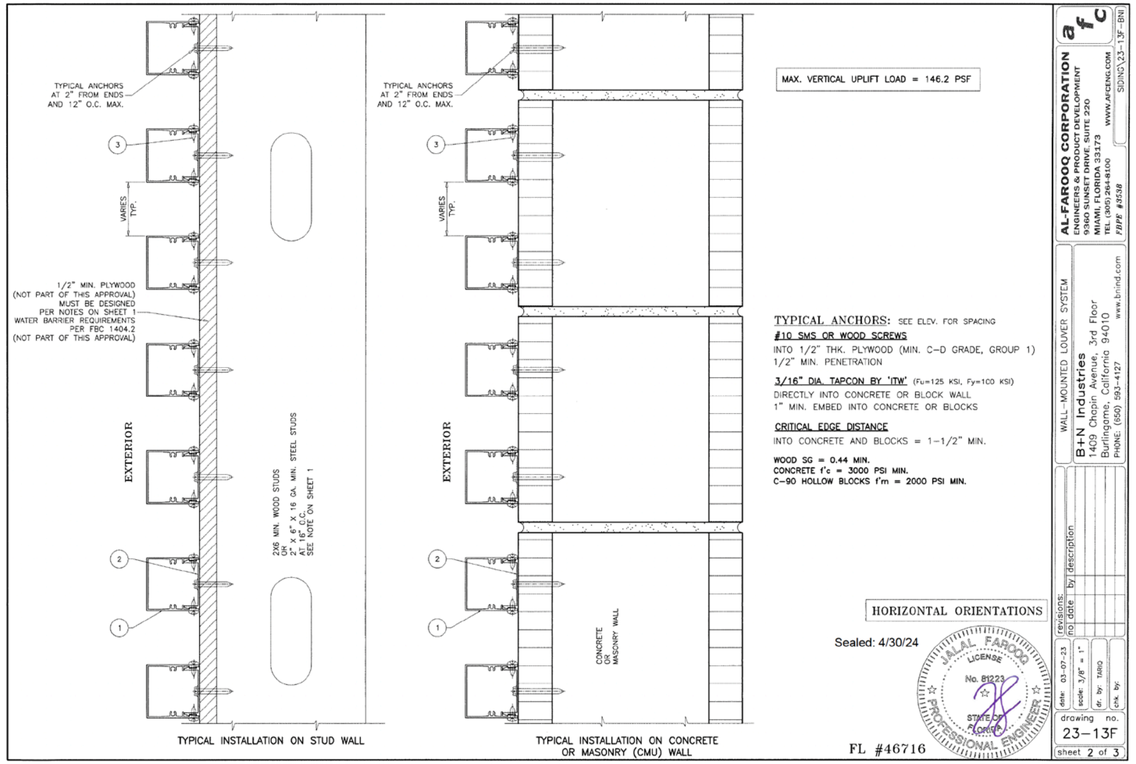
Sealed: 4/30/24

9360 Sunset Drive STE 220 | Miami, FL 33173 | T: 305.264.8100 | F: 305.262.6978 | www.afceng.com | alfarooq@afceng.com

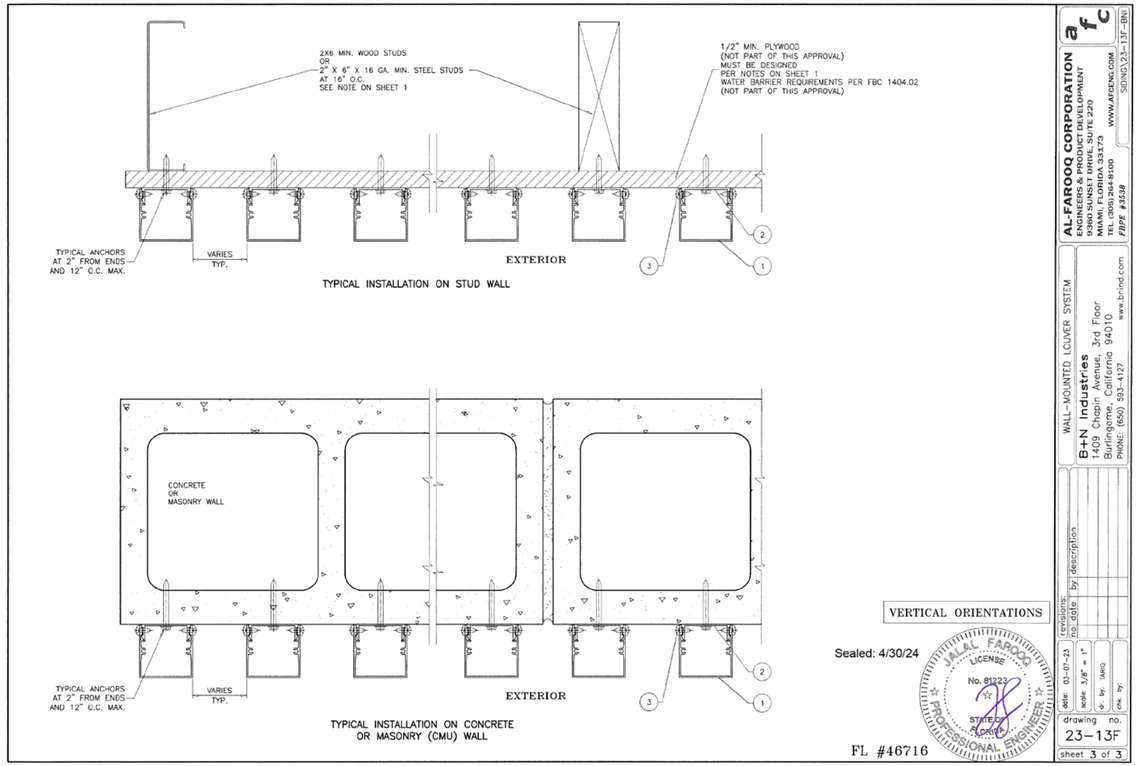
Fortina Wind Load Data



Fortina Wind Load Data

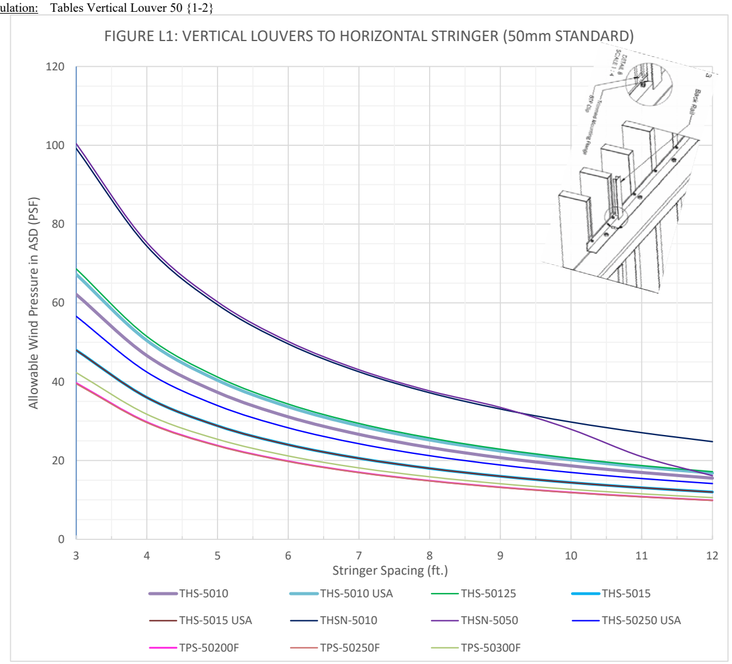


Fortina Wind Load Data



Fortina Wind Load Data

Calculation: Tables Vertical Louver 50 {1-2}



Assumptions

-This chart displays vertical extrusion installation with horizontal support stringers (Assumes continuous span, min 3 bays)

-Capacities Assume the Following

-Horizontal stringer connections back to structure at 16 " o.c.

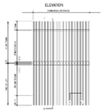
-Louvers spaced no closer than 3 " o.c. for all extrusions other than THS-1040 then 6 " o.c.

-No opinion is given to capacity of connection of stringer to structure or structure capacity

-These capacities apply to full assembly of Louvers and Stringers STAL-7, STAL-8

-Attachment of Stringer to Structure Capacity may govern design and should be investigated.

Capacity per connections Graphs (C1, C2) Tables (T1, T10, T11)



VL - Vertical Louver

HS - Horizontal Stringer

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Project:	B&N Industries Aluminum Extrusion Load Tables	Pg. No:	B - 1
Address:	Anywhere, USA	Date:	6/6/25
Client:	B&N Industries	Job No.:	25098

Fortina Wind Load Data

Calculation: Tables Vertical Louver 50 {1-2}

TABLE T1: VERTICAL LOUVERS HORIZONTAL STRINGER

	Stringer Spacing (ft.)	3	4	5	6	7	8	9	10	11	12
THS-1040		219	158	123	94	59	40	28	20	15	12
		Connection	Stringer	Stringer	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection
THS-2010		63	47	37	21	13	9	6	5	3	3
		Flat Plate	Flat Plate	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection
THS-3010		63	48	38	32	27	24	17	13	10	7
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Deflection	Deflection	Deflection	Deflection
THS-3015		36	27	22	18	15	14	12	11	8	6
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Deflection	Deflection
THS-4080		40	30	24	20	17	15	13	12	11	10
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
THS-5010		62	47	37	31	27	23	21	19	17	16
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
THS-5010 USA	Pressure (PSF)	67	50	40	34	29	25	22	20	18	17
	[ASD]	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
THS-50125	[Failure Mode]	69	51	41	34	29	26	23	21	19	17
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
THS-5015		48	36	29	24	21	18	16	14	13	12
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
THS-5015 USA		48	36	29	24	21	18	16	14	13	12
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
THS-6012		55	41	33	28	24	21	18	17	15	14
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
THSN-5010		99	74	60	50	43	37	33	30	27	25
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
THSN-5050		100	75	60	50	43	38	33	28	21	16
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Deflection	Deflection	Deflection
THS-50250 USA		57	42	34	28	24	21	19	17	15	14
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
TPS-50200F		40	30	24	20	17	15	13	12	11	10
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
TPS-50250F		39	30	24	20	17	15	13	12	11	10
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
TPS-50300F		42	32	25	21	18	16	14	13	12	11
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate

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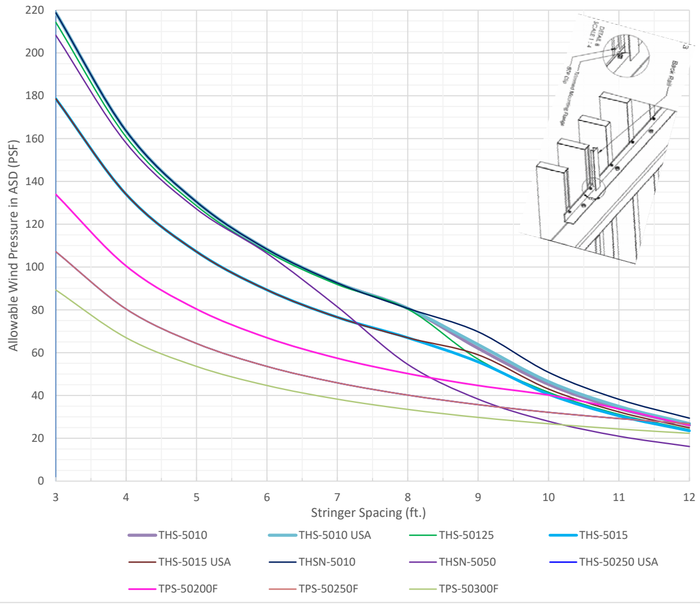
Project:	B&N Industries Aluminum Extrusion Load Tables	Pg. No:	B - 2
Address:	Anywhere, USA	Date:	6/6/25

Fortina Wind Load Data

Calculation: Tables Vertical Louver 50HD{3-4

FIGURE L2: VERTICAL LOUVERS TO HORIZONTAL STRINGER (BTP-30HD)



Assumptions

-This chart displays vertical extrusion installation with horizontal support stringers (Assumes continuous span, min 3 bays)

-Capacities Assume the Following

-Horizontal stringer connections back to structure at 16 " o.c.

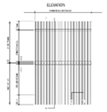
-Louvers spaced no closer than 3 " o.c. for all extrusions other than THS-1040 then 6 " o.c.

-No opinion is given to capacity of connection of stringer to structure or structure capacity

-These capacities apply to full assembly of Louvers and Stringers STAL-7, STAL-8

-Attachment of Stringer to Structure Capacity may govern design and should be investigated. Capacity per (Connections B-34, Tables (T2)

-Allowable loading in tables for shapes THS-5010 USA and THS-5015 USA are only valid when BTP-30HD clip is used for stringer connection



VL - Vertical Louver
HS - Horizontal Stringer

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Project:	B&N Industries Aluminum Extrusion Load Tables	Pg. No:	B - 3
Address:	Anywhere, USA	Date:	6/6/25
Client:	B&N Industries	Job No.:	25098

Fortina Wind Load Data

TABLE T2: VERTICAL LOUVERS HORIZONTAL STRINGER

	Stinger Spacing (ft.)	3	4	5	6	7	8	9	10	11	12
THS-1040		219	158	123	94	59	40	28	20	15	12
		Connection	Stringer	Stringer	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection
THS-2010		63	47	37	21	13	9	6	5	3	3
		Flat Plate	Flat Plate	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection
THS-3010		63	48	38	32	27	24	17	13	10	7
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Deflection	Deflection	Deflection	Deflection
THS-3015		36	27	22	18	15	14	12	11	8	6
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Deflection	Deflection
THS-4080		40	30	24	20	17	15	13	12	11	10
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
THS-5010		219	164	130	108	93	81	62	45	34	26
with BTP-30HD Clip		Connection	Connection	Connection	Connection	Connection	Connection	Deflection	Deflection	Deflection	Deflection
THS-5010 USA	Pressure (PSF)	219	164	130	108	93	81	64	46	35	27
with BTP-30HD Clip	[ASD]	Connection	Connection	Connection	Connection	Connection	Connection	Deflection	Deflection	Deflection	Deflection
THS-50125	[Failure Mode]	214	161	129	107	92	80	57	41	31	24
with BTP-30HD Clip		Shear	Shear	Shear	Shear	Shear	Shear	Deflection	Deflection	Deflection	Deflection
THS-5015		179	134	107	89	77	67	56	41	30	23
with BTP-30HD Clip		Shear	Shear	Shear	Shear	Shear	Shear	Deflection	Deflection	Deflection	Deflection
THS-5015 USA		179	134	107	89	77	67	59	43	32	25
with BTP-30HD Clip		Shear	Shear	Shear	Shear	Shear	Shear	Deflection	Deflection	Deflection	Deflection
THS-6012		55	41	33	28	24	21	18	17	15	14
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
THSN-5010		219	164	130	108	93	81	70	51	38	29
with BTP-30HD Clip		Connection	Connection	Connection	Connection	Connection	Connection	Deflection	Deflection	Deflection	Deflection
THSN-5050		208	158	127	106	81	55	38	28	21	16
with BTP-30HD Clip		Stringer	Stringer	Stringer	Stringer	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection
THS-50250 USA		107	80	64	54	46	40	36	32	29	27
with BTP-30HD Clip		Shear	Shear	Shear	Shear	Shear	Shear	Shear	Shear	Shear	Shear
TPS-50200F		134	100	80	67	57	50	45	40	34	26
with BTP-30HD Clip		Shear	Shear	Shear	Shear	Shear	Shear	Shear	Shear	Deflection	Deflection
TPS-50250F		107	80	64	54	46	40	36	32	29	27
with BTP-30HD Clip		Shear	Shear	Shear	Shear	Shear	Shear	Shear	Shear	Shear	Shear
TPS-50300F		89	67	54	45	38	33	30	27	24	22
with BTP-30HD Clip		Shear	Shear	Shear	Shear	Shear	Shear	Shear	Shear	Shear	Shear

**Shear failures noted in table indicate local shear failure at BTP-30HD clip reinforcement*

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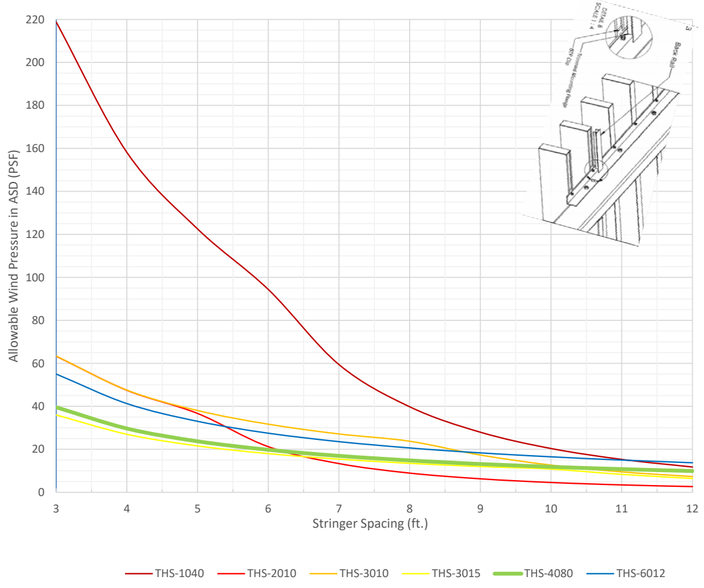
Project:	B&N Industries Aluminum Extrusion Load Tables	Pg. No:	B - 4
Address:	Anywhere, USA	Date:	6/6/25
Client:	B&N Industries	Job No.:	25098

Fortina Wind Load Data

Calculation: Tables Vertical Louver O {5-6}

FIGURE L3: VERTICAL LOUVERS TO HORIZONTAL STRINGER (OTHER STANDARD)



Assumptions

-This chart displays vertical extrusion installation with horizontal support stringers (Assumes continuous span, min 3 bays)

-Capacities Assume the Following

-Horizontal stringer connections back to structure at 16 " o.c.

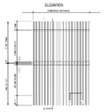
-Louvers spaced no closer than 3 " o.c. for all extrusions other than THS-1040 then 6 " o.c.

-No opinion is given to capacity of connection of stringer to structure or structure capacity

-These capacities apply to full assembly of Louvers and Stringers STAL-7, STAL-8

-Attachment of Stringer to Structure Capacity may govern design and should be investigated.

Capacity per connections Graphs (C3, C4) Tables (T3, T12, T13)



VL - Vertical Louver
HS - Horizontal Stringer

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Project:	B&N Industries Aluminum Extrusion Load Tables	Pg. No:	B - 5
Address:	Anywhere, USA	Date:	6/6/25
Client:	B&N Industries	Job No.:	25098

Fortina Wind Load Data

TABLE T1: VERTICAL LOUVERS HORIZONTAL STRINGER

	Stinger Spacing (ft.)	3	4	5	6	7	8	9	10	11	12
THS-1040		219	158	123	94	59	40	28	20	15	12
		Connection	Stringer	Stringer	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection
THS-2010		63	47	37	21	13	9	6	5	3	3
		Flat Plate	Flat Plate	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection
THS-3010		63	48	38	32	27	24	17	13	10	7
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Deflection	Deflection	Deflection	Deflection
THS-3015		36	27	22	18	15	14	12	11	8	6
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Deflection	Deflection
THS-4080		40	30	24	20	17	15	13	12	11	10
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
THS-5010		62	47	37	31	27	23	21	19	17	16
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
THS-5010 USA	Pressure (PSF)	67	50	40	34	29	25	22	20	18	17
	[ASD]	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
THS-50125	[Failure Mode]	69	51	41	34	29	26	23	21	19	17
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
THS-5015		48	36	29	24	21	18	16	14	13	12
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
THS-5015 USA		48	36	29	24	21	18	16	14	13	12
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
THS-6012		55	41	33	28	24	21	18	17	15	14
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
THSN-5010		99	74	60	50	43	37	33	30	27	25
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
THSN-5050		100	75	60	50	43	38	33	28	21	16
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Deflection	Deflection	Deflection
THS-50250 USA		57	42	34	28	24	21	19	17	15	14
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
TPS-50200F		40	30	24	20	17	15	13	12	11	10
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
TPS-50250F		39	30	24	20	17	15	13	12	11	10
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
TPS-50300F		42	32	25	21	18	16	14	13	12	11
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate

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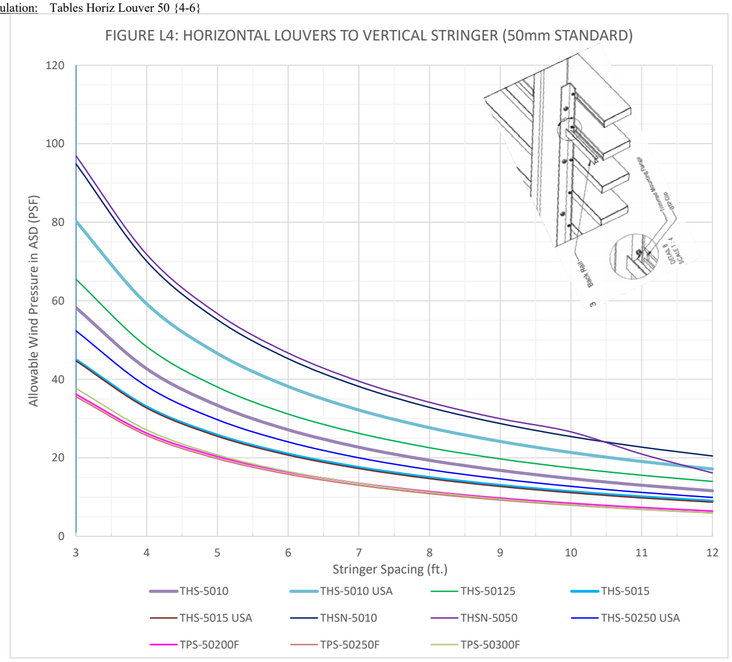
Project:	B&N Industries Aluminum Extrusion Load Tables	Pg. No:	B - 6
Address:	Anywhere, USA	Date:	6/6/25
Client:	B&N Industries	Job No.:	25098

Fortina Wind Load Data

Calculation: Tables Horiz Louver 50 {4-6}

FIGURE L4: HORIZONTAL LOUVERS TO VERTICAL STRINGER (50mm STANDARD)



Assumptions

-This chart displays vertical extrusion installation with vertical support stringers (Assumes continuous span, min 3 bays)

-Capacities Assume the Following

-Vertical stringer connections back to structure at 16 " o.c.

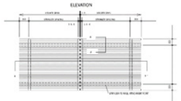
-Louvers spaced no closer than 3 " o.c. for all extrusions other than THS-1040 then 6 " o.c.

-No opinion is given to capacity of connection of stringer to structure or structure capacity

-These capacities apply to full assembly of Louvers and Stringers STAL-7, STAL-8

-Attachment of Stringer to Structure Capacity may govern design and should be investigated.

Capacity per connections Graphs (C1, C2) Tables (T4, T10, T11)



HL - Horizontal Louver
VS - Vertical Stringer

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Project:	B&N Industries Aluminum Extrusion Load Tables	Pg. No:	B - 4
Address:	Anywhere, USA	Date:	6/6/25
Client:	B&N Industries	Job No.:	25098

Fortina Wind Load Data

TABLE T4: HORIZONTAL LOUVERS VERTICAL STRINGER

	Stinger Spacing (ft.)	3	4	5	6	7	8	9	10	11	12
THS-1040	Pressure (PSF) [ASD] [Failure Mode]	219 Connection	158 Stringer	123 Stringer	94 Deflection	59 Deflection	40 Deflection	28 Deflection	20 Deflection	15 Deflection	12 Deflection
THS-2010		61 Flat Plate	45 Flat Plate	34 Deflection	19 Deflection	11 Deflection	7 Deflection	4 Deflection	2 Deflection	1 Deflection	0 Deflection
THS-3010		60 Flat Plate	44 Flat Plate	35 Flat Plate	29 Flat Plate	24 Flat Plate	21 Flat Plate	14 Deflection	10 Deflection	6 Deflection	4 Deflection
THS-3015		34 Flat Plate	25 Flat Plate	19 Flat Plate	16 Flat Plate	13 Flat Plate	11 Flat Plate	10 Flat Plate	8 Flat Plate	6 Deflection	4 Deflection
THS-4080		37 Flat Plate	27 Flat Plate	21 Flat Plate	17 Flat Plate	15 Flat Plate	12 Flat Plate	11 Flat Plate	9 Flat Plate	8 Flat Plate	7 Flat Plate
THS-5010		58 Flat Plate	43 Flat Plate	33 Flat Plate	27 Flat Plate	23 Flat Plate	19 Flat Plate	17 Flat Plate	15 Flat Plate	13 Flat Plate	12 Flat Plate
THS-5010 USA		80 Flat Plate	59 Flat Plate	47 Flat Plate	38 Flat Plate	32 Flat Plate	28 Flat Plate	24 Flat Plate	21 Flat Plate	19 Flat Plate	17 Flat Plate
THS-50125		65 Flat Plate	48 Flat Plate	38 Flat Plate	31 Flat Plate	26 Flat Plate	23 Flat Plate	20 Flat Plate	17 Flat Plate	16 Flat Plate	14 Flat Plate
THS-5015		45 Flat Plate	33 Flat Plate	26 Flat Plate	21 Flat Plate	18 Flat Plate	15 Flat Plate	13 Flat Plate	11 Flat Plate	10 Flat Plate	9 Flat Plate
THS-5015 USA		45 Flat Plate	33 Flat Plate	25 Flat Plate	21 Flat Plate	17 Flat Plate	15 Flat Plate	13 Flat Plate	11 Flat Plate	10 Flat Plate	9 Flat Plate
THS-6012		52 Flat Plate	38 Flat Plate	30 Flat Plate	24 Flat Plate	20 Flat Plate	17 Flat Plate	15 Flat Plate	13 Flat Plate	12 Flat Plate	10 Flat Plate
THSN-5010		95 Flat Plate	70 Flat Plate	55 Flat Plate	45 Flat Plate	38 Flat Plate	33 Flat Plate	29 Flat Plate	25 Flat Plate	23 Flat Plate	20 Flat Plate
THSN-5050		97 Flat Plate	72 Flat Plate	57 Flat Plate	47 Flat Plate	40 Flat Plate	34 Flat Plate	30 Flat Plate	27 Flat Plate	21 Deflection	16 Deflection
THS-50250 USA		52 Flat Plate	38 Flat Plate	30 Flat Plate	24 Flat Plate	20 Flat Plate	17 Flat Plate	15 Flat Plate	13 Flat Plate	11 Flat Plate	10 Flat Plate
TPS-50200F		36 Flat Plate	26 Flat Plate	20 Flat Plate	16 Flat Plate	14 Flat Plate	11 Flat Plate	10 Flat Plate	8 Flat Plate	7 Flat Plate	6 Flat Plate
TPS-50250F		36 Flat Plate	26 Flat Plate	20 Flat Plate	16 Flat Plate	13 Flat Plate	11 Flat Plate	9 Flat Plate	8 Flat Plate	7 Flat Plate	6 Flat Plate
TPS-50300F		38 Flat Plate	27 Flat Plate	21 Flat Plate	17 Flat Plate	14 Flat Plate	11 Flat Plate	9 Flat Plate	8 Flat Plate	7 Flat Plate	6 Flat Plate

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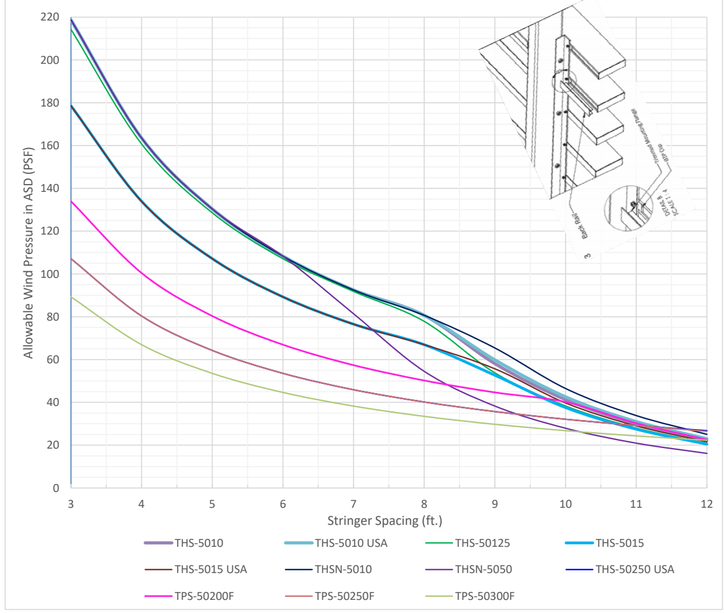
Project:	B&N Industries Aluminum Extrusion Load Tables	Pg. No:	B - 5
Address:	Anywhere, USA	Date:	6/6/25
Client:	B&N Industries	Job No.:	25098

Fortina Wind Load Data

Calculation: Tables Horiz Louver 50HD {7-8}

FIGURE L5: HORIZONTAL LOUVERS TO VERTICAL STRINGER (BTP-30HD)



Assumptions

-This chart displays vertical extrusion installation with vertical support stringers (Assumes continuous span, min 3 bays)

-Capacities Assume the Following

-Vertical stringer connections back to structure at 16 " o.c.

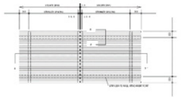
-Louvers spaced no closer than 3 " o.c. for all extrusions other than THS-1040 then 6 " o.c.

-No opinion is given to capacity of connection of stringer to structure or structure capacity

-These capacities apply to full assembly of Louvers and Stringers STAL-7, STAL-8

-Attachment of Stringer to Structure Capacity may govern design and should be investigated. Capacity per (Connections B-36, Tables (T5)

-Allowable loading in tables for shapes THS-5010 USA and THS-5015 USA are only valid when BTP-30HD clip is used for stringer connection



HL - Horizontal Louver
VS - Vertical Stringer

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Project:	B&N Industries Aluminum Extrusion Load Tables	Pg. No:	B - 7
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Client:	B&N Industries	Job No.:	25098

Fortina Wind Load Data

TABLE T5: HORIZONTAL LOUVERS VERTICAL STRINGER

	Stinger Spacing (ft.)	3	4	5	6	7	8	9	10	11	12
THS-1040		219	158	123	94	59	40	28	20	15	12
		Connection	Stringer	Stringer	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection
THS-2010		61	45	34	19	11	7	4	2	1	0
		Flat Plate	Flat Plate	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection
THS-3010		60	44	35	29	24	21	14	10	6	4
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Deflection	Deflection	Deflection	Deflection
THS-3015		34	25	19	16	13	11	10	8	6	4
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Deflection	Deflection
THS-4080		37	27	21	17	15	12	11	9	8	7
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
THS-5010		219	164	130	108	93	81	58	41	30	22
with BTP-30HD Clip		Connection	Connection	Connection	Connection	Connection	Connection	Deflection	Deflection	Deflection	Deflection
THS-5010 USA	Pressure (PSF)	219	164	130	108	93	81	60	43	31	23
with BTP-30HD Clip	[ASD]	Connection	Connection	Connection	Connection	Connection	Connection	Deflection	Deflection	Deflection	Deflection
THS-50125	[Failure Mode]	214	161	129	107	92	78	54	38	28	21
with BTP-30HD Clip		Shear	Shear	Shear	Shear	Shear	Deflection	Deflection	Deflection	Deflection	Deflection
THS-5015		179	134	107	89	77	67	53	38	28	20
with BTP-30HD Clip		Shear	Shear	Shear	Shear	Shear	Shear	Deflection	Deflection	Deflection	Deflection
THS-5015 USA		179	134	107	89	77	67	56	40	29	22
with BTP-30HD Clip		Shear	Shear	Shear	Shear	Shear	Shear	Deflection	Deflection	Deflection	Deflection
THS-6012		52	38	30	24	20	17	15	13	12	10
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
THSN-5010		219	164	130	108	93	81	65	47	34	25
with BTP-30HD Clip		Connection	Connection	Connection	Connection	Connection	Connection	Deflection	Deflection	Deflection	Deflection
THSN-5050		219	164	130	108	81	55	38	28	21	16
with BTP-30HD Clip		Connection	Connection	Connection	Connection	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection
THS-50250 USA		107	80	64	54	46	40	36	32	29	27
with BTP-30HD Clip		Shear	Shear	Shear	Shear	Shear	Shear	Shear	Shear	Shear	Shear
TPS-50200F		134	100	80	67	57	50	45	40	30	23
with BTP-30HD Clip		Shear	Shear	Shear	Shear	Shear	Shear	Shear	Shear	Deflection	Deflection
TPS-50250F		107	80	64	54	46	40	36	32	29	26
with BTP-30HD Clip		Shear	Shear	Shear	Shear	Shear	Shear	Shear	Shear	Shear	Deflection
TPS-50300F		89	67	54	45	38	33	30	27	24	22
with BTP-30HD Clip		Shear	Shear	Shear	Shear	Shear	Shear	Shear	Shear	Shear	Shear

**Shear failures noted in table indicate local shear failure at BTP-30HD clip reinforcement*

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Project:	B&N Industries Aluminum Extrusion Load Tables	Pg. No:	B - 8
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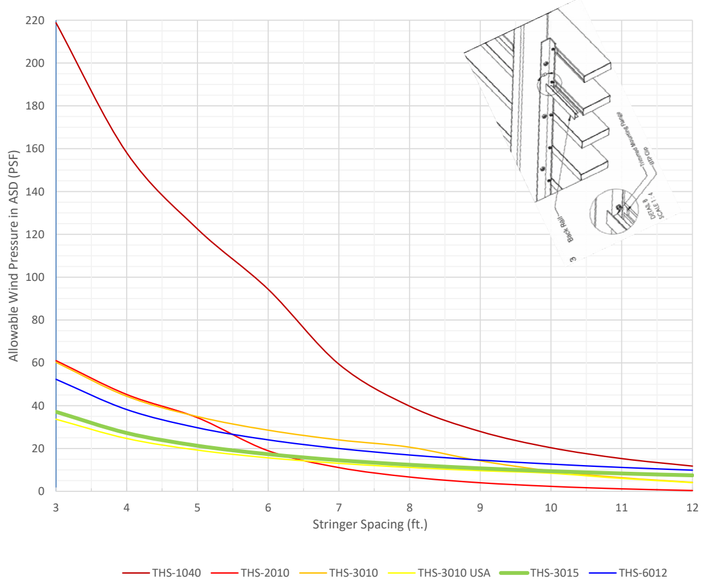
Client:	B&N Industries	Job No.:	25098

Fortina Wind Load Data

Calculation: Tables Horiz Louver O {9-10}

FIGURE L6: HORIZONTAL LOUVERS TO HORIZONTAL STRINGER (OTHER STANDARD)



Assumptions

-This chart displays vertical extrusion installation with vertical support stringers (Assumes continuous span, min 3 bays)

-Capacities Assume the Following

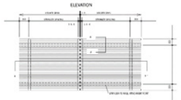
-Vertical stringer connections back to structure at 16 " o.c.

-Louvers spaced no closer than 3 " o.c. for all extrusions other than THS-1040 then 6 " o.c.

-No opinion is given to capacity of connection of stringer to structure or structure capacity

-These capacities apply to full assembly of Louvers and Stringers STAL-7, STAL-8

-Attachment of Stringer to Structure Capacity may govern design and should be investigated. Capacity per connections Graphs (C3, C4) Tables (T6, T12, T13)



HL - Horizontal Louver
VS - Vertical Stringer

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Client:	B&N Industries	Job No.:	25098

Fortina Wind Load Data

TABLE T6: HORIZONTAL LOUVERS VERTICAL STRINGER

	Stinger Spacing (ft.)	3	4	5	6	7	8	9	10	11	12
THS-1040	Pressure (PSF) [ASD] [Failure Mode]	219 Connection	158 Stringer	123 Stringer	94 Deflection	59 Deflection	40 Deflection	28 Deflection	20 Deflection	15 Deflection	12 Deflection
THS-2010		61 Flat Plate	45 Flat Plate	34 Deflection	19 Deflection	11 Deflection	7 Deflection	4 Deflection	2 Deflection	1 Deflection	0 Deflection
THS-3010		60 Flat Plate	44 Flat Plate	35 Flat Plate	29 Flat Plate	24 Flat Plate	21 Flat Plate	14 Deflection	10 Deflection	6 Deflection	4 Deflection
THS-3010 USA		34 Flat Plate	25 Flat Plate	19 Flat Plate	16 Flat Plate	13 Flat Plate	11 Flat Plate	10 Flat Plate	8 Flat Plate	6 Deflection	4 Deflection
THS-3015		37 Flat Plate	27 Flat Plate	21 Flat Plate	17 Flat Plate	15 Flat Plate	12 Flat Plate	11 Flat Plate	9 Flat Plate	8 Flat Plate	7 Flat Plate
THS-3080		58 Flat Plate	43 Flat Plate	33 Flat Plate	27 Flat Plate	23 Flat Plate	19 Flat Plate	17 Flat Plate	15 Flat Plate	13 Flat Plate	12 Flat Plate
THS-4040		80 Flat Plate	59 Flat Plate	47 Flat Plate	38 Flat Plate	32 Flat Plate	28 Flat Plate	24 Flat Plate	21 Flat Plate	19 Flat Plate	17 Flat Plate
THS-4080		65 Flat Plate	48 Flat Plate	38 Flat Plate	31 Flat Plate	26 Flat Plate	23 Flat Plate	20 Flat Plate	17 Flat Plate	16 Flat Plate	14 Flat Plate
THS-5010		45 Flat Plate	33 Flat Plate	26 Flat Plate	21 Flat Plate	18 Flat Plate	15 Flat Plate	13 Flat Plate	11 Flat Plate	10 Flat Plate	9 Flat Plate
THS-5010 USA		45 Flat Plate	33 Flat Plate	25 Flat Plate	21 Flat Plate	17 Flat Plate	15 Flat Plate	13 Flat Plate	11 Flat Plate	10 Flat Plate	9 Flat Plate
THS-50125		52 Flat Plate	38 Flat Plate	30 Flat Plate	24 Flat Plate	20 Flat Plate	17 Flat Plate	15 Flat Plate	13 Flat Plate	12 Flat Plate	10 Flat Plate
THS-5015		95 Flat Plate	70 Flat Plate	55 Flat Plate	45 Flat Plate	38 Flat Plate	33 Flat Plate	29 Flat Plate	25 Flat Plate	23 Flat Plate	20 Flat Plate
THS-5015 USA		97 Flat Plate	72 Flat Plate	57 Flat Plate	47 Flat Plate	40 Flat Plate	34 Flat Plate	30 Flat Plate	27 Flat Plate	21 Deflection	16 Deflection
THS-6012		52 Flat Plate	38 Flat Plate	30 Flat Plate	24 Flat Plate	20 Flat Plate	17 Flat Plate	15 Flat Plate	13 Flat Plate	11 Flat Plate	10 Flat Plate
THS-6025		36 Flat Plate	26 Flat Plate	20 Flat Plate	16 Flat Plate	14 Flat Plate	11 Flat Plate	10 Flat Plate	8 Flat Plate	7 Flat Plate	6 Flat Plate
THSN-5010		36 Flat Plate	26 Flat Plate	20 Flat Plate	16 Flat Plate	13 Flat Plate	11 Flat Plate	9 Flat Plate	8 Flat Plate	7 Flat Plate	6 Flat Plate
THSN-5050		38 Flat Plate	27 Flat Plate	21 Flat Plate	17 Flat Plate	14 Flat Plate	11 Flat Plate	9 Flat Plate	8 Flat Plate	7 Flat Plate	6 Flat Plate

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Project:	B&N Industries Aluminum Extrusion Load Tables	Pg. No:	B - 10
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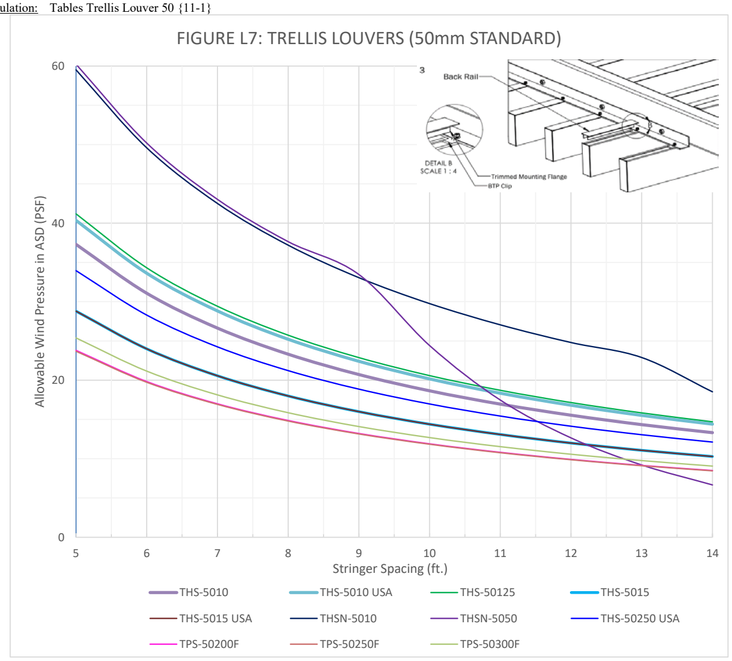
Client:	B&N Industries	Job No.:	25098

Fortina Wind Load Data

Calculation: Tables Trellis Louver 50 {11-1}



Assumptions

-This chart displays vertical extrusion installation with vertical support stringers (Assumes continuous span, min 3 bays)

-Capacities Assume the Following

-Vertical stringer connections back to structure at 16 " o.c.

-Louvers spaced no closer than 3 " o.c. for all extrusions other than THS-1040 then 6 " o.c.

-No opinion is given to capacity of connection of stringer to structure or structure capacity

-These capacities apply to full assembly of Louvers and Stringers STAL-7, STAL-8

-Attachment of Stringer to Structure Capacity may govern design and should be investigated.

Capacity per connections Graphs (C5) Tables (T7, T14)

TL - Trellis Louver

Fortina Wind Load Data

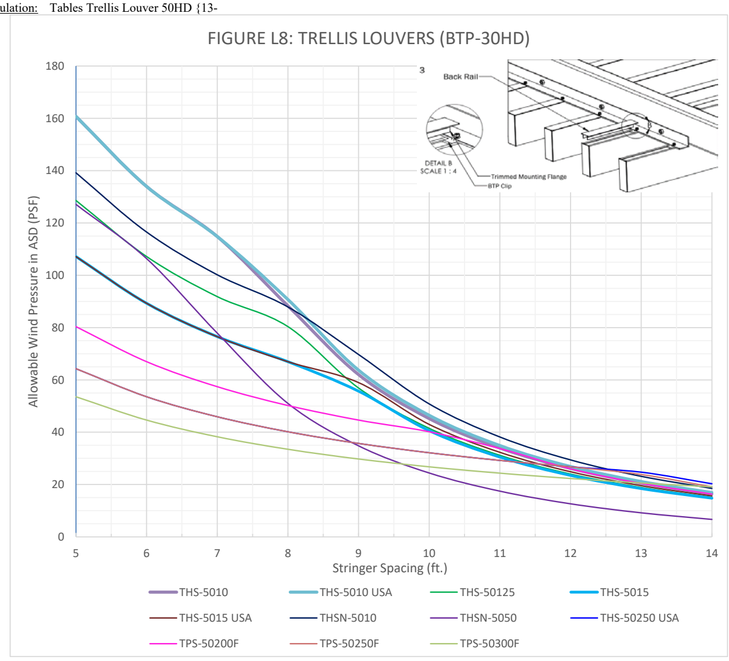
TABLE T7: TRELLIS LOUVERS

	Stinger Spacing (ft.)	5	6	7	8	9	10	11	12	13	14
THS-1040	Pressure (PSF) [ASD] [Failure Mode]	123	91	57	37	25	17	12	9	6	5
		Stringer	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection
THS-2010		37	21	13	9	6	5	3	3	2	2
		Deflection	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection
THS-3010		38	32	27	24	17	13	10	7	6	5
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection
THS-3015		22	18	15	14	12	11	8	6	5	4
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Deflection	Deflection	Deflection	Deflection
THS-4080		24	20	17	15	13	12	11	10	8	7
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Deflection	Deflection
THS-5010		37	31	27	23	21	19	17	16	14	13
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
THS-5010 USA		40	34	29	25	22	20	18	17	16	14
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
THS-50125		41	34	29	26	23	21	19	17	16	15
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
THS-5015		29	24	21	18	16	14	13	12	11	10
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
THS-5015 USA		29	24	21	18	16	14	13	12	11	10
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
THS-6012		33	28	24	21	18	17	15	14	13	12
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
THSN-5010		60	50	43	37	33	30	27	25	23	19
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Deflection
THSN-5050		60	50	43	38	33	24	17	13	9	7
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Deflection	Deflection	Deflection	Deflection	Deflection
THS-50250 USA		34	28	24	21	19	17	15	14	13	12
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
TPS-50200F		24	20	17	15	13	12	11	10	9	8
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
TPS-50250F		24	20	17	15	13	12	11	10	9	8
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
TPS-50300F		25	21	18	16	14	13	12	11	10	9
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate

Fortina Wind Load Data

Calculation: Tables Trellis Louver 50HD {13-

FIGURE L8: TRELLIS LOUVERS (BTP-30HD)



Assumptions

-This chart displays vertical extrusion installation with vertical support stringers (Assumes continuous span, min 3 bays)

-Capacities Assume the Following

-Vertical stringer connections back to structure at 16 " o.c.

-Louvers spaced no closer than 3 " o.c. for all extrusions other than THS-1040 then 6 " o.c.

-No opinion is given to capacity of connection of stringer to structure or structure capacity

-These capacities apply to full assembly of Louvers and Stringers STAL-7, STAL-8

-Attachment of Stringer to Structure Capacity may govern design and should be investigated. Capacity per (Connections B-36, Tables (T8)

-Allowable loading in tables for shapes THS-5010 USA and THS-5015 USA are only valid when BTP-30HD clip is used for stringer connection

TL - Trellis Louver

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Project:	B&N Industries Aluminum Extrusion Load Tables	Pg. No: B - 13
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Client:	B&N Industries	Job No.: 25098

Fortina Wind Load Data

TABLE T8: TRELLIS LOUVERS

	Stringer Spacing (ft.)	5	6	7	8	9	10	11	12	13	14
THS-1040		123	91	57	37	25	17	12	9	6	5
		Stringer	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection
THS-2010		37	21	13	9	6	5	3	3	2	2
		Deflection	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection
THS-3010		38	32	27	24	17	13	10	7	6	5
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection
THS-3015		22	18	15	14	12	11	8	6	5	4
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Deflection	Deflection	Deflection	Deflection
THS-4080		24	20	17	15	13	12	11	10	8	7
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Deflection	Deflection
THS-5010		161	134	115	88	62	45	34	26	21	16
with BTP-30HD Clip		Shear	Shear	Shear	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection
THS-5010 USA	Pressure (PSF)	161	134	115	91	64	46	35	27	21	17
with BTP-30HD Clip	[ASD]	Shear	Shear	Shear	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection
THS-50125	[Failure Mode]	129	107	92	80	57	41	31	24	19	15
with BTP-30HD Clip		Shear	Shear	Shear	Shear	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection
THS-5015		107	89	77	67	56	41	30	23	18	15
with BTP-30HD Clip		Shear	Shear	Shear	Shear	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection
THS-5015 USA		107	89	77	67	59	43	32	25	20	16
with BTP-30HD Clip		Shear	Shear	Shear	Shear	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection
THS-6012		33	28	24	21	18	17	15	14	13	12
		Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate
THSN-5010		139	117	100	88	70	51	38	29	23	19
with BTP-30HD Clip		Stringer	Stringer	Stringer	Stringer	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection
THSN-5050		127	106	78	51	35	24	17	13	9	7
with BTP-30HD Clip		Stringer	Stringer	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection	Deflection
THS-50250 USA		64	54	46	40	36	32	29	27	25	20
with BTP-30HD Clip		Shear	Shear	Shear	Shear	Shear	Shear	Shear	Shear	Shear	Deflection
TPS-50200F		80	67	57	50	45	40	34	26	20	16
with BTP-30HD Clip		Shear	Shear	Shear	Shear	Shear	Shear	Deflection	Deflection	Deflection	Deflection
TPS-50250F		64	54	46	40	36	32	29	27	24	19
with BTP-30HD Clip		Shear	Shear	Shear	Shear	Shear	Shear	Shear	Shear	Deflection	Deflection
TPS-50300F		54	45	38	33	30	27	24	22	21	19
with BTP-30HD Clip		Shear	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate	Flat Plate

**Shear failures noted in table indicate local shear failure at BTP-30HD clip reinforcement*

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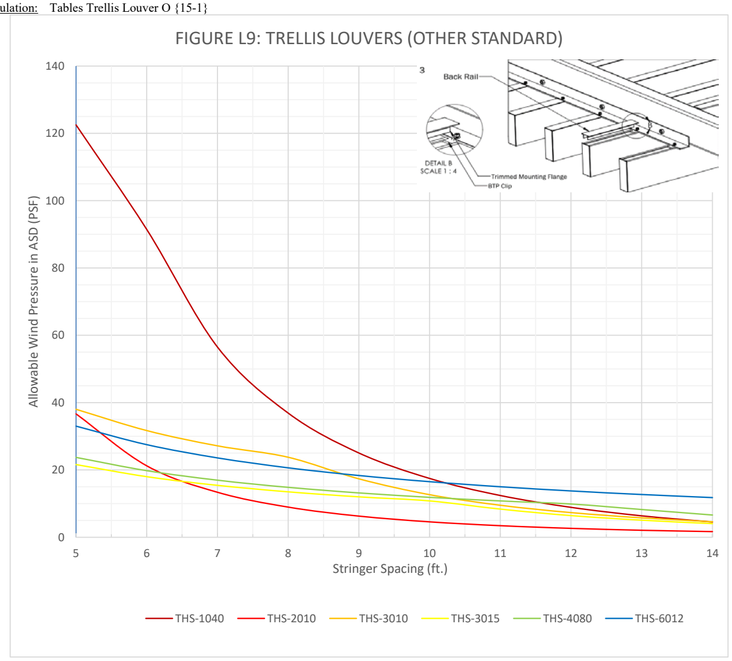
Project:	B&N Industries Aluminum Extrusion Load Tables	Pg. No: B - 14
Address:	Anywhere, USA	Date: 6/6/25
Client:	B&N Industries	Job No.: 25098

Fortina Wind Load Data

Calculation: Tables Trellis Louver O {15-1}



Assumptions

-This chart displays vertical extrusion installation with vertical support stringers (Assumes continuous span, min 3 bays)

-Capacities Assume the Following

-Vertical stringer connections back to structure at 16 " o.c.

-Louvers spaced no closer than 3 " o.c. for all extrusions other than THS-1040 then 6 " o.c.

-No opinion is given to capacity of connection of stringer to structure or structure capacity

-These capacities apply to full assembly of Louvers and Stringers STAL-7, STAL-8

-Attachment of Stringer to Structure Capacity may govern design and should be investigated.

Capacity per connections Graphs (C6) Tables (T9, T14)

TL - Trellis Louver

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Project:	B&N Industries Aluminum Extrusion Load Tables	Pg. No:	B - 15
Address:	Anywhere, USA	Date:	6/6/25
Client:	B&N Industries	Job No.:	25098

Fortina Wind Load Data

TABLE T9: TRELLIS LOUVERS

	Stinger Spacing (ft.)	5	6	7	8	9	10	11	12	13	14
THS-1040	Pressure (PSF) [ASD] [Failure Mode]	123 Stringer	91 Deflection	57 Deflection	37 Deflection	25 Deflection	17 Deflection	12 Deflection	9 Deflection	6 Deflection	5 Deflection
THS-2010		37 Deflection	21 Deflection	13 Deflection	9 Deflection	6 Deflection	5 Deflection	3 Deflection	3 Deflection	2 Deflection	2 Deflection
THS-3010		38 Flat Plate	32 Flat Plate	27 Flat Plate	24 Flat Plate	17 Deflection	13 Deflection	10 Deflection	7 Deflection	6 Deflection	5 Deflection
THS-3015		22 Flat Plate	18 Flat Plate	15 Flat Plate	14 Flat Plate	12 Flat Plate	11 Flat Plate	8 Deflection	6 Deflection	5 Deflection	4 Deflection
THS-4080		24 Flat Plate	20 Flat Plate	17 Flat Plate	15 Flat Plate	13 Flat Plate	12 Flat Plate	11 Flat Plate	10 Flat Plate	8 Deflection	7 Deflection
THS-5010		37 Flat Plate	31 Flat Plate	27 Flat Plate	23 Flat Plate	21 Flat Plate	19 Flat Plate	17 Flat Plate	16 Flat Plate	14 Flat Plate	13 Flat Plate
THS-5010 USA		40 Flat Plate	34 Flat Plate	29 Flat Plate	25 Flat Plate	22 Flat Plate	20 Flat Plate	18 Flat Plate	17 Flat Plate	16 Flat Plate	14 Flat Plate
THS-50125		41 Flat Plate	34 Flat Plate	29 Flat Plate	26 Flat Plate	23 Flat Plate	21 Flat Plate	19 Flat Plate	17 Flat Plate	16 Flat Plate	15 Flat Plate
THS-5015		29 Flat Plate	24 Flat Plate	21 Flat Plate	18 Flat Plate	16 Flat Plate	14 Flat Plate	13 Flat Plate	12 Flat Plate	11 Flat Plate	10 Flat Plate
THS-5015 USA		29 Flat Plate	24 Flat Plate	21 Flat Plate	18 Flat Plate	16 Flat Plate	14 Flat Plate	13 Flat Plate	12 Flat Plate	11 Flat Plate	10 Flat Plate
THS-6012		33 Flat Plate	28 Flat Plate	24 Flat Plate	21 Flat Plate	18 Flat Plate	17 Flat Plate	15 Flat Plate	14 Flat Plate	13 Flat Plate	12 Flat Plate
THSN-5010		60 Flat Plate	50 Flat Plate	43 Flat Plate	37 Flat Plate	33 Flat Plate	30 Flat Plate	27 Flat Plate	25 Flat Plate	23 Flat Plate	19 Deflection
THSN-5050		60 Flat Plate	50 Flat Plate	43 Flat Plate	38 Flat Plate	33 Flat Plate	24 Deflection	17 Deflection	13 Deflection	9 Deflection	7 Deflection
THS-50250 USA		34 Flat Plate	28 Flat Plate	24 Flat Plate	21 Flat Plate	19 Flat Plate	17 Flat Plate	15 Flat Plate	14 Flat Plate	13 Flat Plate	12 Flat Plate
TPS-50200F		24 Flat Plate	20 Flat Plate	17 Flat Plate	15 Flat Plate	13 Flat Plate	12 Flat Plate	11 Flat Plate	10 Flat Plate	9 Flat Plate	8 Flat Plate
TPS-50250F		24 Flat Plate	20 Flat Plate	17 Flat Plate	15 Flat Plate	13 Flat Plate	12 Flat Plate	11 Flat Plate	10 Flat Plate	9 Flat Plate	8 Flat Plate
TPS-50300F		25 Flat Plate	21 Flat Plate	18 Flat Plate	16 Flat Plate	14 Flat Plate	13 Flat Plate	12 Flat Plate	11 Flat Plate	10 Flat Plate	9 Flat Plate

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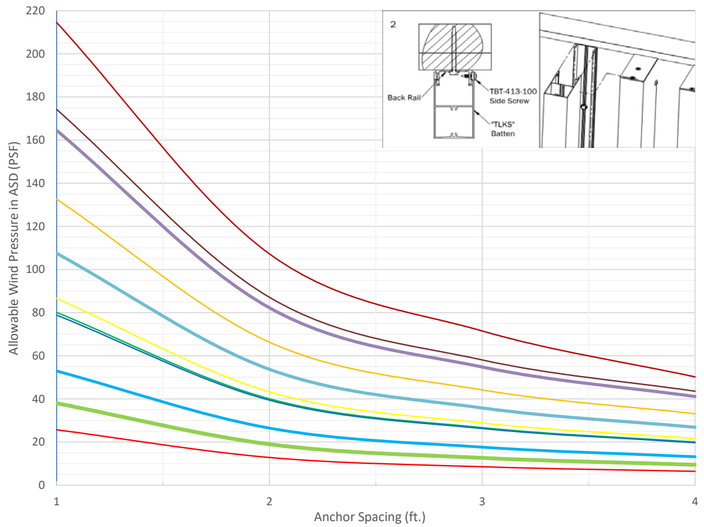
Project:	B&N Industries Aluminum Extrusion Load Tables	Pg. No:	B - 16
Address:	Anywhere, USA	Date:	6/6/25
Client:	B&N Industries	Job No.:	25098

Fortina Wind Load Data

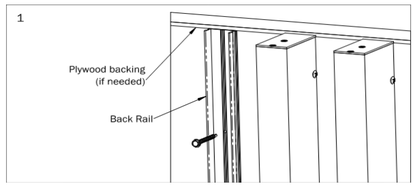
Calculation: Tables Vert Direct TLKS {26-27}

FIGURE L16: VERTICAL LOUVERS DIRECT ATTACHMENT TLKS



Assumptions
-This chart displays vertical extrusion installation with direct attachment to structure (Assumes continuous span, min 3 bays)
-Capacity per (B-41 -> B43) Tables (T-16)

Final Wall Assembly



Fortina Wind Load Data

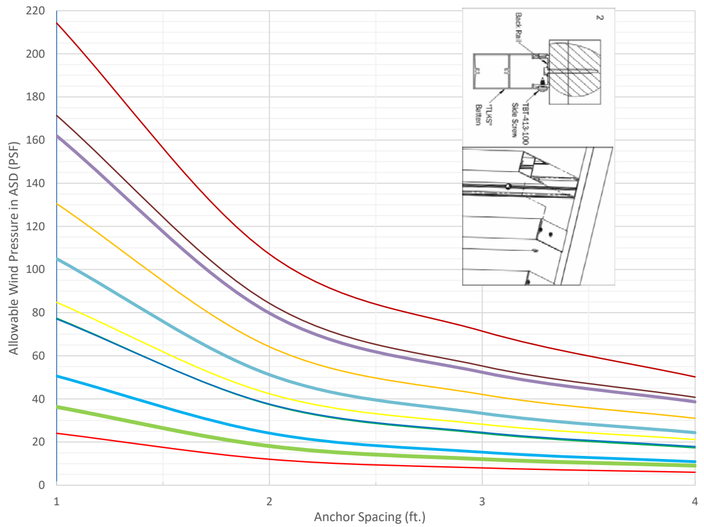
TABLE T16: VERTICAL LOUVERS DIRECT ATTACHMENT (TLKS)

	Anchor Spacing (ft.	1	2	3	4						
TLKS-1030		215	107	72	50						
		Connection	Connection	Connection	Deflection						
TLKS-2015		26	13	9	6						
		Connection	Connection	Connection	Connection						
TLKS-2060		133	66	44	33						
		Flat Plate	Flat Plate	Flat Plate	Flat Plate						
TLKS-3010		87	43	29	22						
		Connection	Connection	Connection	Connection						
TLKS-3015		38	19	13	9						
		Connection	Connection	Connection	Connection						
TLKS-3050		164	82	55	41						
		Flat Plate	Flat Plate	Flat Plate	Flat Plate						
TLKS-4075	Pressure (PSF)	108	54	36	27						
	[ASD]	Flat Plate	Flat Plate	Flat Plate	Flat Plate						
TLKS-5010	[Failure Mode]	80	40	27	20						
		Flat Plate	Flat Plate	Flat Plate	Flat Plate						
TLKS-5015		53	26	18	13						
		Flat Plate	Flat Plate	Flat Plate	Flat Plate						
TLKS-5050		174	87	58	44						
		Flat Plate	Flat Plate	Flat Plate	Flat Plate						
TLKV-3210		79	39	26	20						
		Flat Plate	Flat Plate	Flat Plate	Flat Plate						

Fortina Wind Load Data

Calculation: Tables Horiz Direct TLKS {28-2}

FIGURE L17: HORIZONTAL LOUVERS DIRECT ATTACHMENT TLKS

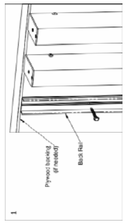


Assumptions

-This chart displays vertical extrusion installation with direct attachment to structure (Assumes continuous span, min 3 bays)

-Capacity per (B-44 -> B46) Tables (T-17)

Final Wall Assembly



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Project:	B&N Industries Aluminum Extrusion Load Tables	Pg. No:	B - 28
Address:	Anywhere, USA	Date:	6/6/25
Client:	B&N Industries	Job No.:	25098

Fortina Wind Load Data

TABLE T17: VERTICAL LOUVERS DIRECT ATTACHMENT (TLKS)

	Anchor Spacing (ft.	1	2	3	4						
TLKS-1030		214	107	71	50						
		Connection	Connection	Connection	Deflection						
TLKS-2015		24	12	8	6						
		Connection	Connection	Connection	Connection						
TLKS-2060		131	64	42	31						
		Flat Plate	Flat Plate	Flat Plate	Flat Plate						
TLKS-3010		85	42	28	21						
		Connection	Connection	Connection	Connection						
TLKS-3015		36	18	12	9						
		Connection	Connection	Connection	Connection						
TLKS-3050		162	80	52	39						
		Flat Plate	Flat Plate	Flat Plate	Flat Plate						
TLKS-4075	Pressure (PSF)	105	51	33	24						
	[ASD]	Flat Plate	Flat Plate	Flat Plate	Flat Plate						
TLKS-5010	[Failure Mode]	77	37	24	17						
		Flat Plate	Flat Plate	Flat Plate	Flat Plate						
TLKS-5015		51	24	15	11						
		Flat Plate	Flat Plate	Flat Plate	Flat Plate						
TLKS-5050		171	84	55	41						
		Flat Plate	Flat Plate	Flat Plate	Flat Plate						
TLKV-3210		77	38	24	18						
		Flat Plate	Flat Plate	Flat Plate	Flat Plate						

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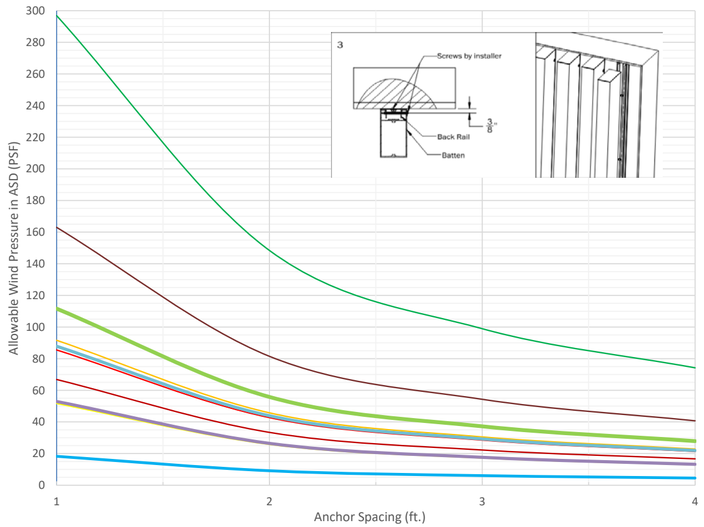
Project:	B&N Industries Aluminum Extrusion Load Tables	Pg. No:	B - 29
Address:	Anywhere, USA	Date:	6/6/25
Client:	B&N Industries	Job No.:	25098

Fortina Wind Load Data

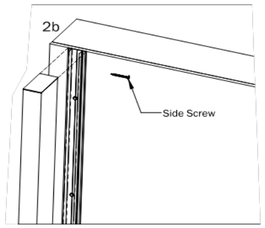
Calculation: Tables Vert Direct THS {30-31}

FIGURE L18: VERTICAL LOUVERS DIRECT ATTACHMENT THS



Assumptions
-This chart displays vertical extrusion installation with direct attachment to structure (Assumes continuous span, min 3 bays)
-Capacity per (B-41 -> B43) Tables (T-18)


Final Wall Assembly



Fortina Wind Load Data

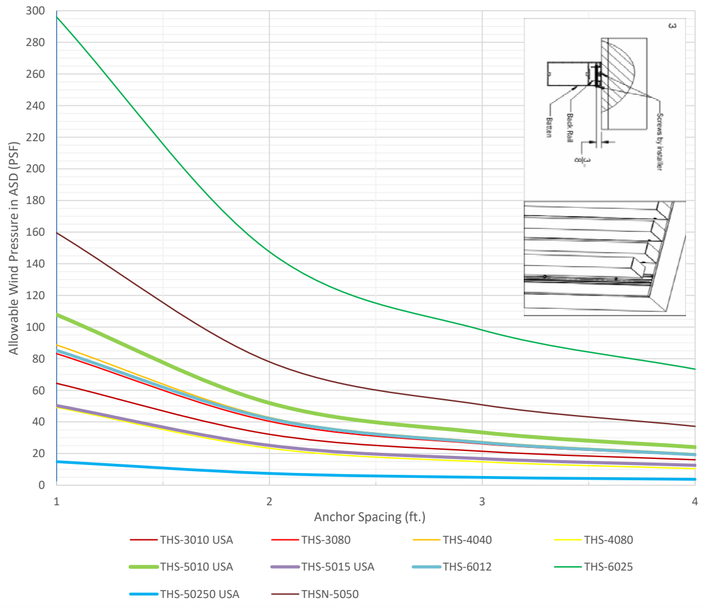
TABLE T18: VERTICAL LOUVERS DIRECT ATTACHMENT (THS)

	Anchor Spacing (ft.	1	2	3	4
THS-3010 USA	Pressure (PSF) [ASD] [Failure Mode]	67 Connection	33 Connection	22 Connection	17 Connection
THS-3080		86 Flat Plate	43 Flat Plate	29 Flat Plate	21 Flat Plate
THS-4040		92 Flat Plate	46 Flat Plate	31 Flat Plate	23 Flat Plate
THS-4080		52 Flat Plate	26 Flat Plate	17 Flat Plate	13 Flat Plate
THS-5010 USA		112 Flat Plate	56 Flat Plate	37 Flat Plate	28 Flat Plate
THS-5015 USA		53 Connection	26 Connection	18 Connection	13 Connection
THS-6012		88 Connection	44 Connection	29 Connection	22 Connection
THS-6025		297 Flat Plate	148 Flat Plate	99 Flat Plate	74 Flat Plate
THS-50250 USA		18 Connection	9 Connection	6 Connection	5 Connection
THSN-5050		163 Flat Plate	82 Flat Plate	54 Flat Plate	41 Flat Plate

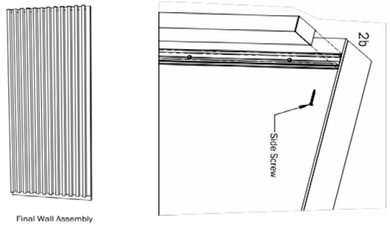
Fortina Wind Load Data

Calculation: Tables Horiz Direct THS {32-33}

FIGURE L19: HORIZONTAL LOUVERS DIRECT ATTACHMENT THS



Assumptions
-This chart displays vertical extrusion installation with direct attachment to structure (Assumes continuous span, min 3 bays)
-Capacity per (B-44 -> B46) Tables (T-19)



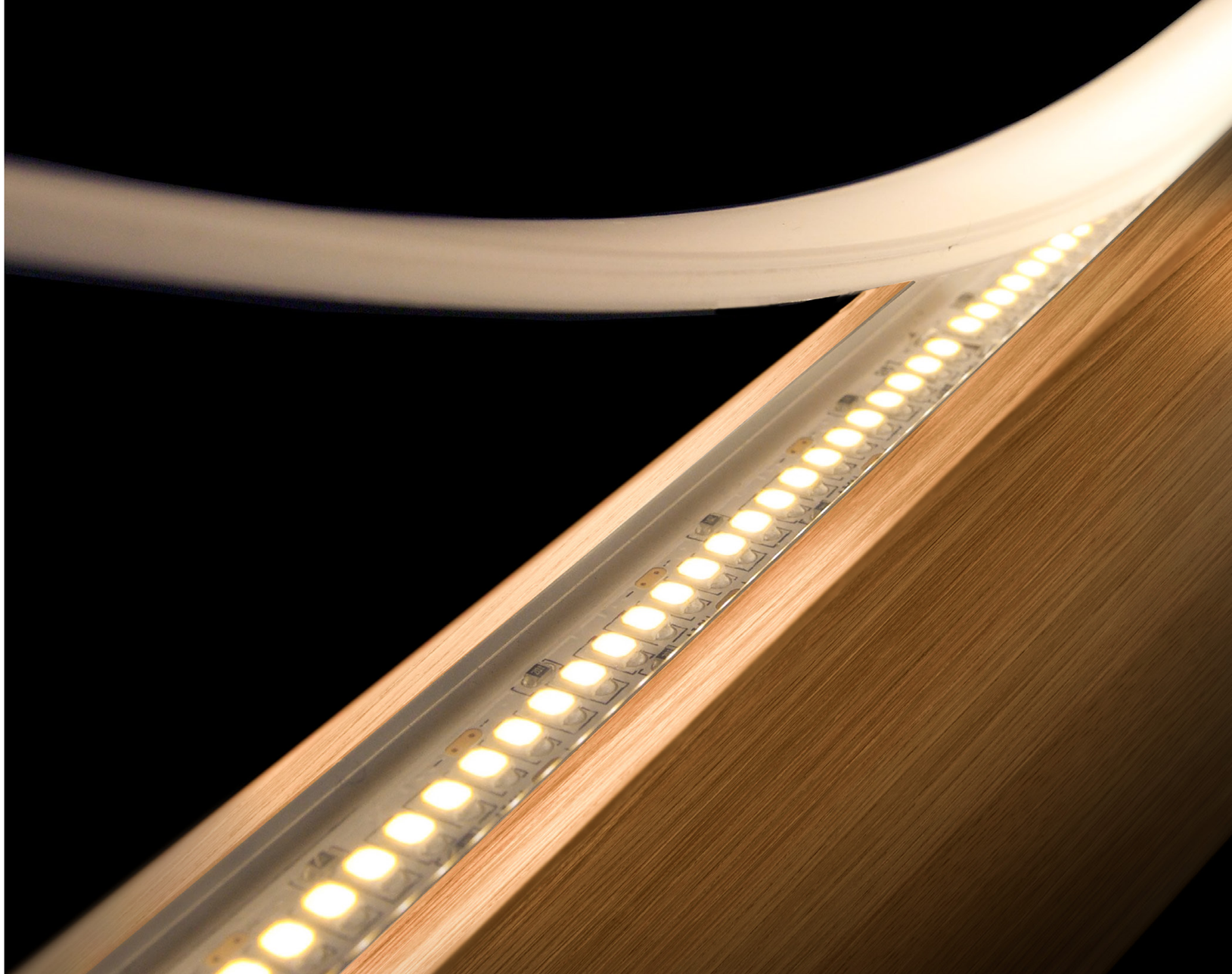
Fortina Wind Load Data

TABLE T19: HORIZONTAL LOUVERS DIRECT ATTACHMENT (THS)

	Anchor Spacing (ft.	1	2	3	4
THS-3010 USA	Pressure (PSF) [ASD] [Failure Mode]	64 Connection	32 Connection	21 Connection	16 Connection
THS-3080		83 Flat Plate	40 Flat Plate	26 Flat Plate	19 Flat Plate
THS-4040		89 Flat Plate	43 Flat Plate	28 Flat Plate	20 Flat Plate
THS-4080		49 Flat Plate	23 Flat Plate	15 Flat Plate	10 Flat Plate
THS-5010 USA		108 Flat Plate	52 Flat Plate	33 Flat Plate	24 Flat Plate
THS-5015 USA		50 Connection	25 Connection	17 Connection	13 Connection
THS-6012		85 Connection	42 Flat Plate	27 Flat Plate	19 Flat Plate
THS-6025		296 Flat Plate	148 Flat Plate	98 Flat Plate	73 Flat Plate
THS-50250 USA		15 Connection	7 Connection	5 Connection	4 Connection
THSN-5050		160 Flat Plate	78 Flat Plate	51 Flat Plate	37 Flat Plate

LED Strips For Fortina LightStrip Colors

	24VDC				
	100 LUMEN RANGE **VLX1** **Max. Run:** 80 ft. **Cut Points:** 1.32 in. **Wattage:** 1.0W/ft.	**200** LUMEN RANGE **VLX2** **Max. Run:** 53 ft. **Cut Points:** 1.32 in. **Wattage:** 1.9W/ft.	**300** LUMEN RANGE **VLX3** **Max. Run:** 41 ft. **Cut Points:** 1.32 in. **Wattage:** 2.8W/ft.	**500** LUMEN RANGE **VLX5** **Max. Run:** 30 ft. **Cut Points:** 1.32 in. **Wattage:** 4.6W/ft.	**800** LUMEN RANGE **VLX8** **Max. Run:** 19 ft. **Cut Points:** 1.32 in. **Wattage:** 7.2W/ft.
CCT	**Lumens/ft.**	**Lumens/ft.**	**Lumens/ft.**	**Lumens/ft.**	**Lumens/ft.**
2000K	104	194	299	–	–
2200K	104	194	299	–	–
2400K	104	194	299	469	730
2700K	101	207	311	495	782
3000K	106	218	323	557	853
3500K	108	218	328	586	906
4000K	112	228	342	534	806
5000K	116	242	365	592	840
6300K	112	244	363	578	924



LED Strips For Fortina LightStrip

For installation of LED Strips, see Installation Instructions

VALENT® X

High-Density LED Tape Light

Precision-engineered, high-density tape light for demanding applications when light quality matters most. Up to 900+ lumens per foot with 95+ CRI/90+ R9.

FEATURES & BENEFITS

- Dense LED placement for uninterrupted linear light
- 95+ CRI/90+ R9
- Highest lumen output option

QUICK SPECS

Voltage	24VDC
Width	12mm
CRI	95+
Warranty	12 Year Limited Warranty
Dimming	Dimmable
Environment	Indoor/Damp Location (IP20)
Certification	UL Listed 2108
Connector	12mm Terminal Block

Visit the product page on the website for specification sheets, install guides, IES files, and photometric reports.

DI	VOLTAGE		MODEL	LUMEN SERIES		CCT				LENGTH	
DI	**24V**	(24VDC)	**VLX**	**1**	(100 Lumen Range)	**20**	(2000K)	**35**	(3500K)	**016**	(16.4 ft.)
				2	(200 Lumen Range)	**22**	(2200K)	**40**	(4000K)	**100**	(100 ft.)
				3	(300 Lumen Range)	**24**	(2400K)	**50**	(5000K)		
				5	(500 Lumen Range)	**27**	(2700K)	**63**	(6300K)		
				8	(800 Lumen Range)	**30**	(3000K)				

EXAMPLE: 24V VALENT® X 800 LUMENS 5000K 16.4 FT. SPOOL = **DI–24V–VLX8–50–016**

	24VDC				
	100 LUMEN RANGE **VLX1** **Max. Run:** 80 ft. **Cut Points:** 1.32 in. **Wattage:** 1.0W/ft.	**200** LUMEN RANGE **VLX2** **Max. Run:** 53 ft. **Cut Points:** 1.32 in. **Wattage:** 1.9W/ft.	**300** LUMEN RANGE **VLX3** **Max. Run:** 41 ft. **Cut Points:** 1.32 in. **Wattage:** 2.8W/ft.	**500** LUMEN RANGE **VLX5** **Max. Run:** 30 ft. **Cut Points:** 1.32 in. **Wattage:** 4.6W/ft.	**800** LUMEN RANGE **VLX8** **Max. Run:** 19 ft. **Cut Points:** 1.32 in. **Wattage:** 7.2W/ft.
CCT	**Lumens/ft.**	**Lumens/ft.**	**Lumens/ft.**	**Lumens/ft.**	**Lumens/ft.**
2000K	104	194	299	–	–
2200K	104	194	299	–	–
2400K	104	194	299	469	730
2700K	101	207	311	495	782
3000K	106	218	323	557	853
3500K	108	218	328	586	906
4000K	112	228	342	534	806
5000K	116	242	365	592	840
6300K	112	244	363	578	924

Power Sources for Fortina LightStrip

See Technical Specifications and Installation Instructions for detailed information. Contact your Sales Rep for power calculation needs.

Hardwired Driver
Omnidrive® X Dimmable Hard Wired Driver

OMNIDRIVE® X is a driver with universal dimmer compatibility in most high-performance dimming applications. Simplify installation with universal input voltage and multiple dimming protocols in a single driver.

FEATURES & BENEFITS

- ELV, TRIAC, and 0-10V dimming in a single driver
- 100-277VAC universal input
- No minimum load
- Minimum dimming level of <1%, depending on the dimmer
- UL Listed and Title 24 compliant

QUICK SPECS

Environment	Indoor/Outdoor
Input Voltage	100-277VAC
Output Voltage	12VDC & 24VDC Models
Connection Type	Hardwired
Warranty	5 Year Limited Warranty
Dimming	Forward Phase, Reverse Phase Dimming, and 0-10V Dimming
Certification	UL Listed & JA8/JA10 Compliant

Commercial Grade
Plug-In Adapter

24VDC Plug-in Adapters convert 120VAC voltage to 24VDC output. An adapter is the right choice for portable installations where hard-wiring is not desired.

FEATURES & BENEFITS

- Black Finish
- Short circuit, over current, over voltage, over temperature protections
- Fanless design / cooling by free-air convection
- UL Listed 1310 Class 2
- For use with commercial applications

QUICK SPECS

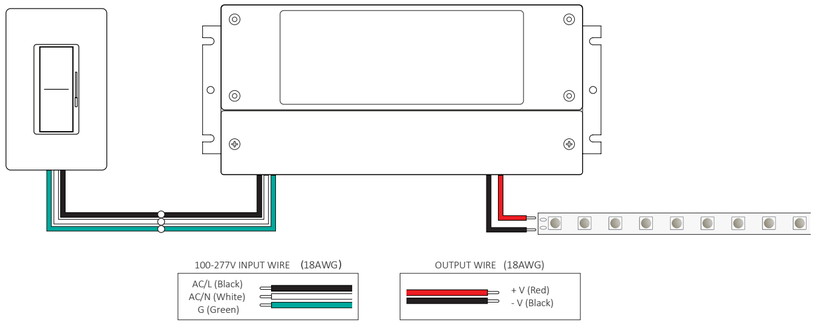
Environment	Indoor/Dry Location
Input Voltage	100-240VAC
Output Voltage	24VDC
Connection Type	Wire
Warranty	3 Year Limited Warranty
Dimming	PWM
Certification	UL Listed

Omnidrive® X Dimmable Hard Wired Driver

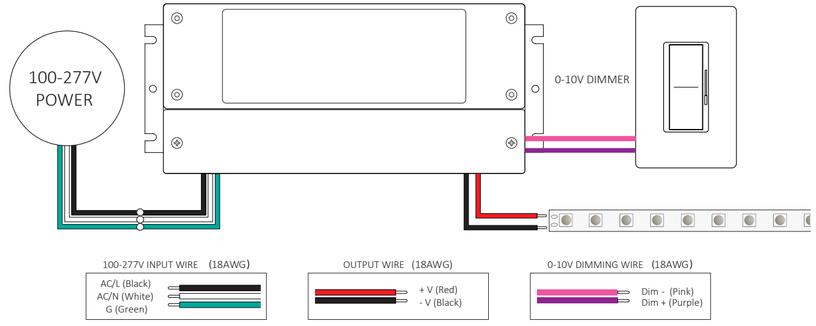
System Diagrams

The following diagrams are provided as example system designs. Always review each component installation guide for detailed and up-to-date wiring instructions. Install in accordance with NEC and local regulations.

OMNIDRIVE® X 2-Wire Dimming or ON/OFF Standard System Diagram



OMNIDRIVE® X 0-10V System Diagram (Dimmer with No Power Pack)



*If utilizing power pack, refer to third party manufacturer's Instruction Guide.

* Driver may not require a framed ground connection. Refer to driver specifications for additional information.

^ Install a compatible dimming control or switch. See the 'Electronic Dimmable Driver / Dimmer Compatibility List' for compatible dimming controls. See the dimming control manufacturer installation guide for complete wiring instructions.

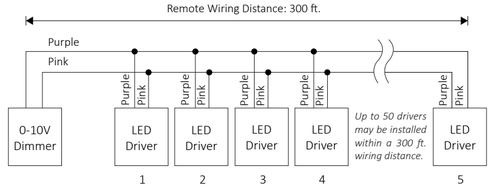
‡‡ See fixture specifications for maximum series run limits.

IG120423-4.0

Omnidrive® X Dimmable Hard Wired Driver

System Diagrams Cont'd

0-10V Dimmable Driver Large Install System Diagram (Example)



Troubleshooting

Fixture does not illuminate	• See 'System Diagram', 'Wiring Connections' and installation guides of all components. Ensure the system is wired correctly and polarities are correct. • Ensure a compatible constant voltage *dimmable* fixture is installed. • Ensure the driver and fixture have the same voltage specifications (12V & 12V, or 24V & 24V).
Fixture does not dim	• Ensure a compatible constant voltage *dimmable* fixture is installed. • Ensure a compatible dimming control is installed and wired correctly. See 'OMNIDRIVE® X / Dimming Control Compatibility List'.
Different fixture types do not dim in sync	• Different fixture types have different circuit designs and may react differently when dimmed. Ensure each fixture type is installed on a separate dimmable driver for best performance.
Fixture is quickly flashing or flickering	• Verify a compatible dimming control is installed. If flickering is apparent at low light levels install a compatible trim-adjustable dimming control. • Ensure a compatible constant voltage *dimmable* fixture is installed. • Ensure different fixture types are not connected to a single driver. Different fixture types must be connected to individual drivers. • Ensure all connections are properly secured. • Ensure fixture is receiving the correct input voltage.
Fixture is slowly flashing	• Ensure driver is not overloaded. An overloaded driver will cause the internal auto-reset to trip repeatedly.
Installation Trips Main Breaker	• Check wiring for short circuit. If breaker continues to trip there may be a short in the driver. Call customer support for a replacement driver.

Additional Resources

Visit the online product page at www.DiodeLED.com for additional product specifications & warranty information.

- **OMNIDRIVE® X Specification Sheet**
  For full specifications.
- **OMNIDRIVE® X Dimming Control Compatibility List**
  For compatible dimming controls.
- **Voltage Drop Charts**
  Use to specify appropriate wire gauge for installation. Available at the 'Tools & Resources' page at www.DiodeLED.com.

Power Sources for Fortina LightStrip

Hardwired Driver
Omnidrive® X Dimmable Hard Wired Driver

OMNIDRIVE® X is a driver with universal dimmer compatibility in most high-performance dimming applications. Simplify installation with universal input voltage and multiple dimming protocols in a single driver.

FEATURES & BENEFITS

- ELV, TRIAC, and 0-10V dimming in a single driver
- 100-277VAC universal input
- No minimum load
- Minimum dimming level of <1%, depending on the dimmer
- UL Listed and Title 24 compliant

QUICK SPECS

Environment	Indoor/Outdoor
Input Voltage	100-277VAC
Output Voltage	12VDC & 24VDC Models
Connection Type	Hardwired
Warranty	5 Year Limited Warranty
Dimming	Forward Phase, Reverse Phase Dimming, and 0-10V Dimming
Certification	UL Listed & JA8/JA10 Compliant

24V OMNIDRIVE® X

OUTPUT	SKU	WATTAGE	CLASS 2	ENVIRONMENT	DIMENSIONS W/O J-BOX	DIMENSIONS W/ J-BOX (-J)
24 VDC	DI-ODX-24V30W(-J)*	30W	Yes	Indoor/Outdoor	2.1x0.8x6.1 in.	3.7x1.36x6.5 in.
	DI-ODX-24V60W(-J)*	60W	Yes	Indoor/Outdoor	2.4x1x7 in.	3.7x1.36x7.4 in.
	DI-ODX-24V96W(-J)*	96W	Yes	Indoor/Outdoor	2.7x1.7x9 in.	3.7x1.36x8.66 in.
	DI-ODX-24V120W-J	120W	No	Indoor/Outdoor	–	3.7x1.36x8.66 in.
	DI-ODX-24V200W-J	200W	No	Indoor/Outdoor	–	4.92x1.95x10.24 in.

12V OMNIDRIVE® X

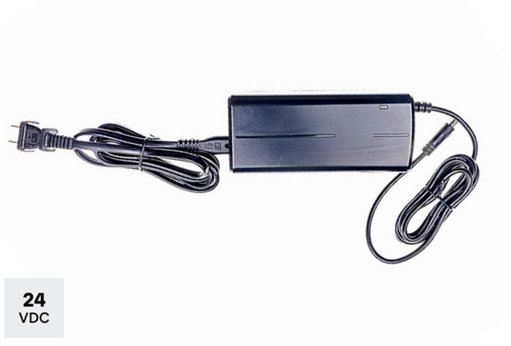
OUTPUT	SKU	WATTAGE	CLASS 2	ENVIRONMENT	DIMENSIONS W/O J-BOX	DIMENSIONS W/ J-BOX (-J)
12 VDC	DI-ODX-12V30W(-J)*	30W	Yes	Indoor/Outdoor	2.1x0.8x6.1 in.	3.7x1.36x6.5 in.
	DI-ODX-12V60W(-J)*	60W	Yes	Indoor/Outdoor	2.4x1x7 in.	3.7x1.36x7.4 in.
	DI-ODX-12V100W-J	100W	No	Indoor/Outdoor	–	3.7x1.36x8.66 in.
	DI-ODX-12V120W-J	120W	No	Indoor/Outdoor	–	3.7x1.36x8.66 in.
	DI-ODX-12V200W-J	200W	No	Indoor/Outdoor	–	4.92x1.95x10.24 in.

These drivers have an optional junction box (J). For driver only, do not include "-J".

Plug-In Power

Commercial Grade
Plug-In Adapter

24VDC Plug-in Adapters convert 120VAC voltage to 24VDC output. An adapter is the right choice for portable installations where hard-wiring is not desired.



FEATURES & BENEFITS

- Black Finish
- Short circuit, over current, over voltage, over temperature protections
- Fanless design / cooling by free-air convection
- UL Listed 1310 Class 2
- For use with commercial applications

QUICK SPECS

Environment	Indoor/Dry Location
Input Voltage	100-240VAC
Output Voltage	24VDC
Connection Type	Wire
Warranty	3 Year Limited Warranty
Dimming	PWM
Certification	UL Listed

DI	—	MODEL	—	VOLTAGE/WATTAGE	—	CLASS	—	COLOR	—	GRADE	
DI	**—**	**PA**	**—**	**24V96W**	**—**	**CL2**		**B (Black)**	**—**	**CG**	(Commercial Grade)

EXAMPLE: 24V 96W Commercial Grade Plug-In Adapter = **DI-PA-24V96W-CL2-B-CG**

Valent X LED Tape

SAFETY & WARNINGS

1. Install in accordance with national and local electrical code regulations.
2. This product is intended to be installed and serviced by a qualified, licensed electrician.
3. Do not modify product beyond instructions or warranty will be void.
4. Do not submerge, nor install within 5 feet of a swimming pool.
5. Only install with a Listed Class 2 DC LED driver.
6. To avoid a visible reduction in light output, ensure wire gauge used with LED Tape Light is sufficient to keep under 3% voltage drop.
7. Do not exceed maximum run recommended for Tape Light.
8. Diode LED Tape Light is designed to be cut at designated cut points only. Cutting anywhere other than the cut points will result in damage to the Tape Light.
9. Failure to follow safety warnings, and installation instructions will void the warranty.

PROPER PREPARATION FOR LED TAPE ADHESION

Handling the Tape Light

- Wear latex gloves when handling tape light to prevent skin oils from contacting the yellow phosphor on the LED chip.
- Oils can stick to the phosphor and degrade it over time when the LEDs generate heat.

Preparing Mounting Surfaces

- Always clean the metal channel and surrounding surfaces thoroughly before applying tape light.
- Use a spray bottle with a 70% alcohol / 30% water solution.
- Allow the surface to dry for 3–5 minutes.
- Adhere the tape light as soon as the surface is dry to prevent dust or debris from settling on it again.

Installing in Aluminum Channel

- Start from the inner corner of the aluminum channel, depending on left-to-right or right-to-left install direction.
- This approach helps reduce dark spots at joints when connecting multiple 8' channel runs.
- How you start the run matters—position the tape light straight and even at the beginning to ensure the rest follows suit properly.

Wet Location LEDs

- Unroll wet-rated LED tape and lay flat to let the run relax before applying.
- Expect some separation between the silicone sleeve and adhesive in areas due to LED being stored in a coiled posture.
- During installation, use beanbags or light clamping to hold the LED in place.
- Allow 12 hours (or overnight) for the tape to fully relax and the adhesive to bond with both the metal and the silicone surfaces.
- Some applications and environments might require overclips to help hold LEDs in place as the bond between adhesives and materials including our wet location silicon jacketed products may be impacted by factors such as temperature variation.

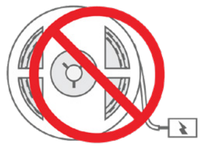
WARNING

DO NOT CONNECT DIRECTLY TO LINE VOLTAGE POWER!

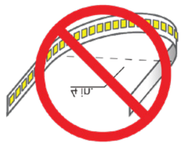
Read all warnings and installation instructions thoroughly.

HANDLE WITH CARE

Do not cover Tape light with any materials.

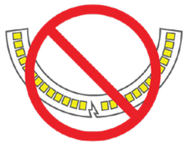


Do not power Tape Light while attached to spool or tightly coiled.



Do not bend LED Tape Light to a diameter less than 4 inches.

Do not fold, crease, or twist LED Tape Light.



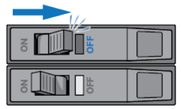
Do not bend LED Tape Light on a horizontal plane.

FORTINA LIGHTSTRIP INSTALLATION INSTRUCTIONS

Valent X LED Tape

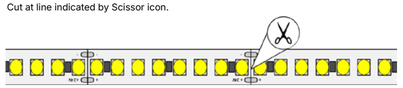
1. Turn Power Off at Circuit Breaker

Never cut tape light attached to a live circuit. Do not exceed Class 2 Limit.



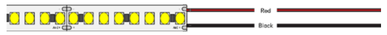
2. Cut Tape Light to Desired Length

Cut at line indicated by Scissor icon.



3. Connect Tape Light to Wire

Ensure polarity matches from the tape light to the wire.



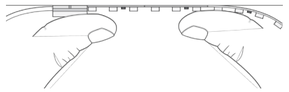
4. Mount Tape Light (Dry)

Clean surface before mounting.

Peel off 3M™ adhesive backing. Ensure minimum ambient temperature of 50°F (10°C) or tape light will not adhere properly.

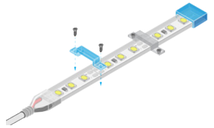
Tear off backing along connector edge.

Adhere to a smooth, dry surface, working from one end to the other, being gentle with the LEDs.



5. Mount Tape Light (Wet)

Mount using included mounting clips/screws. Silicone adhesive can also be utilized to mount tape light to surfaces.



6. Turn Power On at Circuit Breaker

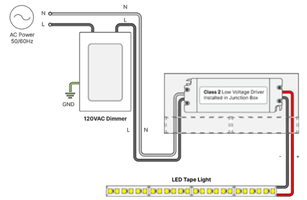
SYSTEM DIAGRAM

Mount using included mounting clips/screws. Silicone adhesive can also be utilized to mount tape light to surfaces.

The following diagram is an example system design. For information regarding larger systems or systems not pictured below, please see our web page or contact technical support. Always review each component installation guide for detailed and up-to-date wiring instructions. Install in accordance with national and local electrical codes.

Other diagrams will vary based on power and dimming requirements.

Standard Dimmer System



Omnidrive® X Dimmable Hard Wired Driver

Before you begin, read all warnings and installation instructions thoroughly.

Safety & Warnings ⚠

- Install in accordance with the National Electric Code, and local regulations.
- This product is intended to be installed and serviced by a qualified, licensed electrician.
- Only install compatible LED fixtures & controls. Only use copper wiring.
- Proper heat dissipation will prolong the working lifespan of this product. Install in a well-ventilated area free from explosive gases and vapors.
- Ensure applicable wire is installed between driver, fixture, and any controls in between. When choosing wire, factor in voltage drop, amperage rating, and type (in-wall rated, wet location rated, etc.). Inadequate wire installation could overheat wires, and cause a fire.
- Do not install if product has any visible damage.
- Do not modify or disassemble this product beyond instructions or the warranty will be void.

Quick Specs

Input Voltage	120-277VAC, 50/60Hz
Output Voltage	See driver label
Ambient Temperature †	-40°F ~ 140°F (-40°C ~ 60°C)
Minimum Load	None
Maximum Load	Refer to 'Derating Curve'

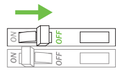
† Do not install product in an environment outside the listed ambient temperature.

Installation

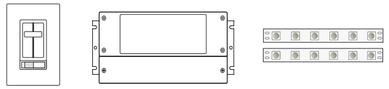
Prior to installation, ensure all components are a compatible system. Configure and pre-test your LED system prior to permanent installation to ensure all components are operating correctly. Install in accordance with the NEC and local regulations.

1. **Turn OFF High Voltage AC Power** at the main breaker.

⚠WARNING **Shock Hazard. May result in serious injury or death.** Turn off power at circuit breaker before installing this product.



2. **Determine Locations to Install 3 Main Components.** Refer to the 'System Diagrams.'



1) Compatible Control 2) Driver 3) Fixture

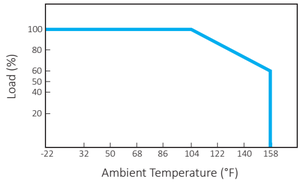
Ensure applicable wire is installed between driver, fixture, and any controls in between. When choosing wire, factor in voltage drop, amperage rating, and type (in-wall rated, wet location rated, etc.).

3. **Mount Driver to Surface.** See 'Wiring Connections' for mounting holes. **Driver may be mounted in any orientation**.

4. **Attach Lighting Load and Control.** ***Only use copper wiring.*** Refer to 'Wiring Connections', 'System Diagrams', and dimming control installation guides. **Ensure to install a compatible dimming control** listed on the 'OMNIDRIVE® X Dimming Control Compatibility List' available at www.DiodeLED.com.

a. When installing in ambient temperatures that may reach over 100°F, **refer to the 'Derating Curve' to avoid overheating and damage to the driver.**

DERATING CURVE



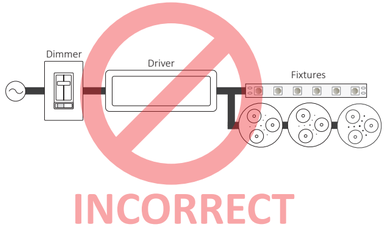
IG120423-4.0

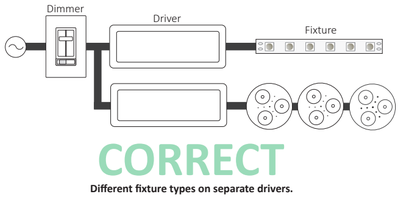
Omnidrive® X Dimmable Hard Wired Driver

4 Continued

b. **All Models** - Use applicable UL Listed wire nuts and junction box to secure wire connections.

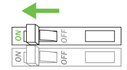
c. **Do not install different fixture types on the same power supply** as flickering and altered dimming range may occur.





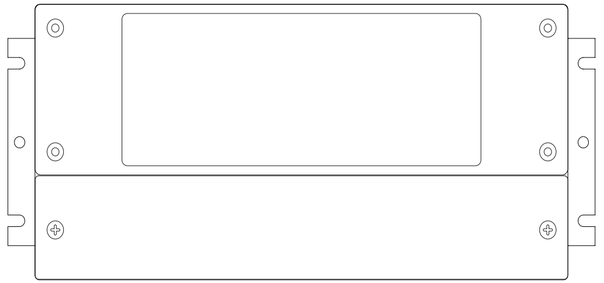
Different fixture types on separate drivers.

5. **Install Additional Components, Verify connections, and Turn Main Power ON at Breaker.**



If system remains unresponsive or is working improperly, turn OFF main power at breaker and verify all connections. Review the 'Wiring Connections', 'System Diagrams', and dimming control installation guides.

Mechanical Diagram



Wire caps must be removed from purple and pink wires for 0-10V installations.
Wire caps must remain on purple and pink wires for all other installations.

General Technical Information / Performance

Overview
Fortina QuickStick is an environmentally friendly polypropylene film, replicating real veneers with a hyper-realistic non-PVC surface. The combination of these materials makes the collection perfect for “green” building. The large collection of finishes has a touch and feel that is indistinguishable from real wood. It dramatically enhances environments with the benefits of lighter weight, less cost, less waste, easier maintenance, as well as more consistent color and finish than real wood.

Description
Fortina QuickStick Adhesive Backed film is suitable for bonding to most surfaces. The adhesive provides an excellent bond to various fabricated foams, fabrics, substrates and has good shear strength at elevated temperatures.

Construction
A high strength adhesive with a nonstick liner.

Product Dimension
- Width: 960mm (3 feet) or 1,260mm (4 feet)
- Thickness: 0.13mm to 0.16mm (subject to emboss structure)
- Roll size 50LM per roll (shipped in cardboard box)
- MOQ: 250 LM (5 rolls x 50 LM)

Product Benefit
- 100% PVC FREE (no chlorine, no plasticizer)
- Special surface textures and varieties of designs
- Excellent properties (BS EN 438)
- Choose from over 100 different colors (50m / 250m roll)

Typical Physical Properties and Performance Characteristics
Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

Surface	**72 Hour Dwell**		**72 Hour Dwell @ 158°F**
	Oz./In.	N/100mm	Oz./In.
Stainless Steel	88	98	177
Stainless Steel High Surface Energy Surfaces, such as HPL, Acrylic, ABS and other Non-Porous Hard Surfaces	72	80	49

Environmental Performance
The bond strength of the adhesive increases as a function of time and temperature.

Temperature Resistance	Short term: 250 (121°C)
Humidity Resistance	No adverse effect on the bond after exposure to 100% relative humidity at 100 (38°C)
U.V. Resistance	Adhesive is resistant to oxidation and ozone when exposed to air or ultraviolet light.

Environmental Performance
Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

Shear Adhesion: (ASTM D3654, 1” x 1” Overlap with one hour dwell).

Surface		**Minutes to Fail**
Stainless Steel	1000 grams at room temperature 250 grams at 158°F(70°C) high temperature	10,000 10,000

Installation

Adhesive Backed Film (QuickStick) Installation Guide
QuickStick is the ideal product for refacing non-porous, clean surfaces. The product can be used in a wide variety of applications such as, Cabinet Refacing for Residential, Commercial Casework Refacing, Wall System Refacing, Refrigerator Refurbishment, and Office Furniture Refurbishment.

Adhesive Properties
Toppan does not warranty the adhesive properties of the QuickStick because it is impossible to control the substrate variables. If, however, you receive product that is visibly defective, please contact us within 48 hours of receipt of the product for replacement. Preparing the surface may seem like an obvious part of the vinyl installation process, but often time it is the most obvious steps that people miss. Whether it is hurried installers working by the job or inexperienced applicators who don’t understand the process, contaminated substrates are one of the leading causes of adhesion failure.

Installation
Step 1
Surface Preparation. This is the most critical step of the process. Clean the surface with a degreaser that does not contain ammonia, which can leave a residue and affect adhesive on the film. Cleaning products which do not degrease will not work. Sufficient time should be allowed for the degreaser to evaporate completely after cleaning. Other solvents may alter the target surface or reduce the adhesion properties of the vinyl film. Application should not take place at temperatures below +10°C (+50°F). Surface contamination and application below minimum temperatures are avoidable causes for adhesion failure.
Step 2
Fill the gaps and holes with wood filler. Although our thick QuickStick product will hide most telegraphing, large gaps will still be visible even under the product. Be sure the cabinets are smooth enough and that there are no loose particles left on the cabinet surface.
Step 3
Apply the film. When applying the QuickStick film be sure to only pull the release paper as you apply it. If you pull it off first you can wrinkle the product and small particles can get onto the adhesive back. Be careful about over handling the product as the oil from your hands can decrease the adhesive properties.
Step 4
Trim. When trimming the QuickStick, use a sharp blade as well as straight edge guides to assist you. Remember that if there is any material that is exposed, even by a micron, then it could be pulled up. Some companies hold their knives at an angle on cabinet bottoms to ensure there are no edges to be picked up.
Step 5
Setting. Be sure to rub the surfaces with a clean rag. Rollers will not get the material to bite as well as your fingers can (fingers can apply pressure to multiple points). Rollers are okay to use, but always conclude with this rubbing technique as a finishing touch.

Our QuickStick product can drastically cut down installation time and reduce the amount of dust created during installation. Please note that, like most new crafts, you will develop your own techniques and will be able to identify which applications warrant the use of laminate and which applications warrant the use of QuickStick.

Characteristics / Warranty

Storage
Store at room temperature conditions of 72°F(22°C) and 50% relative humidity.

Shelf Life
Product retains its performance properties for two years from date of manufacture.

Technical Information
The technical information, recommendations, and other statements contained in this document are based upon tests or experience that Toppan believes are reliable, but the accuracy or completeness of such information is not guaranteed.

Product Use
Many factors beyond Toppan’s control and uniquely within user’s knowledge and control can affect the use and performance of a Toppan product in a particular application. Given the variety of factors that can affect the use and performance of the product, user is solely responsible for evaluating the product and determining whether it is a fit for a particular purpose and suitable for user’s method of application.

Limitation of Liability
Except where prohibited by law, Toppan will not be liable for any loss or damage arising from the product, whether direct, indirect, special, incidental, or consequential, regardless of the legal theory asserted, including warranty, contract, negligence, or strict liability.

Terms And Conditions

QUOTE BY PHONE
1-800-350-4127 (Outside Northern California)
1-650-593-4127 (Northern California)

QUOTE/ORDERING BY E-MAIL
MAIL@BNIND.COM (Ready 24 hours a day)

CUSTOMER SERVICE
Customer service is available 8:00 am to 5:00 pm (PST) Mon. – Thurs. and 8:00 am to 12:00 pm on Fri. to answer your inquiries regarding products, quotes or orders.

WARRANTY
We fully support the quality of our product. If there are any manufacturing defects within a year of delivery, please contact our Customer Service Department by phone or e-mail for assistance.

PRODUCT WARRANTY LIMITATIONS
The Customer is purchasing the fixtures in an "as-is" condition, unless otherwise reported to the Company pursuant to [the inspection provision in the contract], as of the date of delivery and specifically and expressly without any warranties, representations or guarantees, either expressed or implied, except as set forth below, as to its condition, fitness for any particular purpose, merchantability, or any other warranty of any kind, nature or type whatsoever from or on behalf of the seller.
The Company hereby warrants to the Customer and its successors and assigns that the product supplied to the Customer is constructed only for the use and purposes contemplated by the Customer set forth in the contract; and the Company, immediately prior to the delivery of the product had good and lawful right to sell the product, and that there is hereby conveyed to the Customer on the date of delivery, good title to the product, free and clear of all liens, claims, encumbrances and rights of others.

WEBSITE / PRINTED MATERIALS
The copy has been reviewed to present information as accurately as possible. If an error is found in description or pricing, or the item has been discontinued, yet not updated, B+N reserves the right to correct it at the time it was discovered.
PRODUCT OFFERINGS AND MATERIAL FINISHES ARE SUBJECT TO CHANGE AT ANY TIME.

ORDER SHIPMENTS ESTIMATES
Orders in stock will ship via ground in 2 – 5 days, unless another service level is requested by the customer.

BACK ORDERS
Unless otherwise noted, back orders will ship when they are back in stock at our facility. Your Sales Administrator will keep you advised on the status of all back orders.

BLANKET ORDERS
Blanket orders are subject to a unique set of Terms & Conditions defined at the time of order placement.

MINIMUM ORDER REQUIREMENTS
$500 threshold must be reached to place an order.

STORAGE
Storage fees will be assessed after 30 days for all materials that were scheduled to ship but were delayed for customer related reasons at no fault to B&N Industries. Fees will be assessed weekly at $500 or 5% of the total order, whichever is greater. If an order is paid in full, then the storage fees must be cleared prior to shipment. If an order is partially paid for, then the remaining balance on the order plus storage fees must be paid prior to shipment.

CANCELLATION AND RETURN ITEMS
1. Stock items must be returned within 30 days, in re-sellable condition. Return of stock items may incur a 25% re-stocking fee. Freight charges on returns are the customer's responsibility. A return authorization is required for all returns. Items returned without the proper authorization will not be accepted. B+N assumes no liability for customer returns which arrive damaged due to shipment transportation.
2. Non-stock items purchased may not be returned.
3. Prepaid material that remains beyond the 30-day original delivery schedule prior to cancellation will also be subject to storage fees.

FREIGHT AND MULTIPLE SHIPMENTS
1. The following will result in additional charges unless otherwise stated on your quotation:
– Shipments to multiple destinations or split shipments to the same location.
– Customer requesting custom packaging (includes breakout into multiple packages) and shipped to one location.
2. Collect or 3rd Party Billing shipments are the responsibility of the freight payer.
3. Freight quotations are subject to re-quote at any time prior to the order being placed or at time of shipment if shipment is delayed.
4. Customer is responsible to arrange and pay for International freight, as quotes are for transportation only. Freight quotes provided by B&N do not include the broker, customs duties, fees or taxes. That is the responsibility of the customer to obtain and pay directly to the source. Broker information must be provided prior to shipping.
5. Weights and measurements may change due to changes in suppliers and/or packaging.
6. B&N is unable to guarantee delivery times or dates. Delivery times and dates are the responsibility of the shipping agent.
7. Regarding split shipments: On occasion, an order may ship from multiple locations based on availability.

PRODUCT DISCREPANCIES AND DAMAGES VIA SHIPMENT
1. Customer must inspect items upon delivery for damage or discrepancy. Please refer to B&N's Delivery Shipper Checklist Info document for terms.

The Delivery Checklist can be found here:
https://www.BNIND.COM/resources/technical-data

2. B+N accepts no liability for damage incurred during shipping. Any damage found at time of delivery must be noted by customer on delivery receipt and signed/initialed by driver. Customer is to retain all packaging with damaged items for an on-site inspection by carrier.
3. For damage on 3rd party or collect shipments, the customer is responsible for filing the claim with the carrier for financial reimbursement.
4. If any product arrives in damaged condition, a freight claim must be filed with the delivering carrier. Retain packing material and note on the Bill of Lading "DAMAGED". Our Customer Service Department will assist you with any questions regarding filing a freight claim.
5. All claims regarding shortages and freight damages must be presented WITHIN 7 DAYS of receiving the shipment.

PAYMENT METHODS AND TERMS
ACH, Wire, and Company Checks
· Banking information can be provided upon request for electronic payment options

Credit Cards (subject to 2.5% processing fee)
· We accept VISA, MASTERCARD, AMERICAN EXPRESS.

1. Payment is due in full prior to shipping of product for all PREPAID ACCOUNTS. We do not ship COD. For payments made by check or bank transfer, the order will be processed upon receipt and approval of check or receipt of funds.
2. Consideration for establishing terms requires a combined order amount of $1,000,000+.
3. Approved repeat customers may qualify for NET terms at B&N's discretion if sufficient volume is reached. A credit application must be completed with the necessary references. Please allow 2-3 weeks for processing. All custom orders outside of a standard project scope will continue to require a 50% deposit.

SALES TAX
Due to the Wayfair vs South Dakota ruling all orders are subject to sales tax in the state that the material is delivered to unless a valid resale certificate is provided. Due to uncertain Economic Nexus requirements sales tax can be added to any order after a quote has been provided.
1. Taxable orders paid for by the customer and will-called at our California facility are taxed at the current rate for San Mateo County.

PROTOTYPES, DRAWINGS, TOOLING, AND FIXTURES
1. Drawings provided by B+N are the exclusive property of B+N Industries, Inc.
2. Prototypes made from drawings that are not detailed and approved by B+N Industries, Inc., or have been supplied via verbal instruction from the customer, are subject to the interpretation of B+N Industries, Inc.
3. Tooling dies and fixtures made and used exclusively for a job or customer, remain the property of B+N Industries, Inc., unless otherwise established.

PHOTOGRAPHY OF COMPLETED PROJECTS
B+N Industries, Inc. reserves the right to photograph a completed project that has utilized our product offerings and retains the rights to use the photographs in advertising, on our website, public relations and all marketing materials.

FORTINA SPECIFIC ORDERS WARRANTY
WARRANTY
We support the quality of the Fortina product for 10 years. For more information, please visit our Warranty section.

CANCELLATION AND RETURN ITEMS
Fortina is considered a custom made to order line, therefore, may not be returned.
If an order is canceled which is in production the customer is liable for paying for all products ordered.

B+N Industries

Main Offices:
15 Guittard Road
Burlingame, California 94010
1.800.350.4127
www.BNIND.COM

New York Showroom and Offices:
(By Appointment Only)
420 West 14th Street
New York, New York 10014
212.255.4110

Houston Showroom and Offices:
(By Appointment Only)
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pinterest.com/bnindustries/