Effective January 1, 2019, the requirements for PV rapid shutdown inside the array boundary went into effect in the 2017 NEC Section 690.12(B)(2). Are there any Certified (Listed) products available to meet this requirement?

Yes. As one option in the 2017 NEC Section 690.12(B)(2)(1) requires that inside the array boundary the photovoltaic (PV) array shall be Certified (Listed) or field labeled as a rapid shutdown PV array and the PV array shall be installed and used in accordance with the instructions included with the rapid shutdown PV array Certification (Listing) or field labeling.

On December 22, 2017 a revision was published for the 2nd edition of UL 1741 the Standard for Safety for Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources which addresses PV rapid shutdown equipment and systems. UL1741 requires PV Rapid Shutdown System Equipment (QJW) and PV Rapid Shutdown Systems (QJS) to be extensively evaluated. To increase reliability of these safety critical systems, UL 1741
UL can also conduct a field evaluation on products already installed in the field to determine if they are suitable as a rapid shutdown PV array. For more information on UL field evaluations or a quote, please contact UL’s Customer Service at 877-854-3577, prompt No. 2 or www.ul.com/field.

**Q**

I have seen a lot of extra flex type EF liquid-tight flexible metal conduit sold at the supply house, but I don’t see a UL Mark on the conduit. Does UL Certify (List) this conduit? Does it comply with the NEC?

**A**

Extra flexible—also commonly referred to as Type EF—liquid-tight flexible metal conduit is not UL Certified (Listed) and does not comply with the National Electrical Code ANSI/NFPA 70 Section 350.6 that requires the conduit and fittings to be Listed (Certified).

When compared to Certified (Listed) Type LFMC, Type EF, extra flexible liquid-tight flexible metal conduit has an increased bending radius but is less substantial. It may not have the equivalent mechanical strength to protect conductors such as crush strength, resistance to environmental conditions, or dimensional equivalence for proper assembly to Certified (Listed) fittings as is required in the NEC. In addition, the conduit does not have the equipment grounding capabilities required for Certified (Listed) conduit and is not suitable as an equipment grounding conductor as is required for Certified (Listed) Type LFMC.

UL Certifies (Lists) Type LFMC conduit under the product category Liquid-tight Flexible Metal Conduit (DXHR) and investigates the conduit for compliance with ANSI/UL 360, the Standard for Safety for Liquid-tight Flexible Metal Conduit. The UL guide information and Certifications (Listings) can be located on UL’s Product iQ database at https://productiq.ul.com; enter DXHR at the keyword search. UL Product iQ is free to all users but requires registration.

The guide information for DXHR under the UL Marks section describes how Certified (Listed) Type LFMC conduit can be identified.

The Certification or Listing Mark of UL will appear on the attached tag, reel, or on the smallest unit container in which the product is packaged—with or without the UL symbol on the product. This is the only method to identify products manufactured under UL’s Certification and Follow-Up Service. The Certification Mark for these products includes the UL symbol, the words “CERTIFIED” and “SAFETY,” the geographic identifier(s), and a file number. The Listing Mark for these products includes the UL symbol together with the word “LISTED,” a control number, and the product name “Liquid-Tight Flexible Metal Conduit.”