
# Whitepaper: UL3741 and the FR510-6dg: Streamlining Solar Compliance and Efficiency

As safety regulations evolve and project timelines tighten, installers and EPCs require solar solutions that combine reliability, efficiency, and compliance. The 100% American made Sollega FastRack (FR510-6DG), certified under UL 3741, delivers a simplified, cost-effective solution while reducing installation complexity and up-front costs.

Built for practical deployment and designed with the installer in mind, the FR510-6DG system streamlines deployment across a wide range of flat-roof and ground-mount C&I applications.

**Key System Advantages:**

- No module-level power electronics (MLPEs) required in most configurations, reducing component count and points of failure.
- Preassembled, modular design expedites layout and installation.
- Ballasted construction can eliminate the need for roof penetrations, but is compatible with them if needed.
- Corrosion-resistant materials ideal for coastal and high-humidity environments.

**System Overview:**

| Feature: | Specification: |
|---|---|
| Material | Glass-Reinforced Nylon 6 |
| Certifications | UL 1703: Class 'A' Type 1,2,3,29 Modules, UL2703,UL3741 |
| Unit Weight | 4.5 lbs (2kg) |
| Wire Management | Integrated |
| Compatible Modules | Rated up to 46" (1168.4mm) in Width |

## Understanding UL 3741

The primary goal of rapid shutdown regulations, as outlined in NEC 690.12, is to enhance firefighter and first responder safety during emergencies involving buildings equipped with photovoltaic (PV) systems. In a fire or structural emergency, energized solar panels and wiring can present a significant shock hazard, even after the utility power is turned off. NEC 690.12 requires PV systems to rapidly reduce voltage to safe levels to protect emergency personnel.

Initially, compliance often involved installing module-level power electronics (MLPEs) on every panel, significantly increasing system complexity, labor, and maintenance costs.

## UL 3741: A Streamlined Path to Compliance

UL 3741, officially titled Standard for Safety for Photovoltaic Hazard Control Systems (PVHCS), provides an alternative by certifying complete PV hazard control systems—including racking, wiring, and inverters—to meet rapid shutdown requirements without the need for MLPEs on every module. In essence, UL 3741 certification enables Sollega's FR510-6DG system to deliver a safer, simpler, and more scalable PV installation approach.

## Industry Implications:

The adoption of UL 3741 is reshaping how installers, EPCs, and developers approach PV system design and safety compliance. Beyond simplifying installation, UL 3741 systems bring long-term

benefits that significantly reduce O&I costs and improve overall project economics:

- Operational Efficiency: By removing MLPEs from the system architecture, the FR510-6DG minimizes the number of electronic failure points, decreasing the frequency of service calls and truck rolls.
    - This includes reducing on-roof DC connection points by 2/3rds.
- Reduced Downtime: MLPE devices are frequently cited as a major contributor to system faults and service calls due to their exposure to harsh rooftop environments and higher failure rates compared to other components (SMA America, 2020; NREL, 2020; Solar Builder Magazine, 2023).
- Simplified O&M: Fewer components and a streamlined design mean less diagnostic complexity and lower labor intensity during preventative maintenance or troubleshooting. This improves uptime and reduces long-term O&M expenditure.
- Portfolio-Scale Impact: For developers managing large PV portfolios, reducing MLPE-related issues translates to lower lifecycle costs and a more stable production baseline across assets.

In short, UL 3741 is enabling a new class of PV system that is not only safer and easier to install, but also more resilient and cost-effective over time.

**Installation and Cost Benefits:**

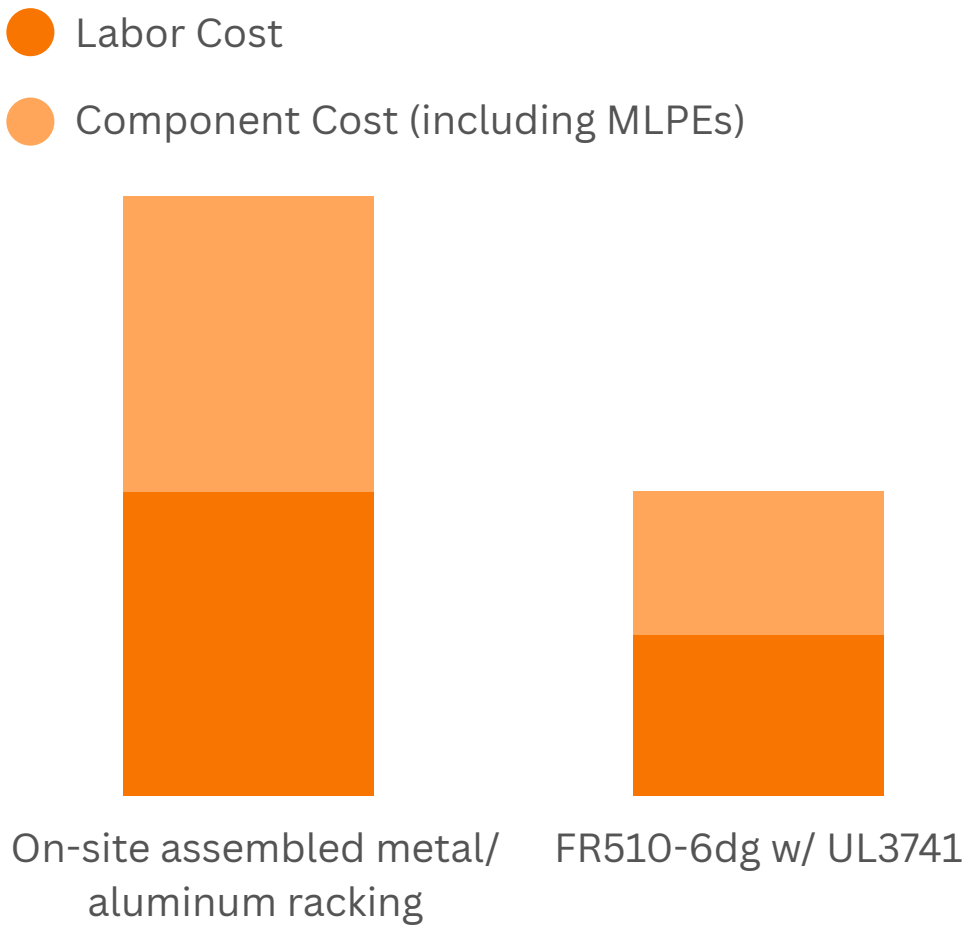
The benchmark set in the NREL study on “U.S. Solar Photovoltaic System Cost Benchmark: Q1 2016” indicates an estimated “module installation” time of 18 minutes per module for traditional systems. The FR510-6dg system, by coming pre-

assembled and eliminating MLPEs through UL3741 reduces installation time to the 5-10 minute range.

**Installer and EPC Benefits**

- Reduced Installation Timelines: Simplified logistics and fewer components accelerate project delivery.
- Lower Project Costs: Decreased labor and component expenses improve ROI.
- Improved System Reliability: Fewer connections reduce potential points of failure.
- Streamlined Compliance: Pre-certified systems ease the approval process.

**Overall Cost of Install including long term O&M:**



**By utilizing the FR510-6DG with UL 3741:**
Installation timelines are reduced, thanks to simplified logistics and fewer components. Project costs are lowered, improving return on investment. System reliability is enhanced, minimizing future service calls. Compliance is streamlined, offering a clear path through evolving regulatory landscapes.

Sollega's FR510-6DG system, when deployed under UL 3741 guidelines, acts as a major simplification of solar project delivery. It offers a balance of safety, simplicity, and scalability—empowering installers and EPCs to meet today's demands with confidence.

**Contact Us**
For specifications, compatibility charts, or to schedule a consultation, visit **sollega.com** or email **info@sollega.com**.

**Resources:**

National Renewable Energy Laboratory (NREL). U.S. Solar Photovoltaic System Cost Benchmark: Q1 2016. NREL, Sept. 2016, www.nrel.gov/docs/fy17osti/66532.pdf.

SMA America. "Solar Straight Talk: SMA Expert Op-Ed – The Real Costs of Module-Level Power Electronics (MLPEs)." Sunny SMA Blog, 2020, www.sma-sunny.com/us/solar-straight-talk-sma-expert-oped-the-real-costs-of-module-level-power-electronics-mlpes.

Solar Builder Magazine. "Winding Down Rapid Shutdown Issues on C&I Rooftops." Solar Builder, 2023, solarbuildermag.com/news/winding-down-rapid-shutdown-issues-on-ci-rooftops.

UL Standards & Engagement. UL 3741 Standard for Photovoltaic Hazard Control Systems (PVHCS). UL, 2020.