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Solar roofing best practices

By Jeff Spies

An ounce of prevention is worth a pound of cure. This old adage definitely applies to the waterproofing of solar rooftop mounts.

Solar panel prices have fallen more than 90 percent in the past three decades, making residential installations an attractive investment for homeowners in many states. However, the impact of leaks resulting from inadequate waterproofing can dramatically extend payback and reduce ROI. The cost to replace the mounts due to failed seals can range from $500 for a single leak to $3,000 or more to remove and reinstall an average-sized 6-kW array.

These costs can be avoided by making smart choices in the early stages and using quality flashed mounts that waterproof the roof penetrations for the 30-year-plus life of the solar array.

Here are three tips for getting the best value from your solar investment:

**Tip #1: Use high quality flashed mounts.**

Inexpensive mounts have flourished as installed solar prices have declined, but I question the logic of saving $100-$200 on cheap flashed mounts when the penalty could be $2000-$3000 in 10 to 15 years. Most inexpensive flashed mounts rely solely on a seal located at roof level. These seals are prone to leaking when the rubber inevitably develops cracks over time. Deck level seals are also vulnerable when rain turns to ice, exerting excessive pressure on the seal.

Quality flashed mounts rely on multiple layers of waterproofing. For example, the Quick Mount PV “E-Mount” uses a patented, elevated, double-sealing system. The primary seal is raised 0.7” above the roof surface and utilizes a bonded EPDM stainless steel sealing washer. The seal is encapsulated inside a mounting block that minimizes the catch basin, greatly reducing water contact with the seal. Finally, a secondary EPDM washer prevents moisture from getting to the primary sealing surface. The primary seal never sees any moisture, ice, or UV exposure. The E-Mount uses aluminum and stainless steel, assuring the mount can last the 30-year-plus life of a quality PV array.

While quality flashed mounts will cost $100-$200 more than low cost commodity flashings, they may save thousands in repair costs, making this extra expense a wise investment.

**Tip #2: Replace the roof under the array before installing solar.**

Most shingle or tile roofs last 15 to 30 years before new shingles or new tile underlayment is required. However, the majority of solar systems are installed on roofs with less than half their life remaining.

If the roof fails under the array in the first 10 to 15 years, the homeowner will be facing significant costs for “removal and reinstallation” (R&R). These R&R costs start around $2000-$3000 and can increase significantly for leaks that develop after 10-15 years. As the array ages, PV cable insulation becomes brittle and can crack, requiring replacement to avoid electrical shock and fire hazards. Racking hardware often seizes up, and parts may need to be replaced. Finally, many systems will require new grounding hardware.

Wire management may also need replacement, especially any plastic wire ties, which often fail apart in less than five years. In some situations, R&R may lead to premature death of PV modules if the cables are damaged near the non-serviceable junction boxes, as is common in panels made in the past five years.

All this can be avoided by starting with a new roof under the array. It is not necessary to replace the entire roof, only the roof surface that is supporting the PV array. Since solar is installed on roofs that face south, and those roof surfaces wear out first, it is logical to replace this section of roofing at the time of install. This way, when the rest of the roof fails, the array can remain intact and will suffer no R&R-caused damage. In most cases, the cost to replace the roof under the array before installation is less than the R&R costs!

**Tip #3: Use a competent licensed solar contractor.**

Some installers fail to use code-required flashing and just install the mounts directly to the roof with only sealant for waterproofing. These installations are prone to leaking after 5-10 years when the sealant develops cracks. Other installers tend towards the bare minimum in flashing, resulting in an increased exposure to future repair costs. Many times installers fail to explain the cost impact of installing solar on older roofs.

The best contractors address the method of waterproofing with the customer during the initial consultation. They advise on the condition of the current roof, recommend a new roof whenever possible, and explain the impact waterproofing can have on financial performance. Quality installers follow code requirements for using flashing and are diligent about centering lag bolts in the rafter. Finally, the best installers use only mounts that are approved by the roofing manufacturer. Failure to use approved mounts can void the roofing manufacturer’s warranty.

**To learn more:** Quick Mount PV has developed training webinars, videos, and informational resources to help contractors and homeowners make wise choices in designing and installing code-compliant, roofing manufacturer-approved mounts that will help system owners protect their solar investment. Visit www.quickmountpv.com/training for more information.

Jeff Spies is the senior vice president of business development for Quick Mount PV, a leading supplier of flashed solar roof mounts. He has been on the forefront of solar training since 2007. Thousands of contractors have attended his trainings, and he is a regular speaker at major industry trade shows. He also serves as secretary for NABCEP, the solar industry certification agency. Spies holds a B.S. in Mechanical Engineering.