**Features**

- Trifab® VG 450 is 4-1/2" deep with a 1-3/4" sight line
- 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
- 1/8", 1/4" or 3/8" infill options
- Permanodic® anodized finishes in 7 choices
- Painted finishes in standard and custom choices

**Optional Features**

- High performance interlocking flashing

**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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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

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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 COMPLETED FRAME.

SCREW SPLINE ASSEMBLY

THE SHEAR BLOCK SYSTEM OF FABRICATION ALLOWS A FRAME TO BE PRE-ASSEMBLED AND INSTALLED AS A SINGLE UNIT. HORIZONTALS ARE ATTACHED TO THE VERTICALS WITH SHEAR BLOCKS.

SHEAR BLOCK ASSEMBLY

THE STICK SYSTEM ALLOWS ON-SITE ASSEMBLY. 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.

STICK ASSEMBLY

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 SNAP TOGETHER TO FORM A COMPLETED FRAME.

SCREW SPLINE ASSEMBLY

MULLION
SNAP-IN FILLER
SPLINE SCREWS
HEAD
GlasSTOP
HORIZONTAL
FLAT FILLER
GlasSTOP
SILL
SILL FLASHING

THE SHEAR BLOCK SYSTEM OF FABRICATION ALLOWS A FRAME TO BE PRE-ASSEMBLED AND INSTALLED AS A SINGLE UNIT. HORIZONTALS ARE ATTACHED TO THE VERTICALS WITH SHEAR BLOCKS.

SHEAR BLOCK ASSEMBLY

MULLION
SHEAR BLOCK
HEAD
GlasSTOP
HORIZONTAL
FLAT FILLER
GlasSTOP
SILL
SILL FLASHING

THE STICK SYSTEM ALLOWS ON-SITE ASSEMBLY. 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.

STICK ASSEMBLY

HEAD-RECEPTOR
HEAD INSERT
SHEAR BLOCK
MULLION
HORIZONTAL
GLASS STOP
GlasSTOP
SILL INSERT
SILL RECEPTOR

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 32)
THE STICK SYSTEM ALLOWS ON-SITE ASSEMBLY. HEAD AND SILL RECEP'TORS ARE FASTENED TO THE SURROUND. VERTICAL MULLIONS ARE THEN INSTALLED IN THESE RECEP'TORS 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 32)
THE 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.

**TYPE-B ASSEMBLY**

**PUNCHED OPENING**

(CAPTURED)

---

**TYPE-B ASSEMBLY**

**PUNCHED OPENING**

(SSG)

---

**TYPE-B ASSEMBLY**

**PUNCHED OPENING**

(WEATHERSEAL)
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 COMPLETED FRAME.

THE STICK SYSTEM ALLOWS ON-SITE ASSEMBLY. 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 43)
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"

**SCREW SPLINE**

CAD Details = TF_VG_450-SS-Center--CAD.zip

**SHEAR BLOCK**

CAD Details = TF_VG_450-SB-Center--CAD.zip

**STICK**

CAD Details = TF_VG_450-Stick-Center--CAD.zip

*See page 14 for Optional High Performance Flashing.*
## SCALE 3" = 1'-0"

<table>
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<tr>
<td>450-CG-002</td>
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<td>450-CG-003</td>
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<td>450-CG-004</td>
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<table>
<thead>
<tr>
<th>SHEAR BLOCK</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>450-CG-001</td>
</tr>
<tr>
<td>450-CG-005</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>STICK</th>
</tr>
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<tbody>
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<td>CAD Details = TF_VG_450-Stick-Center--CAD.zip</td>
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<tr>
<td>450-CG-001</td>
</tr>
<tr>
<td>450-CG-005</td>
</tr>
</tbody>
</table>

*See page 14 for Optional High Performance Flashing."
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 Anchors must be used.

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.

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TRIFAB® VG 450

MISCELLANEOUS FRAMING (CENTER)

SCALE 3" = 1'-0"

CAD Details SCREW SPLINE
= TF_VG_450-SS-Center--CAD.zip

CAD Details SHEAR BLOCK
= TF_VG_450-SB-Center--CAD.zip

CAD Details STICK
= TF_VG_450-Stick-Center--CAD.zip

NOTE: SIDELITE BASES SHOWN ARE FOR USE WITH SCREW SPLINE AND SHEAR BLOCK SYSTEMS ONLY.

TYPICAL

STANDARD HEAD
COMPENSATING RECEPTOR

HEAVY WEIGHT
HEAD
COMPENSATING RECEPTOR

ONE PIECE
HEAD
COMPENSATING RECEPTOR

JAMB
COMPENSATING RECEPTOR

NARROW SIDELITE BASE

NARROW SIDELITE BASE

SIDELITE BASE

4-1/2" X 4-1/2"
HORIZONTAL

SCALE 3" = 1'-0"
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"

CURVING DETAILS
(Center Plane Only)

STOOL TRIM CLIP
WITH STANDARD FLASHING

STOOL TRIM CLIP
WITH HIGH PERFORMANCE FLASHING

STOOL TRIM CLIP
FOR STICK/TYP-E ASSEMBLY

BRAKE METAL ADAPTOR
AT HORIZONTAL

BRAKE METAL ADAPTOR
AT VERTICAL

Kawneer reserves the right to change the configuration of this detail 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.

SCALE 3" = 1'-0"

TRIFAB® VG 450 FRAMING INCORPORATING KAWNEER® “190” DOORS.

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

TRIFAB® VG 450 ENTRANCE FRAMING (CENTER)

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

SINGLE ACTING DOOR

DOUBLE ACTING DOOR

SINGLE ACTING DOOR WITH TRANSOM

DOUBLE ACTING DOOR WITH TRANSOM

DOUBLE ACTING DOOR

TRIFAB® VG 450 JANUARY, 2009

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Laws and building and safety codes governing the design and use of building products are subject to change. The user is responsible for ensuring conformance to the applicable laws and codes. 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 450 FRAMING INCORPORATING KAWNEER® “190” DOORS.

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

MAXIMUM / MINIMUM SIZES (1/4" INFILL)

PROJECT-OUT
- MAXIMUM 60" x 36"
- MINIMUM 12" x 12"

OUTSWING CASEMENT
- MAXIMUM 36" x 60"
- MINIMUM 12" x 12"

CAD Details SCREW SPLINE = TF_VG_450-SS-Center--CAD.zip
CAD Details SHEAR BLOCK = TF_VG_450-SB-Center--CAD.zip
CAD Details STICK = TF_VG_450-Stick-Center--CAD.zip

TRIFAB® VG 450
GLASSvent™ (CENTER)

JANUARY, 2009
EC 97911-07

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## 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>STANDARD</td>
</tr>
<tr>
<td>Insect screen</td>
<td>OPTIONAL</td>
<td>OPTIONAL</td>
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</tbody>
</table>

### Diagrams
- **Cam Lock**
- **Cam Lock with Pole Ring**
- **Pull Ring**
- **Custodial Lock**
- **Removable Handle**
- **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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TRIFAB® VG 450
VENTS (CENTER)

SCALE 3" = 1'-0"

PROJECT-OUT VERTICAL SECTION

7225 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
INDEX (FRONT)

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CORNERS....................................................................................... 33
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TRIFAB® VG 450

BASIC FRAMING DETAILS (FRONT - Outside Glazed)

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SCALE 3" = 1'-0"

ELEVATION IS NUMBER KEYED TO DETAILS

<table>
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<tr>
<th>SCREW SPLINE</th>
<th>SHEAR BLOCK</th>
<th>STICK</th>
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<td>450-VG-003</td>
<td>450-VG-005</td>
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<td>1-3/4&quot; (44.5)</td>
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<td>4-1/2&quot; (114.3)</td>
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</tbody>
</table>

*See page 31 for Optional High Performance Flashing.

*See page 31 for Optional High Performance Flashing.
Laws and building and safety codes governing the design and use of glass, metal, and insulation materials are constantly changing. 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

SCREW SPLINE
CAD Details = TF_VG_450-SS-Front--CAD.zip

SHEAR BLOCK
CAD Details = TF_VG_450-SB-Front--CAD.zip

STICK
CAD Details = TF_VG_450-Stick-Front--CAD.zip

*See page 31 for Optional High Performance Flashing.

TRIFAB® VG 450
BASIC FRAMING DETAILS (FRONT - Inside Glazed)

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

AN ALCOA COMPANY
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.

STICK SYSTEM (INSIDE GLAZED)
TWO COLOR OPTION
STANDARD RECEPTOR with SSG ADAPTOR

CAD Details STICK = TF_VG_450-Stick-Front-CAD.zip

STICK SYSTEM (INSIDE GLAZED)
TWO COLOR OPTION
STANDARD RECEPTOR with SSG ADAPTOR
Laws and building and safety codes governing the design and use of framed, 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 450

BASIC FRAMING DETAILS (FRONT)

SCALE 3" = 1'-0"

ELEVATION IS NUMBER KEYED TO DETAILS

STICK SYSTEM (INSIDE GLAZED)
SSG RECEPTOR

CAD Details STICK SSG = TF_VG_450-Stick-SSG-Front--CAD.zip

STICK SYSTEM (OUTSIDE GLAZED)
SSG RECEPTOR

CAD Details STICK SSG = TF_VG_450-Stick-SSG-Front--CAD.zip

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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.

Kawneer reserves the right to change configuration when deemed necessary for product improvement.

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SCALE 3" = 1'-0"

STICK SYSTEM (INSIDE GLAZED)  
SSG RECEPTOR  
TWO COLOR OPTION

CAD Details STICK SSG = TF_VG_450-Stick-SSG-Front--CAD.zip

1-3/4" (44.5) TYP.

1-1/2" (41.3) TYP.

HEAD

HORIZONTAL

SILL
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 450

BASIC FRAMING DETAILS (FRONT)

SCALE 3" = 1'-0"

TYPE-B MULTI-LITE PUNCHED OPENINGS
(20 FEET MAXIMUM UNIT WIDTH)

ELEVATION IS NUMBER KEYED TO DETAILS

TYPE-B (INSIDE GLAZED)
PUNCHED OPENING

CAD Details TYPE-B = TF_.VG_.450_Type-B_Front--CAD.zip

1 HEAD
2 HORIZONTAL
3 SILL
4 JAMB
5 VERTICAL

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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.

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SCALE 3" = 1'-0"

EXPANSION MULLION

SNAP-IN FLAT FILLER

SNAP-IN FLAT POCKET FILLER

STANDARD HEAD COMPENSATING RECEPTOR

HEAVY WEIGHT HEAD COMPENSATING RECEPTOR

ONE PIECE HEAD COMPENSATING RECEPTOR

JAMB COMPENSATING RECEPTOR

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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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.

NOTE:
Mullion Anchor not used with Lightweight Receptor.

CAD Details SCREW SPLINE
= TF_VG_450-SS-Front--CAD.zip

CAD Details SHEAR BLOCK
= TF_VG_450-SB-Front--CAD.zip

CAD Details STICK
= TF_VG_450-Stick-Front--CAD.zip

SCALE 3" = 1'-0"

MULLION ANCHOR

SSG MULLION ANCHOR

OPTIONAL LIGHTWEIGHT CAN RECEPTORS
(Stick System)

OPTIONAL UNEQUAL LEG CAN RECEPTORS
(Stick System)

STOOL TRIM CLIP
FOR STICK/TYPE-B ASSEMBLY

STOOL TRIM CLIP
WITH STANDARD FLASHING

STOOL TRIM
WITH HIGH PERFORMANCE FLASHING

MISCELLANEOUS FRAMING (FRONT)

JANUARY, 2009

EC 97911-07
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 450 FRAMING INCORPORATING KAWNEER® “190” DOORS.

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

SCALE 3" = 1'-0"

Transom area for both double or single acting doors with glass surround. Jams above transom bar are routed out to accept glass holding insert.

TRIFAB® VG 450 ENTRANCE FRAMING (FRONT)

NOTE: Other types of Kawneer doors may be used with this framing system. See entrance details for additional information.

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SCALE 3" = 1'-0"

OUTSWING CASEMENT
VERTICAL SECTION SHOWN

PROJECT-OUT
VERTICAL SECTION SHOWN

ELEVATION IS NUMBER KEYED TO DETAILS

OUTSWING CASEMENT
HORIZONTAL SECTION SHOWN

PROJECT-OUT
HORIZONTAL SECTION SHOWN

MAXIMUM / MINIMUM SIZES (1/4" INFILL)

PROJECT-OUT
MAXIMUM 60" x 36"
MINIMUM 12" x 12"

OUTSWING CASEMENT
MAXIMUM 36" x 60"
MINIMUM 12" x 12"
## STOREFRONT GLASSvent™ HARDWARE SELECTION GUIDE

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>PROJECT - OUT</th>
<th>OUTSWING CASEMENT</th>
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<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>
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</tr>
<tr>
<td>Cast white bronze concealed lock with removable hex key</td>
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</tr>
<tr>
<td>Cast white bronze pole/pull ring</td>
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<td>OPTIONAL</td>
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<tr>
<td>Pivot-shoe roto-operator</td>
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<tr>
<td>Multi-point lock with cast white bronze locking handle</td>
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<tr>
<td>Insect screen</td>
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![CAM LOCK](image1.png)

![CAM LOCK WITH POLE RING](image2.png)

![PULL RING](image3.png)

![CUSTODIAL LOCK](image4.png)

![REMOVABLE HANDLE](image5.png)

![ROTO-OPERATOR](image6.png)

![STAINLESS STEEL 4 BAR HINGES](image7.png)

![CONCEALED LOCK](image8.png)

![INSECT SCREEN WITH STANDARD WICKET](image9.png)

![INSECT SCREEN WITH FULL WICKET](image10.png)
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SCALE 3" = 1'-0"

7225 VENTS SHOWN
NOTE: OTHER VENT TYPES CAN BE ACCOMMODATED, CONSULT YOUR KAWNEER REPRESENTATIVE FOR OTHER OPTIONS

ELEVATION IS NUMBER KEYED TO DETAILS

CAD Details SCREW SPLINE
= TF_VG_450-SS-Front--CAD.zip

CAD Details SHEAR BLOCK
= TF_VG_450-SB-Front--CAD.zip

CAD Details STICK
= TF_VG_450-Stick-Front--CAD.zip
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ENTRANCE FRAMING................................................................. 45
**SCALE 3" = 1'-0"**

### SCREW SPLINE

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<thead>
<tr>
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<td>5 VERTICAL</td>
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<tr>
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#### HORIZONTAL

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*See page 42 for Optional High Performance Flashing.*

### SHEAR BLOCK

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<td>450-037</td>
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*See page 42 for Optional High Performance Flashing.*

### STICK

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#### HORIZONTAL

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#### SILL

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<td>451-VG-106</td>
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**SCALE 3" = 1'-0"**

<table>
<thead>
<tr>
<th>SCREW SPLINE</th>
<th>SHEAR BLOCK</th>
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<tr>
<td>CAD Details = TF_VG_450-SS-Back--CAD.zip</td>
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**JAMB**

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**VERTICAL**

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**HEAD**

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**HORIZONTAL**

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**SILL**

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<tr>
<th>450-VG-004</th>
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</table>

**1-3/4" (44.5) TYP.**

1-3/4" (44.5) TYP.

*See page 42 for Optional High Performance Flashing.*

*See page 42 for Optional High Performance Flashing.*
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Kawneer reserves the right to change configuration without prior notice when deemed necessary for product improvement.

SCALE 3\" = 1'-0"

CAD Details SCREW SPLINE
= TF_VG_450-SS-Back--CAD.zip

CAD Details SHEAR BLOCK
= TF_VG_450-SB-Back--CAD.zip

CAD Details STICK
= TF_VG_450-Stick-Back--CAD.zip

EXPANSION MULLION

FLAT FILLER

SNAP-IN FLAT FILLER

STANDARD HEAD COMPENSATING RECEPTOR

HEAVY WEIGHT HEAD COMPENSATING RECEPTOR

ONE PIECE HEAD COMPENSATING RECEPTOR

JAMB COMPENSATING RECEPTOR

HIGH PERFORMANCE FLASHING

TRAFFIC VG 450

JANUARY, 2009

MISCELLANEOUS FRAMING (BACK)

EC 97911-07
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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 Anchors must be used.

NOTE:
Mullion Anchor not used with Lightweight Receptor.

STOOL TRIM CLIP WITH STANDARD FLASHING
STOOL TRIM CLIP WITH HIGH PERFORMANCE FLASHING
STOOL TRIM CLIP FOR STICK ASSEMBLY
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SCALE 3" = 1'-0"

CAD Details SCREW SPLINE
= TF_VG_450-SS-Back--CAD.zip

CAD Details SHEAR BLOCK
= TF_VG_450-SB-Back--CAD.zip

CAD Details STICK
= TF_VG_450-Stick-Back--CAD.zip

4-1/2" x 4-1/2" TUBE

TWO PIECE NO POCKET CORNER

ONE POCKET CORNER

90° OUTSIDE BRAKE METAL CORNER

TWO POCKET BRAKE METAL POST

VARIABLE DEGREE BRAKE METAL OUTSIDE CORNER

90° INSIDE BRAKE METAL CORNER

VARIABLE DEGREE BRAKE METAL INSIDE CORNER
TRIFAB® VG 450 FRAMING INCORPORATING KAWNEER® “190” DOORS.

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. Jams above transom bar are routed out to accept glass holding insert.
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BASIC FRAMING DETAILS

(See appropriate Center, Front or Back Section for Miscellaneous Details.)
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EC 97911-07

BASIC FRAMING DETAILS (MULTI-PLANE - Inside Glazed)

SCALE 3" = 1'-0"

ELEVATION IS NUMBER KEYED TO DETAILS

CAD Details MULTI-PLANE (SCREW SPLINE) = TF_VG_450-SS+SB-MULTI–CAD.zip

Front

See Pages 24 thru 37 for all FRONT details.

Back

See Pages 40 thru 45 for all BACK details.

Center

See Pages 12 thru 22 for all CENTER details.

JANUARY, 2009

TRIFAB® VG 450

SCREW SPLINE ASSEMBLY

1 HEAD

4 HEAD

7 HEAD

2 HORIZONTAL

5 HORIZONTAL

8 HORIZONTAL

3 SILL

6 SILL

9 SILL

SCALE 3" = 1'-0"

JAMB

VERTICAL

JAMB

VERTICAL

JAMB

VERTICAL

10

11

12

13

14

Front Back Center Front

See Pages 24 thru 37 for all FRONT details.

See Pages 40 thru 45 for all BACK details.

See Pages 12 thru 22 for all CENTER details.

See Pages 24 thru 37 for all FRONT details.

See Pages 40 thru 45 for all BACK details.

See Pages 12 thru 22 for all CENTER details.

See Pages 24 thru 37 for all FRONT details.

See Pages 40 thru 45 for all BACK details.

See Pages 12 thru 22 for all CENTER details.

See Pages 24 thru 37 for all FRONT details.

See Pages 40 thru 45 for all BACK details.

See Pages 12 thru 22 for all CENTER details.

See Pages 24 thru 37 for all FRONT details.

See Pages 40 thru 45 for all BACK details.

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See Pages 24 thru 37 for all FRONT details.

See Pages 40 thru 45 for all BACK details.

See Pages 12 thru 22 for all CENTER details.
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Note: Transition verticals are required to be two piece.

CAD Details MULTI-PLANE (SHEAR BLOCK) = TF_VG_450-SS+SB-MULTI--CAD.zip

SCALE 3" = 1'-0"

ELEVATION IS NUMBER KEYED TO 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.

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TRIFAB® VG 450

BASIC FRAMING DETAILS (MULTI-PLANE - Inside Glazed)

SHEAR BLOCK ASSEMBLY

SCALE 3" = 1'-0"

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

ELEVATION IS NUMBER KEYED TO DETAILS

Note: Transition verticals are required to be two piece

CAD Details MULTI-PLANE (SHEAR BLOCK) = TF_VG_450-SS+SB-MULTI--CAD.zip

111
13
14
12
10
JAMB

450-VG-001
450-VG-001
450-VG-001
450-037
450-037
450-037
450-037
450-VG-001
450-VG-001

10 JAMB 11 VERTICAL 12 VERTICAL 13 VERTICAL 14 JAMB

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

FRONT
See Pages 24 thru 37 for all FRONT details.

450-VG-103
450-VG-104
450-VG-002
450-VG-003
450-VG-004
450-VG-005
450-VG-006
450-VG-007

HEAD

2 5 8
HORIZONTAL
HORIZONTAL
HORIZONTAL

450-VG-111
450-VG-011
450-VG-011
450-037
450-037
450-037
450-037

SILL

3 6 9
SILL
SILL
SILL

450-VG-001
450-VG-001
450-VG-001
450-VG-001
450-VG-001
450-VG-001
450-VG-001
450-VG-001

Note: Transition verticals are required to be two piece

See Pages 24 thru 37 for all FRONT details.
See Pages 40 thru 45 for all BACK details.
See Pages 12 thru 22 for all CENTER details.
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Note: Transition verticals are required to be two piece.
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TRIFAB® VG 450

BASIC FRAMING DETAILS (MULTI-PLANE - Inside Glazed)

SCALE 3" = 1'-0"

ELEVATION IS NUMBER KEYED TO DETAILS

Note: Transition verticals are required to be two piece

FRONT
See Pages 24 thru 37 for all FRONT details.

BACK
See Pages 40 thru 45 for all BACK details.

CENTER
See Pages 12 thru 22 for all CENTER details.

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ENTRANCE FRAMING ......................................................... 64-66
DEADLOAD CHARTS ................................................................. 67,68
END REACTION CHARTS .................................................. 69
THERMAL CHARTS ................................................................. 70,73
Mullions are designed for deflection limitations in accordance with AAMA TIR-A11 of L\175 up to 13'-6" and L\240 + 1/4" above 13'-6". These curves are for mullions WITH and WITHOUT HORIZONTALS and are based on precise engineering calculations for stress and deflection. Allowable windload stress for ALUMINUM 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.)

---

### WITH HORIZONTALS

**WIDTH IN METERS**

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### WITHOUT HORIZONTALS

**WIDTH IN METERS**

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### WITH HORIZONTALS

**WIDTH IN FEET**

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### WITHOUT HORIZONTALS

**WIDTH IN FEET**

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### WITH HORIZONTALS

**WITH 450-110 STEEL**

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### WITHOUT HORIZONTALS

**WITH 450-110 STEEL**

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<td>Width in Feet</td>
<td>1</td>
<td>2</td>
<td>3</td>
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</table>

---

### IS = 1.935 (80.54 x 10^4)

**SS = 0.938 (15.37 x 10^3)**

---

**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)
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### TRIFAB® VG 450

**WINDLOAD CHARTS (CENTER)**

**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:

- A = 15 PSF
- B = 20 PSF
- C = 25 PSF
- D = 30 PSF
- E = 40 PSF

**WIDTH IN FEET**

- Width in meters:
  - 0.5
  - 1
  - 1.5
  - 2

**450-CG-013**

**450-CG-002**

**I = 4.481 (186.51 x 10⁴)**

**S = 1.991 (32.63 x 10³)**

**WITHOUT HORIZONTALS**

**WIDTH IN METERS**

Height in feet:

- I = 4.481
- S = 1.991

**WIDTH IN FEET**

- Width in meters:
  - 0.5
  - 1
  - 1.5
  - 2

**WIDTH IN METERS**

Height in feet:

- I = 4.481
- S = 1.991

**WIDTH IN FEET**

- Width in meters:
  - 0.5
  - 1
  - 1.5
  - 2

**450-CG-013**

**450-CG-002**

**WITH HORIZONTALS**

**WIDTH IN METERS**

Height in feet:

- I = 4.481 (186.51 x 10⁴)
- S = 1.991 (32.63 x 10³)

**WIDTH IN FEET**

- Width in meters:
  - 0.5
  - 1
  - 1.5
  - 2

**450-CG-013**

**450-CG-002**

**WITHOUT HORIZONTALS**

**WIDTH IN METERS**

Height in feet:

- I = 4.481 (186.51 x 10⁴)
- S = 1.991 (32.63 x 10³)

**WIDTH IN FEET**

- Width in meters:
  - 0.5
  - 1
  - 1.5
  - 2
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

WITHOUT HORIZONTALS
WIDTH IN METERS

I = 2.523 \times 10^5 (105.01 \times 10^4)
S = 1.121 \times 10^2 (18.37 \times 10^3)

I_A = 2.523 \times 10^5 (105.01 \times 10^4)
S_A = 1.121 \times 10^2 (18.37 \times 10^3)

I_B = 1.935 \times 10^5 (80.54 \times 10^4)
S_B = 0.938 \times 10^2 (15.37 \times 10^3)
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**WITH HORIZONTALS**

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**TRIFAB® VG 450**

**WINDLOAD CHARTS (FRONT or BACK)**

**WITH HORIZONALS**

**WIDTH IN METERS**

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**WITHOUT HORIZONTALS**

**WIDTH IN METERS**

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**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)**

---

**I = 3.074 (127.95 x 10^4)**

**S = 1.192 (19.53 x 10^3)**

---

<table>
<thead>
<tr>
<th>I_a</th>
<th>1.302 (54.19 x 10^3)</th>
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</thead>
<tbody>
<tr>
<td>S_a</td>
<td>2.042 (17.08 x 10^3)</td>
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</tbody>
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<th>12</th>
</tr>
</thead>
</table>
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

WITHOUT HORIZONTALS

I = 2.978 (123.95 x 10^4)
S = 1.192 (19.53 x 10^3)

I_A = 2.978 (123.95 x 10^4)
S_A = 1.192 (19.53 x 10^3)
I_S = 1.302 (54.19 x 10^4)
S_S = 1.042 (17.08 x 10^3)
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TRIFAB® VG 450

WINDLOAD CHARTS (SSG/WEATHERSEAL)

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

WITHOUT HORIZONTALS

450-SSG-005

I = 2.445 (101.76 x 10^4)
S = 1.352 (22.15 x 10^3)

450-SSG-005

I = 2.445 (101.76 x 10^4)
S = 1.302 (54.19 x 10^4)

WITH HORIZONTALS

WITHOUT HORIZONTALS

450-SSG-005

with 1" x 2-1/2" STEEL BAR

I = 2.445 (101.76 x 10^4)
S = 1.352 (22.15 x 10^3)

I = 1.302 (54.19 x 10^4)
S = 1.042 (17.08 x 10^3)
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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

WITHOUT HORIZONTALS
WIDTH IN METERS

WITH 450-110 STEEL

WITH 450-019

WITH 450-501

TRIFAB® VG 450
JANUARY, 2009
WINDLOAD CHARTS (ENTRANCES)

EC 97911-07

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**WINDLOAD CHARTS (ENTRANCES)**

**WITH HORIZONTALS**

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<td>4</td>
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</tbody>
</table>

---

**WITH 450-110 STEEL**

\[
\begin{align*}
I &= 3.226 \times 10^4 \\
S &= 1.467 \times 10^3
\end{align*}
\]

\[
\begin{align*}
I &= 1.935 \times 10^3 \\
S &= 0.938 \times 10^3
\end{align*}
\]
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TRIFAB® VG 450
WINDLOAD CHARTS (ENTRANCES)

WITH HORIZONTALS

WIDTH IN METERS

HEIGHT IN FEET

WITH HORIZONTALS

WIDTH IN FEET

HEIGHT IN METERS

WITH HORIZONTALS

WIDTH IN METERS

HEIGHT IN FEET

WITH HORIZONTALS

WIDTH IN FEET

HEIGHT IN METERS

WITH HORIZONTALS

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HEIGHT IN FEET

WITH HORIZONTALS

WIDTH IN FEET

HEIGHT IN METERS

WITH HORIZONTALS

WIDTH IN METERS

HEIGHT IN FEET

WITH HORIZONTALS

WIDTH IN FEET

HEIGHT IN METERS

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)

I = 2.985 \times 10^4
S = 1.244 \times 10^3

450-VG-019

WITH 1" x 2-1/2" STEEL BAR

I_A = 2.985 \times 10^4
S_A = 1.244 \times 10^3

I_B = 1.302 \times 10^4
S_B = 1.042 \times 10^3

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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 1/4" (6.4) thick glass supported on two setting blocks at the loading points shown.

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 1/4" (6.4) thick glass supported on two setting blocks at the loading points shown.

A = (1/4 POINT LOADING)
B = (1/6 POINT LOADING)
C = (1/8 POINT LOADING)

DEADLOADS ON ENTRANCE TRANSOM BARS

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 1/4" (6.4) thick glass supported on two setting blocks placed at the loading points shown.

A = (1/4 POINT LOADING)
B = (1/6 POINT LOADING)
C = (1/8 POINT LOADING)
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)

500 lbs. Max. End Reaction
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·ft²·°F
TRIFAB® VG 450 (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 450 (CENTER)

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

System Visible Transmittance (VT) vs Percent of Vision Area

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TRIFAB® VG 450

**Thermal Transmittance**

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<th>Overall U-Factor ⁴</th>
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**SHGC Matrix**

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**Visible Transmittance**

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<th>Overall VT ⁴</th>
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<tr>
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<td>0.18</td>
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</table>

**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").
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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