Features

- Trifab™ VG 451/451T is 4-1/2” (114.3) deep with a 2” (50.8) 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 debridged thermal break option with Trifab™ VG 451T
- Infill options up to 1-1/8” (28.6) thickness
- Permanodic™ anodized finishes in seven 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)
- Integrates with Versoleil™ SunShade Outrigger System and Horizontal Single Blade System
- Profit$Maker™ plus die sets available

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 windows or GLASSvent™ Windows for Storefront Framing 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.

© Kawneer Company, Inc., 2013
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.

© Kawneer Company, Inc., 2013

kawneer.com

Trifab™ VG 451/451T Framing System

SEPTEMBER, 2016

BLANK PAGE
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.

**SCREW SPLINE ASSEMBLY**

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.

**SHEAR BLOCK ASSEMBLY**

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.

**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)

---

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.

© Kawneer Company, Inc., 2013

kawneer.com

ADMC040EN
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 34)
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 34)
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.

© Kawneer Company, Inc., 2013
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.

© Kawneer Company, Inc., 2013

SCREW SPLINE

1 HEAD

4-1/2" (114.3)

TYPICAL

2 HORIZONTAL

3 SILL

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

SHEAR BLOCK

1 HEAD

2 HORIZONTAL

3 SILL

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

STICK

1 HEAD

2 HORIZONTAL

3 SILL

© Kawneer Company, Inc., 2013

Trifab™ VG 451/451T Framing System
BASIC FRAMING DETAILS (CENTER - Outside Glazed)
SEPTEMBER, 2016
EC 97911-118

SCALE 3" = 1'-0"

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

NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS
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.

© Kawneer Company, Inc., 2013

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

SHEAR BLOCK

STICK

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

© Kawneer Company, Inc., 2013

kawneer.com
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.

© Kawneer Company, Inc., 2013

Trifab™ VG 451/451T Framing System

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

**THERMAL POCKET FILLERS**

**MULLION ANCHOR**

*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.

© Kawneer Company, Inc., 2013

SCALE 3" = 1'-0"

STANDARD HEAD COMPENSATING RECEPTOR

HEAVY WEIGHT HEAD COMPENSATING RECEPTOR

ONE PIECE HEAD COMPENSATING RECEPTOR

JAMB COMPENSATING RECEPTOR

*NARROW SIDELITE BASES REQUIRE THE USE OF NON-THERMAL 2-PIECE VERTICALS ONLY.

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.

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

© Kawneer Company, Inc., 2013

---

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

**4-1/2" X 4-1/2" TUBE**

**TWO PIECE NO POCKET CORNER**

**ONE POCKET CORNER**

**TWO POCKET 90° CORNER**

**TWO POCKET CORNER POST**

**THREE POCKET 90° CORNER**

**FOUR POCKET 90° CORNER**

**135° CORNER (NON-THERMAL)**

**135° CORNER (THERMAL)**

**155° TO 180° PIVOT MULLION (OUTSIDE CORNER)**

**155° TO 180° PIVOT MULLION (INSIDE CORNER)**
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.

© Kawneer Company, Inc., 2013

SCALE 3" = 1'-0"

CURVING DETAILS
(Center Plane Only)

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

BRAKE METAL FILLERS

451VG150
[451TVG150]

BRAKE METAL ADAPTOR AT HORIZONTAL

BRAKE METAL ADAPTOR AT VERTICAL
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 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.

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.

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.

© Kawneer Company, Inc., 2013

NOTE: Black spacer is recommended when 1" (25.4) insulating glass is 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.

© Kawneer Company, Inc., 2013

SCALE 3" = 1'-0"

PROJECT-OUT
VERTICAL SECTION

7225 NON-THERMAL WINDOW 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
Trifab™ VG 451/451T Framing System

BASIC FRAMING DETAILS (CENTER - Outside Glazed)
LEVEL D - LARGE MISSILE IMPACT

SCALE 3” = 1’-0”

ELEVATION IS NUMBER KEYED TO DETAILS

SCREW SPLINE

OPTIONAL FRAMING (CENTER)

© Kawneer Company, Inc., 2013

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

© Kawneer Company, Inc., 2013
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.

© Kawneer Company, Inc., 2013

Trifab™ VG 451 FRAMING INCORPORATING KAWNEER™ “350/500 IR” DOORS (DRY GLAZED).

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"

ELEVATIONS ARE NUMBER KEYED TO DETAILS

Concealed Overhead Closers

Trifab™ VG 451/451T Framing System

SEPTMBER, 2016

EC 97911-118

ENTRANCE FRAMING (CENTER)
LEVEL D - LARGE MISSILE IMPACT

© Kawneer Company, Inc., 2013

kawneer.com

ADMC040EN
Trifab™ VG 451 FRAMING INCORPORATING KAWNEER™ “350/500 IR” DOORS (DRY GLAZED).

**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 with or without steel reinforcing.

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

**Hurricane Resistant Product**
BASIC FRAMING DETAILS .......................................................... 26-32
MISCELLANEOUS FRAMING...................................................... 33-34
CORNERS .............................................................................. 35-36
ENTRANCE FRAMING.............................................................. 37
GLASSvent™ WINDOW for STOREFRONT FRAMING............... 38
7225 NON-THERMAL WINDOWS ............................................. 39
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.

© Kawneer Company, Inc., 2013

SCREW SPLINE

SHEAR BLOCK

STICK

*See Page 33 for Thermal Flashing and Optional High Performance Flashing

*See Page 33 for Thermal Flashing and Optional High Performance Flashing

NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

SCALE 3" = 1'-0"
Trifab™ VG 451/451T Framing System

BASIC FRAMING DETAILS (FRONT - Inside Glazed)

SCALE 3" = 1'-0"

ELEVATION IS NUMBER KEYED TO DETAILS

NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

SCREW SPLINE

SHEAR BLOCK

STICK

*See Page 33 for Thermal Flashing and Optional High Performance Flashing
**Trifab™ VG 451/451T Framing System**

**BASIC FRAMING DETAILS (FRONT)**

**SCALE 3” = 1'-0”**

**STICK (INSIDE GLAZED)**

**TWO COLOR OPTION**

**STANDARD RECEPTOR with SSG ADAPTOR**

**ELEVATION IS NUMBER KEYED TO DETAILS**

**NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS**

---

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.

© Kawneer Company, Inc., 2013

kawneer.com

ADMC040EN
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.

© Kawneer Company, Inc., 2013

Trifab™ VG 451/451T Framing System
BASIC FRAMING DETAILS (FRONT)

SCALE 3" = 1'-0"

STICK (INSIDE GLAZED)
SSG RECEPTOR

STICK (OUTSIDE GLAZED)
SSG RECEPTOR

NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS
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.

© Kawneer Company, Inc., 2013

Trifab™ VG 451/451T Framing System
BASIC FRAMING DETAILS (FRONT)

SCALE 3" = 1'-0"

ELEVATION IS NUMBER KEYED TO DETAILS

NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

STICK (INSIDE GLAZED) TWO COLOR OPTION

SSG RECEPTOR

4 JAMB

5 SSG VERTICAL

5 WEATHERSEAL VERTICAL

1 HEAD

2 HORIZONTAL

3 SILL

© Kawneer Company, Inc., 2013

Trifab™ VG 451/451T Framing System
BASIC FRAMING DETAILS (FRONT)

SCALE 3" = 1'-0"

ELEVATION IS NUMBER KEYED TO DETAILS

NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

STICK (INSIDE GLAZED) TWO COLOR OPTION

SSG RECEPTOR

4 JAMB

5 SSG VERTICAL

5 WEATHERSEAL VERTICAL

1 HEAD

2 HORIZONTAL

3 SILL

© Kawneer Company, Inc., 2013

Trifab™ VG 451/451T Framing System
BASIC FRAMING DETAILS (FRONT)

SCALE 3" = 1'-0"

ELEVATION IS NUMBER KEYED TO DETAILS

NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

STICK (INSIDE GLAZED) TWO COLOR OPTION

SSG RECEPTOR

4 JAMB

5 SSG VERTICAL

5 WEATHERSEAL VERTICAL

1 HEAD

2 HORIZONTAL

3 SILL

© Kawneer Company, Inc., 2013
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.

© Kawneer Company, Inc., 2013
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"

TYPE-B (INSIDE GLAZED) SSG \ WEATHERSEAL

PUNCHED OPENING

NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

ELEVATION IS NUMBER KEYED TO DETAILS

Trifab™ VG 451/451T Framing System
BASIC FRAMING DETAILS (FRONT)

ADMC040EN SEPTEMBER, 2016

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

© Kawneer Company, Inc. 2013

kawneer.com
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.

© Kawneer Company, Inc., 2013
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:
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.

Seal over Stool Trim fasteners to prevent water infiltration.
SCALE 3" = 1'-0"

4-1/2" X 4-1/2" TUBE

TWO PIECE NO POCKET CORNER

ONE POCKET CORNER

TWO POCKET CORNER POST

VARIABLE DEGREE BRAKE METAL OUTSIDE CORNER

VARIABLE DEGREE BRAKE METAL INSIDE CORNER

90° CORNER

135° CORNER
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.

Kawneer Company, Inc., 2013
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.

© Kawneer Company, Inc., 2013

Trifab™ VG 451/451T Framing System
GLASSvent™ WINDOW for STOREFRONT FRAMING (FRONT)

Scale 3" = 1'-0"

**Outswing Casement Vertical Section**

1. 451VG004
   - 451VG003 (451TVG003)
   - 469407
2. 451VG004
   - 451VG011 (451TVG011)
   - 469407

**Project-Out Vertical Section**

3. 451VG004
   - 451VG011 (451TVG011)
   - 469407

**Outswing Casement Horizontal Section**

5. 451VG005 (451TG005)
   - 469407
6. 451VG005 (451TVG005)
   - 469407

**Project-Out Horizontal Section**

7. 451VG005 (451TG005)
   - 469407
8. 451VG005 (451TVG005)
   - 469407

**Note:** Black spacer is recommended when 1" insulating glass is 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.

7225 NON-THERMAL WINDOW SHOWN

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

ELEVATION IS NUMBER KEYED TO DETAILS

PROJECT-OUT
VERTICAL SECTION

PROJECT-OUT
HORIZONTAL SECTION
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.

© Kawneer Company, Inc., 2013
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.

© Kawneer Company, Inc., 2013
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.

© Kawneer Company, Inc., 2013

SCALE 3" = 1'-0"

ELEVATION IS NUMBER KEYED TO DETAILS

NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

SCREW SPLINE

SHEAR BLOCK

STICK

*See Page 44 for Thermal Flashing and Optional High Performance Flashing

*See Page 44 for Thermal Flashing and Optional High Performance Flashing

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

© Kawneer Company, Inc., 2013
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.

© Kawneer Company, Inc., 2013

---

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

**ELEVATION IS NUMBER KEYED TO DETAILS**

**NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS**

---

### SCREW SPLINE

**1** HEAD

451VG001

451TVG001

451VG026

**2** HORIZONTAL

451VG003

451TVG003

451VG012

[451TVG012]

451VG004

**3** SILL

451VG001

[451TVG001]

450037

[451TV037]

**4** JAMB

451VG026

**5** VERTICAL

---

### SHEAR BLOCK

**1** HEAD

451VG001

451TVG001

**2** HORIZONTAL

451VG003

451TVG003

451VG005

[451TVG005]

**3** SILL

451VG001

[451TVG001]

450037

[451TV037]

**4** JAMB

451VG026

**5** VERTICAL

---

### STICK

**1** HEAD

451VG006

[451TVG006]

**2** HORIZONTAL

451VG008

[451TVG008]

**3** SILL

451VG007

[451TVG007]

451TVG106

**4** JAMB

451VG026

**5** VERTICAL

---

*See Page 44 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.

© Kawneer Company, Inc., 2013

SCALE 3" = 1'-0"

EXPANSION MULLION

TUBULAR EXPANSION MULLION

TUBULAR EXPANSION MULLION WITH STEEL

1/4" (6.4) INFILL SNAP-IN ADAPTOR

5/8" (15.9) 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
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.

© Kawneer Company, Inc., 2013

SCALE 3" = 1'-0"

MULLION ANCHOR

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.

OPTIONAL LIGHTWEIGHT CAN RECEPOTERS

OPTIONAL UNEQUAL LEG CAN RECEPOTERS

BRAKE METAL ADAPTOR

Seal over Stool Trim fasteners to prevent water infiltration.

STOOL TRIM CLIP with STANDARD FLASHING

STOOL TRIM CLIP with HP FLASHING

STOOL TRIM CLIP FOR STICK ASSEMBLY
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.

© Kawneer Company, Inc., 2013

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.

ELEVATIONS ARE NUMBER KEYED TO DETAILS

TRANSOM BAR

SINGLE ACTING

DOUBLE ACTING

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.

SINGLE ACTING HEADER

DOUBLE ACTING HEADER

SINGLE ACTING DOOR JAMBS

DOUBLE ACTING DOOR JAMBS
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.

© Kawneer Company, Inc., 2013
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.

BASIC FRAMING DETAILS ................................................. 50-55
(See appropriate Center, Front or Back Section for Miscellaneous 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.

© Kawneer Company, Inc., 2013

**SCALE 3” = 1'-0’”**

**SCREW SPLINE ASSEMBLY**

<table>
<thead>
<tr>
<th>1</th>
<th>4</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRONT</td>
<td>BACK</td>
<td>CENTRE</td>
</tr>
</tbody>
</table>

1. **HEAD**
   - FRONT: 451VG004
   - BACK: 451VG003
   - CENTRE: 451VG01

2. **HORIZONTAL**
   - FRONT: 451VG011
   - BACK: 451VG026

3. **SILL**
   - FRONT and BACK: 450037

<table>
<thead>
<tr>
<th>2</th>
<th>5</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRONT VERTICAL</td>
<td>BACK VERTICAL</td>
<td>CENTRE VERTICAL</td>
</tr>
</tbody>
</table>

4. **HEAD**
   - FRONT: 451VG103
   - BACK: 451VG104

5. **HORIZONTAL**
   - FRONT: 451VG111
   - BACK: 451VG104

6. **SILL**
   - FRONT: 450037

<table>
<thead>
<tr>
<th>3</th>
<th>6</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRONT</td>
<td>BACK</td>
<td>CENTRE</td>
</tr>
</tbody>
</table>

7. **HEAD**
   - BACK: 451CG003
   - CENTRE: 451CG004

8. **HORIZONTAL**
   - BACK: 451CG002
   - CENTRE: 451CG004

9. **SILL**
   - BACK: 451CG003
   - CENTRE: 451CG004

**NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS**

---

*See Page 33 for Thermal Flashing and Optional High Performance Flashing
*See Page 44 for Thermal Flashing and Optional High Performance Flashing
*See Page 14 for Thermal Flashing and Optional High Performance Flashing

---

**FRONT**

See Pages 26 thru 39 for all FRONT details.

**BACK**

See Pages 42 thru 47 for all BACK details.

**CENTER**

See Pages 12 thru 21 for all CENTER details.

---

See Pages 26 thru 39 for all FRONT details.

See Pages 42 thru 47 for all BACK details.

See Pages 12 thru 21 for all CENTER 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.

© Kawneer Company, Inc., 2013

Trifab™ VG 451/451T Framing System
BASIC FRAMING DETAILS (MULTI-PLANE - Inside Glazed)

SCALE 3" = 1'-0"

SCREW SPLINE ASSEMBLY

ELEVATION IS NUMBER KEYED TO DETAILS

NUMBERS IN BRACKETS ARE THERMALLY BROKEN MEMBERS

FRONT
See Pages 26 thru 39 for all FRONT details.

BACK
See Pages 42 thru 47 for all BACK details.

CENTER
See Pages 12 thru 21 for all CENTER details.

HEAD

HORIZONTAL

SILL

*See Page 33 for Thermal Flashing and Optional High Performance Flashing

*See Page 44 for Thermal Flashing and Optional High Performance Flashing

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

See Pages 26 thru 39 for all FRONT details.
See Pages 42 thru 47 for all BACK details.
See Pages 12 thru 21 for all CENTER 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.

© Kawneer Company, Inc., 2013

Trifab™ VG 451/451T Framing System

BASIC FRAMING DETAILS (MULTI-PLANE - Outside Glazed)

SCALE 3” = 1’-0”

SHEAR BLOCK ASSEMBLY

ELEVATION IS NUMBER KEYED TO DETAILS

Note: Transition verticals are required to be two piece.

FRONT

See Pages 26 thru 39 for all FRONT details.

BACK

See Pages 42 thru 47 for all BACK details.

CENTER

See Pages 12 thru 21 for all CENTER details.

*See Page 33 for Thermal Flashing and Optional High Performance Flashing
*See Page 44 for Thermal Flashing and Optional High Performance Flashing
*See Page 14 for Thermal Flashing and Optional High Performance Flashing

Kawneer does not control the selection of product configurations, operating hardware, or glazing materials, and assumes no responsibility therefor.
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.

© Kawneer Company, Inc., 2013

SCALE 3" = 1'-0"

SHEAR BLOCK ASSEMBLY

Note: Transition verticals are required to be two piece

FRONT
See Pages 26 thru 39 for all FRONT details.

BACK
See Pages 42 thru 47 for all BACK details.

CENTER
See Pages 12 thru 21 for all CENTER details.

*See Page 33 for Thermal Flashing and Optional High Performance Flashing

*See Page 44 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.
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.

© Kawneer Company, Inc., 2013

SCALE 3" = 1'-0"

STICK ASSEMBLY

Note: Transition verticals are required to be two piece.

See Pages 26 thru 39 for all FRONT details.

See Pages 42 thru 47 for all BACK details.

See Pages 12 thru 21 for all CENTER 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.

© Kawneer Company, Inc., 2013

---

**Trifab™ VG 451/451T Framing System**

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

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

<table>
<thead>
<tr>
<th>FRONT</th>
<th>BACK</th>
<th>CENTER</th>
<th>FRONT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 HEAD</td>
<td>4 HEAD</td>
<td>7 HEAD</td>
<td></td>
</tr>
<tr>
<td>2 HORIZONTAL</td>
<td>5 HORIZONTAL</td>
<td>8 HORIZONTAL</td>
<td></td>
</tr>
<tr>
<td>3 SILL</td>
<td>6 SILL</td>
<td>9 SILL</td>
<td></td>
</tr>
</tbody>
</table>

See Pages 12 thru 21 for all CENTER details.

See Pages 26 thru 39 for all FRONT details.

See Pages 42 thru 47 for all BACK details.

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

© Kawneer Company, Inc., 2013
<table>
<thead>
<tr>
<th>INDEX (CHARTS)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WINDLOAD CHARTS</strong> (CENTER)</td>
</tr>
<tr>
<td>TF VG 451 (Non-Thermal) .............................................................. 58-62</td>
</tr>
<tr>
<td>TF VG 451T (Thermal) .............................................................. 63-66</td>
</tr>
<tr>
<td><strong>WINDLOAD CHARTS</strong> (FRONT or BACK)</td>
</tr>
<tr>
<td>TF VG 451 (Non-Thermal) .............................................................. 67-70</td>
</tr>
<tr>
<td>TF VG 451T (Thermal) .............................................................. 71-73</td>
</tr>
<tr>
<td><strong>WINDLOAD CHARTS</strong> (FRONT or BACK)</td>
</tr>
<tr>
<td>TF VG 451/451T (SSG Mullions) .............................................................. 74</td>
</tr>
<tr>
<td><strong>WINDLOAD CHARTS</strong> (MULTI PLANE)</td>
</tr>
<tr>
<td>TF VG 451 (Non-Thermal) .............................................................. 75</td>
</tr>
<tr>
<td>TF VG 451T (Thermal) .............................................................. 76</td>
</tr>
<tr>
<td><strong>WINDLOAD CHARTS</strong> (ENTRANCE FRAMING)</td>
</tr>
<tr>
<td>TF VG 451/451T .............................................................. 77-78</td>
</tr>
<tr>
<td><strong>DEADLOAD CHARTS</strong></td>
</tr>
<tr>
<td>TF VG 451/451T .............................................................. 79-80</td>
</tr>
<tr>
<td><strong>END REACTION CHARTS</strong> .............................................................. 81</td>
</tr>
<tr>
<td><strong>THERMAL CHARTS</strong></td>
</tr>
<tr>
<td>EXAMPLE CALCULATION .............................................................. 82</td>
</tr>
<tr>
<td>TF VG 451 (CENTER – Non-Thermal) .............................................................. 83-85</td>
</tr>
<tr>
<td>TF VG 451T (CENTER – Thermal) .............................................................. 86-88</td>
</tr>
<tr>
<td>TF VG 451T (FRONT – Thermal) .............................................................. 89-91</td>
</tr>
<tr>
<td>TF VG 451T (BACK – Thermal) .............................................................. 92-94</td>
</tr>
<tr>
<td>TF VG 451T with Steel (CENTER) .............................................................. 95-97</td>
</tr>
</tbody>
</table>
WIND LOAD CHARTS

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 HORIZONTALS and are based on engineering calculations for stress and deflection. Allowable wind load stress for ALUMINUM 15,152 psi (104MPa), STEEL 30,000 psi (207MPa). Charted curves, in all cases are for the limiting value. Wind load charts contained herein are based upon nominal wind load utilized in allowable stress design. A conversion from Load Resistance Factor Design (LRFD) is provided. To convert ultimate wind loads to nominal loads, multiply ultimate wind loads by a factor of 0.6 per ASCE/SEI 7. A 4/3 increase in allowable stress has not been used to develop these curves. For special situations not covered by these curves, contact your Kawneer representative for additional information.

If the end reaction of the mullion [mullion spacing (ft.) times height (ft.) times specified wind load (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.)*

DEADLOAD CHARTS

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

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

© Kawneer Company, Inc., 2013
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.

© Kawneer Company, Inc., 2013

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

© Kawneer Company, Inc., 2013

**Windload Charts (Center) Non-Thermal**

<table>
<thead>
<tr>
<th>Allowable Stress Design Load</th>
<th>LRFD Ultimate Design Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>A = 15 PSF (720)</td>
<td>25 PSF (1200)</td>
</tr>
<tr>
<td>B = 20 PSF (960)</td>
<td>33 PSF (1580)</td>
</tr>
<tr>
<td>C = 25 PSF (1200)</td>
<td>42 PSF (2000)</td>
</tr>
<tr>
<td>D = 30 PSF (1440)</td>
<td>50 PSF (2400)</td>
</tr>
<tr>
<td>E = 40 PSF (1920)</td>
<td>67 PSF (3200)</td>
</tr>
</tbody>
</table>

| A = 15 PSF (720)            | 25 PSF (1200)             |
| B = 20 PSF (960)            | 33 PSF (1580)             |
| C = 25 PSF (1200)           | 42 PSF (2000)             |
| D = 30 PSF (1440)           | 50 PSF (2400)             |
| E = 40 PSF (1920)           | 67 PSF (3200)             |
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.

© Kawneer Company, Inc., 2013

451CG005A

I = 3.016 (125.53 x 10^4)
S = 1.340 (21.96 x 10^3)

451CG005

I = 2.907 (120.99 x 10^4)
S = 1.292 (21.17 x 10^3)

451CG005A with 450110 STEEL

I = 3.016 (125.53 x 10^4)
S = 1.340 (21.96 x 10^3)

I = 1.935 (80.54 x 10^4)
S = 0.938 (15.37 x 10^3)

451CG005

I = 2.907 (120.99 x 10^4)
S = 1.292 (21.17 x 10^3)
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.

© Kawneer Company, Inc., 2013

Trifab™ VG 451 Framing System
WINDLOAD CHARTS (CENTER) Non-Thermal

EC 97911-118

Allowable Stress Design Load

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load</td>
<td>15 PSF (720)</td>
<td>20 PSF (960)</td>
<td>25 PSF (1200)</td>
<td>30 PSF (1440)</td>
<td>40 PSF (1920)</td>
</tr>
<tr>
<td></td>
<td>25 PSF (1200)</td>
<td>33 PSF (1580)</td>
<td>42 PSF (2000)</td>
<td>50 PSF (2400)</td>
<td>67 PSF (3200)</td>
</tr>
</tbody>
</table>

LRFD Ultimate Design Load

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>25 PSF (1200)</td>
<td>33 PSF (1580)</td>
<td>42 PSF (2000)</td>
<td>50 PSF (2400)</td>
<td>67 PSF (3200)</td>
</tr>
</tbody>
</table>

© Kawneer Company, Inc., 2013
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.

© Kawneer Company, Inc., 2013
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.

© Kawneer Company, Inc., 2013

Trifab™ VG 451T Framing System

WINDLOAD CHARTS (CENTER) Thermal

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

WITH HORIZONTALS

WIDTH IN METERS

WITH HORIZONTALS

WIDTH IN FEET

WITH HORIZONTALS

WIDTH IN METERS

WITH HORIZONTALS

WIDTH IN FEET

Without Horizontals

WIDTH IN METERS

Without Horizontals

WIDTH IN FEET

Allowable Stress Design Load | LRFD Ultimate Design Load
---|---
A = 15 PSF (720) | 25 PSF (1200)
B = 20 PSF (960) | 33 PSF (1580)
C = 25 PSF (1200) | 42 PSF (2000)
D = 30 PSF (1440) | 50 PSF (2400)
E = 40 PSF (1920) | 67 PSF (3200)
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.

© Kawneer Company, Inc., 2013

WINDLOAD CHARTS (CENTER) Thermal

Allowable Stress Design Load | LRFD Ultimate Design Load
--- | ---
A = 15 PSF (720) | 25 PSF (1200)
B = 20 PSF (960) | 33 PSF (1580)
C = 25 PSF (1200) | 42 PSF (2000)
D = 30 PSF (1440) | 50 PSF (2400)
E = 40 PSF (1920) | 67 PSF (3200)

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

Trifab™ VG 451T Framing System

SEPTMBER, 2016

Trifab™ VG 451T Framing System

WINDLOAD CHARTS (CENTER) Thermal
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.

© Kawneer Company, Inc., 2013

Without Horizontals

Windload charts are based on composite properties which are calculated in accordance with AAMA TIR-A8 and AAMA 505.
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.

© Kawneer Company, Inc., 2013

Trifab™ VG 451 Framing System

WINDLOAD CHARTS (FRONT/BACK) Non-Thermal

WITH HORIZONTALS
WIDTH IN METERS

<table>
<thead>
<tr>
<th>Height in Feet</th>
<th>1</th>
<th>1.5</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I</td>
<td>S</td>
<td>I</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

I = 3.346 (139.27 x 10⁴)
S = 1.447 (23.71 x 10³)

WITH HORIZONTALS
WIDTH IN METERS

<table>
<thead>
<tr>
<th>Height in Feet</th>
<th>1</th>
<th>1.5</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I</td>
<td>S</td>
<td>I</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

I = 0.949 (39.50 x 10⁴)
S = 0.844 (13.83 x 10³)

WITH HORIZONTALS
WIDTH IN METERS

<table>
<thead>
<tr>
<th>Height in Feet</th>
<th>1</th>
<th>1.5</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I</td>
<td>S</td>
<td>I</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

I = 3.001 (124.91 x 10⁴)
S = 1.323 (21.68 x 10³)

WITH HORIZONTALS
WIDTH IN METERS

<table>
<thead>
<tr>
<th>Height in Feet</th>
<th>1</th>
<th>1.5</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I</td>
<td>S</td>
<td>I</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

I = 1.447 (23.71 x 10³)
S = 1.447 (23.71 x 10³)

WITH HORIZONTALS
WIDTH IN METERS

<table>
<thead>
<tr>
<th>Height in Feet</th>
<th>1</th>
<th>1.5</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I</td>
<td>S</td>
<td>I</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

I = 0.844 (13.83 x 10³)
S = 0.844 (13.83 x 10³)

WITH HORIZONTALS
WIDTH IN METERS

<table>
<thead>
<tr>
<th>Height in Feet</th>
<th>1</th>
<th>1.5</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I</td>
<td>S</td>
<td>I</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

I = 1.323 (21.68 x 10³)
S = 1.323 (21.68 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.

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

© Kawneer Company, Inc., 2013

---

**Trifab™ VG 451 Framing System**

**WINDLOAD CHARTS (FRONT/BACK) Non-Thermal**

**WITH HORIZONTALS**

<table>
<thead>
<tr>
<th>Width in Meters</th>
<th>Height in Feet</th>
<th>I (in x 10^4)</th>
<th>S (in x 10^3)</th>
<th>IS (in x 10^4)</th>
<th>SS (in x 10^3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**WITH HORIZONTALS**

<table>
<thead>
<tr>
<th>Width in Meters</th>
<th>Height in Feet</th>
<th>I (in x 10^4)</th>
<th>S (in x 10^3)</th>
<th>IS (in x 10^4)</th>
<th>SS (in x 10^3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**WITH HORIZONTALS**

<table>
<thead>
<tr>
<th>Width in Meters</th>
<th>Height in Feet</th>
<th>I (in x 10^4)</th>
<th>S (in x 10^3)</th>
<th>IS (in x 10^4)</th>
<th>SS (in x 10^3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**WITH HORIZONTALS**

<table>
<thead>
<tr>
<th>Width in Meters</th>
<th>Height in Feet</th>
<th>I (in x 10^4)</th>
<th>S (in x 10^3)</th>
<th>IS (in x 10^4)</th>
<th>SS (in x 10^3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**451VG005**

with 1" x 2-1/4" STEEL BAR

I = 3.001 (124.91 x 10^4)
S = 1.323 (21.68 x 10^3)

**451VG014**

with 1" x 2" STEEL BAR

I = 5.604 (233.25 x 10^4)
S = 2.397 (39.28 x 10^3)

---

Allowable Stress Design Load | LRFD Ultimate Design Load
---|---
A = 15 PSF (720) | 25 PSF (1200)
B = 20 PSF (960) | 33 PSF (1580)
C = 25 PSF (1200) | 42 PSF (2000)
D = 30 PSF (1440) | 50 PSF (2400)
E = 40 PSF (1920) | 67 PSF (3200)

---

**CHARTS**

**Allowable Stress**

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

**Design Load**

- 15 PSF (720)
- 20 PSF (960)
- 25 PSF (1200)
- 30 PSF (1440)
- 40 PSF (1920)

**LRFD Ultimate Design Load**

- 25 PSF (1200)
- 33 PSF (1580)
- 42 PSF (2000)
- 50 PSF (2400)
- 67 PSF (3200)
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.

© Kawneer Company, Inc., 2013

Windload Charts (Front/Back) Non-Thermal

Allowable Stress
Design Load
LRFD Ultimate
Design Load

A = 15 PSF (720) 25 PSF (1200)
B = 20 PSF (960) 33 PSF (1580)
C = 25 PSF (1200) 42 PSF (2000)
D = 30 PSF (1440) 50 PSF (2400)
E = 40 PSF (1920) 67 PSF (3200)

I = 2.930 (121.96 x 10^4)
S = 1.290 (21.13 x 10^3)

I = 2.930 (121.96 x 10^4)
S = 1.290 (21.13 x 10^3)

I = 4.418 (183.89 x 10^4)
S = 1.831 (30.00 x 10^3)
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.

© Kawneer Company, Inc., 2013

Trifab™ VG 451 Framing System

WINDLOAD CHARTS (FRONT/BACK) Non-Thermal

Allowable Stress Design Load

<table>
<thead>
<tr>
<th>Design Load</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>15 PSF (720)</td>
</tr>
<tr>
<td>B</td>
<td>20 PSF (960)</td>
</tr>
<tr>
<td>C</td>
<td>25 PSF (1200)</td>
</tr>
<tr>
<td>D</td>
<td>30 PSF (1440)</td>
</tr>
<tr>
<td>E</td>
<td>40 PSF (1920)</td>
</tr>
</tbody>
</table>

LRFD Ultimate Design Load

<table>
<thead>
<tr>
<th>Design Load</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>25 PSF (1200)</td>
</tr>
<tr>
<td>B</td>
<td>33 PSF (1580)</td>
</tr>
<tr>
<td>C</td>
<td>42 PSF (2000)</td>
</tr>
<tr>
<td>D</td>
<td>50 PSF (2400)</td>
</tr>
<tr>
<td>E</td>
<td>67 PSF (3200)</td>
</tr>
</tbody>
</table>

I = 5.076 (211.27 x 10^4)
S = 2.133 (34.95 x 10^3)

© Kawneer Company, Inc., 2013
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.

© Kawneer Company, Inc., 2013

[charts and diagrams]

Trifab™ VG 451T Framing System
WINDLOAD CHARTS (FRONT/BACK) Thermal

<table>
<thead>
<tr>
<th>Allowable Stress</th>
<th>LRFD Ultimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Load</td>
<td>Design Load</td>
</tr>
<tr>
<td>A = 15 PSF (720)</td>
<td>25 PSF (1200)</td>
</tr>
<tr>
<td>B = 20 PSF (960)</td>
<td>33 PSF (1580)</td>
</tr>
<tr>
<td>C = 25 PSF (1200)</td>
<td>42 PSF (2000)</td>
</tr>
<tr>
<td>D = 30 PSF (1440)</td>
<td>50 PSF (2400)</td>
</tr>
<tr>
<td>E = 40 PSF (1920)</td>
<td>67 PSF (3200)</td>
</tr>
</tbody>
</table>

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

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN METERS
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.

© Kawneer Company, Inc., 2013

WINDLOAD CHARTS (FRONT/BACK) Thermal

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN FEET

WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN FEET

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN FEET

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN FEET

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN FEET

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN FEET

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN FEET

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN FEET

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN FEET

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN FEET

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN FEET

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN FEET

WITH HORIZONTALS
WIDTH IN METERS

WITH HORIZONTALS
WIDTH IN FEET

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

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

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

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

Allowable Stress Design Load | LRFD Ultimate Design Load
--- | ---
A = 15 PSF (720) | 25 PSF (1200)
B = 20 PSF (960) | 33 PSF (1580)
C = 25 PSF (1200) | 42 PSF (2000)
D = 30 PSF (1440) | 50 PSF (2400)
E = 40 PSF (1920) | 67 PSF (3200)

451TVG014

451TVG134 with 1" x 2-1/4" STEEL BAR

451TVG134

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.

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

© Kawneer Company, Inc., 2013

---

**WINDLOAD CHARTS (FRONT/BACK) Thermal**

**WITH HORIZONTALS**

**WIDTH IN METERS**

![Graph](image)

**HEIGHT IN FEET**

<table>
<thead>
<tr>
<th>Allowable Stress Design Load</th>
<th>LRFD Ultimate Design Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>A = 15 PSF (720)</td>
<td>25 PSF (1200)</td>
</tr>
<tr>
<td>B = 20 PSF (960)</td>
<td>33 PSF (1580)</td>
</tr>
<tr>
<td>C = 25 PSF (1200)</td>
<td>42 PSF (2000)</td>
</tr>
<tr>
<td>D = 30 PSF (1440)</td>
<td>50 PSF (2400)</td>
</tr>
<tr>
<td>E = 40 PSF (1920)</td>
<td>67 PSF (3200)</td>
</tr>
</tbody>
</table>

**WITH HORIZONTALS**

**WIDTH IN METERS**

![Graph](image)

**HEIGHT IN FEET**

**451TVG540**

**451TVG010A**

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

**WITHOUT HORIZONTALS**

**WIDTH IN METERS**

![Graph](image)

**HEIGHT IN FEET**

**451TVG540**

**451TVG010**

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

---

**WINDLOAD CHARTS (FRONT/BACK) Thermal**

**WITH HORIZONTALS**

**WIDTH IN METERS**

![Graph](image)

**HEIGHT IN FEET**

**451TVG540**

**451TVG010A**

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

**WITHOUT HORIZONTALS**

**WIDTH IN METERS**

![Graph](image)

**HEIGHT IN FEET**

**451TVG540**

**451TVG010**

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

© Kawneer Company, Inc., 2013
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.

© Kawneer Company, Inc., 2013

TRIFAB™ VG 451 Framing System

WINDLOAD CHARTS (MULTI-PLANE) Non-Thermal

<table>
<thead>
<tr>
<th>Allowable Stress Design Load</th>
<th>LRFD Ultimate Design Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>A = 15 PSF (720)</td>
<td>25 PSF (1200)</td>
</tr>
<tr>
<td>B = 20 PSF (960)</td>
<td>33 PSF (1580)</td>
</tr>
<tr>
<td>C = 25 PSF (1200)</td>
<td>42 PSF (2000)</td>
</tr>
<tr>
<td>D = 30 PSF (1440)</td>
<td>50 PSF (2400)</td>
</tr>
<tr>
<td>E = 40 PSF (1920)</td>
<td>67 PSF (3200)</td>
</tr>
</tbody>
</table>

### WITH HORIZONTALS

**WIDTH IN METERS**

- **HEIGHT IN FEET**
  - 15
  - 14
  - 13
  - 12
  - 11
  - 10
  - 9
  - 8
  - 7
  - 6
  - 5
  - 4
  - 3.5
  - 3.0
  - 2.5
  - 2.0
  - 1.5
  - 1.0

- **WIDTH IN FEET**
  - 1
  - 1.5
  - 2
  - 3
  - 4
  - 5
  - 6
  - 7
  - 8

**I** = 3.470 \((145.05 \times 10^4)\)

**S** = 1.468 \((24.06 \times 10^3)\)

**451VG001**

**451CG002**

### WITHOUT HORIZONTALS

**WIDTH IN METERS**

- **HEIGHT IN FEET**
  - 15
  - 14
  - 13
  - 12
  - 11
  - 10
  - 9
  - 8
  - 7
  - 6
  - 5
  - 4
  - 3.5
  - 3.0
  - 2.5
  - 2.0
  - 1.5

- **WIDTH IN FEET**
  - 1
  - 1.5
  - 2
  - 3
  - 4
  - 5
  - 6
  - 7
  - 8

**I** = 3.485 \((145.05 \times 10^4)\)

**S** = 1.468 \((24.06 \times 10^3)\)

**451VG001**

**451CG002**

### WITH HORIZONTALS

**WIDTH IN METERS**

- **HEIGHT IN FEET**
  - 15
  - 14
  - 13
  - 12
  - 11
  - 10
  - 9
  - 8
  - 7
  - 6
  - 5
  - 4
  - 3.5
  - 3.0
  - 2.5
  - 2.0
  - 1.5

- **WIDTH IN FEET**
  - 1
  - 1.5
  - 2
  - 3
  - 4
  - 5
  - 6
  - 7
  - 8

**I** = 3.740 \((144.43 \times 10^4)\)

**S** = 1.431 \((23.45 \times 10^3)\)

**451VG052**

**451CG028**

### WITHOUT HORIZONTALS

**WIDTH IN METERS**

- **HEIGHT IN FEET**
  - 15
  - 14
  - 13
  - 12
  - 11
  - 10
  - 9
  - 8
  - 7
  - 6
  - 5
  - 4
  - 3.5
  - 3.0
  - 2.5
  - 2.0
  - 1.5

- **WIDTH IN FEET**
  - 1
  - 1.5
  - 2
  - 3
  - 4
  - 5
  - 6
  - 7
  - 8

**I** = 3.815 \((145.05 \times 10^4)\)

**S** = 1.468 \((24.06 \times 10^3)\)

**451VG069**

**451VG069**

### WITH HORIZONTALS

**WIDTH IN METERS**

- **HEIGHT IN FEET**
  - 15
  - 14
  - 13
  - 12
  - 11
  - 10
  - 9
  - 8
  - 7
  - 6
  - 5
  - 4
  - 3.5
  - 3.0
  - 2.5
  - 2.0
  - 1.5

- **WIDTH IN FEET**
  - 1
  - 1.5
  - 2
  - 3
  - 4
  - 5
  - 6
  - 7
  - 8

**I** = 3.642 \((139.94 \times 10^4)\)

**S** = 1.180 \((19.34 \times 10^3)\)

**451VG069**

**451VG069**

---

Kawneer reserves the right to change configuration without prior notice when deemed necessary for product improvement. The selection of product configurations, operating hardware, or glazing materials shall be at the specifier’s discretion and assumes no responsibility therefor.
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.

© Kawneer Company, Inc., 2013
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.

© Kawneer Company, Inc., 2013

Trifab™ VG 451/451T Framing System

WINDLOAD CHARTS (ENTRANCES) Non-Thermal

---

**WITH HORIZONTALS**

<table>
<thead>
<tr>
<th>WIDTH IN METERS</th>
<th>HEIGHT IN FEET</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>1.5</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

**WITHOUT HORIZONTALS**

<table>
<thead>
<tr>
<th>WIDTH IN METERS</th>
<th>HEIGHT IN FEET</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>1.5</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

---

**Allowable Stress Design Load**

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

**LRFD Ultimate Design Load**

| A | 25 PSF (1200) |
| B | 33 PSF (1580) |
| C | 42 PSF (2000) |
| D | 50 PSF (2400) |
| E | 67 PSF (3200) |

---

**WITH HORIZONTALS**

I = $3.116 \times 10^4$
S = $1.385 \times 10^5$

**WITHOUT HORIZONTALS**

I = $1.935 \times 10^4$
S = $0.938 \times 10^3$

---

**WITH HORIZONTALS**

I = $3.565 \times 10^4$
S = $1.559 \times 10^3$

**WITHOUT HORIZONTALS**

I = $1.599 \times 10^3$
S = $0.938 \times 10^3$
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.

© Kawneer Company, Inc., 2013
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)
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: 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.

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.

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)
**Generic Project Specific U-factor Example Calculation**

(Percent of Glass will vary on specific products depending on sitelines)

- 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

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.
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.

© Kawneer Company, Inc., 2013

### THERMAL PERFORMANCE MATRIX

#### Trifab™ VG 451

(CENTER – Non-Thermal)

**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").

<table>
<thead>
<tr>
<th>Thermal Transmittance</th>
<th>Glass U-Factor</th>
<th>Overall U-Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.48</td>
<td>0.63</td>
</tr>
<tr>
<td></td>
<td>0.46</td>
<td>0.61</td>
</tr>
<tr>
<td></td>
<td>0.44</td>
<td>0.60</td>
</tr>
<tr>
<td></td>
<td>0.42</td>
<td>0.58</td>
</tr>
<tr>
<td></td>
<td>0.40</td>
<td>0.57</td>
</tr>
<tr>
<td></td>
<td>0.38</td>
<td>0.55</td>
</tr>
<tr>
<td></td>
<td>0.36</td>
<td>0.53</td>
</tr>
<tr>
<td></td>
<td>0.34</td>
<td>0.52</td>
</tr>
<tr>
<td></td>
<td>0.32</td>
<td>0.50</td>
</tr>
<tr>
<td></td>
<td>0.30</td>
<td>0.49</td>
</tr>
<tr>
<td></td>
<td>0.28</td>
<td>0.47</td>
</tr>
<tr>
<td></td>
<td>0.26</td>
<td>0.45</td>
</tr>
<tr>
<td></td>
<td>0.24</td>
<td>0.44</td>
</tr>
<tr>
<td></td>
<td>0.22</td>
<td>0.42</td>
</tr>
<tr>
<td></td>
<td>0.20</td>
<td>0.41</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SHGC Matrix</th>
<th>Glass SHGC</th>
<th>Overall SHGC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.90</td>
<td>0.80</td>
</tr>
<tr>
<td></td>
<td>0.85</td>
<td>0.76</td>
</tr>
<tr>
<td></td>
<td>0.80</td>
<td>0.71</td>
</tr>
<tr>
<td></td>
<td>0.75</td>
<td>0.67</td>
</tr>
<tr>
<td></td>
<td>0.70</td>
<td>0.63</td>
</tr>
<tr>
<td></td>
<td>0.65</td>
<td>0.58</td>
</tr>
<tr>
<td></td>
<td>0.60</td>
<td>0.64</td>
</tr>
<tr>
<td></td>
<td>0.55</td>
<td>0.49</td>
</tr>
<tr>
<td></td>
<td>0.50</td>
<td>0.45</td>
</tr>
<tr>
<td></td>
<td>0.45</td>
<td>0.41</td>
</tr>
<tr>
<td></td>
<td>0.40</td>
<td>0.36</td>
</tr>
<tr>
<td></td>
<td>0.35</td>
<td>0.32</td>
</tr>
<tr>
<td></td>
<td>0.30</td>
<td>0.27</td>
</tr>
<tr>
<td></td>
<td>0.25</td>
<td>0.23</td>
</tr>
<tr>
<td></td>
<td>0.20</td>
<td>0.18</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Visible Transmittance</th>
<th>Glass VT</th>
<th>Overall VT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.90</td>
<td>0.79</td>
</tr>
<tr>
<td></td>
<td>0.85</td>
<td>0.75</td>
</tr>
<tr>
<td></td>
<td>0.80</td>
<td>0.71</td>
</tr>
<tr>
<td></td>
<td>0.75</td>
<td>0.66</td>
</tr>
<tr>
<td></td>
<td>0.70</td>
<td>0.62</td>
</tr>
<tr>
<td></td>
<td>0.65</td>
<td>0.57</td>
</tr>
<tr>
<td></td>
<td>0.60</td>
<td>0.53</td>
</tr>
<tr>
<td></td>
<td>0.55</td>
<td>0.49</td>
</tr>
<tr>
<td></td>
<td>0.50</td>
<td>0.44</td>
</tr>
<tr>
<td></td>
<td>0.45</td>
<td>0.40</td>
</tr>
<tr>
<td></td>
<td>0.40</td>
<td>0.35</td>
</tr>
<tr>
<td></td>
<td>0.35</td>
<td>0.31</td>
</tr>
<tr>
<td></td>
<td>0.30</td>
<td>0.26</td>
</tr>
<tr>
<td></td>
<td>0.25</td>
<td>0.22</td>
</tr>
<tr>
<td></td>
<td>0.20</td>
<td>0.18</td>
</tr>
</tbody>
</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.

© Kawneer Company, Inc., 2013

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 Framing System**

**THERMAL PERFORMANCE MATRIX**

**Trifab™ VG 451T**  
(CENTER – Thermal)

**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”).

### Thermal Transmittance

<table>
<thead>
<tr>
<th>Glass U-Factor ³</th>
<th>Overall U-Factor ⁴</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.48</td>
<td>0.55</td>
</tr>
<tr>
<td>0.46</td>
<td>0.53</td>
</tr>
<tr>
<td>0.44</td>
<td>0.52</td>
</tr>
<tr>
<td>0.42</td>
<td>0.50</td>
</tr>
<tr>
<td>0.40</td>
<td>0.49</td>
</tr>
<tr>
<td>0.38</td>
<td>0.47</td>
</tr>
<tr>
<td>0.36</td>
<td>0.45</td>
</tr>
<tr>
<td>0.34</td>
<td>0.44</td>
</tr>
<tr>
<td>0.32</td>
<td>0.42</td>
</tr>
<tr>
<td>0.30</td>
<td>0.41</td>
</tr>
<tr>
<td>0.28</td>
<td>0.39</td>
</tr>
<tr>
<td>0.26</td>
<td>0.37</td>
</tr>
<tr>
<td>0.24</td>
<td>0.36</td>
</tr>
<tr>
<td>0.22</td>
<td>0.34</td>
</tr>
<tr>
<td>0.20</td>
<td>0.32</td>
</tr>
</tbody>
</table>

### SHGC Matrix

<table>
<thead>
<tr>
<th>Glass SHGC ³</th>
<th>Overall SHGC ⁴</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.75</td>
<td>0.67</td>
</tr>
<tr>
<td>0.70</td>
<td>0.62</td>
</tr>
<tr>
<td>0.65</td>
<td>0.58</td>
</tr>
<tr>
<td>0.60</td>
<td>0.54</td>
</tr>
<tr>
<td>0.55</td>
<td>0.49</td>
</tr>
<tr>
<td>0.50</td>
<td>0.45</td>
</tr>
<tr>
<td>0.45</td>
<td>0.40</td>
</tr>
<tr>
<td>0.40</td>
<td>0.36</td>
</tr>
<tr>
<td>0.35</td>
<td>0.32</td>
</tr>
<tr>
<td>0.30</td>
<td>0.27</td>
</tr>
<tr>
<td>0.25</td>
<td>0.23</td>
</tr>
<tr>
<td>0.20</td>
<td>0.18</td>
</tr>
<tr>
<td>0.15</td>
<td>0.14</td>
</tr>
<tr>
<td>0.10</td>
<td>0.10</td>
</tr>
<tr>
<td>0.05</td>
<td>0.05</td>
</tr>
</tbody>
</table>

### Visible Transmittance

<table>
<thead>
<tr>
<th>Glass VT ³</th>
<th>Overall VT ⁴</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.75</td>
<td>0.66</td>
</tr>
<tr>
<td>0.70</td>
<td>0.61</td>
</tr>
<tr>
<td>0.65</td>
<td>0.57</td>
</tr>
<tr>
<td>0.60</td>
<td>0.53</td>
</tr>
<tr>
<td>0.55</td>
<td>0.48</td>
</tr>
<tr>
<td>0.50</td>
<td>0.44</td>
</tr>
<tr>
<td>0.45</td>
<td>0.40</td>
</tr>
<tr>
<td>0.40</td>
<td>0.35</td>
</tr>
<tr>
<td>0.35</td>
<td>0.31</td>
</tr>
<tr>
<td>0.30</td>
<td>0.26</td>
</tr>
<tr>
<td>0.25</td>
<td>0.22</td>
</tr>
<tr>
<td>0.20</td>
<td>0.18</td>
</tr>
<tr>
<td>0.15</td>
<td>0.13</td>
</tr>
<tr>
<td>0.10</td>
<td>0.09</td>
</tr>
<tr>
<td>0.05</td>
<td>0.04</td>
</tr>
</tbody>
</table>

---

1. **Glass U-Factor**: Determined in accordance with NFRC 100.
2. **SHGC and VT values**: Determined in accordance with NFRC 200.
3. **Glass properties**: Based on center of glass values and obtained from your glass supplier.
4. **Overall U-Factor, SHGC, and VT Matrices**: Based on the standard NFRC specimen size of 2000mm wide by 2000mm high (78-3/4” by 78-3/4”).
Trifab™ VG 451T (FRONT – 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 (FRONT – Thermal)

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

System Visible Transmittance (VT) vs Percent of Vision Area
### Thermal Transmittance 1 (BTU/hr • ft² • °F)

<table>
<thead>
<tr>
<th>Glass U-Factor 3</th>
<th>Overall U-Factor 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.48</td>
<td>0.57</td>
</tr>
<tr>
<td>0.46</td>
<td>0.55</td>
</tr>
<tr>
<td>0.44</td>
<td>0.54</td>
</tr>
<tr>
<td>0.42</td>
<td>0.52</td>
</tr>
<tr>
<td>0.40</td>
<td>0.50</td>
</tr>
<tr>
<td>0.38</td>
<td>0.49</td>
</tr>
<tr>
<td>0.36</td>
<td>0.47</td>
</tr>
<tr>
<td>0.34</td>
<td>0.46</td>
</tr>
<tr>
<td>0.32</td>
<td>0.44</td>
</tr>
<tr>
<td>0.30</td>
<td>0.42</td>
</tr>
<tr>
<td>0.28</td>
<td>0.41</td>
</tr>
<tr>
<td>0.26</td>
<td>0.39</td>
</tr>
<tr>
<td>0.24</td>
<td>0.37</td>
</tr>
<tr>
<td>0.22</td>
<td>0.36</td>
</tr>
<tr>
<td>0.20</td>
<td>0.34</td>
</tr>
</tbody>
</table>

### SHGC Matrix 2

<table>
<thead>
<tr>
<th>Glass SHGC 3</th>
<th>Overall SHGC 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.75</td>
<td>0.68</td>
</tr>
<tr>
<td>0.70</td>
<td>0.63</td>
</tr>
<tr>
<td>0.65</td>
<td>0.59</td>
</tr>
<tr>
<td>0.60</td>
<td>0.55</td>
</tr>
<tr>
<td>0.55</td>
<td>0.50</td>
</tr>
<tr>
<td>0.50</td>
<td>0.46</td>
</tr>
<tr>
<td>0.45</td>
<td>0.41</td>
</tr>
<tr>
<td>0.40</td>
<td>0.37</td>
</tr>
<tr>
<td>0.35</td>
<td>0.32</td>
</tr>
<tr>
<td>0.30</td>
<td>0.28</td>
</tr>
<tr>
<td>0.25</td>
<td>0.24</td>
</tr>
<tr>
<td>0.20</td>
<td>0.19</td>
</tr>
<tr>
<td>0.15</td>
<td>0.15</td>
</tr>
<tr>
<td>0.10</td>
<td>0.10</td>
</tr>
<tr>
<td>0.05</td>
<td>0.06</td>
</tr>
</tbody>
</table>

### Visible Transmittance 2

<table>
<thead>
<tr>
<th>Glass VT 3</th>
<th>Overall VT 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.75</td>
<td>0.66</td>
</tr>
<tr>
<td>0.70</td>
<td>0.62</td>
</tr>
<tr>
<td>0.65</td>
<td>0.58</td>
</tr>
<tr>
<td>0.60</td>
<td>0.53</td>
</tr>
<tr>
<td>0.55</td>
<td>0.49</td>
</tr>
<tr>
<td>0.50</td>
<td>0.44</td>
</tr>
<tr>
<td>0.45</td>
<td>0.40</td>
</tr>
<tr>
<td>0.40</td>
<td>0.35</td>
</tr>
<tr>
<td>0.35</td>
<td>0.31</td>
</tr>
<tr>
<td>0.30</td>
<td>0.27</td>
</tr>
<tr>
<td>0.25</td>
<td>0.22</td>
</tr>
<tr>
<td>0.20</td>
<td>0.18</td>
</tr>
<tr>
<td>0.15</td>
<td>0.13</td>
</tr>
<tr>
<td>0.10</td>
<td>0.09</td>
</tr>
<tr>
<td>0.05</td>
<td>0.04</td>
</tr>
</tbody>
</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").
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 Framing System

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
## THERMAL PERFORMANCE MATRIX

### Trifab™ VG 451T (BACK – Thermal)

**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 Matricies are based on the standard NFRC specimen size of 2000mm wide by 2000mm high (78-3/4" by 78-3/4").

#### Thermal Transmittance

<table>
<thead>
<tr>
<th>Glass U-Factor</th>
<th>Overall U-Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.48</td>
<td>0.54</td>
</tr>
<tr>
<td>0.46</td>
<td>0.52</td>
</tr>
<tr>
<td>0.44</td>
<td>0.50</td>
</tr>
<tr>
<td>0.42</td>
<td>0.49</td>
</tr>
<tr>
<td>0.40</td>
<td>0.47</td>
</tr>
<tr>
<td>0.38</td>
<td>0.46</td>
</tr>
<tr>
<td>0.36</td>
<td>0.44</td>
</tr>
<tr>
<td>0.34</td>
<td>0.42</td>
</tr>
<tr>
<td>0.32</td>
<td>0.41</td>
</tr>
<tr>
<td>0.30</td>
<td>0.39</td>
</tr>
<tr>
<td>0.28</td>
<td>0.38</td>
</tr>
<tr>
<td>0.26</td>
<td>0.36</td>
</tr>
<tr>
<td>0.24</td>
<td>0.34</td>
</tr>
<tr>
<td>0.22</td>
<td>0.33</td>
</tr>
<tr>
<td>0.20</td>
<td>0.31</td>
</tr>
</tbody>
</table>

#### SHGC Matrix

<table>
<thead>
<tr>
<th>Glass SHGC</th>
<th>Overall SHGC</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.75</td>
<td>0.67</td>
</tr>
<tr>
<td>0.70</td>
<td>0.62</td>
</tr>
<tr>
<td>0.65</td>
<td>0.58</td>
</tr>
<tr>
<td>0.60</td>
<td>0.53</td>
</tr>
<tr>
<td>0.55</td>
<td>0.49</td>
</tr>
<tr>
<td>0.50</td>
<td>0.45</td>
</tr>
<tr>
<td>0.45</td>
<td>0.40</td>
</tr>
<tr>
<td>0.40</td>
<td>0.36</td>
</tr>
<tr>
<td>0.35</td>
<td>0.31</td>
</tr>
<tr>
<td>0.30</td>
<td>0.27</td>
</tr>
<tr>
<td>0.25</td>
<td>0.22</td>
</tr>
<tr>
<td>0.20</td>
<td>0.18</td>
</tr>
<tr>
<td>0.15</td>
<td>0.14</td>
</tr>
<tr>
<td>0.10</td>
<td>0.09</td>
</tr>
<tr>
<td>0.05</td>
<td>0.05</td>
</tr>
</tbody>
</table>

#### Visible Transmittance

<table>
<thead>
<tr>
<th>Glass VT</th>
<th>Overall VT</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.75</td>
<td>0.66</td>
</tr>
<tr>
<td>0.70</td>
<td>0.62</td>
</tr>
<tr>
<td>0.65</td>
<td>0.58</td>
</tr>
<tr>
<td>0.60</td>
<td>0.53</td>
</tr>
<tr>
<td>0.55</td>
<td>0.49</td>
</tr>
<tr>
<td>0.50</td>
<td>0.44</td>
</tr>
<tr>
<td>0.45</td>
<td>0.40</td>
</tr>
<tr>
<td>0.40</td>
<td>0.35</td>
</tr>
<tr>
<td>0.35</td>
<td>0.31</td>
</tr>
<tr>
<td>0.30</td>
<td>0.27</td>
</tr>
<tr>
<td>0.25</td>
<td>0.22</td>
</tr>
<tr>
<td>0.20</td>
<td>0.18</td>
</tr>
<tr>
<td>0.15</td>
<td>0.13</td>
</tr>
<tr>
<td>0.10</td>
<td>0.09</td>
</tr>
<tr>
<td>0.05</td>
<td>0.04</td>
</tr>
</tbody>
</table>
Trifab™ VG 451T with Steel (CENTER)

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 with Steel (CENTER)

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

System Visible Transmittance (VT) vs Percent of Vision Area
### Thermal Transmittance  
(\text{BTU/hr} \cdot \text{ft}^2 \cdot ^\circ\text{F})

<table>
<thead>
<tr>
<th>Glass U-Factor</th>
<th>Overall U-Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.48</td>
<td>0.59</td>
</tr>
<tr>
<td>0.46</td>
<td>0.57</td>
</tr>
<tr>
<td>0.44</td>
<td>0.55</td>
</tr>
<tr>
<td>0.42</td>
<td>0.54</td>
</tr>
<tr>
<td>0.40</td>
<td>0.52</td>
</tr>
<tr>
<td>0.38</td>
<td>0.51</td>
</tr>
<tr>
<td>0.36</td>
<td>0.49</td>
</tr>
<tr>
<td>0.34</td>
<td>0.48</td>
</tr>
<tr>
<td>0.32</td>
<td>0.46</td>
</tr>
<tr>
<td>0.30</td>
<td>0.44</td>
</tr>
<tr>
<td>0.28</td>
<td>0.43</td>
</tr>
<tr>
<td>0.26</td>
<td>0.41</td>
</tr>
<tr>
<td>0.24</td>
<td>0.40</td>
</tr>
<tr>
<td>0.22</td>
<td>0.38</td>
</tr>
<tr>
<td>0.20</td>
<td>0.37</td>
</tr>
</tbody>
</table>

### SHGC Matrix

<table>
<thead>
<tr>
<th>Glass SHGC</th>
<th>Overall SHGC</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.75</td>
<td>0.66</td>
</tr>
<tr>
<td>0.70</td>
<td>0.62</td>
</tr>
<tr>
<td>0.65</td>
<td>0.58</td>
</tr>
<tr>
<td>0.60</td>
<td>0.53</td>
</tr>
<tr>
<td>0.55</td>
<td>0.49</td>
</tr>
<tr>
<td>0.50</td>
<td>0.45</td>
</tr>
<tr>
<td>0.45</td>
<td>0.40</td>
</tr>
<tr>
<td>0.40</td>
<td>0.36</td>
</tr>
<tr>
<td>0.35</td>
<td>0.32</td>
</tr>
<tr>
<td>0.30</td>
<td>0.27</td>
</tr>
<tr>
<td>0.25</td>
<td>0.23</td>
</tr>
<tr>
<td>0.20</td>
<td>0.19</td>
</tr>
<tr>
<td>0.15</td>
<td>0.14</td>
</tr>
<tr>
<td>0.10</td>
<td>0.10</td>
</tr>
<tr>
<td>0.05</td>
<td>0.05</td>
</tr>
</tbody>
</table>

### Visible Transmittance

<table>
<thead>
<tr>
<th>Glass VT</th>
<th>Overall VT</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.75</td>
<td>0.65</td>
</tr>
<tr>
<td>0.70</td>
<td>0.61</td>
</tr>
<tr>
<td>0.65</td>
<td>0.57</td>
</tr>
<tr>
<td>0.60</td>
<td>0.52</td>
</tr>
<tr>
<td>0.55</td>
<td>0.48</td>
</tr>
<tr>
<td>0.50</td>
<td>0.44</td>
</tr>
<tr>
<td>0.45</td>
<td>0.39</td>
</tr>
<tr>
<td>0.40</td>
<td>0.35</td>
</tr>
<tr>
<td>0.35</td>
<td>0.31</td>
</tr>
<tr>
<td>0.30</td>
<td>0.26</td>
</tr>
<tr>
<td>0.25</td>
<td>0.22</td>
</tr>
<tr>
<td>0.20</td>
<td>0.17</td>
</tr>
<tr>
<td>0.15</td>
<td>0.13</td>
</tr>
<tr>
<td>0.10</td>
<td>0.09</td>
</tr>
<tr>
<td>0.05</td>
<td>0.04</td>
</tr>
</tbody>
</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.

© Kawneer Company, Inc., 2013