

Technical Bulletin: 07/08/2020

Rivet Requirement on Metal Profiles

AFCC Installation Guidelines prohibit the use of screws for attaching panels onto metal profiles. Rivets supplied by AFCC must be used when the substructure is metal. Screws may only be used on wooden profiles. AFCC's standard installation guidelines for Aluminum and Steel profiles can be found at www.americanfibercement.com. Here are the reasons why rivets must be used with metal applications.

1. Screws can be installed misaligned with the center point of the hole. With a rivet gun, a centralizing tool can be used to ensure every rivet is centered within the hole. This will allow the panel to expand and contract freely.

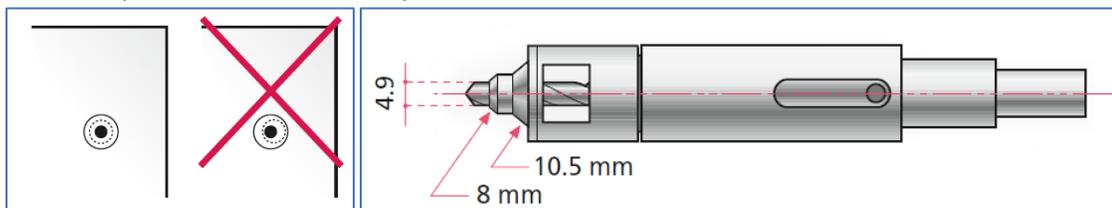


Figure 1: Aligned Hole vs. Misaligned Hole | Figure 2: AFCC Centralizing Tool

2. Screws can be installed at an angle that is not perpendicular to the metal profile. This will also block panel expansion and contraction. The collar on a rivet rests flat up against the metal so it cannot be installed at an angle.

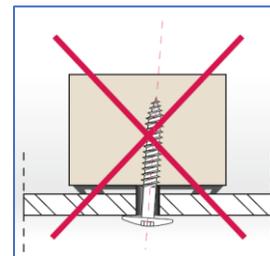


Figure 3: Screw Installed at an Angle

3. Screws can loosen overtime with temperature change cycles. Changes in temperature cause the metal to expand and contract. After this occurs a number of times, it can cause the screw to back out of the profile.

4. Panel movement will be improved. The AFCC metal attachment system utilizing a rivet with a collar and foam tape allows the panel to move in three dimensions (X, Y, and Z axis). A panel fastened with a screw, at best, will only allow panel movement in two dimensions (X and Y axis). The collar on the AFCC rivet rests up against the metal profile when it is pulled. This prevents it from overtightening. An overtightened screw will hinder panel movement in all three directions, which will lead to cracking.

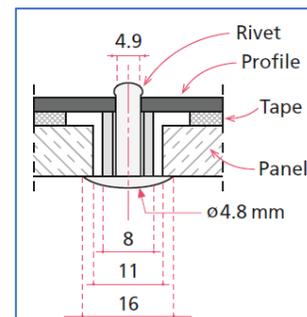


Figure 4: Rivet collar rests flat against profile



A fiber cement panel's ability to move is paramount to its lifespan. Both the metal profiles and the fiber cement panels expand and contract due to different conditions. Metal moves with respect to changes in the thermal gradient. Fiber cement moves with respect to moisture absorption. There are climatic conditions where these movements can take place simultaneously but in opposite directions. For example, if the temperature is dropping but there is heavy rain the profiles will contract, and the panel will expand. In this scenario, free unrestricted movement is critical. The AFCC rivet allows more free movement than any other fastening method.

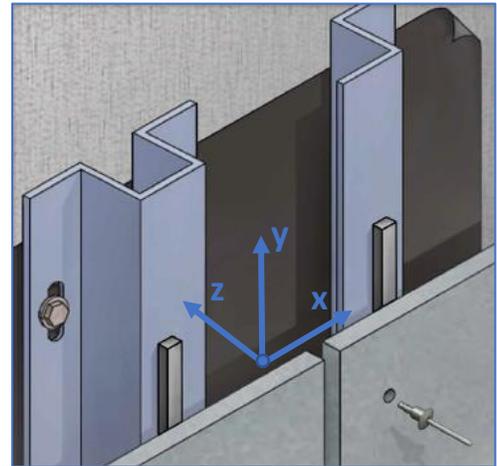


Figure 5: Panel Movement Directions (X, Y, and Z)

5. With the AFCC rivet, the designer has independently tested pull out strengths for various gauges/thicknesses of metal. This can be used to determine the proper fixing pattern for wind load calculations and avoids the need to conduct independent testing. With screws, the pull out values vary widely with the type of screw and based on its hardness, lead, pitch, and diameter (max vs min). Quality control becomes a potential issue if different screws are interchanged. For AFCC's rivet datasheet and rivet pullout data, contact house@afcccladding.com.
6. Other rivet systems with collars have the collar separate from the rivet in a two piece setup. AFCC's collar is connected to the rivet allowing for easier installation.

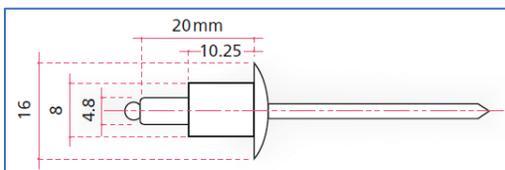


Figure 6: AFCC Rivet Dimensions

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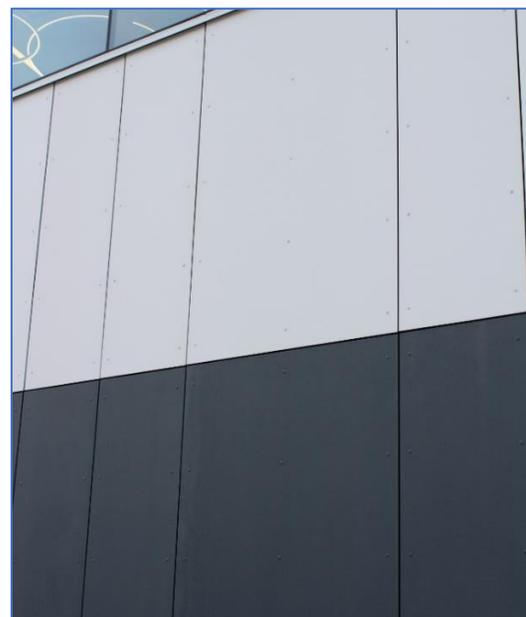


Figure 7: AFCC Color-Matched Rivet Installation