

Short-Term Fastening in FRP vs. Permanent Fastening in Steel & GreenGirt® CMH™

FRP vs. 16-Gauge Steel vs. GreenGirt® Composite Metal Hybrid (CMH™)







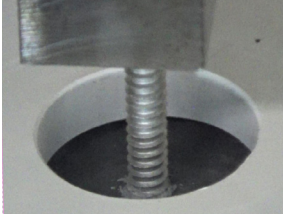
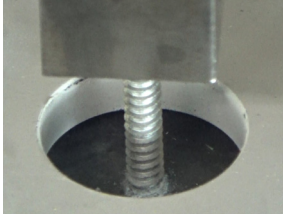


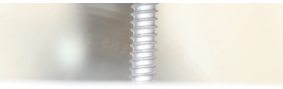
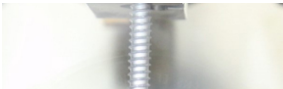





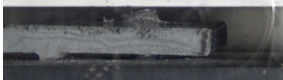



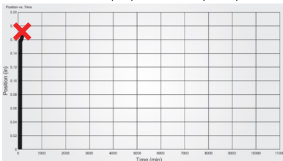
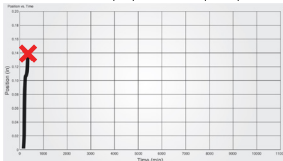
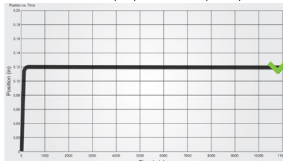
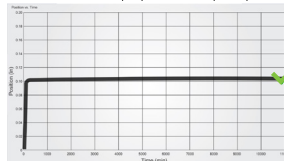
ASTM D7332 7-Day Fastener Pull-Out Resistance Test

Don't be misled – Fiber-Reinforced Polymer (FRP) differs from steel in that it will exhibit **Screw-Creep**. Screws directly attached into FRP will lose capacity over a combination of time, force, and heat. It's a known **Power Law phenomenon**. Given the elevated temperatures found inside wall cavities, it is necessary to conduct tests involving time, force, and heat to ascertain its durability and true capabilities. Employing the ASTM D7332 test at the high service temperature of a building envelope over a duration of seven days allows for a better determination of an FRP product's ultimate usable fastener retention value. This procedure establishes a practical baseline for a product's fastener retention performance in FRP-based products.

Scan here to watch the test video now!



Test Results

 FAILED Generic FRP at 82° C (180° F)	 FAILED Generic FRP at 70° C (158° F)	 FAILED Generic FRP at 50° C (122° F)	 PASSED 16 Ga. Steel at 82° C (180° F)	 PASSED GreenGirt® CMH™ at 82° C (180° F)
00:00:00:59 DAY HR MIN SEC #14 T3 Fastener Tested at 50% of ASTM D7332 Tested Value of 869 lbs = 435 lbs	00:00:01:24 DAY HR MIN SEC #14 T3 Fastener Tested at 50% of ASTM D7332 Tested Value of 869 lbs = 435 lbs	00:02:17:20 DAY HR MIN SEC #14 T3 Fastener Tested at 50% of ASTM D7332 Tested Value of 869 lbs = 435 lbs	07:00:00:00 DAY HR MIN SEC #14 T3 Fastener Tested at 90% of ASTM D7332 Tested Value of 613 lbs = 552 lbs	07:00:00:00 DAY HR MIN SEC #14 T3 Fastener Tested at 90% of ASTM D7332 Tested Value of 613 lbs = 552 lbs
				
				
				
Position (in.) vs Time (min.)	Position (in.) vs Time (min.)	Position (in.) vs Time (min.)	Position (in.) vs Time (min.)	Position (in.) vs Time (min.)
				

Key Points

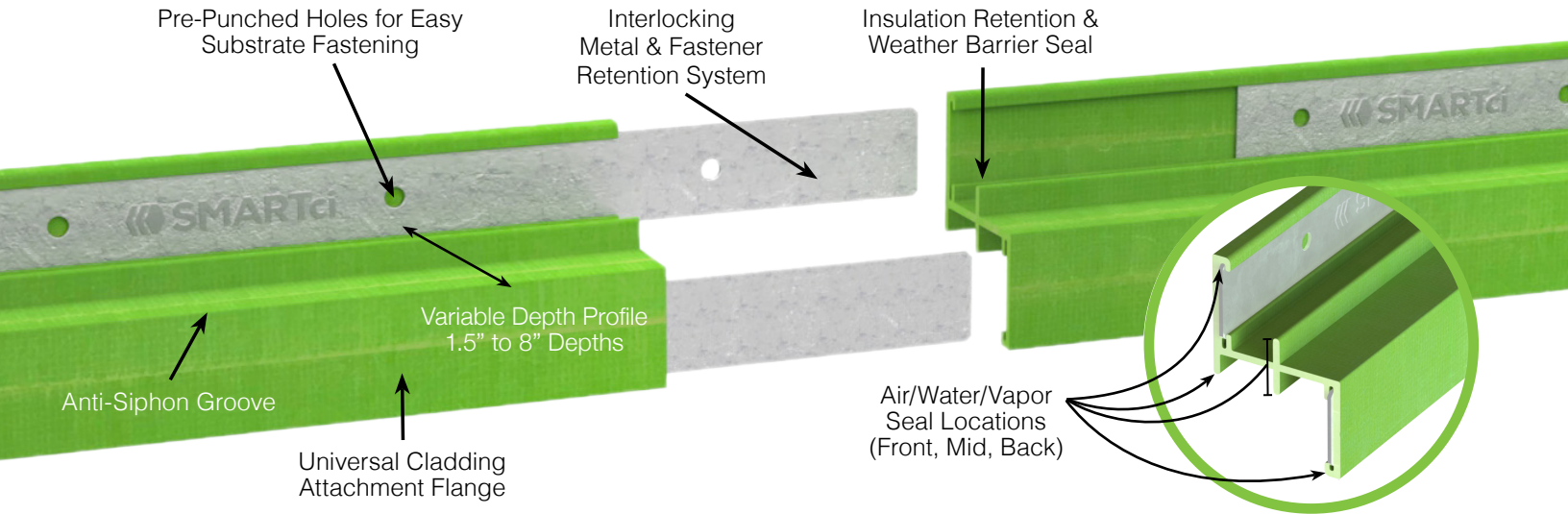
- GreenGirt® CMH™ is NOT FRP – it's a Composite Metal Hybrid.
- GreenGirt® CMH™ performs equal to or greater than steel.
- Fasteners in FRP should always have a backer plate per ASCE Structural Plastics Handbook.
- Never direct attach to standalone FRP with a screw for structural fastening.

Smarter by Design. Proven by Performance.

GreenGirt®
COMPOSITE METAL HYBRID

GreenGirt® CMH™ can be found on buildings from coast to coast – from massive transportation hubs, to smaller storefronts, GreenGirt CMH has been designed as an engineered solution to be cost-effective, easy-to-use, and thermally efficient.

The *composite metal hybrid* (CMH) design of GreenGirt is superior to steel, both structurally and thermally. GreenGirt CMH is designed to provide the same loading capabilities of metal z-girts of equivalent depth while eliminating through fasteners and thermal bridging. Furthermore, GreenGirt CMH is not susceptible to moisture, corrosion, or electrochemical reactions.

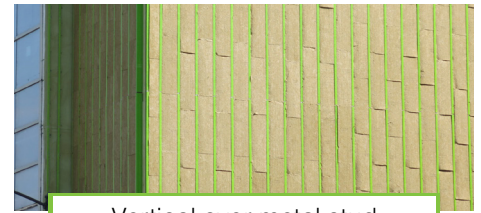


Benefits

- ☞ Universally compatible with all cladding, substrates and insulation material types
- ☞ Meets ASCE structural design guidelines
- ☞ Fastener torque & pullout strength surpasses FRP products
- ☞ 92 – 98% thermally efficient, yielding the highest r-values
- ☞ Can eliminate the need for insulation retention tools
- ☞ No through-insulation fasteners or through-metal to framing
- ☞ Longitudinal & crosswise strength
- ☞ Meets or exceeds requirements in compliance with ASHRAE 90.1, ASHRAE 189.1, IBC, IECC & IgCC energy code
- ☞ Fully tested and approved ASTM E84 Class A rating & NFPA 285 compliant



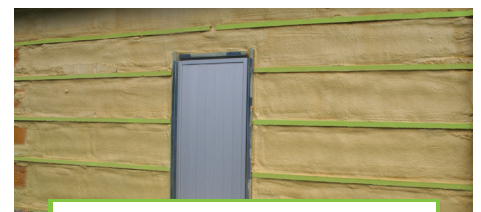
Vertical & horizontal over metal stud with polyiso



Vertical over metal stud with mineral wool



Horizontal over brick, wood & CMU with spray foam



Horizontal over CMU with spray foam

Disclaimers:

*Fastener pull-out in thermoset composite test results was widely inconsistent, resulting in a heteroscedastic time variance greater than 200x, which was not constant across multiple observations.*Performance variances were great between the same batches of some material. *Testing was conducted in a laboratory setting. *Thermoset resins evaluated include polyester and vinyl-based. *Engineering is recommended that product manufacturers utilize ASCE Structural Plastics Best Practices. *This test report does not certify the structural integrity or field performance of any FRP product. *Any use of information in this report is done at the risk of the user. A2P cannot be held liable for any use or misuse of the data.

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For additional supporting documents on service temperature, expected life cycle, test protocol, etc., please visit <https://greengirt.com/>



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