

SUMMARY OF PHOTOVOLTAIC WIRE REQUIREMENTS AS OUTLINED IN UL 4703



UL 4703 Comparison Chart

UL 4703 Version	2005 Issue #1	2010 Issue #4
Other standards referenced by 4703	UL Standard 493 thermoplastic UF and UL Standard 854 USE-2	UL Standard 83 THW-2 and UL Standard 44 RHW-2
Temperature ratings	90°C wet or dry	90, 105, 125 and 150°C dry or 90°C wet
Voltage ratings	600 V only	600 V, 1,000 V*, 2,000 V*
Conductor types	Stranded copper	Stranded copper, copper-clad aluminum or aluminum
Conductor sizes	18-8 AWG	18 AWG-2,000 kcmil copper or 12 AWG-2,000 kcmil aluminum
Direct burial optional rating	No	Yes
Cold impact test	No	Yes
600 V insulation thickness #10 (no jacket)	0.075" of PVC or 0.060" of XLPE	0.075" of PVC or 0.060" of XLPE

There have been some key changes to UL Subject 4703 since its initial release. Titled "Outline of Investigation for Photovoltaic Wire," UL Subject 4703 is in its fourth revision since its release in 2005 and outlines the construction and performance requirements of photovoltaic wire in photovoltaic electrical energy systems. The most recent issue of UL Subject 4703 includes a wide range of products that include multiple conductor material options and voltage ratings.

Photovoltaic wire is used to connect photovoltaic panels to each other and to the energy-collection and conversion equipment. Photovoltaic panels generate electricity by turning the sun's radiant energy directly into electricity in the cells on the panel's surface.

Photovoltaic wire was originally intended to be a single conductor similar in construction to a Type UF (Underground Feeder) or Type USE-2 (Underground Service Entrance wire rated for 90°C wet applications). However, because some solar applications are massive, the amount of power they generate is considered utility scale. This large amount of power requires a large conductor, often called a collector cable, which is addressed by the increases in sizes now allowed for UL Listed Photovoltaic Wire under the UL Subject 4703 revisions.

The new voltage ratings permitted in UL Subject 4703 can now accommodate voltages greater than 1,000 volts. By connecting the direct-current generating panels together in series, the voltage in an entire array can be increased to fairly high levels, which accounts for the higher voltages.

Finally, in order to provide designers, installers and users more options to keep solar installations economical, aluminum conductors are now allowed under UL Subject 4703. The aluminum used is known as the 8000 series and is specifically designed to operate safely in photovoltaic applications. Aluminum conductors are generally less sensitive to variations in commodity prices, which sometimes results in significant savings on the project's total cost.



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