1. Outrigger
   A member projecting from a curtain wall product to hold and support louvers and fascia elements.

2. Louver
   Horizontal extruded member that acts as a canopy and controls the radiation of light through glazing elements.

3. Fascia
   Outermost louver element that trims the face of the ThermaShade assembly.

4. Outrigger Connector
   "I" shaped extrusion used to align adjacent outriggers and prevent separation under loading conditions.

5. Flat Outrigger Cap
   Finished part used to cap the external gap created by two square extruded outriggers.

6. Spacer
   Unfinished part used at anchor clip to ensure proper spacing between ThermaShade assemblies.

7. Face Cover
   Extrusions that cover the pressure plate and anchoring components.

8. Face Cover Splice
   Formed angles used as a backer for the sealing of the joint between two face covers.

9. Medallion
   Circular attachment component used to prevent separation between the end outrigger and the first ThermaShade unit.
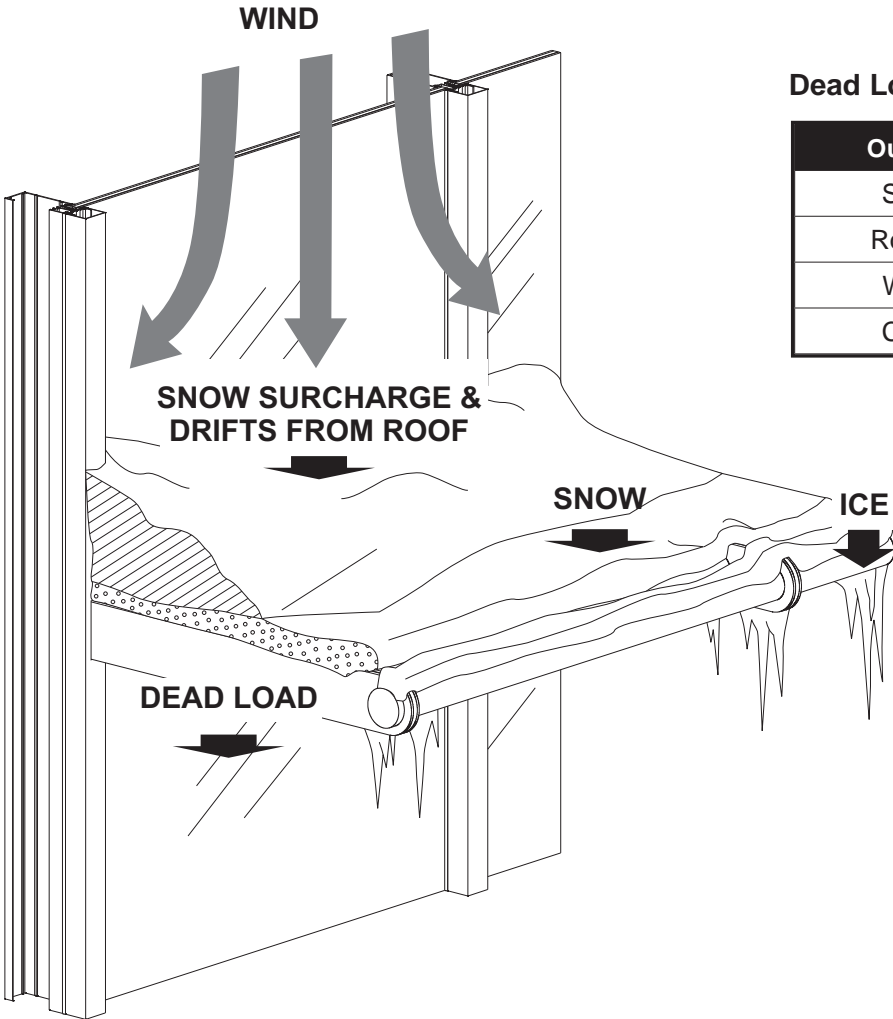
10. Pressure Plate Assembly
   Aluminum extrusion combined with gaskets and thermal isolator used to seal and retain the glass in a curtain wall system.

11. Anchor Clip
   Prefabricated part to attach ThermaShade units to curtain wall system.

12. Mitered Cover
   Optional cover attachment.

WIND

SNOW SURCHARGE & DRIFTS FROM ROOF

SNOW

ICE

DEAD LOAD

Dead Load Weight per Square Foot

Outrigger	Weight
Square	3.65 lbs./FT²
Rounded	3.09 lbs./FT²
Wedge	4.63 lbs./FT²
Curved	3.08 lbs./FT²

After certified combined load data indicated below has been obtained, it should be used to determine if project qualifies for use of pre-engineered ThermaShade®. A copy of this document must be maintained in your files.

NOTE: Allowable combined load (in PSF) as required by the code of jurisdiction and/or code referenced in ASCE standard (Minimum Design Loads for Buildings and Other Structures) and determined by the building engineer of record (reference signed document) consisting of dead – see chart above – load plus other load effects such as snow, snow surcharges and drifts, ice, wind, live load roof, or others.
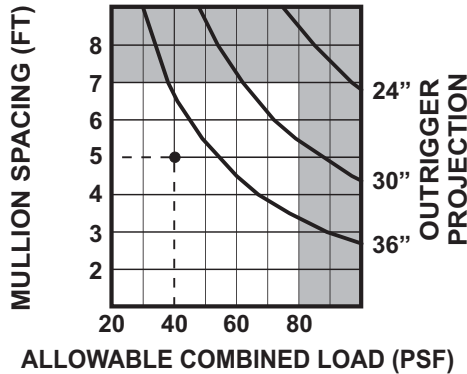
PROJECT: _____

LOCATION: _____

COMBINED LOAD: _____

ENGINEER OF RECORD: _____

SIGNATURE _____

DATE: _____

ThermaShade® Calculation Worksheet for E9-1215

Chart A
ALLOWABLE UNIFORM COMBINED LOAD FOR THERMASHADE ATTACHED TO E9-1215 MULLION

MULLION SPACING (FT)

24"
30"
36"
OUTRIGGER PROJECTION

ALLOWABLE COMBINED LOAD (PSF)

Chart B

ThermaShade Length	Combined Load	Reduction Factor
24 Inch	80 PSF	0.81
24 Inch	60 PSF	0.86
24 Inch	40 PSF	0.90
24 Inch	20 PSF	0.95
30 Inch	80 PSF	0.73
30 Inch	60 PSF	0.82
30 Inch	40 PSF	0.85
30 Inch	20 PSF	0.92
36 Inch	80 PSF	0.64
36 Inch	60 PSF	0.71
36 Inch	40 PSF	0.80
36 Inch	20 PSF	0.89

E9-1215 WITH HORIZONTALS WITHOUT THERMASHADES

VERTICAL SPAN (FT)

20 PSF
30 PSF
40 PSF
50 PSF
60 PSF

MULLION SPACING (FT)

Use the following charts to validate outrigger projection, mullion spacing, and vertical span. The following worksheet is for one standard ThermaShade per mullion.

Use the following job requirements as an example:
Combined Load = 40 psf
Mullion Spacing = 5'
Desired Outrigger Projection = 30"
Vertical Span = 15.75'
Wind Load = 20 psf

STEP 1
OBTAIN COMBINED LOAD
*COMBINED LOAD: _____ (example: 40 psf)

*Allowable combined load (in PSF) as required by the code of jurisdiction and/or code referenced ASCE standard (Minimum Design Loads for Buildings and Other Structures) and determined by the building engineer of record (reference signed document) consisting of dead load plus other load effects such as snow, snow surcharges and drifts, ice, wind, live load roof, or others.

STEP 2
VALIDATE OUTRIGGER PROJECTION
Using **Chart A**, validate the desired sunshade depth (outrigger projection).
*COMBINED LOAD: _____
(Draw a vertical line at the Combined Load. Example: 40 psf)
VERTICAL MULLION SPACING: _____
(Draw horizontal line at Mullion Spacing. Example: 5')
DESIRED OUTRIGGER PROJECTION: _____
(Example: 30")

Intersecting point must be below the curve of the Outrigger Projection. In the example shown, the intersecting point is below the 30" Outrigger Projection curve, therefore it is validated.

STEP 3
DETERMINE REDUCTION FACTOR
Determine Wind Load reduction factor from **Chart B**.

REDUCTION FACTOR: _____ (example: 0.85)
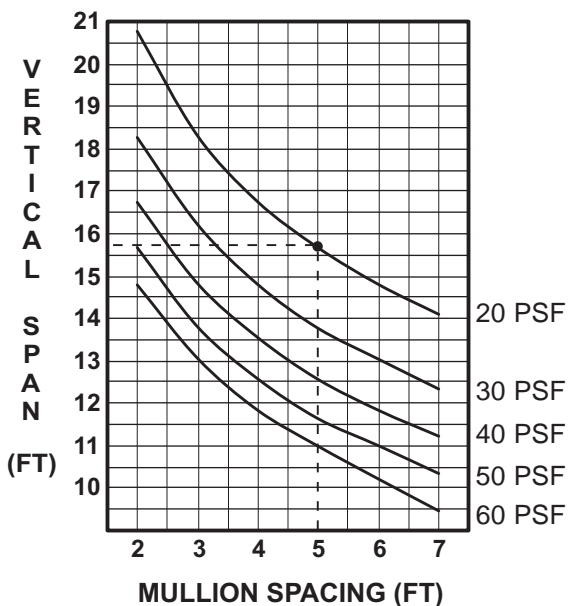Note: Interpolate the reduction factor for combined loads not shown.

STEP 4
APPLY REDUCTION FACTOR AND VALIDATE THE DESIRED VERTICAL SPAN
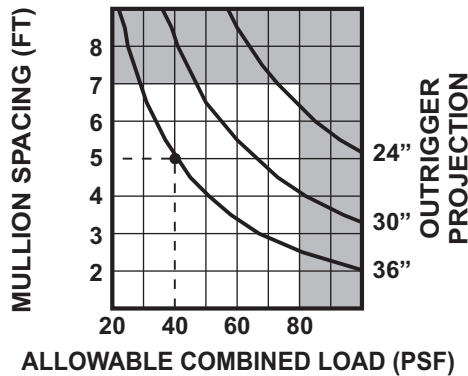Using the standard Wind Load Chart to the left, apply the Reduction Factor to the Vertical Span.
-Draw a vertical line at the Mullion Spacing until it intersects the desired Wind Load curve. (Example: 5'/20psf)
-Draw a horizontal line at the intersecting point and determine the Vertical Span (before applying the Reduction Factor). (Example: 15.75')
-Multiply the Vertical Span by the Reduction Factor to determine if the reduced span is acceptable. For example:
15.75' (Vertical Span) X 0.85 (Reduction Factor) = 13.39'. Since 15.75' is greater than 13.39', the desired Vertical Span has been validated.

If any of the data calculated above does not validate the desired job requirements, consider reducing the outrigger projection, mullion spacing or vertical span. Solutions may also be available to meet your specific needs by contacting our engineering group at 1-866-955-2732.

ThermaShade® Calculation Worksheet for E9-1225

YKK ap®

Chart A

ALLOWABLE UNIFORM COMBINED LOAD FOR THERMASHADE ATTACHED TO E9-1225 MULLION

MULLION SPACING (FT)

OUTRIGGER PROJECTION

24"
30"
36"

ALLOWABLE COMBINED LOAD (PSF)

Chart B

ThermaShade Length	Combined Load	Reduction Factor
24 Inch	80 PSF	0.79
24 Inch	60 PSF	0.86
24 Inch	40 PSF	0.89
24 Inch	20 PSF	0.94
30 Inch	80 PSF	0.68
30 Inch	60 PSF	0.75
30 Inch	40 PSF	0.83
30 Inch	20 PSF	0.92
36 Inch	80 PSF	0.58
36 Inch	60 PSF	0.66
36 Inch	40 PSF	0.76
36 Inch	20 PSF	0.88

E9-1225 WITH HORIZONTALS WITHOUT THERMASHADES

VERTICAL SPAN (FT)

20 PSF
30 PSF
40 PSF
50 PSF
60 PSF

MULLION SPACING (FT)

Use the following charts to validate outrigger projection, mullion spacing, and vertical span. The following worksheet is for one standard ThermaShade per mullion.

Use the following job requirements as an example:
Combined Load = 40 psf
Mullion Spacing = 5'
Desired Outrigger Projection = 30"
Vertical Span = 14.4'
Wind Load = 20 psf

STEP 1
OBTAIN COMBINED LOAD
   *COMBINED LOAD: _____ (example: 40 psf)

*Allowable combined load (in PSF) as required by the code of jurisdiction and/or code referenced ASCE standard (Minimum Design Loads for Buildings and Other Structures) and determined by the building engineer of record (reference signed document) consisting of dead load plus other load effects such as snow, snow surcharges and drifts, ice, wind, live load roof, or others.

STEP 2
VALIDATE OUTRIGGER PROJECTION
Using **Chart A**, validate the desired sunshade depth (outrigger projection).
   *COMBINED LOAD: _____
   (Draw a vertical line at the Combined Load. Example: 40 psf)
   VERTICAL MULLION SPACING: _____
   (Draw horizontal line at Mullion Spacing. Example: 5')
   DESIRED OUTRIGGER PROJECTION: _____
   (Example: 30")

Intersecting point must be below the curve of the Outrigger Projection. In the example shown, the intersecting point is below the 30" Outrigger Projection curve, therefore it is validated.

STEP 3
DETERMINE REDUCTION FACTOR
Determine Wind Load reduction factor from **Chart B**.

   REDUCTION FACTOR: _____ (example: 0.83)
   Note: Interpolate the reduction factor for combined loads not shown.

STEP 4
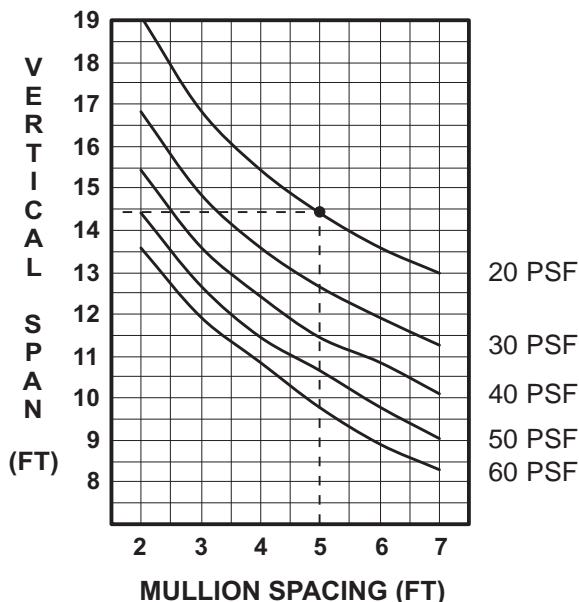### APPLY REDUCTION FACTOR AND VALIDATE THE DESIRED VERTICAL SPAN
Using the standard Wind Load Chart to the left, apply the Reduction Factor to the Vertical Span.
-Draw a vertical line at the Mullion Spacing until it intersects the desired Wind Load curve. (Example: 5'/20psf)
-Draw a horizontal line at the intersecting point and determine the Vertical Span (before applying the Reduction Factor). (Example: 14.4')
-Multiply the Vertical Span by the Reduction Factor to determine if the reduced span is acceptable. For example:
14.4' (Vertical Span) X 0.83 (Reduction Factor) = 11.95'. Since 14.4' is greater than 11.95', the desired Vertical Span has been validated.

If any of the data calculated above does not validate the desired job requirements, consider reducing the outrigger projection, mullion spacing or vertical span. Solutions may also be available to meet your specific needs by contacting our engineering group at 1-866-955-2732.

Chart A

ALLOWABLE UNIFORM COMBINED LOAD FOR THERMASHADE ATTACHED TO E9-1246 MULLION

MULLION SPACING (FT)

OUTRIGGER PROJECTION

24"
30"
36"

ALLOWABLE COMBINED LOAD (PSF)

Chart B

ThermaShade Length	Combined Load	Reduction Factor
24 Inch	80 PSF	0.76
24 Inch	60 PSF	0.82
24 Inch	40 PSF	0.87
24 Inch	20 PSF	0.94
30 Inch	80 PSF	0.65
30 Inch	60 PSF	0.72
30 Inch	40 PSF	0.81
30 Inch	20 PSF	0.90
36 Inch	80 PSF	0.54
36 Inch	60 PSF	0.62
36 Inch	40 PSF	0.73
36 Inch	20 PSF	0.86

E9-1246 WITH HORIZONTALS WITHOUT THERMASHADES

VERTICAL SPAN (FT)

20 PSF
30 PSF
40 PSF
50 PSF
60 PSF

MULLION SPACING (FT)

Use the following charts to validate outrigger projection, mullion spacing, and vertical span. The following worksheet is for one standard ThermaShade per mullion.

Use the following job requirements as an example:
Combined Load = 40 psf
Mullion Spacing = 5'
Desired Outrigger Projection = 30"
Vertical Span = 13.6'
Wind Load = 20 psf

STEP 1
OBTAIN COMBINED LOAD
 *COMBINED LOAD: _____(example: 40 psf)

*Allowable combined load (in PSF) as required by the code of jurisdiction and/or code referenced ASCE standard (Minimum Design Loads for Buildings and Other Structures) and determined by the building engineer of record (reference signed document) consisting of dead load plus other load effects such as snow, snow surcharges and drifts, ice, wind, live load roof, or others.

STEP 2
VALIDATE OUTRIGGER PROJECTION
Using **Chart A**, validate the desired sunshade depth (outrigger projection).
 *COMBINED LOAD: _____
 (Draw a vertical line at the Combined Load. Example: 40 psf)
 VERTICAL MULLION SPACING: _____
 (Draw horizontal line at Mullion Spacing. Example: 5')
 DESIRED OUTRIGGER PROJECTION: _____
 (Example: 30")

Intersecting point must be below the curve of the Outrigger Projection. In the example shown, the intersecting point is below the 30" Outrigger Projection curve, therefore it is validated.
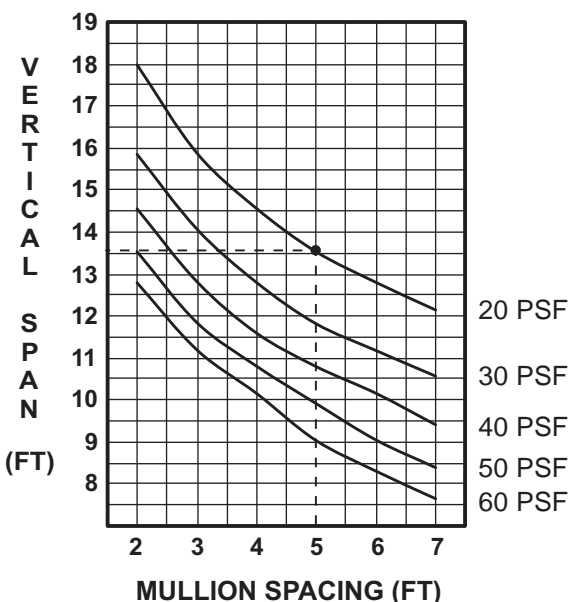
STEP 3
DETERMINE REDUCTION FACTOR
Determine Wind Load reduction factor from **Chart B**.

 REDUCTION FACTOR: _____(example: 0.81)
 Note: Interpolate the reduction factor for combined loads not shown.

STEP 4
APPLY REDUCTION FACTOR AND VALIDATE THE DESIRED VERTICAL SPAN
Using the standard Wind Load Chart to the left, apply the Reduction Factor to the Vertical Span.
-Draw a vertical line at the Mullion Spacing until it intersects the desired Wind Load curve. (Example: 5'/20psf)
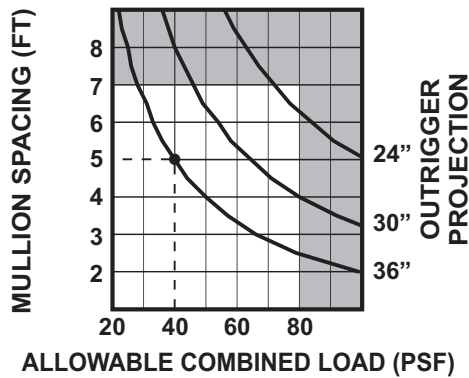-Draw a horizontal line at the intersecting point and determine the Vertical Span (before applying the Reduction Factor). (Example: 13.6')
-Multiply the Vertical Span by the Reduction Factor to determine if the reduced span is acceptable. For example:
13.6' (Vertical Span) X 0.81 (Reduction Factor) = 11.02'. Since 13.6' is greater than 11.02', the desired Vertical Span has been validated.

If any of the data calculated above does not validate the desired job requirements, consider reducing the outrigger projection, mullion spacing or vertical span. Solutions may also be available to meet your specific needs by contacting our engineering group at 1-866-955-2732.

Chart A

ALLOWABLE UNIFORM COMBINED LOAD FOR THERMASHADE ATTACHED TO E9-3601 &3602 MULLION

Chart B

ThermaShade Length	Combined Load	Reduction Factor
24 Inch	80 PSF	0.80
24 Inch	60 PSF	0.85
24 Inch	40 PSF	0.90
24 Inch	20 PSF	0.95
30 Inch	80 PSF	0.69
30 Inch	60 PSF	0.77
30 Inch	40 PSF	0.84
30 Inch	20 PSF	0.92
36 Inch	80 PSF	0.57
36 Inch	60 PSF	0.67
36 Inch	40 PSF	0.78
36 Inch	20 PSF	0.89

E9-3601/E9-3602
(Mullion Clips or Horizontals Placed Every 36")
WITHOUT THERMASHADES

Use the following charts to validate outrigger projection, mullion spacing, and vertical span. The following worksheet is for one standard ThermaShade per mullion.

Use the following job requirements as an example:
Combined Load = 40 psf
Mullion Spacing = 5'
Desired Outrigger Projection = 30"
Vertical Span = 15.6'
Wind Load = 20 psf

STEP 1

OBTAIN COMBINED LOAD
   *COMBINED LOAD: _____ (example: 40 psf)

*Allowable combined load (in PSF) as required by the code of jurisdiction and/or code referenced ASCE standard (Minimum Design Loads for Buildings and Other Structures) and determined by the building engineer of record (reference signed document) consisting of dead load plus other load effects such as snow, snow surcharges and drifts, ice, wind, live load roof, or others.

STEP 2

VALIDATE OUTRIGGER PROJECTION
Using **Chart A**, validate the desired sunshade depth (outrigger projection).
   *COMBINED LOAD: _____
   (Draw a vertical line at the Combined Load. Example: 40 psf)
   VERTICAL MULLION SPACING: _____
   (Draw horizontal line at Mullion Spacing. Example: 5')
   DESIRED OUTRIGGER PROJECTION: _____
   (Example: 30")

Intersecting point must be below the curve of the Outrigger Projection. In the example shown, the intersecting point is below the 30" Outrigger Projection curve, therefore it is validated.

STEP 3

DETERMINE REDUCTION FACTOR
Determine Wind Load reduction factor from **Chart B**.

   REDUCTION FACTOR: _____ (example: 0.84)
   Note: Interpolate the reduction factor for combined loads not shown.

STEP 4

APPLY REDUCTION FACTOR AND VALIDATE THE DESIRED VERTICAL SPAN
Using the standard Wind Load Chart to the left, apply the Reduction Factor to the Vertical Span.
-Draw a vertical line at the Mullion Spacing until it intersects the desired Wind Load curve. (Example: 5'/20psf)
-Draw a horizontal line at the intersecting point and determine the Vertical Span (before applying the Reduction Factor). (Example: 15.6")
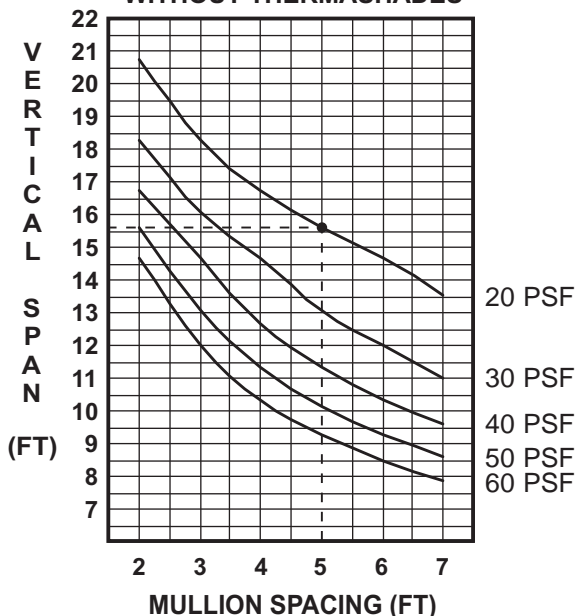-Multiply the Vertical Span by the Reduction Factor to determine if the reduced span is acceptable. For example:
  15.6' (Vertical Span) X 0.84 (Reduction Factor) = 13.10'. Since 15.6' is greater than 13.10', the desired Vertical Span has been validated.

If any of the data calculated above does not validate the desired job requirements, consider reducing the outrigger projection, mullion spacing or vertical span. Solutions may also be available to meet your specific needs by contacting our engineering group at 1-866-955-2732.
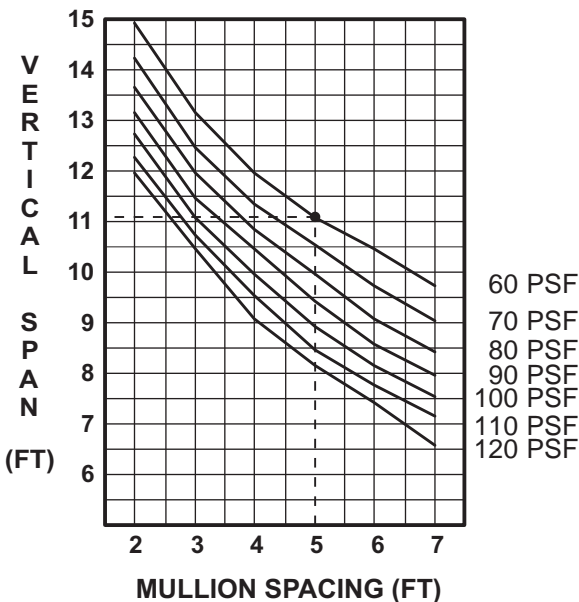
Chart A

ALLOWABLE UNIFORM COMBINED LOAD FOR THERMASHADE ATTACHED TO E9-3101 MULLION

Chart B

ThermaShade Length	Combined Load	Reduction Factor
24 Inch	80 PSF	0.82
24 Inch	60 PSF	0.86
24 Inch	40 PSF	0.91
24 Inch	20 PSF	0.95
30 Inch	80 PSF	0.73
30 Inch	60 PSF	0.79
30 Inch	40 PSF	0.86
30 Inch	20 PSF	0.93
36 Inch	80 PSF	0.63
36 Inch	60 PSF	0.71
36 Inch	40 PSF	0.80
36 Inch	20 PSF	0.90

E9-3101 WITH HORIZONTALS WITHOUT THERMASHADES

Use the following charts to validate outrigger projection, mullion spacing, and vertical span. The following worksheet is for one standard ThermaShade per mullion.

Use the following job requirements as an example:
Combined Load = 40 psf
Mullion Spacing = 5'
Desired Outrigger Projection = 24"
Vertical Span = 11.1'
Wind Load = 60 psf

STEP 1
OBTAIN COMBINED LOAD

  *COMBINED LOAD: _____ (example: 40 psf)

*Allowable combined load (in PSF) as required by the code of jurisdiction and/or code referenced ASCE standard (Minimum Design Loads for Buildings and Other Structures) and determined by the building engineer of record (reference signed document) consisting of dead load plus other load effects such as snow, snow surcharges and drifts, ice, wind, live load roof, or others.

STEP 2
VALIDATE OUTRIGGER PROJECTION

Using **Chart A**, validate the desired sunshade depth (outrigger projection).
  *COMBINED LOAD: _____
  (Draw a vertical line at the Combined Load. Example: 40 psf)
  VERTICAL MULLION SPACING: _____
  (Draw horizontal line at Mullion Spacing. Example: 5')
  DESIRED OUTRIGGER PROJECTION: _____
  (Example: 24")

Intersecting point must be below the curve of the Outrigger Projection. In the example shown, the intersecting point is below the 24" Outrigger Projection curve, therefore it is validated.

STEP 3
DETERMINE REDUCTION FACTOR

Determine Wind Load reduction factor from **Chart B**.

  REDUCTION FACTOR: _____ (example: 0.91)
  Note: Interpolate the reduction factor for combined loads not shown.

STEP 4
APPLY REDUCTION FACTOR AND VALIDATE THE DESIRED VERTICAL SPAN

Using the standard Wind Load Chart to the left, apply the Reduction Factor to the Vertical Span.
-Draw a vertical line at the Mullion Spacing until it intersects the desired Wind Load curve. (Example: 5'/60psf)
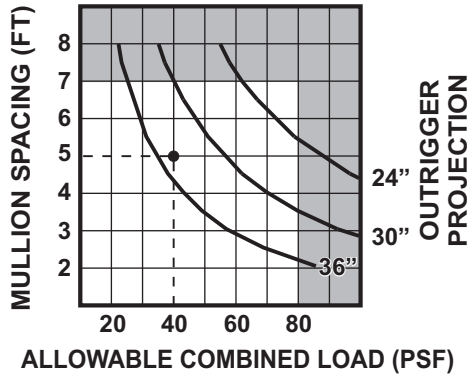-Draw a horizontal line at the intersecting point and determine the Vertical Span (before applying the Reduction Factor). (Example: 11.1')
-Multiply the Vertical Span by the Reduction Factor to determine if the reduced span is acceptable. For example:
11.1' (Vertical Span) X 0.91 (Reduction Factor) = 10.10'. Since 11.1' is greater than 10.10', the desired Vertical Span has been validated.

If any of the data calculated above does not validate the desired job requirements, consider reducing the outrigger projection, mullion spacing or vertical span. Solutions may also be available to meet your specific needs by contacting our engineering group at 1-866-955-2732.

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Chart A
ALLOWABLE UNIFORM COMBINED LOAD FOR THERMASHADE ATTACHED TO E9-3103 MULLION

Chart B

ThermaShade Length	Combined Load	Reduction Factor
24 Inch	80 PSF	0.82
24 Inch	60 PSF	0.86
24 Inch	40 PSF	0.91
24 Inch	20 PSF	0.95
30 Inch	80 PSF	0.73
30 Inch	60 PSF	0.79
30 Inch	40 PSF	0.85
30 Inch	20 PSF	0.93
36 Inch	80 PSF	0.63
36 Inch	60 PSF	0.71
36 Inch	40 PSF	0.80
36 Inch	20 PSF	0.89

E9-3103 WITH HORIZONTALS WITHOUT THERMASHADES

Use the following charts to validate outrigger projection, mullion spacing, and vertical span. The following worksheet is for one standard ThermaShade per mullion.

Use the following job requirements as an example:
Combined Load = 40 psf
Mullion Spacing = 5'
Desired Outrigger Projection = 24"
Vertical Span = 11'
Wind Load = 60 psf

STEP 1
OBTAIN COMBINED LOAD
   *COMBINED LOAD: _____ (example: 40 psf)

*Allowable combined load (in PSF) as required by the code of jurisdiction and/or code referenced ASCE standard (Minimum Design Loads for Buildings and Other Structures) and determined by the building engineer of record (reference signed document) consisting of dead load plus other load effects such as snow, snow surcharges and drifts, ice, wind, live load roof, or others.

STEP 2
VALIDATE OUTRIGGER PROJECTION
Using **Chart A**, validate the desired sunshade depth (outrigger projection).
   *COMBINED LOAD: _____
   (Draw a vertical line at the Combined Load. Example: 40 psf)
   VERTICAL MULLION SPACING: _____
   (Draw horizontal line at Mullion Spacing. Example: 5')
   DESIRED OUTRIGGER PROJECTION: _____
   (Example: 24")

Intersecting point must be below the curve of the Outrigger Projection. In the example shown, the intersecting point is below the 24" Outrigger Projection curve, therefore it is validated.

STEP 3
DETERMINE REDUCTION FACTOR
Determine Wind Load reduction factor from **Chart B**.

   REDUCTION FACTOR: _____ (example: 0.91)
   Note: Interpolate the reduction factor for combined loads not shown.

STEP 4
APPLY REDUCTION FACTOR AND VALIDATE THE DESIRED VERTICAL SPAN
Using the standard Wind Load Chart to the left, apply the Reduction Factor to the Vertical Span.
-Draw a vertical line at the Mullion Spacing until it intersects the desired Wind Load curve. (Example: 5'/60psf)
-Draw a horizontal line at the intersecting point and determine the Vertical Span (before applying the Reduction Factor). (Example: 11')
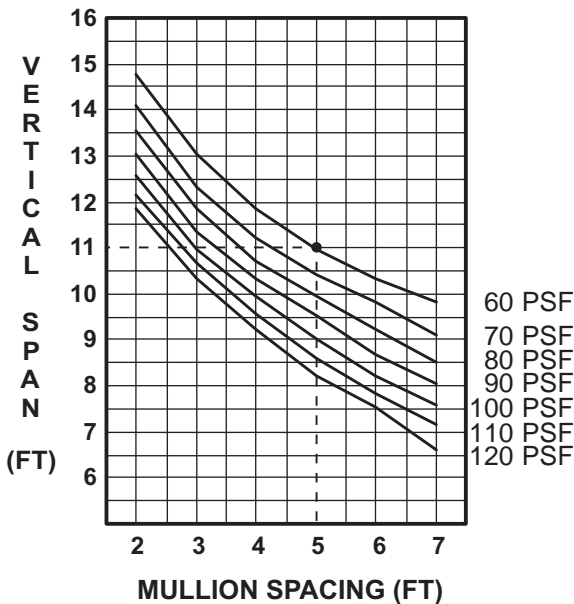-Multiply the Vertical Span by the Reduction Factor to determine if the reduced span is acceptable. For example:
 11' (Vertical Span) X 0.91 (Reduction Factor) = 10.01'. Since 11' is greater than 10.01', the desired Vertical Span has been validated.
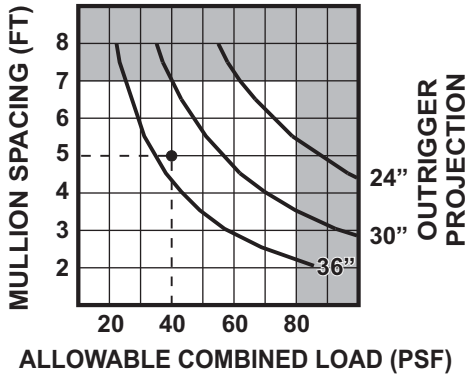
If any of the data calculated above does not validate the desired job requirements, consider reducing the outrigger projection, mullion spacing or vertical span. Solutions may also be available to meet your specific needs by contacting our engineering group at 1-866-955-2732.

Chart A
ALLOWABLE UNIFORM COMBINED LOAD FOR THERMASHADE ATTACHED TO E9-3107 MULLION

MULLION SPACING (FT)

OUTRIGGER PROJECTION

24"
30"
36"

ALLOWABLE COMBINED LOAD (PSF)

Chart B

ThermaShade Length	Combined Load	Reduction Factor
24 Inch	80 PSF	0.84
24 Inch	60 PSF	0.87
24 Inch	40 PSF	0.91
24 Inch	30 PSF	0.93
30 Inch	80 PSF	0.77
30 Inch	60 PSF	0.81
30 Inch	40 PSF	0.87
30 Inch	30 PSF	0.90
36 Inch	80 PSF	0.70
36 Inch	60 PSF	0.75
36 Inch	40 PSF	0.82
36 Inch	30 PSF	0.86

E9-3107 WITH HORIZONTALS WITHOUT THERMASHADES

VERTICAL SPAN (FT)

25 PSF
35 PSF
45 PSF
55 PSF
65 PSF

MULLION SPACING (FT)

Use the following charts to validate outrigger projection, mullion spacing, and vertical span. The following worksheet is for one standard ThermaShade per mullion.

Use the following job requirements as an example:
Combined Load = 40 psf
Mullion Spacing = 5'
Desired Outrigger Projection = 24"
Vertical Span = 13.9'
Wind Load = 25 psf

STEP 1
OBTAIN COMBINED LOAD
*COMBINED LOAD: _____ (example: 40 psf)

*Allowable combined load (in PSF) as required by the code of jurisdiction and/or code referenced ASCE standard (Minimum Design Loads for Buildings and Other Structures) and determined by the building engineer of record (reference signed document) consisting of dead load plus other load effects such as snow, snow surcharges and drifts, ice, wind, live load roof, or others.

STEP 2
VALIDATE OUTRIGGER PROJECTION
Using **Chart A**, validate the desired sunshade depth (outrigger projection).
*COMBINED LOAD: _____
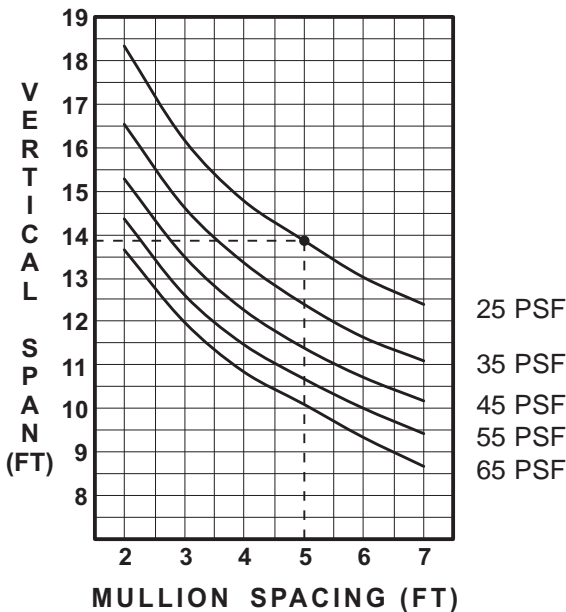(Draw a vertical line at the Combined Load. Example: 40 psf)
VERTICAL MULLION SPACING: _____
(Draw horizontal line at Mullion Spacing. Example: 5')
DESIRED OUTRIGGER PROJECTION: _____
(Example: 24")

Intersecting point must be below the curve of the Outrigger Projection. In the example shown, the intersecting point is below the 24" Outrigger Projection curve, therefore it is validated.

STEP 3
DETERMINE REDUCTION FACTOR
Determine Wind Load reduction factor from **Chart B**.

REDUCTION FACTOR: _____ (example: .91)
Note: Interpolate the reduction factor for combined loads not shown.

STEP 4
APPLY REDUCTION FACTOR AND VALIDATE THE DESIRED VERTICAL SPAN
Using the standard Wind Load Chart to the left, apply the Reduction Factor to the Vertical Span.
-Draw a vertical line at the Mullion Spacing until it intersects the desired Wind Load curve. (Example: 5'/25psf)
-Draw a horizontal line at the intersecting point and determine the Vertical Span (before applying the Reduction Factor). (Example: 13.9')
-Multiply the Vertical Span by the Reduction Factor to determine if the reduced span is acceptable. For example:
13.9' (Vertical Span) X .91 (Reduction Factor) = 12.6'. Since 13.9' is greater than 12.6', the desired Vertical Span has been validated.

If any of the data calculated above does not validate the desired job requirements, consider reducing the outrigger projection, mullion spacing or vertical span. Solutions may also be available to meet your specific needs by contacting our engineering group at 1-866-955-2732.

YKK AP

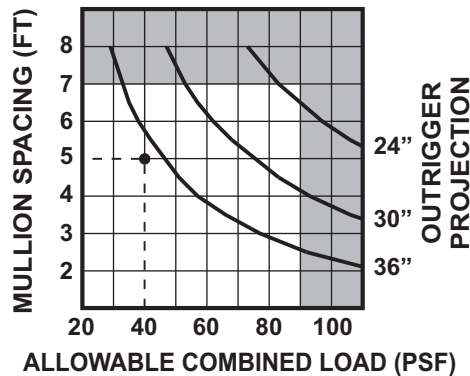## ALLOWABLE UNIFORM COMBINED LOAD FOR THERMASHADE ATTACHED TO E9-3111 MULLION

Chart B

ThermaShade Length	Combined Load	Reduction Factor
24 Inch	80 PSF	0.84
24 Inch	60 PSF	0.87
24 Inch	40 PSF	0.91
24 Inch	30 PSF	0.93
30 Inch	80 PSF	0.77
30 Inch	60 PSF	0.81
30 Inch	40 PSF	0.87
30 Inch	30 PSF	0.90
36 Inch	80 PSF	0.70
36 Inch	60 PSF	0.75
36 Inch	40 PSF	0.82
36 Inch	30 PSF	0.86

E9-3111 WITH HORIZONTALS WITHOUT THERMASHADES
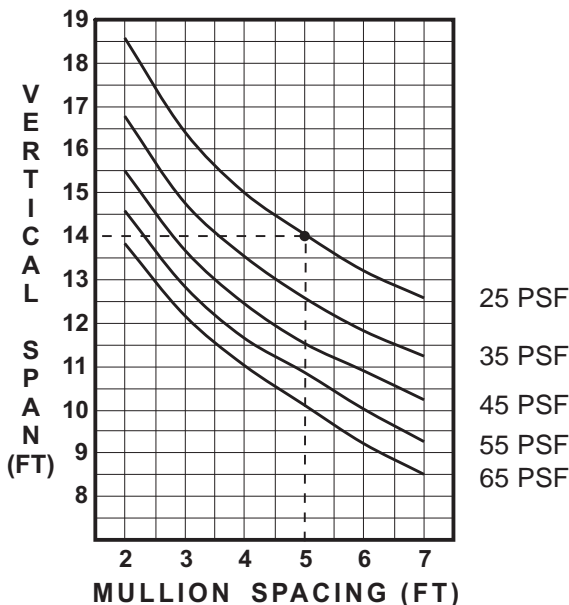
Use the following charts to validate outrigger projection, mullion spacing, and vertical span. The following worksheet is for one standard ThermaShade per mullion.

Use the following job requirements as an example:

Combined Load = 40 psf
Mullion Spacing = 5'
Desired Outrigger Projection = 24"
Vertical Span = 14'
Wind Load = 25 psf

STEP 1
OBTAIN COMBINED LOAD
   *COMBINED LOAD: _____ (example: 40 psf)

*Allowable combined load (in PSF) as required by the code of jurisdiction and/or code referenced ASCE standard (Minimum Design Loads for Buildings and Other Structures) and determined by the building engineer of record (reference signed document) consisting of dead load plus other load effects such as snow, snow surcharges and drifts, ice, wind, live load roof, or others.

STEP 2
VALIDATE OUTRIGGER PROJECTION
Using **Chart A**, validate the desired sunshade depth (outrigger projection).
   *COMBINED LOAD: _____
   (Draw a vertical line at the Combined Load. Example: 40 psf)
   VERTICAL MULLION SPACING: _____
   (Draw horizontal line at Mullion Spacing. Example: 5')
   DESIRED OUTRIGGER PROJECTION: _____
   (Example: 24")

Intersecting point must be below the curve of the Outrigger Projection. In the example shown, the intersecting point is below the 24" Outrigger Projection curve, therefore it is validated.

STEP 3
DETERMINE REDUCTION FACTOR
Determine Wind Load reduction factor from **Chart B**.

   REDUCTION FACTOR: _____ (example: .91)
   Note: Interpolate the reduction factor for combined loads not shown.

STEP 4
APPLY REDUCTION FACTOR AND VALIDATE THE DESIRED VERTICAL SPAN
Using the standard Wind Load Chart to the left, apply the Reduction Factor to the Vertical Span.
-Draw a vertical line at the Mullion Spacing until it intersects the desired Wind Load curve. (Example: 5'/25psf)
-Draw a horizontal line at the intersecting point and determine the Vertical Span (before applying the Reduction Factor). (Example: 14')
-Multiply the Vertical Span by the Reduction Factor to determine if the reduced span is acceptable. For example:
 14' (Vertical Span) X .91 (Reduction Factor) = 12.7'. Since 14' is greater than 12.7', the desired Vertical Span has been validated.

If any of the data calculated above does not validate the desired job requirements, consider reducing the outrigger projection, mullion spacing or vertical span. Solutions may also be available to meet your specific needs by contacting our engineering group at 1-866-955-2732.

ThermaShade® Calculation Worksheet for E9-3182

ALLOWABLE UNIFORM COMBINED LOAD FOR THERMASHADE ATTACHED TO E9-3182 MULLION

Use the following charts to validate outrigger projection, mullion spacing, and vertical span. The following worksheet is for one standard ThermaShade per mullion.

Use the following job requirements as an example:

Combined Load = 40 psf
Mullion Spacing = 5'
Desired Outrigger Projection = 24"
Vertical Span = 15.5'
Wind Load = 60 psf

STEP 1

OBTAIN COMBINED LOAD

COMBINED LOAD: _____ (example: 40 psf)

*Allowable combined load (in PSF) as required by the code of jurisdiction and/or code referenced ASCE standard (Minimum Design Loads for Buildings and Other Structures) and determined by the building engineer of record (reference signed document) consisting of dead load plus other load effects such as snow, snow surcharges and drifts, ice, wind, live load roof, or others.

STEP 2

VALIDATE OUTRIGGER PROJECTION

Using **Chart A**, validate the desired sunshade depth (outrigger projection).

COMBINED LOAD: _____
(Draw a vertical line at the Combined Load. Example: 40 psf)

VERTICAL MULLION SPACING: _____
(Draw horizontal line at Mullion Spacing. Example: 5')

DESIRED OUTRIGGER PROJECTION: _____
(Example: 24")

Intersecting point must be below the curve of the Outrigger Projection. In the example shown, the intersecting point is below the 24" Outrigger Projection curve, therefore it is validated.

Chart B

ThermaShade Length	Combined Load	Reduction Factor
24 Inch	80 PSF	0.89
24 Inch	60 PSF	0.92
24 Inch	40 PSF	0.94
24 Inch	30 PSF	0.96
30 Inch	80 PSF	0.84
30 Inch	60 PSF	0.88
30 Inch	40 PSF	0.91
30 Inch	30 PSF	0.93
36 Inch	80 PSF	0.79
36 Inch	60 PSF	0.83
36 Inch	40 PSF	0.88
36 Inch	30 PSF	0.91

STEP 3

DETERMINE REDUCTION FACTOR

Determine Wind Load reduction factor from **Chart B**.

REDUCTION FACTOR: _____ (example: .94)
Note: Interpolate the reduction factor for combined loads not shown.

STEP 4

APPLY REDUCTION FACTOR AND VALIDATE THE DESIRED VERTICAL SPAN

Using the standard Wind Load Chart to the left, apply the Reduction Factor to the Vertical Span.

-Draw a vertical line at the Mullion Spacing until it intersects the desired Wind Load curve. (Example: 5'/60psf)

-Draw a horizontal line at the intersecting point and determine the Vertical Span (before applying the Reduction Factor). (Example: 11')

-Multiply the Vertical Span by the Reduction Factor to determine if the reduced span is acceptable. For example:

15.5' (Vertical Span) X .94 (Reduction Factor) = 14.6'. Since 15.5' is greater than 14.6', the desired Vertical Span has been validated.

E9-3182 WITH HORIZONTALS WITHOUT THERMASHADES

If any of the data calculated above does not validate the desired job requirements, consider reducing the outrigger projection, mullion spacing or vertical span. Solutions may also be available to meet your specific needs by contacting our engineering group at 1-866-955-2732.

Chart A

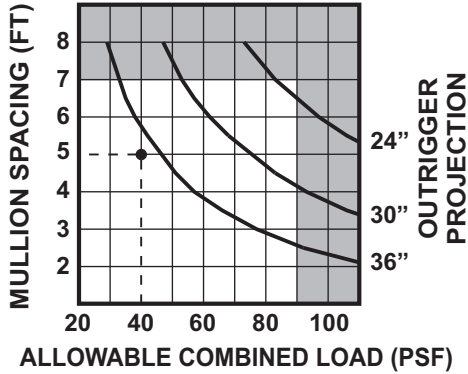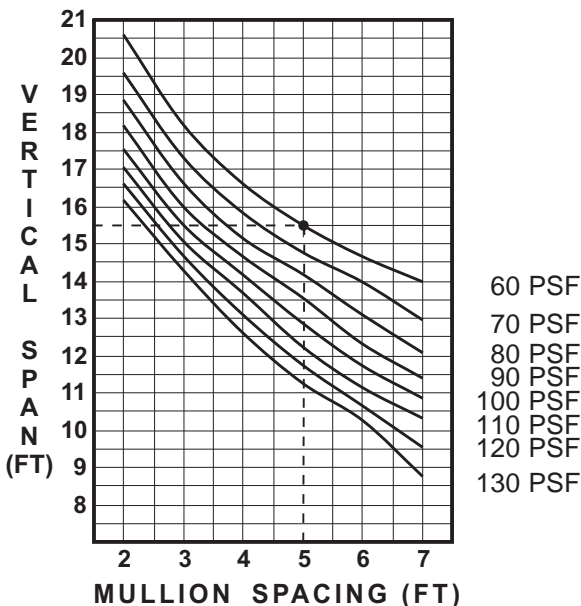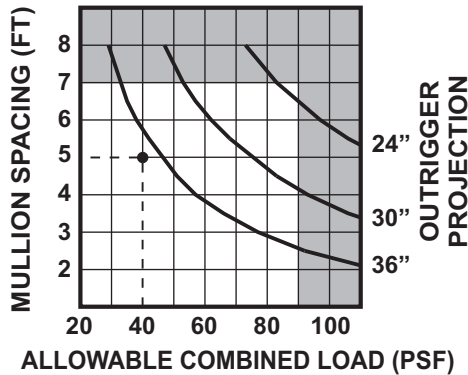**ALLOWABLE UNIFORM COMBINED LOAD FOR THERMASHADE ATTACHED TO E9-3183 MULLION**

MULLION SPACING (FT) / ALLOWABLE COMBINED LOAD (PSF) / OUTRIGGER PROJECTION / 24" / 30" / 36"

Chart B

ThermaShade Length	Combined Load	Reduction Factor
24 Inch	80 PSF	0.89
24 Inch	60 PSF	0.92
24 Inch	40 PSF	0.94
24 Inch	30 PSF	0.96
30 Inch	80 PSF	0.84
30 Inch	60 PSF	0.88
30 Inch	40 PSF	0.91
30 Inch	30 PSF	0.93
36 Inch	80 PSF	0.79
36 Inch	60 PSF	0.83
36 Inch	40 PSF	0.88
36 Inch	30 PSF	0.91

E9-3183 WITH HORIZONTALS WITHOUT THERMASHADES

VERTICAL SPAN (FT) / MULLION SPACING (FT) / 60 PSF / 70 PSF / 80 PSF / 90 PSF / 100 PSF / 110 PSF / 120 PSF / 130 PSF

Use the following charts to validate outrigger projection, mullion spacing, and vertical span. The following worksheet is for one standard ThermaShade per mullion.

Use the following job requirements as an example:

Combined Load = 40 psf
Mullion Spacing = 5'
Desired Outrigger Projection = 24"
Vertical Span = 15.6'
Wind Load = 60 psf

STEP 1

OBTAIN COMBINED LOAD

   *COMBINED LOAD: _____ (example: 40 psf)

*Allowable combined load (in PSF) as required by the code of jurisdiction and/or code referenced ASCE standard (Minimum Design Loads for Buildings and Other Structures) and determined by the building engineer of record (reference signed document) consisting of dead load plus other load effects such as snow, snow surcharges and drifts, ice, wind, live load roof, or others.

STEP 2

VALIDATE OUTRIGGER PROJECTION

Using **Chart A**, validate the desired sunshade depth (outrigger projection).
   *COMBINED LOAD: _____
   (Draw a vertical line at the Combined Load. Example: 40 psf)
   VERTICAL MULLION SPACING: _____
   (Draw horizontal line at Mullion Spacing. Example: 5')
   DESIRED OUTRIGGER PROJECTION: _____
   (Example: 24")

Intersecting point must be below the curve of the Outrigger Projection. In the example shown, the intersecting point is below the 24" Outrigger Projection curve, therefore it is validated.

STEP 3

DETERMINE REDUCTION FACTOR

Determine Wind Load reduction factor from **Chart B**.

   REDUCTION FACTOR: _____ (example: .94)
   Note: Interpolate the reduction factor for combined loads not shown.

STEP 4

APPLY REDUCTION FACTOR AND VALIDATE THE DESIRED VERTICAL SPAN

Using the standard Wind Load Chart to the left, apply the Reduction Factor to the Vertical Span.
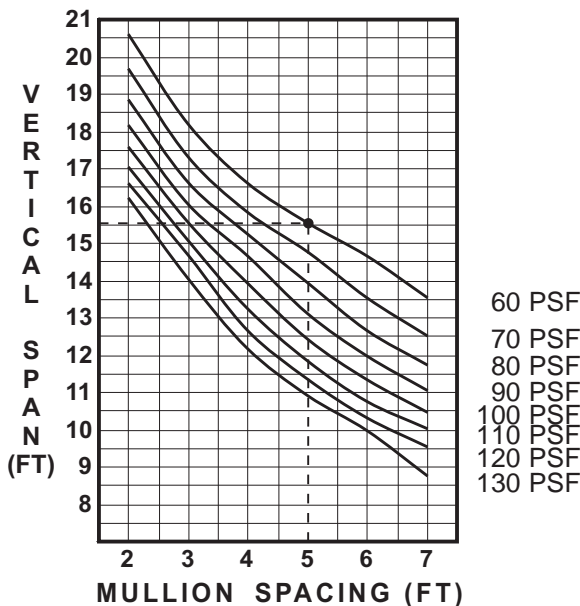-Draw a vertical line at the Mullion Spacing until it intersects the desired Wind Load curve. (Example: 5'/60psf)
-Draw a horizontal line at the intersecting point and determine the Vertical Span (before applying the Reduction Factor). (Example: 11')
-Multiply the Vertical Span by the Reduction Factor to determine if the reduced span is acceptable. For example:
15.6' (Vertical Span) X .94 (Reduction Factor) = 14.7'. Since 15.6' is greater than 14.7', the desired Vertical Span has been validated.

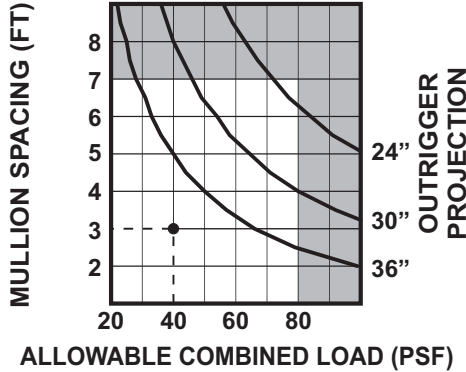If any of the data calculated above does not validate the desired job requirements, consider reducing the outrigger projection, mullion spacing or vertical span. Solutions may also be available to meet your specific needs by contacting our engineering group at 1-866-955-2732.

ThermaShade® Calculation Worksheet for E9-1011/E9-1012

Chart A
ALLOWABLE UNIFORM COMBINED LOAD FOR THERMASHADE ATTACHED TO E9-1013/E9-1012

MULLION SPACING (FT) vs ALLOWABLE COMBINED LOAD (PSF), with OUTRIGGER PROJECTION curves 24", 30", 36"

Chart B

ThermaShade Length	Combined Load	Reduction Factor
24 Inch	80 PSF	0.64
24 Inch	60 PSF	0.70
24 Inch	40 PSF	0.78
24 Inch	30 PSF	0.82
30 Inch	80 PSF	0.53
30 Inch	60 PSF	0.60
30 Inch	40 PSF	0.69
30 Inch	30 PSF	0.75
36 Inch	80 PSF	0.38
36 Inch	60 PSF	0.44
36 Inch	40 PSF	0.61
36 Inch	30 PSF	0.67

E9-1013 / E9-1012 WITH HORIZONTALS WITHOUT THERMASHADES

VERTICAL SPAN (FT) vs MULLION SPACING (FT), with curves 15 PSF, 20 PSF, 30 PSF, 40 PSF

Use the following charts to validate outrigger projection, mullion spacing, and vertical span. The following worksheet is for one standard ThermaShade per mullion.

Use the following job requirements as an example:
Combined Load = 40 psf
Mullion Spacing = 3'
Desired Outrigger Projection = 30"
Vertical Span = 12.2'
Wind Load = 15 psf

STEP 1
OBTAIN COMBINED LOAD
*COMBINED LOAD: _____(example: 40 psf)

*Allowable combined load (in PSF) as required by the code of jurisdiction and/or code referenced ASCE standard (Minimum Design Loads for Buildings and Other Structures) and determined by the building engineer of record (reference signed document) consisting of dead load plus other load effects such as snow, snow surcharges and drifts, ice, wind, live load roof, or others.

STEP 2
VALIDATE OUTRIGGER PROJECTION
Using **Chart A**, validate the desired sunshade depth (outrigger projection).
*COMBINED LOAD: _____
(Draw a vertical line at the Combined Load. Example: 40 psf)
VERTICAL MULLION SPACING: _____
(Draw horizontal line at Mullion Spacing. Example: 3')
DESIRED OUTRIGGER PROJECTION: _____
(Example: 30")

Intersecting point must be below the curve of the Outrigger Projection. In the example shown, the intersecting point is below the 30" Outrigger Projection curve, therefore it is validated.
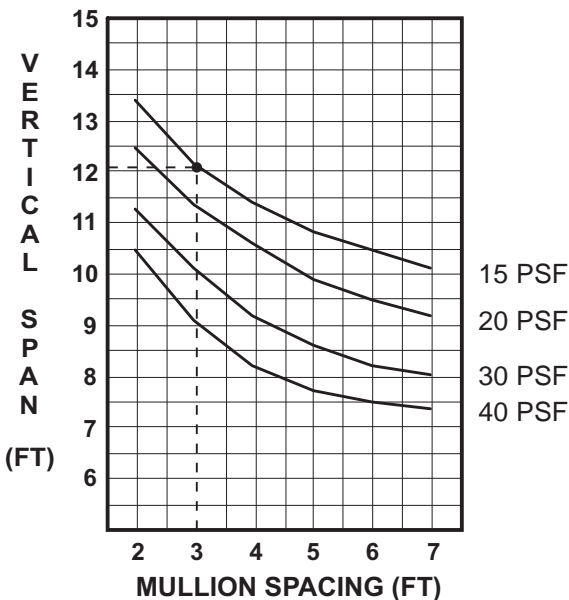
STEP 3
DETERMINE REDUCTION FACTOR
Determine Wind Load reduction factor from **Chart B**.

REDUCTION FACTOR: _____(example: 0.69)
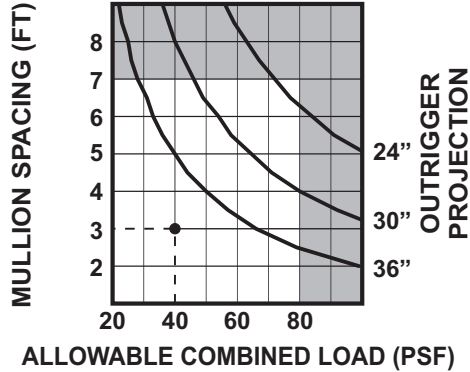Note: Interpolate the reduction factor for combined loads not shown.

STEP 4
APPLY REDUCTION FACTOR AND VALIDATE THE DESIRED VERTICAL SPAN
Using the standard Wind Load Chart to the left, apply the Reduction Factor to the Vertical Span.
-Draw a vertical line at the Mullion Spacing until it intersects the desired Wind Load curve. (Example: 3'/15psf)
-Draw a horizontal line at the intersecting point and determine the Vertical Span (before applying the Reduction Factor). (Example: 12.2')
-Multiply the Vertical Span by the Reduction Factor to determine if the reduced span is acceptable. For example:
12.2' (Vertical Span) X 0.69 (Reduction Factor) = 8.42'. Since 12.2' is greater than 8.42', the desired Vertical Span has been validated.

If any of the data calculated above does not validate the desired job requirements, consider reducing the outrigger projection, mullion spacing or vertical span. Solutions may also be available to meet your specific needs by contacting our engineering group at 1-866-955-2732.

Chart A
ALLOWABLE UNIFORM COMBINED LOAD FOR THERMASHADE ATTACHED TO E9-1013/E9-1012/E1-3847

MULLION SPACING (FT)

OUTRIGGER PROJECTION

24"
30"
36"

ALLOWABLE COMBINED LOAD (PSF)

Chart B

ThermaShade Length	Combined Load	Reduction Factor
24 Inch	80 PSF	0.81
24 Inch	60 PSF	0.85
24 Inch	40 PSF	0.90
24 Inch	30 PSF	0.92
30 Inch	80 PSF	0.73
30 Inch	60 PSF	0.78
30 Inch	40 PSF	0.85
30 Inch	30 PSF	0.88
36 Inch	80 PSF	0.57
36 Inch	60 PSF	0.63
36 Inch	40 PSF	0.79
36 Inch	30 PSF	0.84

E9-1013 / E9-1012 / E1-3847 WITH HORIZONTALS WITHOUT THERMASHADES

VERTICAL SPAN (FT)

15 PSF
20 PSF
30 PSF
40 PSF

MULLION SPACING (FT)

Use the following charts to validate outrigger projection, mullion spacing, and vertical span. The following worksheet is for one standard ThermaShade per mullion.

Use the following job requirements as an example:
Combined Load = 40 psf
Mullion Spacing = 3'
Desired Outrigger Projection = 30"
Vertical Span = 13.5'
Wind Load = 30 psf

STEP 1
OBTAIN COMBINED LOAD
*COMBINED LOAD: _____ (example: 40 psf)

*Allowable combined load (in PSF) as required by the code of jurisdiction and/or code referenced ASCE standard (Minimum Design Loads for Buildings and Other Structures) and determined by the building engineer of record (reference signed document) consisting of dead load plus other load effects such as snow, snow surcharges and drifts, ice, wind, live load roof, or others.

STEP 2
VALIDATE OUTRIGGER PROJECTION
Using **Chart A**, validate the desired sunshade depth (outrigger projection).
*COMBINED LOAD: _____
(Draw a vertical line at the Combined Load. Example: 40 psf)
VERTICAL MULLION SPACING: _____
(Draw horizontal line at Mullion Spacing. Example: 3')
DESIRED OUTRIGGER PROJECTION: _____
(Example: 30")

Intersecting point must be below the curve of the Outrigger Projection. In the example shown, the intersecting point is below the 30" Outrigger Projection curve, therefore it is validated.

STEP 3
DETERMINE REDUCTION FACTOR
Determine Wind Load reduction factor from **Chart B**.

REDUCTION FACTOR: _____ (example: 0.85)
Note: Interpolate the reduction factor for combined loads not shown.

STEP 4
APPLY REDUCTION FACTOR AND VALIDATE THE DESIRED VERTICAL SPAN
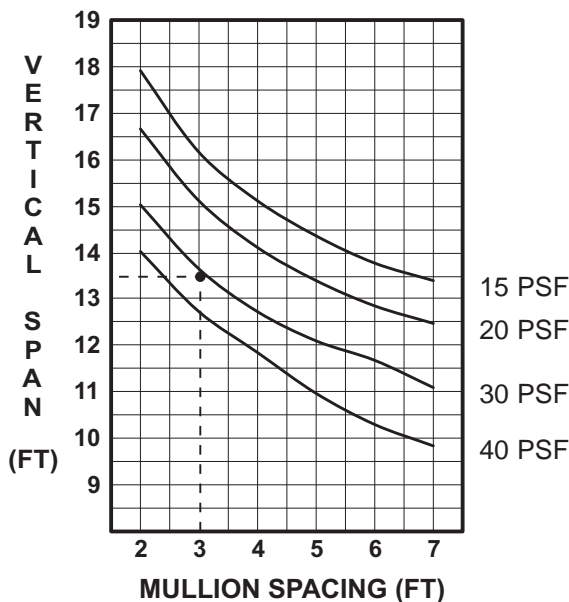Using the standard Wind Load Chart to the left, apply the Reduction Factor to the Vertical Span.
-Draw a vertical line at the Mullion Spacing until it intersects the desired Wind Load curve. (Example: 3'/30psf)
-Draw a horizontal line at the intersecting point and determine the Vertical Span (before applying the Reduction Factor). (Example: 13.5')
-Multiply the Vertical Span by the Reduction Factor to determine if the reduced span is acceptable. For example:
12.2' (Vertical Span) X 0.85 (Reduction Factor) = 11.48'. Since 13.5' is greater than 11.48', the desired Vertical Span has been validated.

If any of the data calculated above does not validate the desired job requirements, consider reducing the outrigger projection, mullion spacing or vertical span. Solutions may also be available to meet your specific needs by contacting our engineering group at 1-866-955-2732.

ThermaShade® Calculation Worksheet for E9-1011/E9-1012

Chart A
ALLOWABLE UNIFORM COMBINED LOAD FOR THERMASHADE ATTACHED TO E9-1011/E9-1012

MULLION SPACING (FT) / ALLOWABLE COMBINED LOAD (PSF) / OUTRIGGER PROJECTION — 24", 30", 36"

Chart B

ThermaShade Length	Combined Load	Reduction Factor
24 Inch	80 PSF	0.63
24 Inch	60 PSF	0.69
24 Inch	40 PSF	0.77
24 Inch	30 PSF	0.82
30 Inch	80 PSF	0.52
30 Inch	60 PSF	0.59
30 Inch	40 PSF	0.69
30 Inch	30 PSF	0.74
36 Inch	80 PSF	0.37
36 Inch	60 PSF	0.44
36 Inch	40 PSF	0.60
36 Inch	30 PSF	0.67

E9-1011 / E9-1012 WITH HORIZONTALS WITHOUT THERMASHADES

VERTICAL SPAN (FT) / MULLION SPACING (FT) — 15 PSF, 20 PSF, 30 PSF, 40 PSF

Use the following charts to validate outrigger projection, mullion spacing, and vertical span. The following worksheet is for one standard ThermaShade per mullion.

Use the following job requirements as an example:
Combined Load = 40 psf
Mullion Spacing = 3'
Desired Outrigger Projection = 30"
Vertical Span = 11.8'
Wind Load = 15 psf

STEP 1
OBTAIN COMBINED LOAD
*COMBINED LOAD: _____ (example: 40 psf)

*Allowable combined load (in PSF) as required by the code of jurisdiction and/or code referenced ASCE standard (Minimum Design Loads for Buildings and Other Structures) and determined by the building engineer of record (reference signed document) consisting of dead load plus other load effects such as snow, snow surcharges and drifts, ice, wind, live load roof, or others.

STEP 2
VALIDATE OUTRIGGER PROJECTION
Using **Chart A**, validate the desired sunshade depth (outrigger projection).
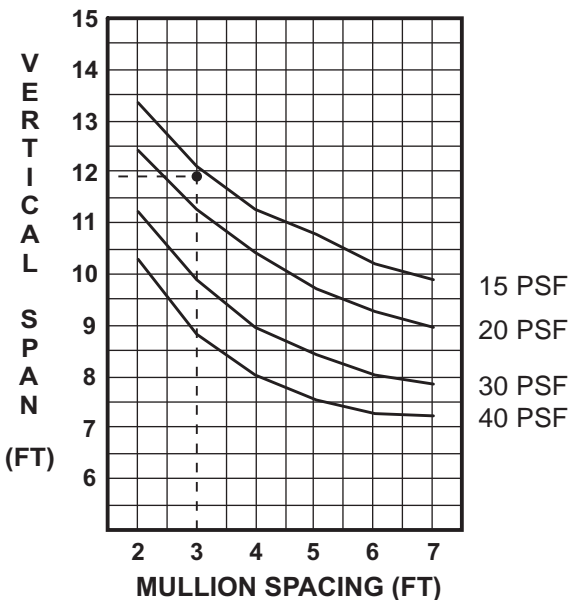***COMBINED LOAD:** _____
(Draw a vertical line at the Combined Load. Example: 40 psf)
VERTICAL MULLION SPACING: _____
(Draw horizontal line at Mullion Spacing. Example: 3')
DESIRED OUTRIGGER PROJECTION: _____
(Example: 30")

Intersecting point must be below the curve of the Outrigger Projection. In the example shown, the intersecting point is below the 30" Outrigger Projection curve, therefore it is validated.

STEP 3
DETERMINE REDUCTION FACTOR
Determine Wind Load reduction factor from **Chart B**.

REDUCTION FACTOR: _____ (example: 0.69)
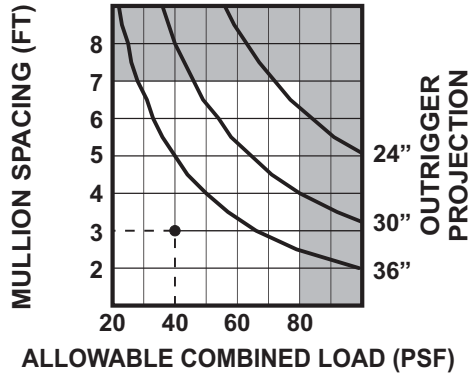Note: Interpolate the reduction factor for combined loads not shown.

STEP 4
APPLY REDUCTION FACTOR AND VALIDATE THE DESIRED VERTICAL SPAN
Using the standard Wind Load Chart to the left, apply the Reduction Factor to the Vertical Span.
-Draw a vertical line at the Mullion Spacing until it intersects the desired Wind Load curve. (Example: 3'/15psf)
-Draw a horizontal line at the intersecting point and determine the Vertical Span (before applying the Reduction Factor). (Example: 11.8')
-Multiply the Vertical Span by the Reduction Factor to determine if the reduced span is acceptable. For example:
11.8' (Vertical Span) X 0.69 (Reduction Factor) = 7.9'. Since 11.8' is greater than 7.9', the desired Vertical Span has been validated.

If any of the data calculated above does not validate the desired job requirements, consider reducing the outrigger projection, mullion spacing or vertical span. Solutions may also be available to meet your specific needs by contacting our engineering group at 1-866-955-2732.

Chart A

ALLOWABLE UNIFORM COMBINED LOAD FOR THERMASHADE ATTACHED TO E9-1011/E9-1012/E1-3847

MULLION SPACING (FT)

OUTRIGGER PROJECTION

24"
30"
36"

ALLOWABLE COMBINED LOAD (PSF)

Chart B

ThermaShade Length	Combined Load	Reduction Factor
24 Inch	80 PSF	0.81
24 Inch	60 PSF	0.85
24 Inch	40 PSF	0.90
24 Inch	30 PSF	0.92
30 Inch	80 PSF	0.73
30 Inch	60 PSF	0.78
30 Inch	40 PSF	0.85
30 Inch	30 PSF	0.88
36 Inch	80 PSF	0.57
36 Inch	60 PSF	0.63
36 Inch	40 PSF	0.79
36 Inch	30 PSF	0.84

E9-1011 / E9-1012 / E1-3847 WITH HORIZONTALS WITHOUT THERMASHADES

VERTICAL SPAN (FT)

15 PSF
20 PSF
30 PSF
40 PSF

MULLION SPACING (FT)

Use the following charts to validate outrigger projection, mullion spacing, and vertical span. The following worksheet is for one standard ThermaShade per mullion.

Use the following job requirements as an example:

Combined Load = 40 psf
Mullion Spacing = 3'
Desired Outrigger Projection = 30"
Vertical Span = 13.6'
Wind Load = 15 psf

STEP 1

OBTAIN COMBINED LOAD

*COMBINED LOAD: _____(example: 40 psf)

*Allowable combined load (in PSF) as required by the code of jurisdiction and/or code referenced ASCE standard (Minimum Design Loads for Buildings and Other Structures) and determined by the building engineer of record (reference signed document) consisting of dead load plus other load effects such as snow, snow surcharges and drifts, ice, wind, live load roof, or others.

STEP 2

VALIDATE OUTRIGGER PROJECTION

Using **Chart A**, validate the desired sunshade depth (outrigger projection).

*COMBINED LOAD: _____
(Draw a vertical line at the Combined Load. Example: 40 psf)

VERTICAL MULLION SPACING: _____
(Draw horizontal line at Mullion Spacing. Example: 3')

DESIRED OUTRIGGER PROJECTION: _____
(Example: 30")

Intersecting point must be below the curve of the Outrigger Projection. In the example shown, the intersecting point is below the 30" Outrigger Projection curve, therefore it is validated.

STEP 3

DETERMINE REDUCTION FACTOR

Determine Wind Load reduction factor from **Chart B**.

REDUCTION FACTOR: _____(example: 0.85)
Note: Interpolate the reduction factor for combined loads not shown.

STEP 4

APPLY REDUCTION FACTOR AND VALIDATE THE DESIRED VERTICAL SPAN

Using the standard Wind Load Chart to the left, apply the Reduction Factor to the Vertical Span.

-Draw a vertical line at the Mullion Spacing until it intersects the desired Wind Load curve. (Example: 3'/30psf)
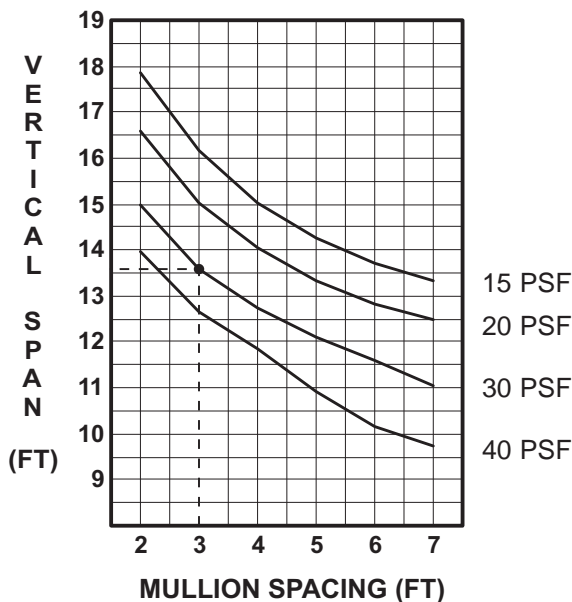-Draw a horizontal line at the intersecting point and determine the Vertical Span (before applying the Reduction Factor). (Example: 13.6')
-Multiply the Vertical Span by the Reduction Factor to determine if the reduced span is acceptable. For example:
 13.6' (Vertical Span) X 0.85 (Reduction Factor) = 11.6'. Since 13.6' is greater than 11.6', the desired Vertical Span has been validated.
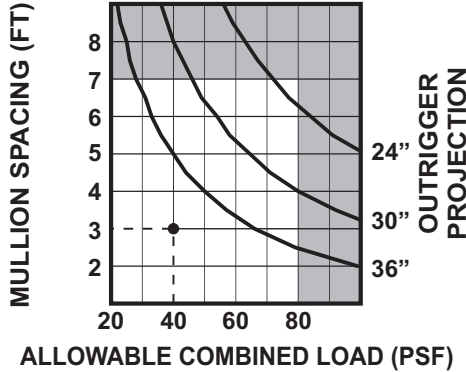
If any of the data calculated above does not validate the desired job requirements, consider reducing the outrigger projection, mullion spacing or vertical span. Solutions may also be available to meet your specific needs by contacting our engineering group at 1-866-955-2732.

ThermaShade® Calculation Worksheet for E9-1075

Chart A
ALLOWABLE UNIFORM COMBINED LOAD FOR THERMASHADE ATTACHED TO E9-1075

Use the following charts to validate outrigger projection, mullion spacing, and vertical span. The following worksheet is for one standard ThermaShade per mullion.

Use the following job requirements as an example:
Combined Load = 40 psf
Mullion Spacing = 3'
Desired Outrigger Projection = 30"
Vertical Span = 12.5'
Wind Load = 15 psf

STEP 1
OBTAIN COMBINED LOAD

   *COMBINED LOAD: _____ (example: 40 psf)

*Allowable combined load (in PSF) as required by the code of jurisdiction and/or code referenced ASCE standard (Minimum Design Loads for Buildings and Other Structures) and determined by the building engineer of record (reference signed document) consisting of dead load plus other load effects such as snow, snow surcharges and drifts, ice, wind, live load roof, or others.

STEP 2
VALIDATE OUTRIGGER PROJECTION
Using **Chart A**, validate the desired sunshade depth (outrigger projection).
   *COMBINED LOAD: _____
   (Draw a vertical line at the Combined Load. Example: 40 psf)
   VERTICAL MULLION SPACING: _____
   (Draw horizontal line at Mullion Spacing. Example: 3')
   DESIRED OUTRIGGER PROJECTION: _____
   (Example: 30")

Intersecting point must be below the curve of the Outrigger Projection. In the example shown, the intersecting point is below the 30" Outrigger Projection curve, therefore it is validated.

Chart B

ThermaShade Length	Combined Load	Reduction Factor
24 Inch	80 PSF	0.64
24 Inch	60 PSF	0.70
24 Inch	40 PSF	0.78
24 Inch	30 PSF	0.82
30 Inch	80 PSF	0.53
30 Inch	60 PSF	0.60
30 Inch	40 PSF	0.69
30 Inch	30 PSF	0.75
36 Inch	80 PSF	0.38
36 Inch	60 PSF	0.44
36 Inch	40 PSF	0.60
36 Inch	30 PSF	0.67

STEP 3
DETERMINE REDUCTION FACTOR
Determine Wind Load reduction factor from **Chart B**.

   REDUCTION FACTOR: _____ (example: 0.69)
   Note: Interpolate the reduction factor for combined loads not shown.

E9-1075
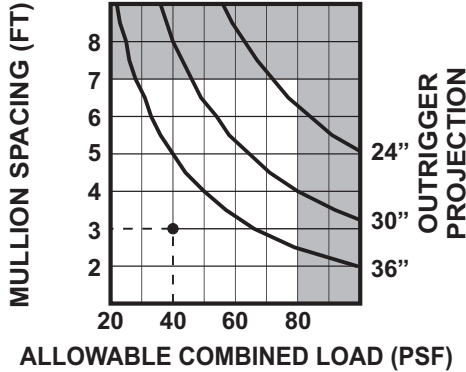### WITH HORIZONTALS WITHOUT THERMASHADES
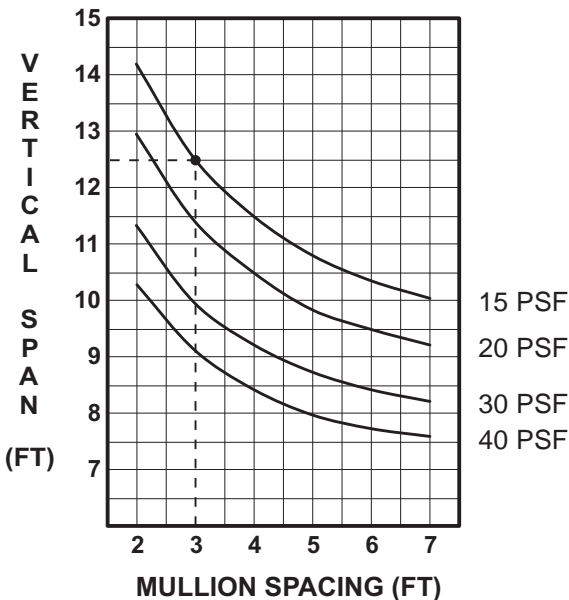
STEP 4
APPLY REDUCTION FACTOR AND VALIDATE THE DESIRED VERTICAL SPAN
Using the standard Wind Load Chart to the left, apply the Reduction Factor to the Vertical Span.
-Draw a vertical line at the Mullion Spacing until it intersects the desired Wind Load curve. (Example: 3'/15psf)
-Draw a horizontal line at the intersecting point and determine the Vertical Span (before applying the Reduction Factor). (Example: 12.5')
-Multiply the Vertical Span by the Reduction Factor to determine if the reduced span is acceptable. For example:
12.5' (Vertical Span) X 0.69 (Reduction Factor) = 8.63'. Since 12.5' is greater than 8.63', the desired Vertical Span has been validated.

If any of the data calculated above does not validate the desired job requirements, consider reducing the outrigger projection, mullion spacing or vertical span. Solutions may also be available to meet your specific needs by contacting our engineering group at 1-866-955-2732.

Chart A

ALLOWABLE UNIFORM COMBINED LOAD FOR THERMASHADE ATTACHED TO E9-1075/E1-3847

MULLION SPACING (FT) / OUTRIGGER PROJECTION

ALLOWABLE COMBINED LOAD (PSF)

24" 30" 36"

Chart B

ThermaShade Length	Combined Load	Reduction Factor
24 Inch	80 PSF	0.82
24 Inch	60 PSF	0.86
24 Inch	40 PSF	0.90
24 Inch	30 PSF	0.92
30 Inch	80 PSF	0.74
30 Inch	60 PSF	0.79
30 Inch	40 PSF	0.87
30 Inch	30 PSF	0.89
36 Inch	80 PSF	0.58
36 Inch	60 PSF	0.64
36 Inch	40 PSF	0.80
36 Inch	30 PSF	0.84

E9-1075 / E1-3847 WITH HORIZONTALS WITHOUT THERMASHADES

VERTICAL SPAN (FT)

MULLION SPACING (FT)

15 PSF
20 PSF
30 PSF
40 PSF

Use the following charts to validate outrigger projection, mullion spacing, and vertical span. The following worksheet is for one standard ThermaShade per mullion.

Use the following job requirements as an example:
Combined Load = 40 psf
Mullion Spacing = 3'
Desired Outrigger Projection = 30"
Vertical Span = 14.7'
Wind Load = 30 psf

STEP 1

OBTAIN COMBINED LOAD

*COMBINED LOAD: _____ (example: 40 psf)

*Allowable combined load (in PSF) as required by the code of jurisdiction and/or code referenced ASCE standard (Minimum Design Loads for Buildings and Other Structures) and determined by the building engineer of record (reference signed document) consisting of dead load plus other load effects such as snow, snow surcharges and drifts, ice, wind, live load roof, or others.

STEP 2

VALIDATE OUTRIGGER PROJECTION

Using **Chart A**, validate the desired sunshade depth (outrigger projection).
*COMBINED LOAD: _____
(Draw a vertical line at the Combined Load. Example: 40 psf)
VERTICAL MULLION SPACING: _____
(Draw horizontal line at Mullion Spacing. Example: 3')
DESIRED OUTRIGGER PROJECTION: _____
(Example: 30")

Intersecting point must be below the curve of the Outrigger Projection. In the example shown, the intersecting point is below the 30" Outrigger Projection curve, therefore it is validated.

STEP 3

DETERMINE REDUCTION FACTOR

Determine Wind Load reduction factor from **Chart B**.

REDUCTION FACTOR: _____ (example: 0.87)
Note: Interpolate the reduction factor for combined loads not shown.

STEP 4

APPLY REDUCTION FACTOR AND VALIDATE THE DESIRED VERTICAL SPAN

Using the standard Wind Load Chart to the left, apply the Reduction Factor to the Vertical Span.
-Draw a vertical line at the Mullion Spacing until it intersects the desired Wind Load curve. (Example: 3'/30psf)
-Draw a horizontal line at the intersecting point and determine the Vertical Span (before applying the Reduction Factor). (Example: 14.7')
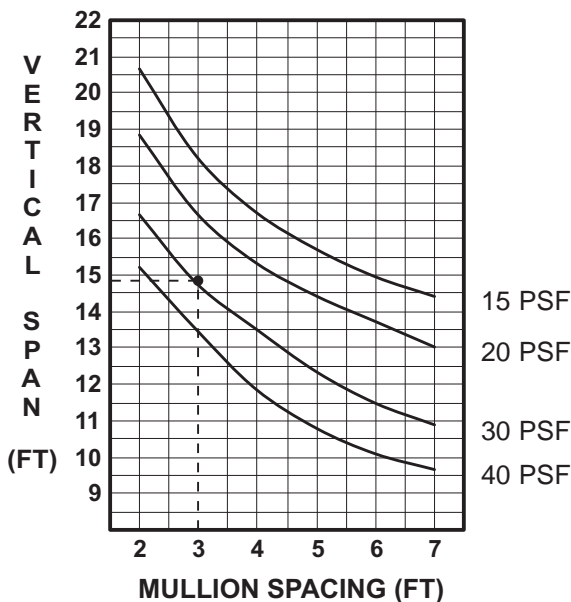-Multiply the Vertical Span by the Reduction Factor to determine if the reduced span is acceptable. For example:
14.7' (Vertical Span) X 0.87 (Reduction Factor) = 12.8'. Since 14.7' is greater than 12.8', the desired Vertical Span has been validated.

If any of the data calculated above does not validate the desired job requirements, consider reducing the outrigger projection, mullion spacing or vertical span. Solutions may also be available to meet your specific needs by contacting our engineering group at 1-866-955-2732.

Chart A
ALLOWABLE UNIFORM COMBINED LOAD FOR THERMASHADE ATTACHED TO BE9-2553/BE9-2552

MULLION SPACING (FT)

8
7
6
5 — 24"
4
3
2 — 30"
— 36"

OUTRIGGER PROJECTION

20 40 60 80

ALLOWABLE COMBINED LOAD (PSF)

Chart B

ThermaShade Length	Combined Load	Reduction Factor
24 Inch	80 PSF	0.60
24 Inch	60 PSF	0.66
24 Inch	40 PSF	0.75
24 Inch	30 PSF	0.80
30 Inch	80 PSF	0.49
30 Inch	60 PSF	0.56
30 Inch	40 PSF	0.66
30 Inch	30 PSF	0.72
36 Inch	80 PSF	0.40
36 Inch	60 PSF	0.47
36 Inch	40 PSF	0.57
36 Inch	30 PSF	0.64

BE9-2553 / BE9-2552 WITH HORIZONTALS WITHOUT THERMASHADES

VERTICAL SPAN (FT)

14
13
12
11
10
9 — 15 PSF
8 — 20 PSF
7 — 30 PSF
6 — 40 PSF

2 3 4 5 6 7

MULLION SPACING (FT)

Use the following charts to validate outrigger projection, mullion spacing, and vertical span. The following worksheet is for one standard ThermaShade per mullion.

Use the following job requirements as an example:
Combined Load = 40 psf
Mullion Spacing = 3'
Desired Outrigger Projection = 30"
Vertical Span = 11.3'
Wind Load = 15 psf

STEP 1
OBTAIN COMBINED LOAD
*COMBINED LOAD: _____(example: 40 psf)

*Allowable combined load (in PSF) as required by the code of jurisdiction and/or code referenced ASCE standard (Minimum Design Loads for Buildings and Other Structures) and determined by the building engineer of record (reference signed document) consisting of dead load plus other load effects such as snow, snow surcharges and drifts, ice, wind, live load roof, or others.

STEP 2
VALIDATE OUTRIGGER PROJECTION
Using **Chart A**, validate the desired sunshade depth (outrigger projection).
*COMBINED LOAD: _____
(Draw a vertical line at the Combined Load. Example: 40 psf)
VERTICAL MULLION SPACING: _____
(Draw horizontal line at Mullion Spacing. Example: 3')
DESIRED OUTRIGGER PROJECTION: _____
(Example: 30")

Intersecting point must be below the curve of the Outrigger Projection. In the example shown, the intersecting point is below the 30" Outrigger Projection curve, therefore it is validated.
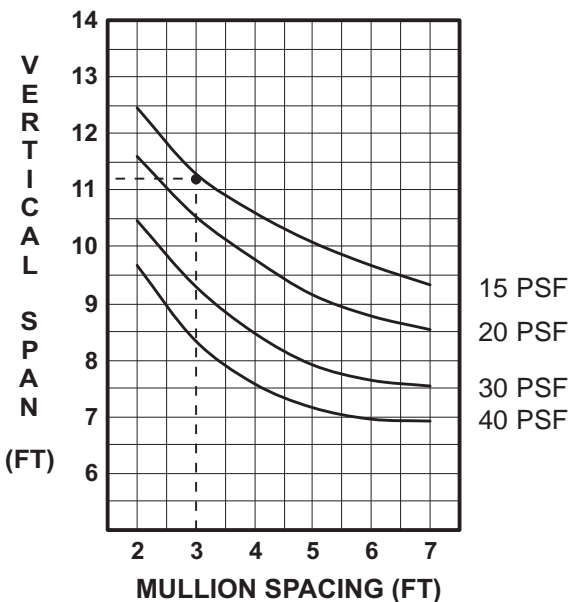
STEP 3
DETERMINE REDUCTION FACTOR
Determine Wind Load reduction factor from **Chart B**.

REDUCTION FACTOR: _____(example: 0.66)
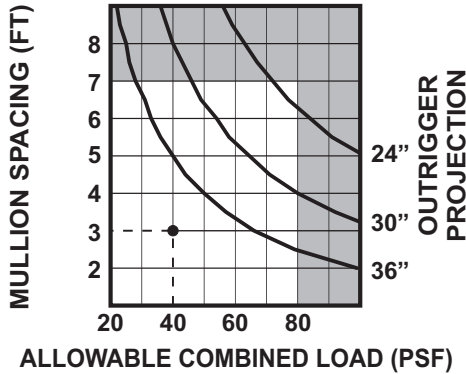Note: Interpolate the reduction factor for combined loads not shown.

STEP 4
APPLY REDUCTION FACTOR AND VALIDATE THE DESIRED VERTICAL SPAN
Using the standard Wind Load Chart to the left, apply the Reduction Factor to the Vertical Span.
-Draw a vertical line at the Mullion Spacing until it intersects the desired Wind Load curve. (Example: 3'/15psf)
-Draw a horizontal line at the intersecting point and determine the Vertical Span (before applying the Reduction Factor). (Example: 11.3')
-Multiply the Vertical Span by the Reduction Factor to determine if the reduced span is acceptable. For example:
11.3' (Vertical Span) X 0.66 (Reduction Factor) = 7.46'. Since 11.3' is greater than 7.46', the desired Vertical Span has been validated.

If any of the data calculated above does not validate the desired job requirements, consider reducing the outrigger projection, mullion spacing or vertical span. Solutions may also be available to meet your specific needs by contacting our engineering group at 1-866-955-2732.

Chart A
ALLOWABLE UNIFORM COMBINED LOAD FOR THERMASHADE ATTACHED TO BE9-2551/BE9-2552

MULLION SPACING (FT) / OUTRIGGER PROJECTION

24", 30", 36"

ALLOWABLE COMBINED LOAD (PSF)

Chart B

ThermaShade Length	Combined Load	Reduction Factor
24 Inch	80 PSF	0.60
24 Inch	60 PSF	0.66
24 Inch	40 PSF	0.75
24 Inch	30 PSF	0.80
30 Inch	80 PSF	0.49
30 Inch	60 PSF	0.56
30 Inch	40 PSF	0.66
30 Inch	30 PSF	0.72
36 Inch	80 PSF	0.35
36 Inch	60 PSF	0.41
36 Inch	40 PSF	0.57
36 Inch	30 PSF	0.64

BE9-2551 / BE9-2552 WITH HORIZONTALS WITHOUT THERMASHADES

VERTICAL SPAN (FT)

15 PSF, 20 PSF, 30 PSF, 40 PSF

MULLION SPACING (FT)

Use the following charts to validate outrigger projection, mullion spacing, and vertical span. The following worksheet is for one standard ThermaShade per mullion.

Use the following job requirements as an example:
Combined Load = 40 psf
Mullion Spacing = 3'
Desired Outrigger Projection = 30"
Vertical Span = 11.4'
Wind Load = 15 psf

STEP 1
OBTAIN COMBINED LOAD

*COMBINED LOAD: _____ (example: 40 psf)

*Allowable combined load (in PSF) as required by the code of jurisdiction and/or code referenced ASCE standard (Minimum Design Loads for Buildings and Other Structures) and determined by the building engineer of record (reference signed document) consisting of dead load plus other load effects such as snow, snow surcharges and drifts, ice, wind, live load roof, or others.

STEP 2
VALIDATE OUTRIGGER PROJECTION
Using **Chart A**, validate the desired sunshade depth (outrigger projection).
*COMBINED LOAD: _____
(Draw a vertical line at the Combined Load. Example: 40 psf)
VERTICAL MULLION SPACING: _____
(Draw horizontal line at Mullion Spacing. Example: 3')
DESIRED OUTRIGGER PROJECTION: _____
(Example: 30")

Intersecting point must be below the curve of the Outrigger Projection. In the example shown, the intersecting point is below the 30" Outrigger Projection curve, therefore it is validated.

STEP 3
DETERMINE REDUCTION FACTOR
Determine Wind Load reduction factor from **Chart B**.

REDUCTION FACTOR: _____ (example: 0.66)
Note: Interpolate the reduction factor for combined loads not shown.

STEP 4
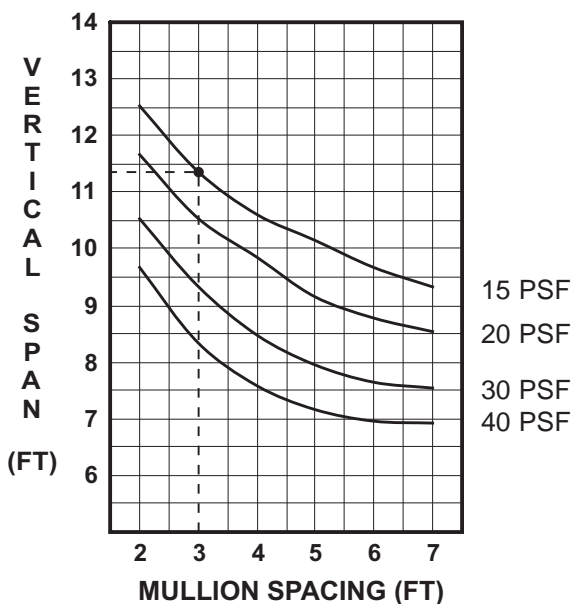### APPLY REDUCTION FACTOR AND VALIDATE THE DESIRED VERTICAL SPAN
Using the standard Wind Load Chart to the left, apply the Reduction Factor to the Vertical Span.
-Draw a vertical line at the Mullion Spacing until it intersects the desired Wind Load curve. (Example: 3'/15psf)
-Draw a horizontal line at the intersecting point and determine the Vertical Span (before applying the Reduction Factor). (Example: 11.4')
-Multiply the Vertical Span by the Reduction Factor to determine if the reduced span is acceptable. For example:
11.4' (Vertical Span) X 0.66 (Reduction Factor) = 7.5'. Since 11.4' is greater than 7.5', the desired Vertical Span has been validated.

If any of the data calculated above does not validate the desired job requirements, consider reducing the outrigger projection, mullion spacing or vertical span. Solutions may also be available to meet your specific needs by contacting our engineering group at 1-866-955-2732.

ThermaShade® Calculation Worksheet for BE9-2555

Chart A
ALLOWABLE UNIFORM COMBINED LOAD FOR THERMASHADE ATTACHED TO BE9-2555

MULLION SPACING (FT) — OUTRIGGER PROJECTION — 24" / 30" / 36"

ALLOWABLE COMBINED LOAD (PSF)

Chart B

ThermaShade Length	Combined Load	Reduction Factor
24 Inch	80 PSF	0.61
24 Inch	60 PSF	0.68
24 Inch	40 PSF	0.76
24 Inch	30 PSF	0.81
30 Inch	80 PSF	0.50
30 Inch	60 PSF	0.57
30 Inch	40 PSF	0.71
30 Inch	30 PSF	0.73
36 Inch	80 PSF	0.36
36 Inch	60 PSF	0.42
36 Inch	40 PSF	0.58
36 Inch	30 PSF	0.65

BE9-2555 WITH HORIZONTALS WITHOUT THERMASHADES

VERTICAL SPAN (FT) vs MULLION SPACING (FT) — 15 PSF / 20 PSF / 30 PSF / 40 PSF

Use the following charts to validate outrigger projection, mullion spacing, and vertical span. The following worksheet is for one standard ThermaShade per mullion.

Use the following job requirements as an example:
Combined Load = 40 psf
Mullion Spacing = 3'
Desired Outrigger Projection = 30"
Vertical Span = 12.3'
Wind Load = 15 psf

STEP 1
OBTAIN COMBINED LOAD
   *COMBINED LOAD: _____ (example: 40 psf)

*Allowable combined load (in PSF) as required by the code of jurisdiction and/or code referenced ASCE standard (Minimum Design Loads for Buildings and Other Structures) and determined by the building engineer of record (reference signed document) consisting of dead load plus other load effects such as snow, snow surcharges and drifts, ice, wind, live load roof, or others.

STEP 2
VALIDATE OUTRIGGER PROJECTION
Using **Chart A**, validate the desired sunshade depth (outrigger projection).
   *COMBINED LOAD: _____
   (Draw a vertical line at the Combined Load. Example: 40 psf)
   VERTICAL MULLION SPACING: _____
   (Draw horizontal line at Mullion Spacing. Example: 3')
   DESIRED OUTRIGGER PROJECTION: _____
   (Example: 30")

Intersecting point must be below the curve of the Outrigger Projection. In the example shown, the intersecting point is below the 30" Outrigger Projection curve, therefore it is validated.

STEP 3
DETERMINE REDUCTION FACTOR
Determine Wind Load reduction factor from **Chart B**.

   REDUCTION FACTOR: _____ (example: 0.71)
   Note: Interpolate the reduction factor for combined loads not shown.

STEP 4
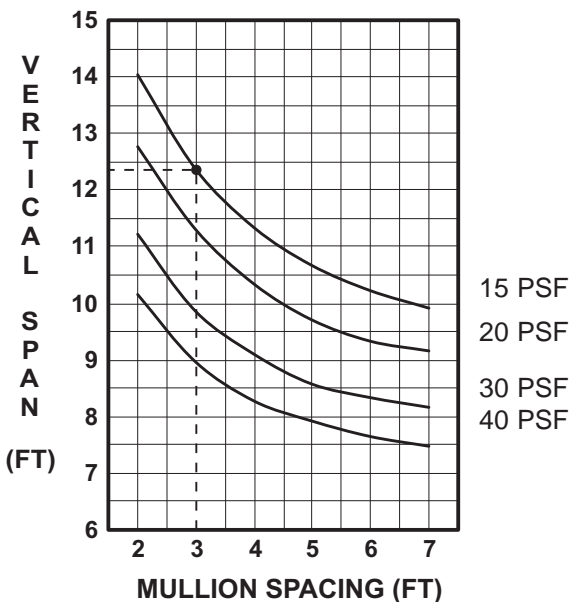### APPLY REDUCTION FACTOR AND VALIDATE THE DESIRED VERTICAL SPAN
Using the standard Wind Load Chart to the left, apply the Reduction Factor to the Vertical Span.
-Draw a vertical line at the Mullion Spacing until it intersects the desired Wind Load curve. (Example: 3'/15psf)
-Draw a horizontal line at the intersecting point and determine the Vertical Span (before applying the Reduction Factor). (Example: 12.3')
-Multiply the Vertical Span by the Reduction Factor to determine if the reduced span is acceptable. For example:
 12.3' (Vertical Span) X 0.71 (Reduction Factor) = 8.7'. Since 12.3' is greater than 8.7', the desired Vertical Span has been validated.
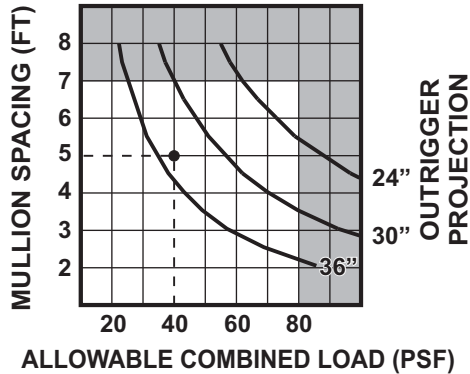
> If any of the data calculated above does not validate the desired job requirements, consider reducing the outrigger projection, mullion spacing or vertical span. Solutions may also be available to meet your specific needs by contacting our engineering group at 1-866-955-2732.

ThermaShade® Calculation Worksheet for BE9-2601/BE9-2605

YKK AP®

Chart A
ALLOWABLE UNIFORM COMBINED LOAD FOR THERMASHADE ATTACHED TO BE9-2601/BE9-2605

MULLION SPACING (FT)

OUTRIGGER PROJECTION

24"
30"
36"

ALLOWABLE COMBINED LOAD (PSF)

Chart B

ThermaShade Length	Combined Load	Reduction Factor
24 Inch	80 PSF	0.59
24 Inch	60 PSF	0.65
24 Inch	40 PSF	0.74
24 Inch	30 PSF	0.79
30 Inch	80 PSF	0.48
30 Inch	60 PSF	0.55
30 Inch	40 PSF	0.65
30 Inch	30 PSF	0.71
36 Inch	80 PSF	0.39
36 Inch	60 PSF	0.46
36 Inch	40 PSF	0.56
36 Inch	30 PSF	0.63

BE9-2601 / BE9-2605 WITH HORIZONTALS WITHOUT THERMASHADES

VERTICAL SPAN (FT)

15 PSF
20 PSF
30 PSF
40 PSF

MULLION SPACING (FT)

Use the following charts to validate outrigger projection, mullion spacing, and vertical span. The following worksheet is for one standard ThermaShade per mullion.

Use the following job requirements as an example:

Combined Load = 40 psf
Mullion Spacing = 5'
Desired Outrigger Projection = 30"
Vertical Span = 9.833'
Wind Load = 15 psf

STEP 1
OBTAIN COMBINED LOAD

> ***COMBINED LOAD:** _____ (example: 40 psf)

*Allowable combined load (in PSF) as required by the code of jurisdiction and/or code referenced ASCE standard (Minimum Design Loads for Buildings and Other Structures) and determined by the building engineer of record (reference signed document) consisting of dead load plus other load effects such as snow, snow surcharges and drifts, ice, wind, live load roof, or others.

STEP 2
VALIDATE OUTRIGGER PROJECTION

Using **Chart A**, validate the desired sunshade depth (outrigger projection).

> ***COMBINED LOAD:** _____
> (Draw a vertical line at the Combined Load. Example: 40 psf)
>
> **VERTICAL MULLION SPACING:** _____
> (Draw horizontal line at Mullion Spacing. Example: 5')
>
> **DESIRED OUTRIGGER PROJECTION:** _____
> (Example: 30")

Intersecting point must be below the curve of the Outrigger Projection. In the example shown, the intersecting point is below the 30" Outrigger Projection curve, therefore it is validated.

STEP 3
DETERMINE REDUCTION FACTOR

Determine Wind Load reduction factor from **Chart B**.

> **REDUCTION FACTOR:** _____ (example: 0.65)
> Note: Interpolate the reduction factor for combined loads not shown.

STEP 4
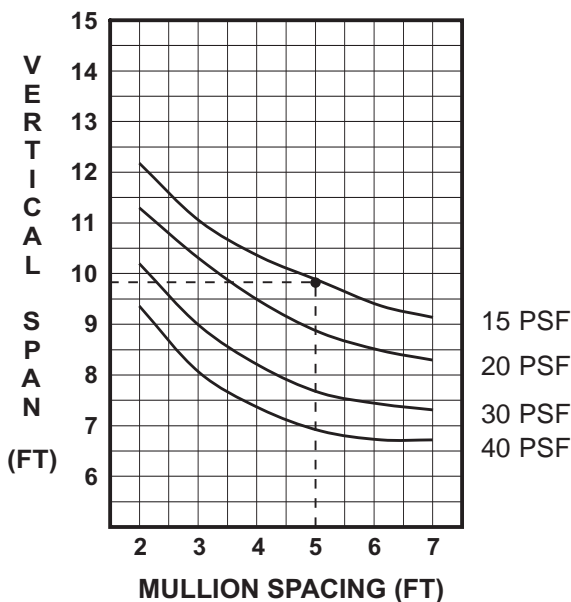### APPLY REDUCTION FACTOR AND VALIDATE THE DESIRED VERTICAL SPAN

Using the standard Wind Load Chart to the left, apply the Reduction Factor to the Vertical Span.

-Draw a vertical line at the Mullion Spacing until it intersects the desired Wind Load curve. (Example: 5'/15psf)
-Draw a horizontal line at the intersecting point and determine the Vertical Span (before applying the Reduction Factor). (Example: 9.833')
-Multiply the Vertical Span by the Reduction Factor to determine if the reduced span is acceptable. For example:
9.833' (Vertical Span) X 0.65 (Reduction Factor) = 6.39'. Since 9.833' is greater than 6.39', the desired Vertical Span has been validated.

If any of the data calculated above does not validate the desired job requirements, consider reducing the outrigger projection, mullion spacing or vertical span. Solutions may also be available to meet your specific needs by contacting our engineering group at 1-866-955-2732.

ThermaShade® Calculation Worksheet for BE9-2606/BE9-2605

YKK ap®

Chart A

ALLOWABLE UNIFORM COMBINED LOAD FOR THERMASHADE ATTACHED TO BE9-2606/BE9-2605

MULLION SPACING (FT) — vertical axis: 2, 3, 4, 5, 6, 7, 8
OUTRIGGER PROJECTION — 24", 30", 36"
ALLOWABLE COMBINED LOAD (PSF) — horizontal axis: 20, 40, 60, 80

Chart B

ThermaShade Length	Combined Load	Reduction Factor
24 Inch	80 PSF	0.65
24 Inch	60 PSF	0.71
24 Inch	40 PSF	0.79
24 Inch	30 PSF	0.83
30 Inch	80 PSF	0.54
30 Inch	60 PSF	0.61
30 Inch	40 PSF	0.70
30 Inch	30 PSF	0.76
36 Inch	80 PSF	0.45
36 Inch	60 PSF	0.52
36 Inch	40 PSF	0.62
36 Inch	30 PSF	0.69

BE9-2606 / BE9-2605 WITH HORIZONTALS WITHOUT THERMASHADES

VERTICAL SPAN (FT) — vertical axis: 6, 7, 8, 9, 10, 11, 12, 13, 14, 15
Curves: 15 PSF, 20 PSF, 30 PSF, 40 PSF
MULLION SPACING (FT) — horizontal axis: 2, 3, 4, 5, 6, 7

Use the following charts to validate outrigger projection, mullion spacing, and vertical span. The following worksheet is for one standard ThermaShade per mullion.

Use the following job requirements as an example:
Combined Load = 40 psf
Mullion Spacing = 5'
Desired Outrigger Projection = 30"
Vertical Span = 11.25'
Wind Load = 15 psf

STEP 1
OBTAIN COMBINED LOAD

*COMBINED LOAD: _____(example: 40 psf)

*Allowable combined load (in PSF) as required by the code of jurisdiction and/or code referenced ASCE standard (Minimum Design Loads for Buildings and Other Structures) and determined by the building engineer of record (reference signed document) consisting of dead load plus other load effects such as snow, snow surcharges and drifts, ice, wind, live load roof, or others.

STEP 2
VALIDATE OUTRIGGER PROJECTION

Using **Chart A**, validate the desired sunshade depth (outrigger projection).
*COMBINED LOAD: _____
(Draw a vertical line at the Combined Load. Example: 40 psf)
VERTICAL MULLION SPACING: _____
(Draw horizontal line at Mullion Spacing. Example: 5')
DESIRED OUTRIGGER PROJECTION: _____
(Example: 30")

Intersecting point must be below the curve of the Outrigger Projection. In the example shown, the intersecting point is below the 30" Outrigger Projection curve, therefore it is validated.
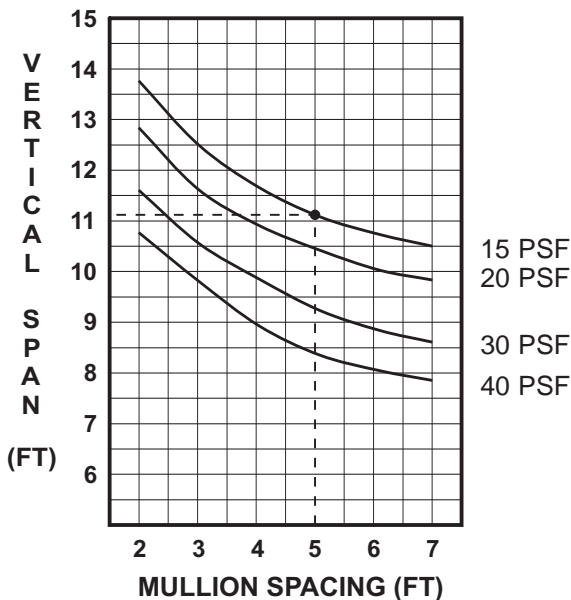
STEP 3
DETERMINE REDUCTION FACTOR

Determine Wind Load reduction factor from **Chart B**.

REDUCTION FACTOR: _____(example: 0.70)
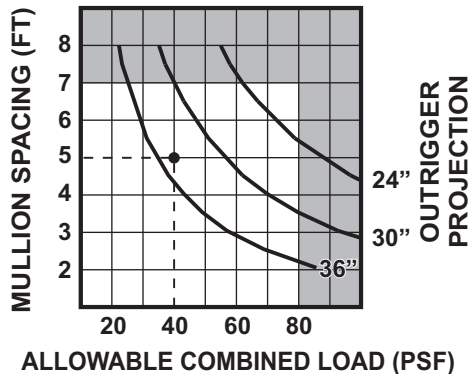Note: Interpolate the reduction factor for combined loads not shown.

STEP 4
APPLY REDUCTION FACTOR AND VALIDATE THE DESIRED VERTICAL SPAN

Using the standard Wind Load Chart to the left, apply the Reduction Factor to the Vertical Span.
-Draw a vertical line at the Mullion Spacing until it intersects the desired Wind Load curve. (Example: 5'/15psf)
-Draw a horizontal line at the intersecting point and determine the Vertical Span (before applying the Reduction Factor). (Example: 11.25')
-Multiply the Vertical Span by the Reduction Factor to determine if the reduced span is acceptable. For example:
11.25' (Vertical Span) X 0.70 (Reduction Factor) = 7.88'. Since 11.25' is greater than 7.88', the desired Vertical Span has been validated.

If any of the data calculated above does not validate the desired job requirements, consider reducing the outrigger projection, mullion spacing or vertical span. Solutions may also be available to meet your specific needs by contacting our engineering group at 1-866-955-2732.

Chart A
ALLOWABLE UNIFORM COMBINED LOAD FOR THERMASHADE ATTACHED TO BE9-2602/BE9-2605

MULLION SPACING (FT)

OUTRIGGER PROJECTION

24"
30"
36"

ALLOWABLE COMBINED LOAD (PSF)

Chart B

ThermaShade Length	Combined Load	Reduction Factor
24 Inch	80 PSF	0.58
24 Inch	60 PSF	0.64
24 Inch	40 PSF	0.73
24 Inch	30 PSF	0.78
30 Inch	80 PSF	0.46
30 Inch	60 PSF	0.54
30 Inch	40 PSF	0.63
30 Inch	30 PSF	0.70
36 Inch	80 PSF	0.38
36 Inch	60 PSF	0.45
36 Inch	40 PSF	0.55
36 Inch	30 PSF	0.62

BE9-2602 / BE9-2605 WITH HORIZONTALS WITHOUT THERMASHADES

VERTICAL SPAN (FT)

15 PSF
20 PSF
30 PSF
40 PSF

MULLION SPACING (FT)

Use the following charts to validate outrigger projection, mullion spacing, and vertical span. The following worksheet is for one standard ThermaShade per mullion.

Use the following job requirements as an example:
Combined Load = 40 psf
Mullion Spacing = 5'
Desired Outrigger Projection = 30"
Vertical Span = 9.40'
Wind Load = 15 psf

STEP 1
OBTAIN COMBINED LOAD
 *COMBINED LOAD: _____(example: 40 psf)

*Allowable combined load (in PSF) as required by the code of jurisdiction and/or code referenced ASCE standard (Minimum Design Loads for Buildings and Other Structures) and determined by the building engineer of record (reference signed document) consisting of dead load plus other load effects such as snow, snow surcharges and drifts, ice, wind, live load roof, or others.

STEP 2
VALIDATE OUTRIGGER PROJECTION
Using **Chart A**, validate the desired sunshade depth (outrigger projection).
 *COMBINED LOAD: _____
 (Draw a vertical line at the Combined Load. Example: 40 psf)
 VERTICAL MULLION SPACING: _____
 (Draw horizontal line at Mullion Spacing. Example: 5')
 DESIRED OUTRIGGER PROJECTION: _____
 (Example: 30")

Intersecting point must be below the curve of the Outrigger Projection. In the example shown, the intersecting point is below the 30" Outrigger Projection curve, therefore it is validated.

STEP 3
DETERMINE REDUCTION FACTOR
Determine Wind Load reduction factor from **Chart B**.

 REDUCTION FACTOR: _____(example: 0.63)
 Note: Interpolate the reduction factor for combined loads not shown.

STEP 4
APPLY REDUCTION FACTOR AND VALIDATE THE DESIRED VERTICAL SPAN
Using the standard Wind Load Chart to the left, apply the Reduction Factor to the Vertical Span.
-Draw a vertical line at the Mullion Spacing until it intersects the desired Wind Load curve. (Example: 5'/15psf)
-Draw a horizontal line at the intersecting point and determine the Vertical Span (before applying the Reduction Factor). (Example: 9.40')
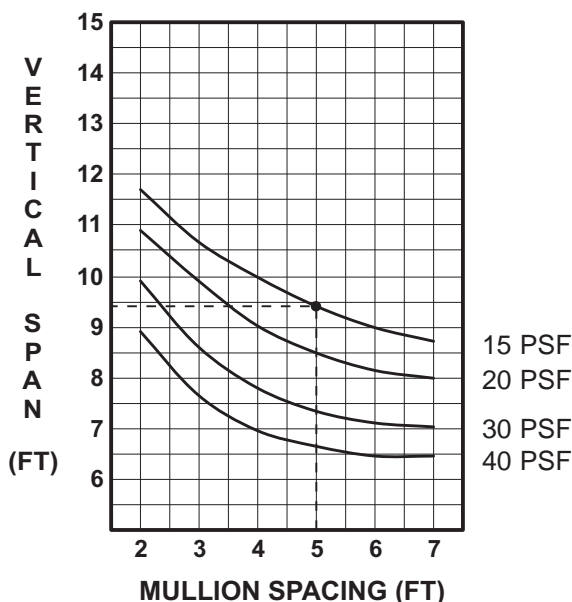-Multiply the Vertical Span by the Reduction Factor to determine if the reduced span is acceptable. For example:
9.40' (Vertical Span) X 0.63 (Reduction Factor) = 5.92'. Since 9.40' is greater than 5.92', the desired Vertical Span has been validated.
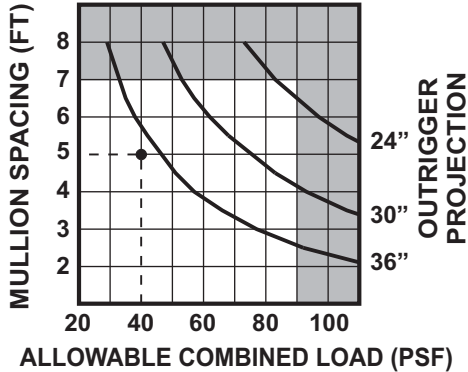
If any of the data calculated above does not validate the desired job requirements, consider reducing the outrigger projection, mullion spacing or vertical span. Solutions may also be available to meet your specific needs by contacting our engineering group at 1-866-955-2732.

Chart A

ALLOWABLE UNIFORM COMBINED LOAD FOR THERMASHADE ATTACHED TO E9-0654/E9-0655

MULLION SPACING (FT)

OUTRIGGER PROJECTION

24"
30"
36"

ALLOWABLE COMBINED LOAD (PSF)

Chart B

ThermaShade Length	Combined Load	Reduction Factor
24 Inch	80 PSF	0.81
24 Inch	60 PSF	0.85
24 Inch	40 PSF	0.90
24 Inch	30 PSF	0.92
30 Inch	80 PSF	0.73
30 Inch	60 PSF	0.78
30 Inch	40 PSF	0.85
30 Inch	30 PSF	0.88
36 Inch	80 PSF	0.57
36 Inch	60 PSF	0.63
36 Inch	40 PSF	0.79
36 Inch	30 PSF	0.84

E9-0654 / E9-0655 WITH HORIZONTALS WITHOUT THERMASHADES

VERTICAL SPAN (FT)

MULLION SPACING (FT)

40 PSF
50 PSF
60 PSF
70 PSF
80 PSF
90 PSF

Use the following charts to validate outrigger projection, mullion spacing, and vertical span. The following worksheet is for one standard ThermaShade per mullion.

Use the following job requirements as an example:

Combined Load = 40 psf
Mullion Spacing = 5'
Desired Outrigger Projection = 30"
Vertical Span = 11.25'
Wind Load = 40 psf

STEP 1
OBTAIN COMBINED LOAD

*COMBINED LOAD: _____(example: 40 psf)

*Allowable combined load (in PSF) as required by the code of jurisdiction and/or code referenced ASCE standard (Minimum Design Loads for Buildings and Other Structures) and determined by the building engineer of record (reference signed document) consisting of dead load plus other load effects such as snow, snow surcharges and drifts, ice, wind, live load roof, or others.

STEP 2
VALIDATE OUTRIGGER PROJECTION

Using **Chart A**, validate the desired sunshade depth (outrigger projection).

*COMBINED LOAD: _____
(Draw a vertical line at the Combined Load. Example: 40 psf)

VERTICAL MULLION SPACING: _____
(Draw horizontal line at Mullion Spacing. Example: 5')

DESIRED OUTRIGGER PROJECTION: _____
(Example: 30")

Intersecting point must be below the curve of the Outrigger Projection. In the example shown, the intersecting point is below the 30" Outrigger Projection curve, therefore it is validated.

STEP 3
DETERMINE REDUCTION FACTOR

Determine Wind Load reduction factor from **Chart B**.

REDUCTION FACTOR: _____(example: 0.85)
Note: Interpolate the reduction factor for combined loads not shown.

STEP 4
APPLY REDUCTION FACTOR AND VALIDATE THE DESIRED VERTICAL SPAN

Using the standard Wind Load Chart to the left, apply the Reduction Factor to the Vertical Span.
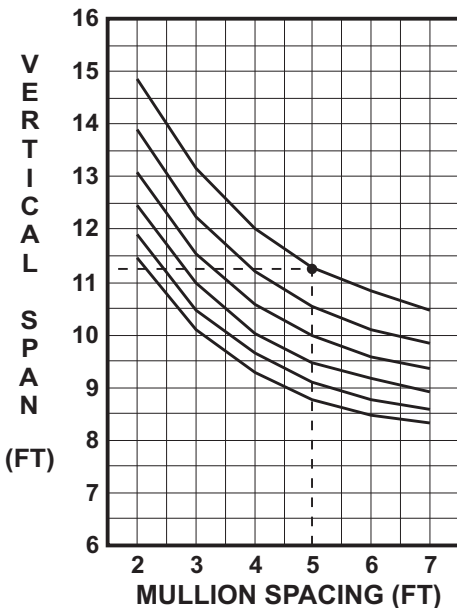
-Draw a vertical line at the Mullion Spacing until it intersects the desired Wind Load curve. (Example: 5'/40psf)

-Draw a horizontal line at the intersecting point and determine the Vertical Span (before applying the Reduction Factor). (Example: 11.25')

-Multiply the Vertical Span by the Reduction Factor to determine if the reduced span is acceptable. For example:

11.25' (Vertical Span) X 0.85 (Reduction Factor) = 9.56'. Since 11.25' is greater than 9.56', the desired Vertical Span has been validated.
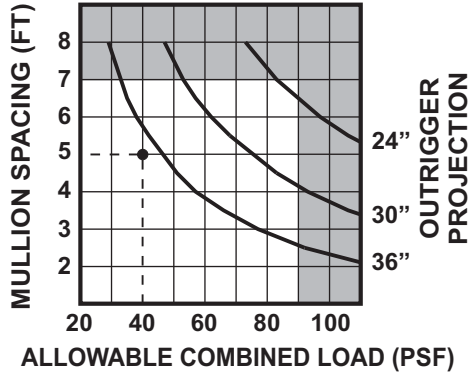
> If any of the data calculated above does not validate the desired job requirements, consider reducing the outrigger projection, mullion spacing or vertical span. Solutions may also be available to meet your specific needs by contacting our engineering group at 1-866-955-2732.

ThermaShade® Calculation Worksheet for BE9-0684/BE9-0655

YKK ap®

Chart A

ALLOWABLE UNIFORM COMBINED LOAD FOR THERMASHADE ATTACHED TO BE9-0684/BE9-0655

Chart B

ThermaShade Length	Combined Load	Reduction Factor
24 Inch	80 PSF	0.81
24 Inch	60 PSF	0.85
24 Inch	40 PSF	0.90
24 Inch	30 PSF	0.92
30 Inch	80 PSF	0.73
30 Inch	60 PSF	0.78
30 Inch	40 PSF	0.85
30 Inch	30 PSF	0.88
36 Inch	80 PSF	0.57
36 Inch	60 PSF	0.63
36 Inch	40 PSF	0.79
36 Inch	30 PSF	0.84

BE9-0684 / E9-0655 WITH HORIZONTALS WITHOUT THERMASHADES

Use the following charts to validate outrigger projection, mullion spacing, and vertical span. The following worksheet is for one standard ThermaShade per mullion.

Use the following job requirements as an example:

Combined Load = 40 psf
Mullion Spacing = 5'
Desired Outrigger Projection = 30"
Vertical Span = 11.1'
Wind Load = 40 psf

STEP 1
OBTAIN COMBINED LOAD

*COMBINED LOAD: _____ (example: 40 psf)

*Allowable combined load (in PSF) as required by the code of jurisdiction and/or code referenced ASCE standard (Minimum Design Loads for Buildings and Other Structures) and determined by the building engineer of record (reference signed document) consisting of dead load plus other load effects such as snow, snow surcharges and drifts, ice, wind, live load roof, or others.

STEP 2
VALIDATE OUTRIGGER PROJECTION

Using **Chart A**, validate the desired sunshade depth (outrigger projection).

*COMBINED LOAD: _____
(Draw a vertical line at the Combined Load. Example: 40 psf)

VERTICAL MULLION SPACING: _____
(Draw horizontal line at Mullion Spacing. Example: 5')

DESIRED OUTRIGGER PROJECTION: _____
(Example: 30")

Intersecting point must be below the curve of the Outrigger Projection. In the example shown, the intersecting point is below the 30" Outrigger Projection curve, therefore it is validated.

STEP 3
DETERMINE REDUCTION FACTOR

Determine Wind Load reduction factor from **Chart B**.

REDUCTION FACTOR: _____ (example: 0.85)
Note: Interpolate the reduction factor for combined loads not shown.

STEP 4
APPLY REDUCTION FACTOR AND VALIDATE THE DESIRED VERTICAL SPAN

Using the standard Wind Load Chart to the left, apply the Reduction Factor to the Vertical Span.
-Draw a vertical line at the Mullion Spacing until it intersects the desired Wind Load curve. (Example: 5'/40psf)
-Draw a horizontal line at the intersecting point and determine the Vertical Span (before applying the Reduction Factor). (Example: 11.1')
-Multiply the Vertical Span by the Reduction Factor to determine if the reduced span is acceptable. For example:
11.1' (Vertical Span) X 0.85 (Reduction Factor) = 9.44'. Since 11.1' is greater than 9.44', the desired Vertical Span has been validated.
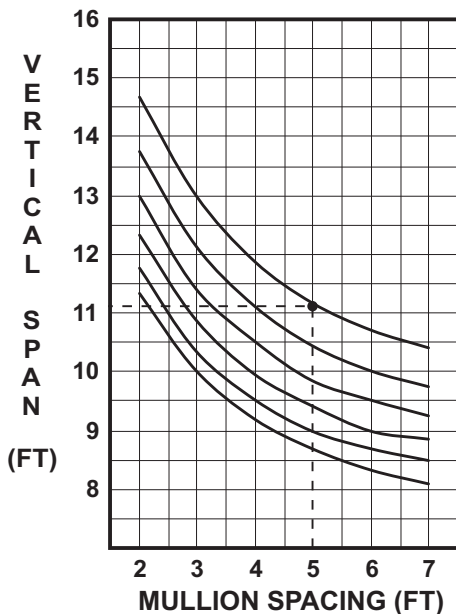
If any of the data calculated above does not validate the desired job requirements, consider reducing the outrigger projection, mullion spacing or vertical span. Solutions may also be available to meet your specific needs by contacting our engineering group at 1-866-955-2732.
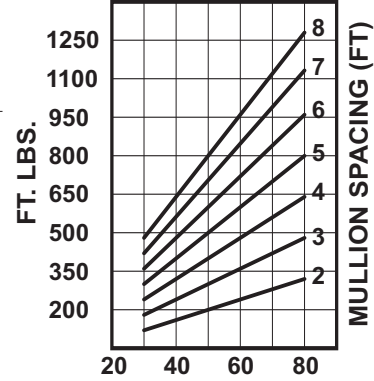
SHEAR AND MOMENT COMBINED LOAD CHARTS
FOR WALL MOUNT ATTACHMENT*

24" THERMASHADE
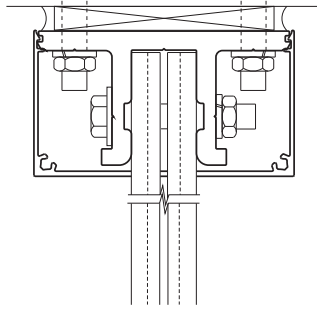### MAX. END REACTIONS-SHEAR
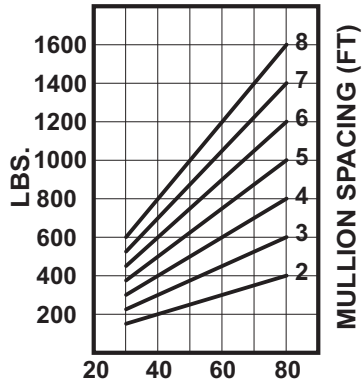### AT THE ATTACHMENT POINT
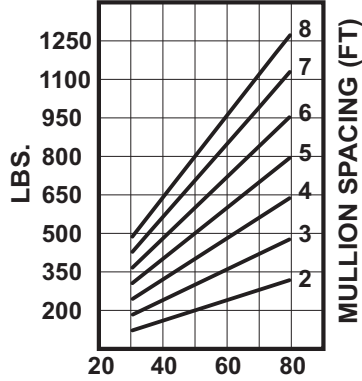
ALLOWABLE COMBINED LOAD (PSF)

24" THERMASHADE
MAX. END REACTIONS-MOMENT
AT THE ATTACHMENT POINT

ALLOWABLE COMBINED LOAD (PSF)

30" THERMASHADE
MAX. END REACTIONS-SHEAR
AT THE ATTACHMENT POINT

ALLOWABLE COMBINED LOAD (PSF)

30" THERMASHADE
MAX. END REACTIONS-MOMENT
AT THE ATTACHMENT POINT

ALLOWABLE COMBINED LOAD (PSF)

36" THERMASHADE
MAX. END REACTIONS-SHEAR
AT THE ATTACHMENT POINT

ALLOWABLE COMBINED LOAD (PSF)

36" THERMASHADE
MAX. END REACTIONS-MOMENT
AT THE ATTACHMENT POINT
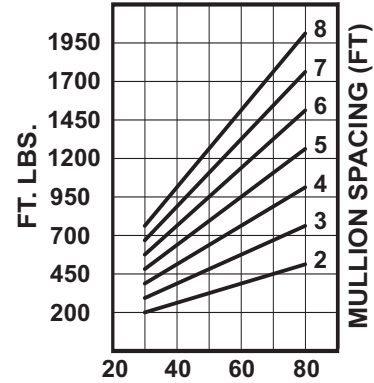
ALLOWABLE COMBINED LOAD (PSF)

*Wall Mount attachment refers to anchoring ThermaShades to various building facade conditions other than aluminum framing systems. It is the responsibility of others (not YKK AP) to ensure the facade condition and anchor attachments are capable of withstanding the reactions applied as shown on these charts.
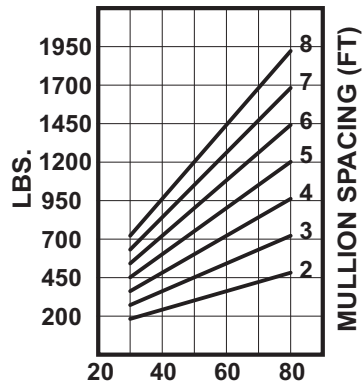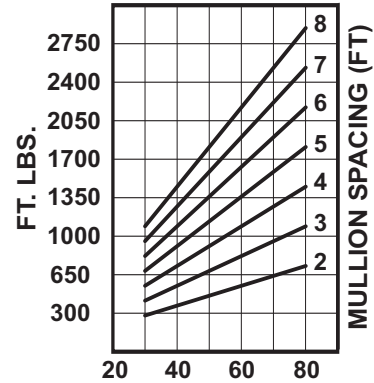
THERMASHADE FOR STOREFRONT
LOCATION OPTIONS

TYPE A

6" to 24" Max.
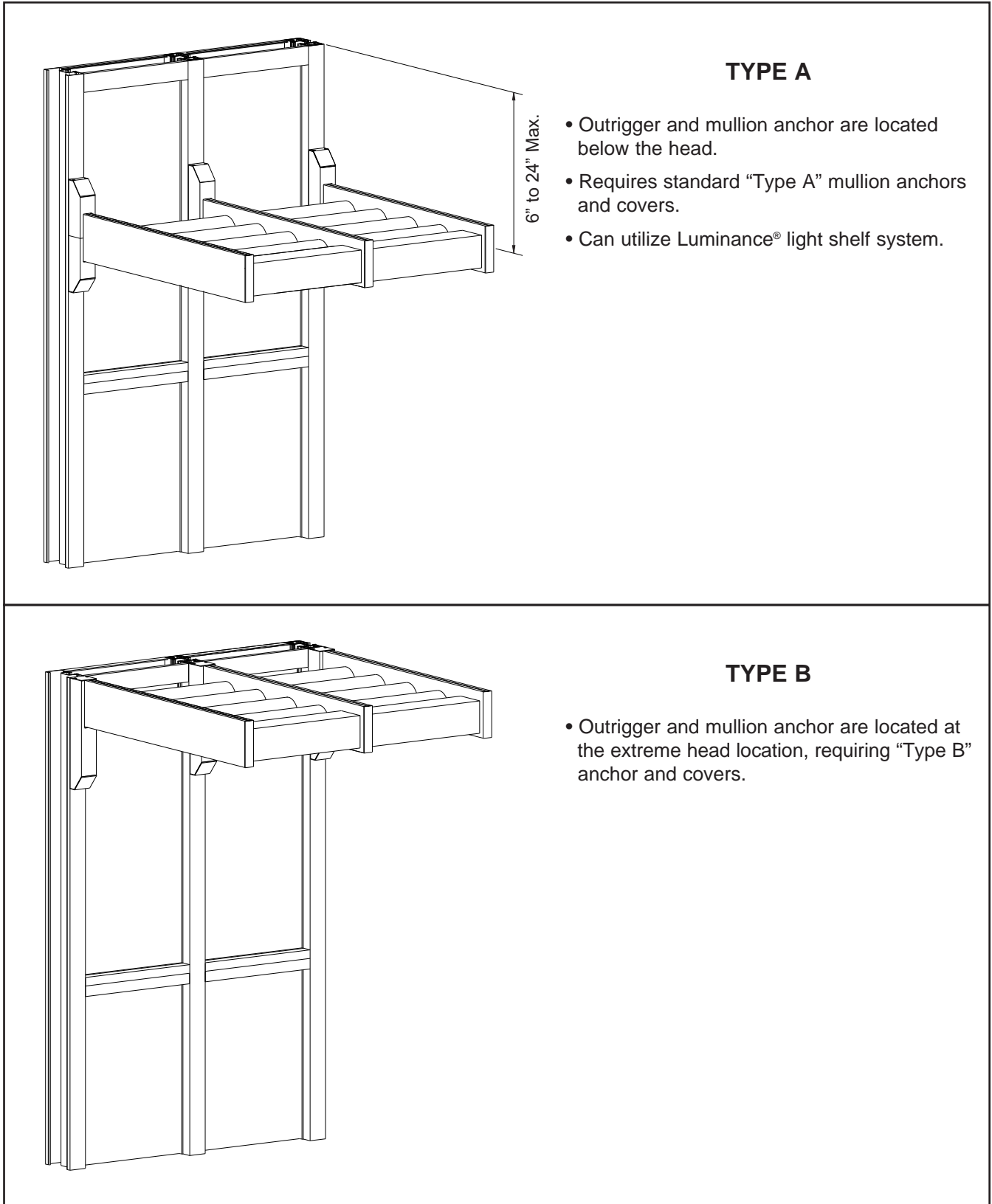
- Outrigger and mullion anchor are located below the head.

- Requires standard "Type A" mullion anchors and covers.

- Can utilize Luminance® light shelf system.

TYPE B

- Outrigger and mullion anchor are located at the extreme head location, requiring "Type B" anchor and covers.

COMBINED LOAD CHARTS
THERMASHADE FOR STOREFRONT

YES 45 FI
SCREW SPLINE WITH MULLION REINFORCEMENT AND STEEL BAR REINFORCEMENT

TYPE A LOCATION

OUTRIGGER SPACING (FT)

OUTRIGGER PROJECTION

24"
30"
36"

ALLOWABLE COMBINED LOAD (PSF)

TYPE B LOCATION

OUTRIGGER SPACING (FT)

OUTRIGGER PROJECTION

24"
30"
36"

ALLOWABLE COMBINED LOAD (PSF)

YES 45 FI
SCREW SPLINE WITH CONTINUOUS STEEL REINFORCEMENT

TYPE A LOCATION

OUTRIGGER SPACING (FT)

OUTRIGGER PROJECTION

24"
30"
36"

ALLOWABLE COMBINED LOAD (PSF)

TYPE B LOCATION

OUTRIGGER SPACING (FT)

OUTRIGGER PROJECTION

24"
30"
36"

ALLOWABLE COMBINED LOAD (PSF)

COMBINED LOAD CHARTS
THERMASHADE FOR STOREFRONT

YES 45 FI
SHEAR BLOCK WITH MULLION REINFORCEMENT AND STEEL BAR REINFORCEMENT

TYPE A LOCATION

OUTRIGGER SPACING (FT)

OUTRIGGER PROJECTION

24"
30"
36"

ALLOWABLE COMBINED LOAD (PSF)

TYPE B LOCATION

OUTRIGGER SPACING (FT)

OUTRIGGER PROJECTION

24"
30"
36"

ALLOWABLE COMBINED LOAD (PSF)

YES 45 FI
SHEAR BLOCK WITH CONTINUOUS STEEL REINFORCEMENT

TYPE A LOCATION

OUTRIGGER SPACING (FT)

OUTRIGGER PROJECTION

24"
30"
36"

ALLOWABLE COMBINED LOAD (PSF)

TYPE B LOCATION

OUTRIGGER SPACING (FT)

OUTRIGGER PROJECTION

24"
30"
36"

ALLOWABLE COMBINED LOAD (PSF)

COMBINED LOAD CHARTS
THERMASHADE FOR STOREFRONT

YES 45 TU
SCREW SPLINE WITH MULLION REINFORCEMENT AND STEEL BAR REINFORCEMENT

TYPE A LOCATION

OUTRIGGER SPACING (FT)

OUTRIGGER PROJECTION

24"
30"
36"

ALLOWABLE COMBINED LOAD (PSF)

TYPE B LOCATION

OUTRIGGER SPACING (FT)

OUTRIGGER PROJECTION

24"
30"
36"

ALLOWABLE COMBINED LOAD (PSF)

YES 45 TU
SHEAR BLOCK WITH MULLION REINFORCEMENT AND STEEL BAR REINFORCEMENT

TYPE A LOCATION

OUTRIGGER SPACING (FT)

OUTRIGGER PROJECTION

24"
30"
36"

ALLOWABLE COMBINED LOAD (PSF)

TYPE B LOCATION

OUTRIGGER SPACING (FT)

OUTRIGGER PROJECTION
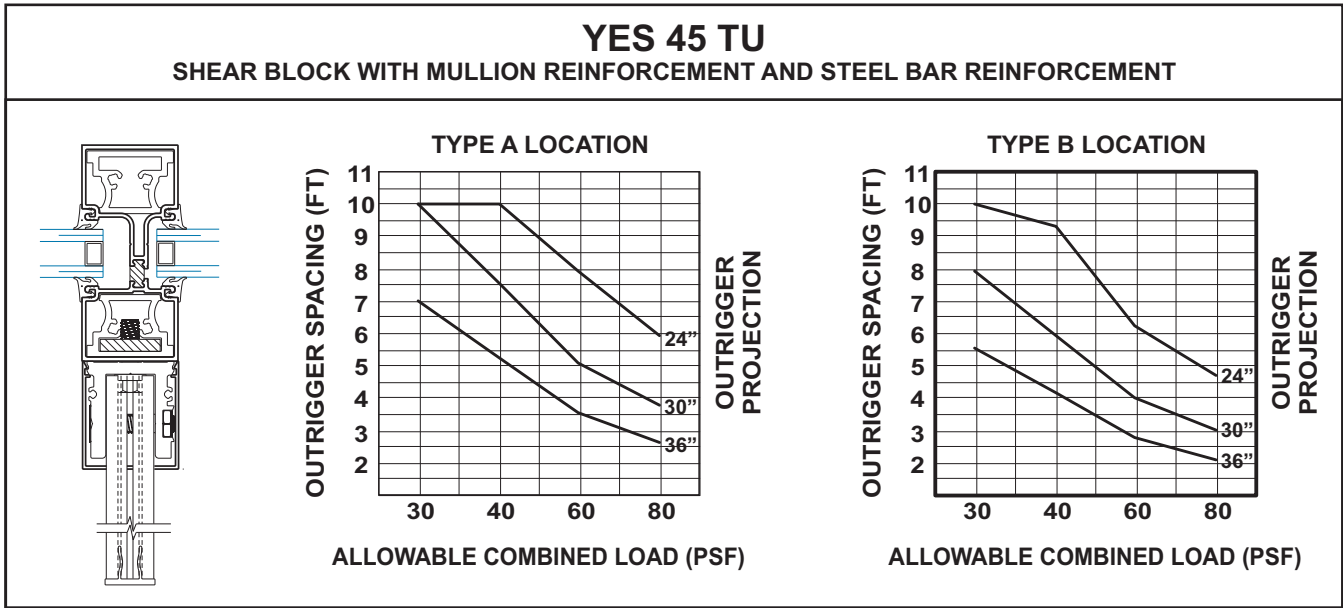
24"
30"
36"

ALLOWABLE COMBINED LOAD (PSF)

COMBINED LOAD CHARTS
THERMASHADE FOR STOREFRONT

YES 45 XT
SCREW SPLINE WITH MULLION REINFORCEMENT AND STEEL BAR REINFORCEMENT

TYPE A LOCATION

OUTRIGGER SPACING (FT)

OUTRIGGER PROJECTION

24"
30"
36"

ALLOWABLE COMBINED LOAD (PSF)

TYPE B LOCATION

OUTRIGGER SPACING (FT)

OUTRIGGER PROJECTION

24"
30"
36"

ALLOWABLE COMBINED LOAD (PSF)

YES 45 XT
SCREW SPLINE WITH MULLION REINFORCEMENT AND STEEL BAR REINFORCEMENT

TYPE A LOCATION

OUTRIGGER SPACING (FT)

OUTRIGGER PROJECTION

24"
30"
36"

ALLOWABLE COMBINED LOAD (PSF)

TYPE B LOCATION

OUTRIGGER SPACING (FT)

OUTRIGGER PROJECTION

24"
30"
36"

ALLOWABLE COMBINED LOAD (PSF)

COMBINED LOAD CHARTS
THERMASHADE FOR STOREFRONT

YHS 50 FI

TYPE A LOCATION

OUTRIGGER SPACING (FT)

ALLOWABLE COMBINED LOAD (PSF)

OUTRIGGER PROJECTION

24"
30"
36"

TYPE B LOCATION

OUTRIGGER SPACING (FT)

ALLOWABLE COMBINED LOAD (PSF)

OUTRIGGER PROJECTION

24"
30"
36"

YHS 50 TU

TYPE A LOCATION

OUTRIGGER SPACING (FT)

ALLOWABLE COMBINED LOAD (PSF)

OUTRIGGER PROJECTION

24"
30"
36"

TYPE B LOCATION

OUTRIGGER SPACING (FT)

ALLOWABLE COMBINED LOAD (PSF)

OUTRIGGER PROJECTION

24"
30"
36"