

## Product Evaluation

EC156 | 1123

Engineering Services Program

The following product has been evaluated for compliance with the wind loads specified in the International Residential Code (IRC) and the International Building Code (IBC).

This product evaluation is not an endorsement of this product or a recommendation that this product be used. The Texas Department of Insurance has not authorized the use of any information contained in the product evaluation for advertising, or other commercial or promotional purpose.

This product evaluation is intended for use by those individuals who are following the design wind load criteria in Chapter 3 of the IRC and Section 1609 of the IBC. The design loads determined for the building or structure shall not exceed the design load rating specified for the products shown in the limitations section of this product evaluation. This product evaluation does not relieve a Texas licensed engineer of his responsibilities as outlined in the Texas Insurance Code, the Texas Administrative Code, and the Texas Engineering Practice Act.

For more information, contact TDI Engineering Services Program at (800) 248-6032.

**Evaluation ID:** EC-156

**Effective Date:** November 1, 2023

**Re-evaluation Date:** November 2027

**Product Name:** KeraTwin K20 Ceramic Facade Panels

**Manufacturer:** Agrob Buchtal GmbH  
Buchtal 1  
D-92521 Schwarzenfeld, Germany  
Tel.: 09435/391-0

**Distributor:** Acme Brick Company  
3024 Acme Brick Plaza  
Fort Worth, Texas  
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### General Description:

KeraTwin K20 ceramic facade panels are extruded clay cladding panels designed to be installed as part of a drained and back ventilated rain screen wall assembly. The panels are made in heights ranging from 6" to 24" and in lengths from 2' up to 6' long with unglazed or glazed surface finishes. Holding grooves are extruded into the back faces of the panels allowing them to be hung on proprietary system rails made of aluminum alloy. Hooks are punched in the metal of the rails to engage the grooves on the cladding panels. Tabs punched into the rails serve as springs to hold the panels in place and prevent any vibration clattering that could be produced by wind force on the panels. The 20 to 25mm thick panels serve as the face element of a rain screen assembly and as an aesthetic exterior building veneer.

**Components:**

**Mounting rails:** aluminum alloy rails with punched hooks and spring tabs for holding panels designed with various profiles for different coursing installations of panels.

- Articles 624 and 627 Omega rail for horizontal panel stacked bond mounting. Article 624 is powder coated black for open joint application and 627 is mill finish for applications with joint profile. Rails are made in 20mm and 50mm depths. The 50mm depth is provided for higher system load capability. There is an article 633 Omega corner rail used as panel support at outside wall corners.
- Articles 597-01, 700 (Omega V), and 701 (Omega V) rails for horizontal panel running bond mounting. Article 700 is powder coated black for open joint application while the other components are mill finish. There is an article 705 (Omega V) corner rail used as panel support at outside wall corners.
- Articles 620 and 625 flat rails for attachment to T or L sub-framing rail to support horizontal panel mounted in a stacked bond pattern. Article 620 is powder coated black for open joint application. Article 625 is mill finish for applications with joint profile. There are article 630 and 635 corner rails that are used as panel supports at outside wall corners.
- Article 695Q T-profile rail attaches to sub-frame wall clips to support horizontal panel mounted in a stacked bond pattern. This rail component is powder coated black.
- Articles 627 Omega and 710 (Omega S) rails for vertical panel coursing. Article 710 performs as a load bearing shelf support for vertical panels and is powder coated black. Article 627 Omega is used as a lateral support along the length of the vertical panels and has a mill finish.

**Closed joint profile:** aluminum alloy trim material powder coated black with punched edges designed to fit and connect to either the system mounting rail parts or to the extruded core holes of the KeraTwin ceramic panels. The joint profiles are provided to close the vertical joints between panels installed in a horizontal orientation and the horizontal joints between panels installed in a vertical orientation. These trim pieces also affect installations aesthetically by concealing from view the panel core holes at joints between panels.

- Articles 640 & 647 profiles for vertical joints between panels installed in a horizontal stacked bond coursing. Article 640 is designed to attach to the center of Omega rails where panel ends join over the rail. Article 647 is designed with tabs that bend out to fit into core holes of panels where the panel ends do not join over Omega rail.
- Articles 707 & 712 profiles for vertical joints between panels installed in a horizontal running bond coursing. Article 707 is designed to attach to the center of Omega rails where panel ends join over the rail. Article 712 is designed with tabs that bend out to fit into core holes of panels where the panel ends do not join over Omega rail.
- Article 688 profiles for horizontal joints between panels installed in a vertical orientation. The profile is held in place by Article 689 holding clips that fit into panel core holes at one end of the clip and fit into a groove in the Article 688 joint profile at the other end of the clip.

**Open joint spacer:** Article 645 bent aluminum alloy bar powder coated black and sized to insert into panel cores to use as spacer between horizontally installed panels. The spacer allows the joint between panels to be left completely open.

**Closed corner joint profile:** aluminum alloy trim material powder coated black designed to attach to system rails as corner post for panel installations.

- Article 650 'Square' External Angle Profile for square cut panel ends.
- Article 652 'Sword' External Angle Profile for miter cut panel ends.
- Article 654 'Negative' External Angle Profile for square cut panel ends.

**Mounting clamps:** aluminum alloy panel attachment pieces powder coated black with press brake formed attachment prongs, punched spring tabs, and fastener holes fabricated to fit into panel core holes and be attached with screws or rivets to support sub-framing for vertical or horizontally oriented panels or panels installed as soffit or ceiling cladding.

- Article 680 Twin-clamp designed to support adjacent panel edges.
- Article 681 Edge-clamp designed to support adjacent panel edges at the side ends, or the top or bottom course of an installation.
- Article 682 Edge-clamp left designed to support the left end of a panel at the top or bottom course of an installation.
- Article 683 Edge-clamp right designed to support the right end of a panel at the top or bottom course of an installation.
- Article 684 Single-clamp designed to support adjacent panel edges at the end of a panel course.
- Article 682R R-Clamp designed to fasten left ends of panels to the face of 20mm thick rail parts to attach panel pieces that have had the extruded connection hook removed where panel cut to fit an area of an installation.
- Article 683R R-Clamp designed to fasten right ends of panels to the face of 20mm thick rail parts to attach panel pieces that have had the extruded connection hook removed where panel cut to fit an area of an installation.
- Article 684R R-Clamp designed to fasten adjacent ends of panels to the face of 20mm thick rail parts to attach panel pieces that have had the extruded connection hook removed where panel cut to fit an area of an installation.

**Limitations:**

**Design Pressure (allowable):** + / - 48.7 psf.

**Wall Bracing:** The KeraTwin facade cladding system is not to be used to resist lateral loads. It must not be used as wall bracing or as a shear wall.

**Installation:**

**General Installation Requirements:** KeraTwin ceramic facade panels must be installed in accordance with the manufacturer's installation instructions, any engineering details specific for a project application, and this product evaluation report. Where differences occur between the installation instructions and this evaluation report, this evaluation report must be followed.

**Wall Framing:** Wall framing for general applications shall be 6" deep, 16 gauge thick, 36ksi or 50ksi steel CFMF spaced at 16" on center. Alternative CFMF specifications require analysis by engineer licensed in the state of Texas. Installation on wood framed, CMU, or poured concrete backing wall structures is allowable with analysis by engineer licensed in the state of Texas.

**Wall Bracing:** Wall bracing must be installed as required for the structure.

**Wall Sheathing:** The wall framing is to be fully sheathed with minimum 5/8" thick glass mat faced gypsum sheathing fastened with #8 diameter bugle head fine thread corrosion-resistant drill point drywall screws that are 1-1/4" long and spaced at a maximum of 8" on center. Alternative types of sheathing shall be evaluated and approved by project engineer of record licensed in the state of Texas.

**Water and Air Resistive Barrier:** Fluid applied membrane weather barrier to be applied to wall sheathing per manufacturer's installation instructions. Joints between sheathing panels shall have troweled sealant or shall have glass mesh joint tape applied with caulk embedded over tape. Fastener heads shall be covered with sealant before fluid membrane is applied. Other types of water and air resistive barriers shall be evaluated and approved by engineer or record, façade consultant, or building scientist affiliated with project.

**Substructure System Installation:** Metal or fiberglass reinforced polymer girts are to be installed horizontally or vertically depending on panel coursing direction over wall sheathing where continuous exterior insulation is incorporated into wall assembly. Girts can be fastened through sheathing to framing or attached to concrete or masonry wall material spaced from wall face with minimum 1/8" thick polymer isolation shims or girts can be fastened to intermittent angle clips attached to the wall assembly face. Metal angle clips are to have polymer isolator pads or shims fit between the attachment flange of the clip and the face of the backing wall. Spacing between girts to be 24" unless project engineer licensed in the state of Texas determines an alternative spacing is required.

Fasteners for girts on isolator shims attached to metal framed backing walls are to be minimum diameter #12 screws of 300 series stainless steel or #12 coated bi-metal fasteners with 300 stainless steel tips fused to carbon steel shafts. Fasteners for girts on isolator shims attached to wood framed walls are to be 1/4" diameter 300 series stainless steel screws. The maximum spacing between fasteners shall be 16" on center. Screws shall be 2" long for attachment to metal framing and for wood framing shall be long enough to penetrate a minimum of 1-1/2" into wall studs. Masonry tapper or expansion fasteners for girts on isolator shims attached to concrete or masonry walls must be to be long enough to provide the minimum wall embedment required by the

fastener manufacturer. These fastener specifications are applicable unless project engineering indicates otherwise.

Fasteners for girts on angle clips attached to metal framed backing walls are to be minimum diameter #12 screws of 300 series stainless steel or #12 coated bi-metal fasteners with 300 stainless steel tips fused to carbon steel shafts. Fasteners for girts on angle clips attached to wood framed walls are to be 1/4" diameter 300 series stainless steel screws. The maximum spacing between clips shall be 16" on center unless project engineer licensed in the state of Texas determines a required alternative clip spacing. Screws shall be 2" long for attachment to metal framing and for wood framing shall be long enough to penetrate a minimum of 1-1/2" into wall studs. Masonry tapper or expansion fasteners for girts on isolator shims attached to concrete or masonry walls are to be long enough to provide the minimum wall embedment required by the fastener manufacturer. One long clip will be used at each attached rail section where the fasteners will be fixed through holes in the clip. The other clips for each rail section will be shorter clips with dynamic fastener attachments through the centers of slots in the clip. The long clip with fixed fasteners shall be located near the midpoint of the rail length it supports. These fastener specifications are applicable unless project engineering indicates otherwise.

Rigid foam or mineral wool insulation is installed between substructure supports according to manufacturer's application instructions after the girts are placed.

The installation of metal or fiberglass reinforced polymer substructure girts on top of rigid insulation with long screws fastened to framing through the insulation is an alternative option. Insulation must have a minimum compressive strength of 25psi. Girts to be applied and fasteners used per manufacturer's instructions or according to directions of an engineer licensed in the state of Texas.

Another available application method is the use of structural insulated sheathing in which rigid insulation is bonded to structural wood or magnesium oxide sheathing. The manufacturer's installation instructions or the directions of an engineer licensed in the state of Texas are to be followed for the specification and requirements of fasteners attaching the sheathing to framing and the cladding supports to the sheathing. This wall assembly option eliminates the need for girts. The structural insulated sheathing will require the application of a water and air resistive barrier before the cladding panel supports are attached to it. Cladding support rails are to be installed with minimum 1/8" thick polymer shims between the rails and sheathing to maintain a drainage plane for rain screen wall cavity moisture.

**Application of KeraTwin Panels to Substructure System:** The installation process for KeraTwin panels varies dependent on the panel coursing used. The following text describes the different hardware type installations offered for different panel orientations and coursing arrangements.

Perimeter trim not provided as part of the KeraTwin system is installed at the edges of cladded wall faces and edges of openings through cladded wall faces with appropriate fasteners at spacing the same as the center-to-center stud spacing.

- Article 624 or 627 Omega rails for horizontal panel stacked bond coursing are attached vertically to horizontal substructure girts with #10 stainless steel fasteners screwed through the slots at the rail flanges at each intersection of rail and girt. The 624 rail is used where end joints between panels are to be open and separated with an Article 645 joint spacer. The 627 rail is to be used where an Article 640 or 647 joint profile part is installed for closed joints between panels. The Article 640 joint profile is used where panel end joints occur lapped over Omega rail. The Article 647 joint profile is used where panel ends are cantilevered past the panel to rail connection and end joints occur between rails. Article 633 Omega external angle rails are used at outside wall corners. Rail screws are to be attached at centers of slotted holes except at one location at the bottom, center, or top of a rail where the screws will be installed as a fixed connection either drilled through the rail or attached at opposing ends of a slot or adjacent ends of two slots to pin that point of the rail in place.
- Articles 597-01, 700 (Omega V), and 701 (Omega V) rails for horizontal panel running bond coursing. The 597-01 rails are attached horizontally to vertical substructure girts with #10 stainless steel fasteners screwed through the slots at the web portion of the rail. Rail screws are to be attached at centers of slotted holes at the web except at one location at the one end of the rail length where the end screws will be installed as a fixed connection drilled through the rail into the sub-frame girt or two end screws will be drilled at opposing ends of one slot or adjacent ends of two slots to pin the end of the rail in place. The edge flanges of the rails are to be oriented pointing upwards to receive the panel supporting Omega V 700 and 701 panel supports. The upper hooked flange of the Omega V supports fit over the bottom flange of 597-01 rail and the bottom hooked flange of the Omega V supports fit over the top flange of the 597-01 rail, except at the bottom and top courses of an installation where the 597-01 rails are shifted to use outermost flanges to position the rails under the edges of the panel coursing. The Article 700 Omega V support is used where end joints between panels are to be open and separated with an Article 645 joint spacer. The Article 701 Omega V support is to be used where an Article 707 or 712 joint profile part is installed for closed joints between panels. The Article 707 joint profile is used where panel end joints occur lapped over Omega rail. The Article 712 joint profile is used where panel ends are cantilevered past the panel to rail connection and end joints occur between rails. Article 705 Omega V external angle rails are used at outside wall corners. Two #10 stainless steel fasteners are to be used at each 700, 701, and 705 support to fix the parts in place.
- Articles 620 and 625 flat rails for attachment to T or L sub-framing rail to support horizontal panel mounted in a stacked bond pattern. The flat rails are fastened with #10 stainless steel fasteners to the face of T or L rails mounted on intermittent clips attached to a backing wall. The 620 rail is used where end joints between panels are to be open and separated with an Article 645 joint spacer. The 625 rail is to be used where an Article 640 or 647 joint profile part is installed for closed joints between panels. The Article 640 joint profile is used where panel end joints occur lapped over the flat rail. The Article 647 joint profile is used where panel ends are cantilevered past the panel to rail connection and end joints occur between rails. Article

630 and 635 external angle flat rails are used at outside wall corners mounted to support rails on intermittent clips. Rail screws are to be attached at centers of slotted holes on intermittent clips except at one location at the clip nearest to the middle of the attached rail length where the screws will be installed as a fixed connection either drilled through the clip, screwed through a hole, or have two screws attached at opposing ends of a slot or at adjacent ends of two slots to pin that point of the rail in place.

- Article 695Q T-profile rail attachment to sub-frame wall clips to support horizontal panel mounted in a stacked bond pattern. The T-profile rails are fastened with #10 stainless steel fasteners to intermittent clips attached to a backing wall. Article 645 joint spacers are used with the T-profile rail where end joints between panels are to be open. Article 640Q or 647 joint profile parts are used with the T-profile rail for closed joints between panels. The Article 640Q joint profile is used where panel end joints occur lapped over the flat rail. The Article 647 joint profile is used where panel ends are cantilevered past the panel to rail connection and end joints occur between rails. Rail screws are to be attached at centers of slotted holes on intermittent clips except at one location at the clip nearest to the middle of the attached T-profile rail length where the screws will be installed as a fixed connection either drilled through the clip, screwed through a hole at the clip, or have two screws attached at opposing ends of a slot or at adjacent ends of two slots to pin that point of the rail in place.
- Articles 627 and 710 (Omega S) rails for vertical panel coursing. Article 710 Omega S rails perform as load bearing shelf supports for vertical panels and are installed at where the bottom edges of vertical panel courses are to be located. The Article 710 Omega S rails are fastened with #10 stainless steel fasteners at slots in the top flange of the rail to vertical girts. Rail screws are to be attached at centers of slotted holes at the flange except at one location at one end of the rail length where an end screw will be installed as a fixed connection drilled through the rail into the sub-frame girt or two end screws will be drilled at opposing ends of one slot or adjacent ends of two slots to pin the end of the rail in place. Two Article 627 Omega rails are to be placed centered approximately a quarter of the panel height dimension and fastened to vertical girts, one spaced from the top end and one from the bottom end of the panel. Rail screws are to be attached at centers of slotted holes at the Omega flanges where they intersect with vertical girts except at one location at one end of the rail length where end screws will be installed as fixed connections drilled through the rail flanges into the sub-frame girt or two rail end screws will be drilled at opposing ends of a slot at each flange or two screws will be placed at adjacent ends of two slots at each flange to pin the end of the rail in place. These two Article 627 Omega rails hold the vertical panels in place on the Article 710 Omega S shelf rail.

Panels can be set after rail supports are attached to the wall assembly. The extruded grooves at the back face of the panels are fitted over the hooks punched into the metal of the rail sections and then set in place by pushing the panels towards the wall and slightly downward for horizontal coursing or sideways for vertical or soffit/ceiling coursing to depress the compression springs formed at the rails which hold the panels and constrain them from movement.

Article 645 joint spacers or Article 640, 647, 707, 712 joint profiles are used at vertical panel joints for panels installed in a horizontal orientation. These parts are installed as each successive piece or course of panels is set in place. Article 688 joint profile is used at horizontal joints for panels installed in a vertical orientation. The Article 688 joint profile is held in place by Article 689 holding clips inserted, one per panel, into the cores at the tops of the vertical panels. A tab at the top of the Article 689 holding clip fits into a groove formed at the back of the Article 688 joint profile. Articles 650, 652, and 654 external angle profiles are installed at wall corners as trim when joints between outside corner panels are specified to be closed. Article 645 joint spacers can be used to create a consistent gap separation at panels that are miter cut to form an open joint outside corner.

Panels can also be attached to sub-framing in horizontal or vertical orientations or as a soffit/ceiling using Article 680, 681, 682, 683, and 684 clamps. The clamps have prongs that fit into the core holes of the KeraTwin panels and hold them in place with a compression spring that is punched into the clamp. The types of clamp vary based on where they are used in the coursing arrangement of the panels. The installation sequence for the clamps proceeds from side to side for horizontal and soffit/ceiling panels and from low to high for vertical panels. The first row or column of clamps are set in place with their prongs positioned to align with panel core holes and fastened with #10 stainless steel screws or 4.8mm diameter stainless steel rivets. A panel is set at its core holes on clamps at one side and then a set of clamps is installed at the opposite side of the panel and fastened. Successive panels are set on prongs at the clamps at the previous set panels and pinned in place with additional clamps fit and fastened at the edge of the newly set panels.

The KeraTwin system uses a different set of clamps to attach panels that cannot be supported by the system rail material due to cuts made to the panels at the factory or in the field. Cuts sometimes remove the extruded groove portion of the panel that hooks to the support rail. The Article 682R, 683R, and 684R clamps have prongs that fit into panel core holes and are sized to be able to be attached with 4.8mm diameter stainless steel rivets or #10 stainless steel screws to the face of system rail, furring, or blocking to pin panel edges in place.

**Note:** Keep the manufacturer's installation instructions available on the job site during the installation. Use corrosion resistant fasteners as specified in the IRC and the IBC.