



# Technical Bulletin

## Photo-voltaic Systems and Asphalt Roof Shingles

Photo-voltaic (PV) systems are used to convert sunlight into electricity. The two common attachment methods are rack-mounted and roof-integrated (RIPV) installation methods. Proper installation of the PV system is critically important to the integrity of your asphalt roof shingles and your roof system. As with any roofing project, consideration of factors such as safety, design, codes, installation, and integration with other building components is necessary to obtain the desired results. Consult the PV system manufacturer and refer to local building codes for specific requirements.

### Safety and Proper Handling

If the proper precautions and protective equipment are used, PV systems can be installed safely and without incident. Several areas requiring attention are listed below.

- **Fall Hazards:** Working at heights can be dangerous. Follow all necessary precautions and safety guidelines in accordance with OSHA regulations and proper roofing practices, including the use of appropriate fall protection/fall arrest equipment.
- **Shock/Electrocution Hazard:** PV modules generate an electric current. Do not drive nails or screws into any part of the PV module other than in locations specified by the manufacturer. Follow the PV manufacturer's mounting instructions and local code requirements (building code and fire code) for location of panels and wiring. Avoid contacting free ends of connectors with metallic objects and do not install in wet conditions.
- **Additional Safety Precautions:** Additional safety information can be found in the National Roofing Contractors Association's "Guidelines for Roof-mounted Photo-voltaic System Installations" and in NEC Article 690.

### Design, Installation, and Maintenance

- Local codes increasingly contain specific requirements for PV system installation. These requirements should be followed carefully to ensure the safety of the home's occupants, firefighters, and anyone that may be performing work on the roof or in the attic of the home.
- All vertical and horizontal loads from the PV system should be transferred to the building structure without deformation or overloading the roof system or its components.
- Assess the arrangement and location of attic ventilation, gutters, plumbing vents, and other existing roof-mounted equipment to ensure the PV system does not interfere with the effectiveness of other roof system components. Provide sufficient clearance around all roof venting (per local fire code) and regular maintenance.
- In colder climates, consideration should be given to possible drifting snow or ice dams in and around rack mounted PV systems, which may increase roof loads beyond the original design considerations. Installation of snow guards on the roof may be advisable.
- Typically, PV systems should be installed concurrently with new asphalt shingles or shortly after a new roof installation. Doing so will reduce the chance of roof deterioration before the useful life of the PV system is reached.
- Proper waterproofing and flashing of mounting locations where the PV system components intersect with or penetrate the shingle layer is critical and must be done carefully to ensure the roof system's long-term water-tightness.

- Consider a semi-annual roof/PV system inspection and maintenance program performed by a professional roofing contractor, per National Roofing Contractor Association recommendations.

### **Important Legal Disclosure**

This Technical Bulletin is not intended to provide a comprehensive list of all the design considerations, installation practices, or maintenance requirements relating to the PV installation on asphalt shingle roofs. This bulletin provides an overview of some important concerns that should be reviewed when considering PV installation. It is important that the roof system and the PV system be constructed to comply with all the requirements of the building code(s), the shingle manufacturer, and the PV module manufacturer. Atlas makes no warranties or recommendations otherwise regarding the suitability or performance of the PV system installed on roofs in conjunction with asphalt shingles.