Features

- Trifab® VG 451/451T is 4-1/2" deep with a 2" sightline
- Front, Center, Back or Multi-Plane glass applications
- Flush glazed from either the inside or outside
- Screw Spline, Shear Block, Stick or Type-B fabrication
- SSG / Weatherseal option
- Isolock® lanced and debrided thermal break option with Trifab® VG 451T
- Infill options up to 1-1/8" thickness
- Permanodic® anodized finishes in 7 choices
- Painted finishes in standard and custom choices

Optional Features

- High performance interlocking flashing
- Acoustical rating per AAMA 1801 and ASTM E 1425
- Project specific U-factors (See Thermal Charts)

Product Applications

- Storefront, Ribbon Window or Punched Openings
- Single-span
- Integrated entrance framing allowing Kawneer standard entrances or other specialty entrances to be incorporated
- Kawneer Sealair® windows or GLASSvent® are easily incorporated

For specific product applications, Consult your Kawneer representative.
Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

Kawneer reserves the right to change configuration without prior notice when deemed necessary for product improvement.

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LAWS AND BUILDING AND SAFETY CODES GOVERNING THE DESIGN AND USE OF GLAZED ENTRANCE, WINDOW, AND CURTAIN WALL PRODUCTS VARY WIDELY. KAWNEER DOES NOT CONTROL THE SELECTION OF PRODUCT CONFIGURATIONS, OPERATING HARDWARE, OR GLAZING MATERIALS, AND ASSUMES NO RESPONSIBILITY THEREFOR.

Metric (SI) conversion figures are included throughout these details for reference. Numbers in parentheses ( ) are millimeters unless otherwise noted.

The following metric (SI) units are found in these details:

- m – meter
- cm – centimeter
- mm – millimeter
- s – second
- Pa – pascal
- MPa – megapascal

Kawneer reserves the right to change configurations without prior notice when deemed necessary for product improvement.
Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

Kawneer reserves the right to change configuration without prior notice when deemed necessary for product improvement.
The split vertical in the Screw Spline system allows a frame to be installed from unitized assemblies. Screws are driven through the back of the verticals into splines extruded in the horizontal framing members. The Individual units are then snapped together to form a complete frame.

The Shear Block system of fabrication allows a frame to be pre-assembled as a single unit. Horizontals are attached to the verticals with shear blocks.

The Stick system allows on-site construction. Head and sill receptors are fastened to the surround. Vertical mullions are then installed in these receptors and are held in place by snap-in inserts. Intermediate horizontal members are attached to the verticals with shear blocks. Flashing is not required.

NOTE:
If the end reaction of the mullion (mullion spacing (ft.) times height (ft.) times specified windload (psf) divided by two) is more than 500 lbs., the optional mullion anchors must be used. (See page 14)
The split vertical in the **Screw Spline** system allows a frame to be installed from unitized assemblies. Screws are driven through the back of the verticals into splines extruded in the horizontal framing members. The individual units are then snapped together to form a complete frame.

The **Shear Block** system of fabrication allows a frame to be pre-assembled as a single unit. Horizontals are attached to the verticals with shear blocks.

The **Stick** system allows on-site construction. Head and sill receptors are fastened to the surround. Vertical mullions are then installed in these receptors and are held in place by snap-in inserts. Intermediate horizontal members are attached to the verticals with shear blocks. Flashing is not required.

**NOTE:**
If the end reaction of the mullion (mullion spacing (ft.) times height (ft.) times specified windload (psf) divided by two) is more than 500 lbs., the optional mullion anchors must be used. (See page 36)
The Stick system allows on-site construction. Head and sill receptors are fastened to the surround. Vertical mullions are then installed in these receptors and are held in place by snap-in inserts. Intermediate horizontal members are attached to the verticals with shear blocks. Flashing is not required.

**NOTE:**
If the end reaction of the mullion (mullion spacing (ft.) times height (ft.) times specified windload (psf) divided by two) is more than 500 lbs., the optional mullion anchors must be used. (See page 36)
The **TYPE-B** punched opening fabrication allows a frame to be pre-assembled and installed as a single unit. Screws are driven through the back of the head and sill members into splines extruded in the vertical framing members. Intermediate horizontals are attached to the verticals with shear blocks.
The split vertical in the **Screw Spline** system allows a frame to be installed from unitized assemblies. Screws are driven through the back of the verticals into splines extruded in the horizontal framing members. The individual units are then snapped together to form a complete frame.

The **Shear Block** system of fabrication allows a frame to be pre-assembled as a single unit. Horizontals are attached to the verticals with shear blocks.

The **Stick** system allows on-site construction. Head and sill receptors are fastened to the surround. Vertical mullions are then installed in these receptors and are held in place by snap-in inserts. Intermediate horizontal members are attached to the verticals with shear blocks. Flashing is not required.

**NOTE:**
If the end reaction of the mullion (mullion spacing (ft.) times height (ft.) times specified windload (psf) divided by two) is more than 500 lbs., the optional mullion anchors must be used.
Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

Kawneer reserves the right to change configuration without prior notice when deemed necessary for product improvement.
Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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© Kawneer Company, Inc., 2012
Laws and building and safety codes governing the design and use of glass and glazing materials vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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SCALE 3" = 1'-0"

ELEVATION IS NUMBER KEYED TO DETAILS

NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

*Note: See Misc. Details for Thermal Pocket Filler and Thermal Flashing.

SCREW SPLINE

CAD Details (TF451) = TF_VG_451-SS-Center–CAD.zip
(TF451T) = TF_VG_451T-SS-Center–CAD.zip

451-CG-001 [451T-CG-001]
451-CG-001 [451T-CG-001]
451-CG-002 [451T-CG-002]

4 JAMB
5 VERTICAL

HEART

(50.8)

(114.3)

TYPICAL

HORIZONTAL

SILL

451-CG-011 [451T-CG-011]
451-CG-004

451-CG-001 [451T-CG-001]

451-CG-004

451-CG-003 [451T-CG-003]

*See Page 14 for Thermal Flashing and Optional High Performance Flashing

SHEAR BLOCK

CAD Details (TF451) = TF_VG_451-SB-Center–CAD.zip
(TF451T) = TF_VG_451T-SB-Center–CAD.zip

451-CG-001 [451T-CG-001]
451-CG-005 [451T-CG-005]

2"

2" (50.8) TYPICAL

4.125" (104.9)

4 JAMB
5 VERTICAL

HEART

451-CG-003 [451T-CG-003]
451-CG-004

451-CG-001 [451T-CG-001]

451-CG-004

*See Page 14 for Thermal Flashing and Optional High Performance Flashing

STICK

CAD Details (TF451) = TF_VG_451-Stick-Center–CAD.zip
(TF451T) = TF_VG_451T-Stick-Center–CAD.zip

451-CG-001 [451T-CG-001]
451-CG-005 [451T-CG-005]

1 HEAD

451-CG-008 [451T-CG-008]
451-CG-004

5"

5" (127.0)

4 JAMB
5 VERTICAL

HEART

451-CG-008 [451T-CG-008]
451-CG-004

451-CG-065 [451T-CG-065]
451-CG-006

451-CG-066 [451T-CG-066]
451-CG-004

*See Page 14 for Thermal Flashing and Optional High Performance Flashing

MAY, 2012
EC 97911-43
BASIC FRAMING DETAILS (CENTER - Inside Glazed)
Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

Kawneer reserves the right to change configuration without prior notice when deemed necessary for product improvement.

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**SCALE 3" = 1'-0"**

**NOTE:**
If the end reaction of the mullion (mullion spacing (ft.) times height (ft.) times specified windload (psf), divided by two) is more than 500 LBS., the optional mullion anchor must be used. Consult Application Engineering.

**NOTE:**
Mullion Anchor not used with Lightweight Receptor.
Law and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor. Kawneer reserves the right to change configuration without prior notice when deemed necessary for product improvement.

**TRIFAB® VG 451/451T**

**MISCELLANEOUS FRAMING (CENTER)**

**SCALE 3" = 1'-0"**

**NOTE:** SIDELITE BASES SHOWN ARE FOR USE WITH SCREW SPLINE AND SHEAR BLOCK SYSTEMS ONLY.
Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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SCALE 3" = 1'-0"

CURVING DETAILS
(Center Plane Only)

175-186
175-188
4-1/2" (114.3)
TYPICAL

175-190
175-191

STOOL TRIM CLIP
WITH STANDARD FLASHING

STOOL TRIM CLIP
WITH HIGH PERFORMANCE
FLASHING

Seal over Stool Trim fasteners to prevent water infiltration.

STOOL TRIM CLIP
FOR STICK ASSEMBLY

STOOL TRIM

451-VG-640

CURVING DETAILS

175-187

BRAKE METAL
FILLERS

451-VG-150
(451T-VG-150)

BRAKE METAL
ADAPTOR AT HORIZONTAL

BRAKE METAL
FILLERS

451-VG-150
(451T-VG-150)

BRAKE METAL
ADAPTOR AT VERTICAL

CAD Details - SCREW SPLINE
(451) = TF_VG_451-SS-Center-CAD.zip
(451T) = TF_VG_451T-SS-Center-CAD.zip

CAD Details - SHEAR BLOCK
(451) = TF_VG_451-SB-Center-CAD.zip
(451T) = TF_VG_451T-SB-Center-CAD.zip

CAD Details - STICK
(451) = TF_VG_451-Stick-Center-CAD.zip
(451T) = TF_VG_451T-Stick-Center-CAD.zip

STOOL TRIM CLIP
WITH STANDARD FLASHING

STOOL TRIM

451-VG-640
Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

Kawneer reserves the right to change configuration without prior notice when deemed necessary for product improvement.

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TRIFAB® VG 451 FRAMING INCORPORATING KAWNEER® “190” DOORS.

DOOR FRAMING NON-THERMAL ONLY

NOTE: OTHER TYPES OF KAWNEER DOORS MAY BE USED WITH THIS FRAMING SYSTEM.
SEE ENTRANCE DETAILS FOR ADDITIONAL INFORMATION.

SCALE 3" = 1'-0"

TRIFAB® VG 451

ENTRANCE FRAMING (CENTER)

TRANSMOM JAMBS

Transom area for both double or single acting doors with glass surround. Jamb above transom bar are routed out to accept glass holding insert with or without steel reinforcing.
**SCALE 3" = 1'-0"**

**TRIFAB® VG 451 FRAMING INCORPORATING KAWNEER® “190” DOORS.**

DOOR FRAMING NON-THERMAL ONLY

**NOTE:** OTHER TYPES OF KAWNEER DOORS MAY BE USED WITH THIS FRAMING SYSTEM. SEE ENTRANCE DETAILS FOR ADDITIONAL INFORMATION.

---

**TRIFAB® VG 451/451T ENTRANCE FRAMING (CENTER - Open Back)**

**TRANSOM JAMBS**

Transom area for both double or single acting doors with glass surround. Jambs above transom bar are routed out to accept glass holding insert with or without steel reinforcing.

**ELEVATIONS ARE NUMBER KEYED TO DETAILS**

**SCALE 3" = 1'-0"**

**NOTE:** Sidelite mullions must be oriented to provide at least one (1) deep vertical pocket per lite to facilitate glazing.
Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

Kawneer reserves the right to change configuration without prior notice when deemed necessary for product improvement.

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NOTE: Bronze spacer is recommended when 1" insulating glass is used.

MAXIMUM / MINIMUM SIZES (1" INFILL)

PROJECT-OUT
- MAXIMUM 60" x 36"
- MINIMUM 14" x 14"

OUTSWING CASEMENT
- MAXIMUM 36" x 60"
- MINIMUM 14" x 14"
## STOREFRONT GLASSvent® HARDWARE SELECTION GUIDE

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>PROJECT - OUT</th>
<th>OUTSWING CASEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stainless steel 4-bar hinge</td>
<td>STANDARD</td>
<td>STANDARD</td>
</tr>
<tr>
<td>Cast white bronze cam lock</td>
<td>STANDARD</td>
<td>STANDARD</td>
</tr>
<tr>
<td>Cast white bronze cam lock with pole ring</td>
<td>OPTIONAL</td>
<td>OPTIONAL</td>
</tr>
<tr>
<td>Cast white bronze custodial lock with removable handle</td>
<td>OPTIONAL</td>
<td>OPTIONAL</td>
</tr>
<tr>
<td>Cast white bronze concealed lock with removable hex key</td>
<td>OPTIONAL</td>
<td>OPTIONAL</td>
</tr>
<tr>
<td>Cast white bronze pole/pull ring</td>
<td>OPTIONAL</td>
<td></td>
</tr>
<tr>
<td>Pivot-shoe roto-operator</td>
<td>OPTIONAL</td>
<td></td>
</tr>
<tr>
<td>Multi-point lock with cast white bronze locking handle</td>
<td>OPTIONAL</td>
<td></td>
</tr>
<tr>
<td>Insect screen</td>
<td>OPTIONAL</td>
<td>OPTIONAL</td>
</tr>
</tbody>
</table>

**Diagram:**
- CAM LOCK
- CAM LOCK WITH POLE RING
- PULL RING
- CUSTODIAL LOCK
- REMOVABLE HANDLE
- PIVOT SHOE ROTO-OPERATOR
- STAINLESS STEEL 4 BAR HINGES
- CONCEALED LOCK
- INSECT SCREEN WITH STANDARD WICKET
- INSECT SCREEN WITH FULL WICKET
Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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SCALE 3" = 1'-0"

PROJECT-OUT
VERTICAL SECTION

822ST-L VENTS SHOWN
NOTE: OTHER VENT TYPES CAN BE ACCOMMODATED, CONSULT YOUR KAWNEER REPRESENTATIVE FOR OTHER OPTIONS

ELEVATION IS NUMBER KEYED TO DETAILS

PROJECT-OUT
HORIZONTAL SECTION

NOTE:

TRIFAB® VG 451/451T
VENTS (CENTER)
Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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TRIFAB® VG 451/451T BASIC FRAMING DETAILS (CENTER - Outside Glazed) LEVEL D - LARGE MISSILE IMPACT

Hurricane Resistant Product

NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

SCALE 3" = 1'-0"

ELEVATION IS NUMBER KEYED TO DETAILS

SCREW SPLINE

OPTIONAL FRAMING (CENTER)

TUBULAR EXPANSION MULLION

TWO POCKET CORNER POST

TWO POCKET OUTSIDE CORNER POST

TWO POCKET INSIDE CORNER POST
TRIFAB® VG 451/451T
ENTRANCE FRAMING (CENTER)
LEVEL D - LARGE MISSILE IMPACT

SCALE 3" = 1'-0"

TRIFAB® VG 451 FRAMING INCORPORATING KAWNEER® “350IR” DOORS (DRY GLAZED).
DOOR FRAMING NON-THERMAL ONLY

ELEVATIONS ARE NUMBER KEYED TO DETAILS

CONCEALED OVERHEAD CLOSERS

SINGLE ACTING BOTTOM RAIL

Optional Bottom Rail Sweep

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TRIFAB® VG 451 FRAMING INCORPORATING KAWNEER® “350 IR” DOORS (DRY GLAZED).

DOOR FRAMING NON-THERMAL ONLY

TRANSOM JAMBS
Transom area for both double or single acting doors with glass surround. Jambs above transom bar are routed out to accept glass holding insert with or without steel reinforcing.

SINGLE ACTING DOOR JAMBS

MEETING STILES

3M TAPE 350 IR DOOR GLAZING OPTION
Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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**SCALE 3" = 1'-0"**

**SCREW SPLINE**

<table>
<thead>
<tr>
<th>CAD Details (TF451)</th>
<th>CAD Details (TF451T)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TF_VG_451-SS-Front--CAD.zip</td>
<td>TF_VG_451T-SS-Front--CAD.zip</td>
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<thead>
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<th>451-VG-001</th>
<th>451-VG-002</th>
</tr>
</thead>
<tbody>
<tr>
<td>50.8</td>
<td>114.3</td>
</tr>
</tbody>
</table>

**SHEAR BLOCK**

<table>
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<td>114.3</td>
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</tbody>
</table>

**STICK**

<table>
<thead>
<tr>
<th>CAD Details (TF451)</th>
<th>CAD Details (TF451T)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TF_VG_451-Stick-Front--CAD.zip</td>
<td>TF_VG_451T-Stick-Front--CAD.zip</td>
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<td>114.3</td>
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</tbody>
</table>

*See Page 35 for Thermal Flashing and Optional High Performance Flashing*
Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

Kawneer reserves the right to change configuration without prior notice when deemed necessary for product improvement.

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scale 3" = 1'-0"

STICK (INSIDE GLAZED)
TWO COLOR OPTION

STANDARD RECEPTOR with SSG ADAPTOR

CAD Details - STICK (TF451) = TF_VG_451-Stick-Front--CAD.zip
(TF451T) = TF_VG_451T-Stick-Front--CAD.zip

TRIFAB® VG 451/451T
BASIC FRAMING DETAILS (FRONT)

MAY, 2012
EC 97911-43

Kawneer reserves the right to change configuration without prior notice when deemed necessary for product improvement.
SCALE 3" = 1'-0"

**STICK (INSIDE GLAZED)**

**SSG RECEPTOR**

CAD Details - STICK SSG
(TF451) = TF_VG_451-Stick-SSG-F--CAD.zip
(TF451T) = TF_VG_451T-Stick-SSG-F--CAD.zip

**STICK (OUTSIDE GLAZED)**

**SSG RECEPTOR**

CAD Details - STICK SSG
(TF451) = TF_VG_451-Stick-SSG-F--CAD.zip
(TF451T) = TF_VG_451T-Stick-SSG-F--CAD.zip
Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

Kawneer reserves the right to change configuration without prior notice when deemed necessary for product improvement.
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Kawneer reserves the right to change configuration without prior notice when deemed necessary for product improvement.

CAD Details - TYPE-B
(TF451) = TF_VG_451-Type_B-Front-CAD.zip
(TF451T) = TF_VG_451T-Type_B-Front-CAD.zip

SCALE 3" = 1'-0"

ELEVATION IS NUMBER KEYED TO DETAILS

NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

TYPE-B (INSIDE GLAZED)

PUNCHED OPENING

BASIC FRAMING DETAILS (FRONT)
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Kawneer reserves the right to change configurations without prior notice when deemed necessary for product improvement.

SCALE 3" = 1'-0"

ELEVATION IS NUMBER KEYED TO DETAILS

NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

TYPE-B (INSIDE GLAZED)

SSG \ WEATHERSEAL

PUNCHED OPENING

1 HEAD

1A HEAD

2 HORIZONTAL

3 SILL

4 JAMB

5 SSG VERTICAL

5 WEATHERSEAL VERTICAL

CAD Details - TYPE-B
(TF451) = TF_VG_451-Type_B-Front--CAD.zip
(TF451T) = TF_VG_451T-Type_B-Front--CAD.zip
SCALE 3" = 1'-0"

EXPANSION MULLION

TUBULAR EXPANSION MULLION

TUBULAR EXPANSION MULLION WITH STEEL

1/4" INFILL SNAP-IN ADAPTOR

5/8" INFILL SNAP-IN ADAPTOR

PVC FLAT FILLER (NON STRUCTURAL)

THERMAL FLAT FILLER

SNAP-IN FLAT FILLER

THermal FLASHING

STANDARD - HEAD COMPENSATING RECEPTOR

HEAVY WEIGHT - HEAD COMPENSATING RECEPTOR

ONE PIECE - HEAD COMPENSATING RECEPTOR

JAMB COMPENSATING RECEPTOR

HIGH PERFORMANCE FLASHING

MISCELLANEOUS FRAMING (FRONT)
Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor. Kawneer reserves the right to change configuration without prior notice when deemed necessary for product improvement.

SCALE 3" = 1'-0"

NOTE:
If the end reaction of the mullion (mullion spacing (ft.) times height (ft) times specified windload (psf), divided by two) is more than 500 LBS., the optional Mullion Anchor must be used. Consult Application Engineering.

NOTE:
Mullion Anchor not used with Lightweight Receptor.
Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

Kawneer reserves the right to change configuration without prior notice when deemed necessary for product improvement.

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TRIFAB® VG 451/451T
CORNERS (FRONT)

SCALE 3” = 1’-0”

CAD Details - SCREW SPLINE
(TF451) = TF_VG_451-SS-Front--CAD.zip
(TF451T) = TF_VG_451T-SS-Front--CAD.zip

CAD Details - SHEAR BLOCK
(TF451) = TF_VG_451-SS-Front--CAD.zip
(TF451T) = TF_VG_451T-SS-Front--CAD.zip

CAD Details - STICK
(TF451) = TF_VG_451-Stick-Front--CAD.zip
(TF451T) = TF_VG_451T-Stick-Front--CAD.zip
Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

Kawneer reserves the right to change configuration without prior notice when deemed necessary for product improvement.

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SCALE 3" = 1'-0"

CAD Details - STICK SSG
(TF451) = TF_VG_451-Stick-SSG-F--CAD.zip
(TF451T) = TF_VG_451T-Stick-SSG-F--CAD.zip

CAD Details - TYPE-B
(TF451) = TF_VG_451-Type_B-Front--CAD.zip
(TF451T) = TF_VG_451T-Type_B-Front--CAD.zip

90° OUTSIDE CORNER

90° INSIDE CORNER

135° OUTSIDE CORNER

135° INSIDE CORNER
TRIFAB® VG 451 FRAMING INCORPORATING KAWNEER® “190” DOORS.

DOOR FRAMING NON-THERMAL ONLY

NOTE: OTHER TYPES OF KAWNEER DOORS MAY BE USED WITH THIS FRAMING SYSTEM. SEE ENTRANCE DETAILS FOR ADDITIONAL INFORMATION.

Transom area for both double or single acting doors with glass surround. Jambs above transom bar are routed out to accept glass holding insert.
Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

Kawneer reserves the right to change configuration without prior notice when deemed necessary for product improvement.

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SCALE 3" = 1'-0"

NOTE: Bronze spacer is recommended when 1" insulating glass is used.

MAXIMUM / MINIMUM SIZES (1" INFILL)

PROJECT-OUT
- MAXIMUM 60" x 36"
- MINIMUM 14" x 14"

OUTSWING CASEMENT
- MAXIMUM 36" x 60"
- MINIMUM 14" x 14"
## STOREFRONT GLASSvent® HARDWARE SELECTION GUIDE

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>PROJECT - OUT</th>
<th>OUTSWING CASEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stainless steel 4-bar hinge</td>
<td>STANDARD</td>
<td>STANDARD</td>
</tr>
<tr>
<td>Cast white bronze cam lock</td>
<td>STANDARD</td>
<td>STANDARD</td>
</tr>
<tr>
<td>Cast white bronze cam lock with pole ring</td>
<td>OPTIONAL</td>
<td>OPTIONAL</td>
</tr>
<tr>
<td>Cast white bronze custodial/ Air conditioning locks with removable handle</td>
<td>OPTIONAL</td>
<td>OPTIONAL</td>
</tr>
<tr>
<td>Cast white bronze concealed lock with removable hex key</td>
<td>OPTIONAL</td>
<td>OPTIONAL</td>
</tr>
<tr>
<td>Cast white bronze pole/pull ring</td>
<td>OPTIONAL</td>
<td></td>
</tr>
<tr>
<td>Pivot-shoe roto-operator</td>
<td>OPTIONAL</td>
<td></td>
</tr>
<tr>
<td>Multi-point lock with cast white bronze locking handle</td>
<td>OPTIONAL</td>
<td></td>
</tr>
<tr>
<td>Insect screen</td>
<td>OPTIONAL</td>
<td>OPTIONAL</td>
</tr>
</tbody>
</table>

### Diagrams

- **Cam Lock**
- **Cam Lock with Pole Ring**
- **Pull Ring**
- **Custodial Lock**
- **Removable Handle**
- **Pivot Shoe Roto-Operator**
- **Stainless Steel 4 Bar Hinges**
- **Concealed Lock**
- **Insect Screen with Standard Wicket**
- **Insect Screen with Full Wicket**
Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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SCALE 3" = 1'-0"

PROJECT-OUT
VERTICAL SECTION

8225T-L VENTS SHOWN
NOTE: OTHER VENT TYPES CAN BE ACCOMMODATED, CONSULT YOUR KAWNEER REPRESENTATIVE FOR OTHER OPTIONS

PROJECT-OUT
HORIZONTAL SECTION
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MISCELLANEOUS FRAMING .................................................... 46-47
Corners ................................................................................. 48
ENTRANCE FRAMING ............................................................. 49
Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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EC 97911-43

SCALE 3" = 1'-0"

**SCREW SPLINE**

CAD Details (TF451) = TF_VG_451-SS-Back--CAD.zip
(TF451T) = TF_VG_451T-SS-Back--CAD.zip

**SHEAR BLOCK**

CAD Details (TF451) = TF_VG_451-SB-Back--CAD.zip
(TF451T) = TF_VG_451T-SB-Back--CAD.zip

**STICK**

CAD Details (TF451) = TF_VG_451-Stick-Back--CAD.zip
(TF451T) = TF_VG_451T-Stick-Back--CAD.zip

---

*See Page 46 for Thermal Flashing and Optional High Performance Flashing*
Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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<table>
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<tr>
<th>SCREW SPLINE</th>
<th>SHEAR BLOCK</th>
<th>STICK</th>
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<tbody>
<tr>
<td>CAD Details (TF451) = TF_VG.451-SS-Back--CAD.zip</td>
<td>CAD Details (TF451) = TF_VG.451-SB-Back--CAD.zip</td>
<td>CAD Details (TF451) = TF_VG.451-Stick-Back--CAD.zip</td>
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</table>

ELEVATION IS NUMBER KEYED TO DETAILS

NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

*See Page 46 for Thermal Flashing and Optional High Performance Flashing

SCALE 3" = 1'-0"
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SCALE 3" = 1'-0"

EXPANSION MULLION

TUBULAR EXPANSION MULLION

TUBULAR EXPANSION MULLION WITH STEEL

1/4" INFILL SNAP-IN ADAPTOR

5/8" INFILL SNAP-IN ADAPTOR

PVC FLAT FILLER (NON STRUCTURAL)

THERMAL FLAT FILLER

SNAP-IN FLAT FILLER

THERMAL FLASHING

STANDARD - HEAD COMPENSATING RECEPTOR

HEAVY WEIGHT - HEAD COMPENSATING RECEPTOR

HIGH PERFORMANCE FLASHING

STANDARD - HEAD COMPENSATING RECEPTOR

JAMB COMPENSATING RECEPTOR

TRIFAB® VG 451/451T

MISCELLANEOUS FRAMING (BACK)

MAY, 2012

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EC 97911-43

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**SCALE 3" = 1'-0"**

**CAD Details - SCREW SPLINE**

(TF451) = TF_VG_451-SS-Back-CAD.zip
(TF451T) = TF_VG_451T-SS-Back-CAD.zip

**CAD Details - SHEAR BLOCK**

(TF451) = TF_VG_451-SB-Back-CAD.zip
(TF451T) = TF_VG_451T-SB-Back-CAD.zip

**CAD Details - STICK**

(TF451) = TF_VG_451-Stick-Back-CAD.zip
(TF451T) = TF_VG_451T-Stick-Back-CAD.zip

---

**NOTE:**

If the end reaction of the mullion (mullion spacing (ft.) times height (ft) times specified windload (psf), divided by two) is more than 500 LBS., the optional Mullion Anchor must be used. Consult Application Engineering.

**NOTE:**

Mullion Anchor not used with Lightweight Receptor.

---

**STOOL TRIM CLIP**

with STANDARD FLASHING

**STOOL TRIM CLIP**

with HP FLASHING

**STOOL TRIM CLIP**

FOR STICK ASSEMBLY

Seal over Stool Trim fasteners to prevent water infiltration.

Seal over Stool Trim fasteners to prevent water infiltration.

Seal over Stool Trim fasteners to prevent water infiltration.
Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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SCALE 3" = 1'-0"

**CAD Details - SCREW SPLINE**
(TF451) = TF_VG_451-SS-Back-CAD.zip
(TF451T) = TF_VG_451T-SS-Back-CAD.zip

**CAD Details - SHEAR BLOCK**
(TF451) = TF_VG_451-SS-Back-CAD.zip
(TF451T) = TF_VG_451T-SS-Back-CAD.zip

**CAD Details - STICK**
(TF451) = TF_VG_451-Stick-Back-CAD.zip
(TF451T) = TF_VG_451T-Stick-Back-CAD.zip

TRIFAB® VG 451/451T
CORNERS (BACK)
MAY, 2012
EC 97911-43

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TRIFAB® VG 451 FRAMING INCORPORATING KAWNEER® “190” DOORS.

DOOR FRAMING NON-THERMAL ONLY

NOTE: OTHER TYPES OF KAWNEER DOORS MAY BE USED WITH THIS FRAMING SYSTEM.

SEE ENTRANCE DETAILS FOR ADDITIONAL INFORMATION.

TRANSOM JAMBS

Transom area for both double or single acting doors with glass surround. Jambs above transom bar are routed out to accept glass holding insert.
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Kawneer reserves the right to change configuration without prior notice when deemed necessary for product improvement.
BASIC FRAMING DETAILS.......................................................... 52-57
(See appropriate Center, Front or Back Section for Miscellaneous Details.)
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SCALE 3" = 1'-0"

SCREW SPLINE ASSEMBLY

ELEVATION IS NUMBER KEYED TO DETAILS

FRONT BACK CENTRE FRONT

1 4 7
2 5 8
3 6 9
10 11 12 13 14

10 JAMB 11 VERTICAL 12 VERTICAL (THERMAL) 13 VERTICAL (THERMAL) 14 JAMB

FRONT See Pages 28 thru 42 for all FRONT details.

1 HEAD

2 HORIZONTAL

3 SILL

*See Page 35 for Thermal Flashing and Optional High Performance Flashing

BACK See Pages 44 thru 49 for all BACK details.

4 HEAD

5 HORIZONTAL

6 SILL

*See Page 46 for Thermal Flashing and Optional High Performance Flashing

CENTER See Pages 12 thru 22 for all CENTER details.

7 HEAD

8 HORIZONTAL

9 SILL

*See Page 14 for Thermal Flashing and Optional High Performance Flashing

NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

CAD Details - MULTI-PLANE
(THF451) = TF_VG_451-SS+SB-Multi–CAD.zip
(THF451T) = TF_VG_451T-SS+SB-Multi–CAD.zip

TRIFAB® VG 451/451T
BASIC FRAMING DETAILS (MULTI-PLANE - Outside Glazed)

MAY, 2012

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Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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SCALE 3" = 1'-0"

SCREW SPLINE ASSEMBLY

FRONT
See Pages 28 thru 41 for all FRONT details.

BACK
See Pages 44 thru 49 for all BACK details.

CENTER
See Pages 12 thru 22 for all CENTER details.

1 HEAD
4 HEAD
7 HEAD

2 HORIZONTAL
5 HORIZONTAL
8 HORIZONTAL

3 SILL
6 SILL
9 SILL

*See Page 35 for Thermal Flashing and Optional High Performance Flashing
*See Page 46 for Thermal Flashing and Optional High Performance Flashing
*See Page 14 for Thermal Flashing and Optional High Performance Flashing

NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

BASIC FRAMING DETAILS (MULTI-PLANE - Inside Glazed)

TRIFAB® VG 451/451T

MAY, 2012

EC 97911-43

53 DETAILS
Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

Kawneer reserves the right to change configuration without prior notice when deemed necessary for product improvement.

Note: Transition verticals are required to be two piece.

ELEVATION IS NUMBER KEYED TO DETAILS

NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

FRONT
See Pages 28 thru 42 for all FRONT details.

BACK
See Pages 44 thru 49 for all BACK details.

CENTER
See Pages 12 thru 22 for all CENTER details.

*See Page 35 for Thermal Flashing and Optional High Performance Flashing

*See Page 46 for Thermal Flashing and Optional High Performance Flashing

*See Page 14 for Thermal Flashing and Optional High Performance Flashing

Kawneer reserves the right to change configuration without prior notice when deemed necessary for product improvement.
Scale 3" = 1'-0"

Shear Block Assembly

Front
See Pages 28 thru 42 for all Front details.

Back
See Pages 44 thru 49 for all Back details.

Center
See Pages 12 thru 22 for all Center details.

Note: Transition verticals are required to be two piece.
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### SCALE 3" = 1'-0"

#### STICK ASSEMBLY

<table>
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<tr>
<th>FRONT</th>
<th>BACK</th>
<th>CENTER</th>
<th>FRONT</th>
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</thead>
<tbody>
<tr>
<td>10 JAMB</td>
<td>11 VERTICAL</td>
<td>12 VERTICAL (THERMAL)</td>
<td>13 VERTICAL (THERMAL)</td>
</tr>
<tr>
<td>(114.3)</td>
<td>(50.8)</td>
<td>(114.3)</td>
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</tr>
<tr>
<td>2-1/4&quot; (57.2)</td>
<td>5&quot; (127)</td>
<td>2-1/4&quot; (57.2)</td>
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**ELEVATION IS NUMBER KEYED TO DETAILS**

**Note:** Transition verticals are required to be two piece.

### FRONT

See Pages 28 thru 42 for all FRONT details.

1 HEAD

2 HORIZONTAL

3 SILL

### BACK

See Pages 44 thru 49 for all BACK details.

4 HEAD

5 HORIZONTAL

6 SILL

### CENTER

See Pages 12 thru 22 for all CENTER details.

7 HEAD

8 HORIZONTAL

9 SILL

**CAD Details - MULTI-PLANE**

(TF451) = TF_VG_451-Stick-Multi-CAD.zip

(TF451T) = TF_VG_451T-Stick-Multi-CAD.zip

NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

TRIFAB® VG 451/451T

BASIC FRAMING DETAILS (MULTI-PLANE - Outside Glazed)
**TRIFAB® VG 451/451T**

**BASIC FRAMING DETAILS (MULTI-PLANE - Inside Glazed)**

**SCALE 3" = 1'-0"**

**STICK ASSEMBLY**

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<td>CENTER</td>
<td>FRONT</td>
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**ELEVATION IS NUMBER KEYED TO DETAILS**

**Note:** Transition verticals are required to be two piece

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**FRONT**

See Pages 28 thru 42 for all FRONT details.

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**BACK**

See Pages 44 thru 49 for all BACK details.

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**CENTER**

See Pages 12 thru 22 for all CENTER details.

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**CAD Details - MULTI-PLANE**

- (TF451) = TF.VG.451-Stick-Multi--CAD.zip
- (TF451T) = TF.VG.451T-Stick-Multi--CAD.zip
Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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Mullions are designed for deflection limitations in accordance with AAMA TIR-A11 of L175 up to 13'-6" and L240 + 1/4" above 12'-6".

These curves are for mullions WITH and WITHOUT HORIZONTALS and are based on engineering calculations for stress and deflection.

Allowable windload stress for ALUMINUM (assuming full lateral buckling support) 15,152 P.S.I. (104 MPa), FORMED STEEL 30,000 P.S.I. (207 MPa), STEEL BAR 20,000 P.S.I. (138 MPa). Charted curves, in all cases, are for the limiting value. For special situations not covered by these curves, contact your Kawneer representative for additional information.

NOTE:
If the end reaction of the mullion (mullion spacing (ft.) times height (ft.) times specified windload (psf) divided by two) is more than 500 lbs., the optional Mullion Anchors must be used. Consult Application Engineering. (Mullion Anchor not used with Lightweight Receptor.)
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WINDLOAD CHARTS (CENTER) Non-Thermal

WITH HORIZONTALS

WIDTH IN METERS

HEIGHT IN FEET

1 1.5 2

4 1.5 2

15 1

A = 15 PSF (720 Pa)
B = 20 PSF (960 Pa)
C = 25 PSF (1200 Pa)
D = 30 PSF (1440 Pa)
E = 40 PSF (1920 Pa)

WITH HORIZONTALS

WIDTH IN METERS

HEIGHT IN FEET

1 1.5 2

4 1.5 2

15 1

l = 5.907 (245.86 x 10^2)
S = 2.615 (42.85 x 10^2)

WITH HORIZONTALS

WIDTH IN METERS

HEIGHT IN FEET

1 1.5 2

4 1.5 2

15 1

l = 3.346 (139.27 x 10^2)
S = 1.474 (24.15 x 10^2)

WITH HORIZONTALS

WIDTH IN METERS

HEIGHT IN FEET

1 1.5 2

4 1.5 2

15 1

l = 3.346 (139.27 x 10^2)
S = 1.474 (24.15 x 10^2)

WITH HORIZONTALS

WIDTH IN METERS

HEIGHT IN FEET

1 1.5 2

4 1.5 2

15 1

l = 1.935 (80.54 x 10^2)
S = 0.938 (15.37 x 10^2)

WITH HORIZONTALS

WIDTH IN METERS

HEIGHT IN FEET

1 1.5 2

4 1.5 2

15 1

l = 3.346 (139.27 x 10^2)
S = 1.474 (24.15 x 10^2)
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TRIFAB® VG 451T

WITH HORIZONTALS

WIDTH IN METERS

1 1.5 2

HEIGHT IN FEET

15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0

WITH HORIZONTALS

WIDTH IN FEET

1 2 3 4 5 6 7 8

HEIGHT IN FEET

1 2 3 4 5 6 7 8

WITH HORIZONTALS

WIDTH IN METERS

1 1.5 2

HEIGHT IN FEET

15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0

WITH HORIZONTALS

WIDTH IN FEET

1 2 3 4 5 6 7 8

HEIGHT IN FEET

1 2 3 4 5 6 7 8

WITH HORIZONTALS

WIDTH IN METERS

1 1.5 2

HEIGHT IN FEET

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WITH HORIZONTALS

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1 1.5 2

HEIGHT IN FEET

15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0

WITH HORIZONTALS

WIDTH IN FEET

1 2 3 4 5 6 7 8

HEIGHT IN FEET

1 2 3 4 5 6 7 8

A = 15 PSF (720 Pa)
B = 20 PSF (960 Pa)
C = 25 PSF (1200 Pa)
D = 30 PSF (1440 Pa)
E = 40 PSF (1920 Pa)

WITH HORIZONTALS

WIDTH IN METERS

1 1.5 2

HEIGHT IN FEET

15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0

WITH HORIZONTALS

WIDTH IN FEET

1 2 3 4 5 6 7 8

HEIGHT IN FEET

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15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0

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HEIGHT IN FEET

15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0

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WITH HORIZONTALS

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HEIGHT IN FEET

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WITH HORIZONTALS

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1 2 3 4 5 6 7 8

WITH HORIZONTALS

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15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0

WITH HORIZONTALS

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HEIGHT IN FEET

1 2 3 4 5 6 7 8

A = 15 PSF (720 Pa)
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WITH HORIZONTALS

WIDTH IN METERS

1 1.5 2

HEIGHT IN FEET

15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0

WITH HORIZONTALS

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HEIGHT IN FEET

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HEIGHT IN FEET

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HEIGHT IN FEET

15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0

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15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0

WITH HORIZONTALS

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1 2 3 4 5 6 7 8

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1 2 3 4 5 6 7 8

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B = 20 PSF (960 Pa)
C = 25 PSF (1200 Pa)
D = 30 PSF (1440 Pa)
E = 40 PSF (1920 Pa)
Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

Kawneer reserves the right to change configuration without prior notice when deemed necessary for product improvement.

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WINDLOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

A = 15 PSF  (720 Pa)
B = 20 PSF  (960 Pa)
C = 25 PSF  (1200 Pa)
D = 30 PSF  (1440 Pa)
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TRIFAB® VG 451T

WINDLOAD CHARTS (CENTER) Thermal

WITH HORIZONTALS

WIDTH IN METERS

WIDTH IN FEET

HEIGHT IN FEET

WITH HORIZONTALS

WIDTH IN METERS

WIDTH IN FEET

HEIGHT IN FEET

WITH HORIZONTALS

WIDTH IN METERS

WIDTH IN FEET

HEIGHT IN FEET

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HEIGHT IN FEET

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WINDLOAD CHARTS (FRONT.BACK) SSG Mullions

WITH HORIZONTALS

WIDTH IN METERS

1 1.5 2

HEIGHT IN FEET

15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

A = 15 PSF (720 Pa)
B = 20 PSF (960 Pa)
C = 25 PSF (1200 Pa)
D = 30 PSF (1440 Pa)
E = 40 PSF (1920 Pa)

WITH HORIZONTALS

WIDTH IN METERS

1 1.5 2

HEIGHT IN FEET

15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

451-SSG-005

I = 1.527 (63.55 x 10³)
S = 1.057 (17.32 x 10³)

A = 15 PSF (720 Pa)
B = 20 PSF (960 Pa)
C = 25 PSF (1200 Pa)
D = 30 PSF (1440 Pa)
E = 40 PSF (1920 Pa)

WITHOUT HORIZONTALS

WIDTH IN METERS

1 1.5 2

HEIGHT IN FEET

15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

451-SSG-005

I = 1.527 (63.55 x 10³)
S = 1.057 (17.32 x 10³)

WITHOUT HORIZONTALS

WIDTH IN METERS

1 1.5 2

HEIGHT IN FEET

15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

I = 0.667 (27.76 x 10³)
S = 0.667 (10.93 x 10³)
Laws and building and safety codes governing the design and use of glazed entrance, window, and curtain wall products vary widely. Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.

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WINDLOAD CHARTS (MULTI-PLANE) Thermal

A = 15 PSF (720 Pa)
B = 20 PSF (960 Pa)
C = 25 PSF (1200 Pa)
D = 30 PSF (1440 Pa)
E = 40 PSF (1920 Pa)

WINLOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

WITH HORIZONTALS
WIDTH IN METERS

WITHOUT HORIZONTALS
WIDTH IN METERS
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### WINDLOAD CHARTS (ENTRANCES) Non-Thermal

<table>
<thead>
<tr>
<th>Configuration</th>
<th>A = 15 PSF (720 Pa)</th>
<th>B = 20 PSF (960 Pa)</th>
<th>C = 25 PSF (1200 Pa)</th>
<th>D = 30 PSF (1440 Pa)</th>
<th>E = 40 PSF (1920 Pa)</th>
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</thead>
</table>

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### Chart Descriptions

<table>
<thead>
<tr>
<th>Description</th>
<th>Chart Details</th>
</tr>
</thead>
</table>
| 451-VG-019  | With 1" x 2-1/4" STEEL BAR | I = 3.124 (130.03 x 10³) \( S = 1.333 \times 10³ \)

---

### With Horizontals

#### WIDTH IN METERS

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<tr>
<th>HEIGHT IN FEET</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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#### Without Horizontals

#### WIDTH IN METERS

<table>
<thead>
<tr>
<th>HEIGHT IN FEET</th>
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<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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</tbody>
</table>
Horizontal or deadload limitations are based upon 1/8" (3.2) maximum allowable deflection at the center of an intermediate horizontal member. The accompanying charts are calculated for 1" (25.4) thick insulating glass supported on two setting blocks at the loading points shown.

**NOTE:** Charts are for THERMAL and NON-THERMAL members.

A = (1/4 POINT LOADING)
B = (1/6 POINT LOADING)
C = (1/8 POINT LOADING)
Horizontal or deadload limitations are based upon 1/8" (3.2) maximum allowable deflection at the center of an intermediate horizontal member. The accompanying charts are calculated for 1" (25.4) thick insulating glass supported on two setting blocks at the loading points shown.

**NOTE:** Charts are for THERMAL and NON-THERMAL members.

---

Height limitations for transom glass over a doorway are based upon a 1/16" (1.6) maximum allowable deflection at the center of a transom bar. The accompanying charts are calculated for 1" (25.4) thick insulating glass supported on two setting blocks placed at the loading points shown.
For each application, end reactions MUST be checked. These charts are used to verify that the end reactions at the head and sill receptors are 500 lbs. (2224N) or less and will meet the specified windload.

A = 15 PSF (720 Pa)
B = 20 PSF (960 Pa)
C = 25 PSF (1200 Pa)
D = 30 PSF (1440 Pa)
E = 40 PSF (1920 Pa)

Kawneer reserves the right to change configuration without prior notice when deemed necessary for product improvement.
Project Specific U-factor Example Calculation

Example Glass U-factor = 0.42 Btu/hr ft² °F

Total Daylight Opening = 3(5' x 7') + 3(5' x 2') = 135ft²

Total Projected Area = (Total Daylight Opening + Total Area of Framing System) = 15'-8" x 9'-6" = 148.83ft²

Percent of Glass = (Total Daylight Opening ÷ Total Projected Area) = (135 ÷ 148.83)100 = 91%

System U-factor vs Percent of Glass Area

Based on 91% glass and center of glass (COG) U-factor of 0.42
System U-factor is equal to 0.49 Btu/hr x ft² x °F
TRIFAB® VG 451 (CENTER – Non-Thermal)

System U-factor vs Percent of Glass Area

Notes for System U-Factor, SHGC and VT charts:
For glass values that are not listed, linear interpolation is permitted.
Glass properties are based on center of glass values and are obtained from your glass supplier.
TRIFAB® VG 451 (CENTER – Non-Thermal)

System Solar Heat Gain Coefficient (SHGC) vs Percent of Vision Area

System Visible Transmittance (VT) vs Percent of Vision Area
TRIFAB® VG 451 (CENTER – Non-Thermal)

### Thermal Transmittance

<table>
<thead>
<tr>
<th>Glass U-Factor</th>
<th>Overall U-Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.48</td>
<td>0.63</td>
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<tr>
<td>0.46</td>
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<td>0.44</td>
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### SHGC Matrix

<table>
<thead>
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<th>Glass SHGC</th>
<th>Overall SHGC</th>
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<tbody>
<tr>
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### Visible Transmittance

<table>
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<th>Glass VT</th>
<th>Overall VT</th>
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<td>0.20</td>
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**NOTE:** For glass values that are not listed, linear interpolation is permitted.

1. U-Factors are determined in accordance with NFRC 100.
2. SHGC and VT values are determined in accordance with NFRC 200.
3. Glass properties are based on center of glass values and are obtained from your glass supplier.
4. Overall U-Factor, SHGC, and VT Matrices are based on the standard NFRC specimen size of 2000mm wide by 2000mm high (78-3/4" by 78-3/4").
TRIFAB® VG 451T (CENTER – Thermal)

System U-factor vs Percent of Glass Area

Percent of Glass = Vision Area/Total Area
(Total Daylight Opening / Projected Area)

Notes for System U-Factor, SHGC and VT charts:

For glass values that are not listed, linear interpolation is permitted.
Glass properties are based on center of glass values and are obtained from your glass supplier.
TRIFAB® VG 451T (CENTER – Thermal)

System Solar Heat Gain Coefficient (SHGC) vs Percent of Vision Area

System Visible Transmittance (VT) vs Percent of Vision Area
### TRIFAB® VG 451T (CENTER – Thermal)

#### Thermal Transmittance

<table>
<thead>
<tr>
<th>Glass U-Factor</th>
<th>Overall U-Factor</th>
</tr>
</thead>
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#### SHGC Matrix

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<th>Glass SHGC</th>
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#### Visible Transmittance

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**NOTE:** For glass values that are not listed, linear interpolation is permitted.

1. U-Factors are determined in accordance with NFRC 100.
2. SHGC and VT values are determined in accordance with NFRC 200.
3. Glass properties are based on center of glass values and are obtained from your glass supplier.
4. Overall U-Factor, SHGC, and VT Matrices are based on the standard NFRC specimen size of 2000mm wide by 2000mm high (78-3/4" by 78-3/4").
Notes for System U-Factor, SHGC and VT charts:
For glass values that are not listed, linear interpolation is permitted.
Glass properties are based on center of glass values and are obtained from your glass supplier.
TRIFAB® VG 451T (FRONT – Thermal)

System Solar Heat Gain Coefficient (SHGC) vs Percent of Vision Area

System Visible Transmittance (VT) vs Percent of Vision Area
TRIFAB® VG 451T (FRONT – Thermal)

### Thermal Transmittance

<table>
<thead>
<tr>
<th>Glass U-Factor</th>
<th>Overall U-Factor</th>
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### SHGC Matrix

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### Visible Transmittance

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**NOTE:** For glass values that are not listed, linear interpolation is permitted.

1. U-Factors are determined in accordance with NFRC 100.
2. SHGC and VT values are determined in accordance with NFRC 200.
3. Glass properties are based on center of glass values and are obtained from your glass supplier.
4. Overall U-Factor, SHGC, and VT Matrices are based on the standard NFRC specimen size of 2000mm wide by 2000mm high (78-3/4” by 78-3/4”).
TRIFAB® VG 451T (BACK – Thermal)

System U-factor vs Percent of Glass Area

Notes for System U-Factor, SHGC and VT charts:
For glass values that are not listed, linear interpolation is permitted.
Glass properties are based on center of glass values and are obtained from your glass supplier.
TRIFAB® VG 451T (BACK – Thermal)

System Solar Heat Gain Coefficient (SHGC) vs Percent of Vision Area

System Visible Transmittance (VT) vs Percent of Vision Area
TRIFAB® VG 451T (BACK – Thermal)

Thermal Transmittance

<table>
<thead>
<tr>
<th>Glass U-Factor ³</th>
<th>Overall U-Factor ⁴</th>
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<tbody>
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SHGC Matrix

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<th>Glass SHGC ³</th>
<th>Overall SHGC ⁴</th>
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Visible Transmittance

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**NOTE:** For glass values that are not listed, linear interpolation is permitted.

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TRIFAB® VG 451T with Steel (CENTER)

System U-factor vs Percent of Glass Area

Notes for System U-Factor, SHGC and VT charts:
For glass values that are not listed, linear interpolation is permitted.
Glass properties are based on center of glass values and are obtained from your glass supplier.
TRIFAB® VG 451T with Steel (CENTER)

System Solar Heat Gain Coefficient (SHGC) vs Percent of Vision Area

System Visible Transmittance (VT) vs Percent of Vision Area
TRIFAB® VG 451T with Steel (CENTER)

**Thermal Transmittance**

<table>
<thead>
<tr>
<th>Glass U-Factor</th>
<th>Overall U-Factor</th>
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**SHGC Matrix**

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**Visible Transmittance**

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