

Stuart and Claudia Wentworth, Quick Mount PV

Respecting the Roof Since 2006

With the launch of Quick Mount PV in 2006, Stuart and Claudia Wentworth set in motion a significant and long overdue advancement in code-compliant PV mounting, flashing and waterproofing methods. Previously, Stuart and Claudia had spent 20 years working in the construction trades with a focus on green building and metal fabrication, as well as 7 years installing PV systems in the San Francisco Bay Area. Quick Mount PV currently employs 48 people and recently announced major expansion plans that include an 89,000-square-foot manufacturing facility in Walnut Creek, California. Claudia serves as the company's CEO and Stuart serves as COO.

SP: Beyond *NEC* requirements, what codes, standards and regulatory bodies should integrators be aware of, particularly as they relate to roof penetrations?

SW: Many entities have a say about what happens on the roof. Installers, integrators, architects and PV system designers are likely familiar with state and local building codes and standards, but many are less familiar with the code requirements of the National Roofing Contractors Association (NRCA), the Sheet Metal and Air Conditioning Contractors' National Association (SMACNA), the Asphalt Roofing Manufacturers Association (ARMA) and the Tile Roofing Institute (TRI). Each organization provides guidelines and technical information on roof types and flashing methods. Some guidelines are code-required, some are code-related, and others would be classified as industry standards or best practices. Roofing manufacturers take industry



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Since the Wentworths founded Quick Mount PV in 2006, their focus on product development and education related to code-compliant array mounting and penetration waterproofing has had a fundamental impact on the industry.

standards and best practices into play when detailing their products' installation instructions. Not following these instructions can void the manufacturer's warranty.

CW: The roofing type, building structure and geographic location are unique to each PV or solar thermal project. In our product-compliance research, we discovered that the most essential task is maintaining the roofing manufacturer's warranty. For each Quick Mount product, we cross-referenced the most stringent warranty compliance with the roofing industry's best practices. Our popular Wheel of Accountability (quickmountpv.com/waterproof/code-compliant.html) illustrates all of these relationships.

SP: The US PV industry has been conscious of meeting *NEC* requirements for decades. To what do you attribute the lag in widespread industry acceptance of code-compliant array flashing and waterproofing?

SW: PV is an electrical product, of course, and the pioneers were more likely electronic geeks than roofing geeks. The considerable safety issues in dealing with the higher dc voltages common in grid-tied PV systems naturally came first. The roofing penetration considerations tend to take a backseat, since any roof-attachment issues become known only

after high winds or heavy rains cause problems. As important as the quality of materials and workmanship around the roof penetration are, proper flashing and waterproofing is often more of an afterthought and problems are frequently caught later when insurance companies have gotten involved.

CW: In addition, many kinds of roofs and structures create anomalies on any given installation, which makes it difficult to standardize and teach the correct way to mount something to a roof. All our product designs take many of these building variables into account and seek to minimize the installer's liability while keeping installation time to a minimum.

SW: Of course, nothing will be quicker than the old L-foot-to-the-roof method—except

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maybe the demise of the company that did the installation.

SP: What mounting and flashing product characteristics should integrators pay attention to when reviewing available solutions?

SW: One of the most important innovations in our original QBlock family of mounts is our patented elevated water seal. This is accomplished with an internal flute, seamlessly joined to the flashing, which comes up through an attached mounting block. The installation bolt that goes down through this sleeve is then sealed at the top of the flute inside the mounting block, well above the roof surface, where the water runs heavily in a storm. We use a cold weld to bond the flute to the flashing, not the cheaper hot weld that introduces another material subject to electrolysis-caused failure over time.

CW: The flashing and mount should be made of quality materials like aluminum and stainless steel. Does it make sense to use materials with an expected life that's less than that of the modules they support and the roof they are mounted to? Of course not. The mount should last at least 25 years. Our choice was aluminum since galvanized sheet has a shorter lifespan, even when regularly painted. And it has a tendency to rust, which can cause stains on the roof. We use all-aluminum mounting blocks and flashings in our QBlock line and all-aluminum bases and posts in our QBase products.

SW: Engineering is also very important, as the better the shear and pullout strength, the fewer mounting points of penetration are needed. This results in fewer holes and reduces time and liability. Our mounting method is not only quick *on* the roof but also saves time in BOS prep *off* the roof, since our product includes all the exposed hardware. It is stainless steel, and it's right in the box, so we're not leaving to chance the quality and physical properties of the

mounting hardware used. We use over-size flashing: 12 by 12 inches on our Classic Comp Mount. This enables the flashing to get up into the third course above the drip line and also helps block wind-driven rain from the sides. The same goes for the thickness of the aluminum: We use thick flashing that not only adds life, but also prevents the edges from bending upward when the installation bolt puts pressure on the center of the flashing. This is another water block to prevent wind-driven rain from getting under the flashing.

SP: The International Code Council Evaluation Services certifies Quick Mount PV's Classic Composition and Shake Roof Mounts to ICC-ES-2835. Do you have plans to obtain this certification for additional Quick Mount PV products? Are you aware of flashing products from other manufacturers that carry a similar certification?

CW: Yes, ICC testing is under way to certify all Quick Mount PV products. There are indeed other ICC-certified mounts, although some manufacturers use other agencies accredited by ANSI to test and certify flashing and mounts. After careful consideration, we determined that both the structural and waterproofing aspects of ICC are paramount. It's safe to say that ICC is the certifying agency with the most clout worldwide. ICC is to building as UL is to electrical products. We are also working toward International Organization for Standardization (ISO) and CE certifications.

SP: What best practices do you suggest installers follow to not void roof warranties?

SW: This issue is of prime importance. There are typically two warranties attached to a roof: a labor warranty and a materials warranty. The roofer who installed the roof gives the labor warranty. It commonly lasts 1 to 10 years. It's wise to involve the roofer of

record on a new PV installation for at least the waterproofing component. If no labor warranty is remaining, a manufacturer's warranty may still be in effect on the roofing materials. Read the warranty carefully so you can work within its guidelines and not void it. If there are no warranties on the roof, maybe it's time for a new one. Even if a few years are left on the roof, it may prove more practical to reroof at the same time to keep the life spans in sync. If a leak were to occur after an installation using our product, and it was installed correctly and appropriately, the roofing contractor should not be liable for any perceived wrongdoing by the installer, as negligence doesn't come into play. The contractor's insurance company can support the fact that the mounts and flashings were installed to code, giving defense to the argument that the leak came from something else—not the PV penetrations.

CW: What got us into the business of making solar roof mounts was the glaring need for the tools and knowledge to install PV and solar thermal on the roof the correct way, not only for ourselves but industry wide. Keep in mind that the blame for any roof problem gravitates to the last worker on the roof. If your installation crewmembers were the last people on the roof—even if they did everything right—you will likely be called back to the jobsite. Be sure to use only quality products so that in the event of litigation, you can prove that you were not negligent. Follow the mounting and flashing instructions exactly. We include full instructions with every box of mounts so they are available at the site of installation. They are also downloadable from our website.

SW: Don't forget to take good photos before, during and after the installation. This can help shield you and the building owner from liability. And we highly recommend that you consult a professional roofer CONTINUED ON PAGE 88

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if you are not 100% confident in your own roofing knowledge and skills.

SP: What was the impetus for Quick Mount PV's development of the QBase mechanical mount?

SW: The motivation came from customers asking for taller and taller post heights. The QBase's buttressed pyramid shape greatly increases the shear strength of the standoff, opening up the potential for new uses, additional height options, fewer penetrations and increased capacity to withstand the forces on a PV array caused by high winds. Curved tile roofs require taller standoffs above the deck to position the mount above the tile. Low-slope commercial roofs need taller standoffs to clear the thick foam insulation common in low-slope roofs. We believe the QBase is the strongest off-the-shelf solar mount available. The engineering reports for all our post heights are on our website.

SP: What other engineering reports or services does Quick Mount PV offer?

SW: We are sticklers about solid engineering, testing and documentation. Installers can download our engineering reports from our website for inclusion in their permit package to their local building department. Keep in mind that point loads, spans and other necessary system design calculations depend on many factors. The two calculations we can and do provide are the mount's shear strength and pullout strength, which we have independently tested for all products. But it's the job of the installer, integrator, architect, PV system designer and ultimately the engineer of record to use these and other key data to calculate the proper code-compliant span between mounts and other critical system installation data.

SP: In June 2011 you began manufacturing Quick Mount PV products for the

Ontario FIT market. Which Quick Mount PV products or components are manufactured in Ontario?

CW: Currently Quick Mount PV Canada fabricates our Classic Comp Mount for sale in the Ontario market to qualify for the territory's FIT program. We also have distributors in Canada for our full line of products. All our distributors are listed on our website.

SP: Quick Mount PV partnered with Zep Solar to develop a waterproof mounting system for the Zep rail-free racking platform. Are you working directly with other racking manufacturers to develop integrated mounting or weatherproofing solutions?

SW: We are. We're very pleased to be selling the specialty mount we made for Zep-compatible modules. The feedback from the boots on the roof has been very positive, as it has proven simple to install and also increases the engineering strength to enable longer spans in high wind zones as well as greater snow loads. We also just developed the Gator Mount for use with Schletter rails. This has also met with positive field response. There is more in the pipeline. We are always happy to talk with leading racking manufacturers to further our goal of keeping solar dry.

SP: Do you have any plans to expand your product offerings to include racking products?

SW: Our goal is to become the mount under every racking brand. We have solid, combined engineering reports in all 50 states on our mounts when connected to racking from IronRidge, ProSolar, Unirac, Zep and others. We don't have any current plans to manufacture racking ourselves. Our focus is on the point of penetration, the waterproofing and the engineering.

SP: Quick Mount PV is active in industry training on code-compliant array roof-mounting methods. What upcoming

training opportunities are available?

CW: We are fully committed to education and training. In this growing industry, new folks are always on a steep learning curve. We want this industry to thrive, and roof mounting brings physical buildings and structures into play. Over the last 5 years our training director, Johan Alfsen, has single-handedly done more to educate the solar trade in best roofing practices than anybody in the industry. We're really proud of that accomplishment, and we are significantly expanding our training program. Team members who do trainings throughout North America now complement Johan's work. We are producing a growing variety of electronic versions of our trainings to reach an ever-widening audience of installers, distributors, trainers and even consumers who want to learn about our "Respect the Roof" philosophy. For example, we now give a regular 1-hour webinar online. You can sign up on our website (quickmountpv.com), where you will also find a calendar of all upcoming trainings and events.

SP: Is there anything else related to array mounting and waterproofing that you would like to add?

CW: I'll just reiterate the importance of our mission to keep solar dry. The PV industry needs to learn the lessons from the solar thermal problems in the '70s. The technology survived just fine; it was the penetrations through the roof that failed. Solving that problem once and for all is our mission.

SW: That's why we invest time and money into R&D, engineering, education and training. We want this industry to succeed for decades to come, and Quick Mount PV is our modest contribution to the cause. We've shipped out more than a million mounts and never had a single one sent back because of water intrusion. I'd like to think this means they're all working just as they were designed and engineered to work. ☺