MFI™ System

Design & Installation Recommendations

PRODUCT USE & DESCRIPTION

This document is meant to serve as a general guide for installation and design with the Knight MFI™ System. Some information contained within this document may not be applicable to all projects given the custom nature and differences between panel/cladding types, installation circumstances, project staging and hoisting limitations, scaffolding vs lifts and the project/building design in general.

- The MFI™ System is a rain screen attachment system used to support exterior cladding panels used with mineral fiber insulation to help meet energy codes. It can be used without exterior insulation as well if desired.
- The MFI™ System can be installed with rails running vertically or horizontally, whichever best suits the panel layout and requirements.
- This drop-in cladding attachment solution delivers code compliant insulation values to meet and exceed the requirements of ASHRAE 90.1, IECC and local energy codes.
- Only the thermally isolated steel brackets (ThermaBrackets™) penetrate the exterior insulation to dramatically decrease the amount of thermal bridging and thermal loss through the wall assembly. No continuous rails penetrate the insulation when used as intended.
- A wide array of cladding may be supported and include, but is not limited to, fiber cement, phenolic, metal panels, aluminum composite material (ACM) and terra cotta.
- The ThermaBrackets may be attached to varying substrates including steel studs (18 gauge minimum), wood studs, concrete masonry units or concrete.
- The MFI System can be used on buildings of any height. The primary restriction of use is high design wind pressures or heavy cladding.
- The MFI System is available in two iterations. The D-Series and S-Series. The primary difference is how adjustments are made for out-of-plumb substrates. The D-Series (Dynamic Series) allows plane adjustments to be made by an adjustable rail/bracket connection, where the rail may slide in/out at the end of the bracket. The S-Series (Static Series) has a fixed rail/bracket connection. The plane adjustments can only be made via use of special 1/8" thick horseshoe shims placed between the ThermaBracket and substrate. These shims do not increase the thermal transmittance, are sized the same overall dimensions as the bracket (width and height) and fit square, straight and bears evenly for a structurally secure and sound connection due to self-aligning ribs on the shims. Every shipment of S-Series ThermaBrackets typically has some special shims included. Use as needed. Extra shims may be purchased through Knight Wall Systems.

DESIGN & DETAILING

- A minimum of 0.75" gap at the base of the wall is required for proper drainage and ventilation.
- Ventilated coping detail and window heads are required for drainage and ventilation.
- Depending upon the height of the project, ventilation may be required at certain floor line breaks and easily incorporated at through-wall flashing details.
- The cavity must be clear and free from air flow and drainage obstructions.
- The cavity must not be sealed off due to the rain screen design. Ventilation of the rain screen cavity is required.
- Flashing details should be designed to direct water out of the rain screen cavity and deflect away from the building.
- The rails attaching to the ThermaBrackets (S-Rail or D-Rail) may be oriented either vertically or

horizontally. Secondary rails (by KWS or by others) may be attached outside of these rails as required to achieve proper panel layout or to meet the panel manufacturer's requirements.

- The minimum steel stud gauge allowed is 18 gauge, with 16 gauge preferred for high wind pressures (+/- 50 PSF).
- Rigid foam plastic insulation can be used with the MFI System, however the rigid insulation will need to be trimmed to fit properly around brackets. This method is not recommended due to the extra labor involved. All code requirements of foam plastic, including fire, should be reviewed and within compliance.
- Exterior sheathing, such as gypsum or OSB, is required to be used in the wall assembly with the MFI System.
- TEK screws require a three thread minimum penetration into steel studs. Wood screws typically require a minimum one-inch embedment. CMU and concrete anchors typically require a 1.00-1.25 inch embedment, depending upon exact substrate and anchor used. Embedment depths should be verified with project specific engineering.
- Knight Wall rails can be made of 16 or 18 gauge steel with a highly corrosive-resistant coating or stainless steel. 18 gauge steel is standard and typically acceptable for most projects. Contact KWS if your project has high wind pressures or other material concerns.
- For Knights 10 year limited warranty to be issued, project specific engineering calculations and hardware must be purchased through Knight Wall Systems. This is for quality assurance and general product oversight.
- Black painted components are available for open-joint panel assemblies. Black component may increase lead times.

INSTALLATION

- Installer should verify the back-up wall is free of defects and conforms to tolerance suitable for installation of the attachment system component(s).
- Installer should verify the air/water barrier is complete, cured and conforms to the manufacturer's instructions and project specific details. All fenestration, transitions, discontinuities, sills and ledgers should be flashed and sealed to move moisture to the exterior of the building.
- When fastening the system components, do not over-torque the fasteners beyond the fastener manufacture recommendations. Fasteners should be snug-tight for expansion/contraction and not stripped. Stripped holes must not be used and fasteners must be discarded.
- Screws should not be drilled into place, backed out then re-drilled into place more than once. This weakens the pull-out strength of the fastener and the system overall. The material drilled into needs to be replaced, a new location used or a larger diameter fastener needs to be used.
- The drill capacity of Knight Wall Systems typically supplied fasteners (TEK 3 drill tips) is 0.060-0.220 inch thick.
- Self-Drilling TEK screws supplied by Knight Wall Systems must penetrate a minimum of three full threads beyond the metal substrate.
- Self-Drilling TEK screws supplied by Knight Wall Systems should be driven at a maximum of 1750 RPM for No. 14 TEK 3 screws and 2500 RPM for No. 10 TEK 3 screws.
- When drilling into stainless steel, it is recommended that once the screw begins to self-tap into the stainless steel the action is not stopped then restarted as it could cause the head to snap due to work hardening of the stainless steel. Using self-drilling screws into stainless steel will cause an increase in scrap/waste.

DESIGN & INSTALLATION RECOMMENDATIONS

- The ThermaBracket may not be modified without written consent from KWS. Welding, cutting or drilling additional holes is not permitted without prior approval from KWS.
- The rails can be produced in various lengths from 36" to 192". Additional charges may apply.
- Use shearing instruments (i.e. snips, nibbler, etc.) for cutting metal framing components. Saws are not recommended, as the sparks produced during cutting will damage the anti-corrosion coating. If sparks are generated during cutting, be sure the portion of the component to be installed on the building is protected from sparks and that any stockpile near the cutting station is also protected.
- The systems components should not be cut while installed on the building, unless using a shearing instrument.
- Any plastic isolating pieces/parts that break during installation must be replaced with new pieces/parts.
- Stainless steel washers supplied by KWS must be used with every wall anchor's fastener and installed directly under the head of the wall anchor.
- The brackets must be installed in a vertical orientation, such that the two wall anchors are in line with each other vertically and not horizontally.
- When multiple lengths of rails are installed, a 3/8"-1/2" gap must occur between girts for expansion.
- All girts and rails should be installed straight and square (+/- 0.25" in 10 LF).
- If shims are used to align the cladding attachment system to stay within tolerances, the shims must be supplied by Knight and installed between the bracket and substrate. 0.75" max shimming for cladding weighing under 9 PSF. For maximum shimming with cladding over 9 PSF, please contact KWS. Standard shims (~1.5" x 2" horseshoe) can be used between the S-Rail or D-Rail and secondary rails (if used) to a maximum of ½". Shims should be installed facing downward to limit water collection and movement over time.
- Minimum length of installed cut S-Rail or D-Rail is 18" and must be attached to a minimum of two ThermaBrackets.
- The S-Rail or D-Rail must not cantilever greater than 8" past the last fastening point under normal conditions. Greater cantilevers are common, but require project specific evaluation by KWS. See project specific engineering for project specific maximum cantilever.
- If the S-Rail or D-Rail cantilevers past the last bracket further than allowed, a splice clip supplied by KWS must be used to join the ends of the two butting rails together. Main gap between rails as previously described.
- The MFI System must not span across deflection joints, such as floor deflection joints. The system and panels must 'break' at these points to allow for the movement without inducing additional loads on the system and panels. If this cannot be accomplished with a cantilevered rail, the splice clip can be used in this condition as the large slotted holes allow for movement of the S-Rails or D-Rails while resisting bending. See guide details and/or contact KWS for further information and clarification.
- Bracket must be placed within 2 inches of all outside corners and jamb conditions.
- A 3/8" minimum edge distance to center of fastener is required when screw attaching to the face of the S-Rail or D-Rail.
- Exterior insulation should be fully secured per manufacturer's recommendation. If not properly fastened, the exterior insulation may become

deformed and/or out-of-plane on the wall over time.

- Follow all of Knight Wall Systems published installation recommendations. If conflicts exist between published recommendations and verbal direction, the stricter of the two shall always govern. If conflicts exist between project specific engineering (by KWS) and verbal direction, the stricter of the two shall always govern. For conflicts between these recommendations and project specific engineering, when performed by Knight Wall Systems, please contact Knight Wall Systems.

AVAILABILITY & SUPPORT

- All of Knight Wall Systems' components are purchased directly from Knight Wall Systems. Customer service and ordering assistance is available through an extensive network of local sales representatives. Knight Wall Systems will provide technical information and support during design, development and construction. For assistance please call 1.855.KWS.WALL or email info@knightwallsystems.com
- Typical standard lead time for material once project specific engineering is complete (should engineering be supplied by KWS) is 1-2 weeks depending upon order quantities and material type. Contact KWS for current inventory levels. Custom parts/profiles or large order quantities may extend lead time.
- System mock-up support and product orientation can be supplied to each new installing contractor for a high comfort level upon request. This can be done onsite or at a third party location. Contact KWS for more information. Please provide appropriate notice.

PRODUCT DELIVERY & STORAGE

- Verify all crates are undamaged prior to delivery acceptance. If any damage is found, note this on the BOL before accepting delivery.
- Verify the amount of product delivered is equal to the packing list within two business days.
- Crated components should be stored and stacked in a flat, level, dry location. Cover crated components with a waterproof covering if storing outdoors.
- Uncrated, loose components should be elevated and covered if stored outdoors. Avoid stacking or storing components in standing water. Do not reseal crate if contents are wet.
- Components typically arrive on site fully crated. Banded pallets are only used for small order quantities (~100 pieces or less). Full crates can weigh +/- 4,000 lbs. each.

LIMITED WARRANTY

Knight Wall Systems can provide a limited warranty for all components supplied by Knight Wall Systems. Certain requirements must be met, including project specific engineering performed by Knight Wall Systems, for a limited warranty to be issued. Limited warranties will cover defective material and KWS component failure, including the labor to remedy the defect. A limited warranty up to 10 years is available when specified. Contact KWS for full sample warranties.