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Solar Cell Flat Wire - *PV Ribbon Wire*

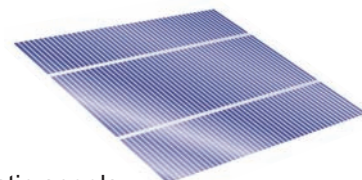
Hot Solder Coated Copper

Solar Cell Flat Wires (***PV Ribbon Wires***) are produced utilizing **Torpedo Specialty Wire's** capability of producing flat copper wire from round wire drawn from copper rod. Special controlled heat treatments are used to provide different tempers depending on the customers' needs. A SuperSoft temper is available with a special modified anneal performed prior to hot solder coating. The SuperSoft tempered material helps reduce wafer fracturing during the connecting process performed by solar module producers.

PV Ribbon Wires are produced to meet the customer's requirements for Cell Interconnect and Tapping Wire applications. Torpedo Specialty Wire products have solder coating on all four sides since the hot solder coating is done after the flat wire is rolled from round wire. Also, Torpedo products solve the problems of edge burrs and exposed copper edges exhibited by slit flat wire. These products are level wound onto plastic spools to provide extra footage for longer cell production runs. Each order is made to specification: conductor type, dimension, solder type, solder thickness, physical properties, and electrical properties.

Copper Base Size		Standard Temper (softness)			SuperSoft Temper (softness)		
Thickness ¹	Width ²	Tensile/Yield ³ Solder Coated		Elongation ³	Tensile/Yield ³ Solder Coated		Elongation ³
		UTS Nominal (average)	0.2% Offset Max		UTS Nominal (average)	0.2% Offset Max	
(in) / (mm)	(in) / (mm)	(KSI) / (N/mm ²)	(KSI) / (N/mm ²)	(% min)	(KSI) / (N/mm ²)	(KSI) / (N/mm ²)	(% min)
0.003 / 0,076	0.060 / 1,52	34 / 235	22 / 152	24	30 / 207	16 / 110	24
0.004 / 0,102	0.060 / 1,52	34 / 235	22 / 152	24	30 / 207	16 / 110	24
	0.080 / 2,03	34 / 235	22 / 152	24	30 / 207	16 / 110	24
0.005 / 0,127	0.080 / 2,03	34 / 235	22 / 152	24	30 / 207	16 / 110	24
	0.100 / 2,54	34 / 235	22 / 152	24	30 / 207	16 / 110	24
0.006 / 0,152	0.080 / 2,03	34 / 235	22 / 152	24	30 / 207	16 / 110	24
	0.100 / 2,54	34 / 235	22 / 152	24	30 / 207	16 / 110	24
Thickness ⁴	Width ⁵						
0.010 / 0,254	0.200 / 5,08	36 / 248	24 / 165	24	32 / 220	20 / 138	24
0.015 / 0,381	0.200 / 5,08	36 / 248	24 / 165	24	32 / 220	20 / 138	24

- ¹ Base material of ETC (CDA-110) or OFHC (CDA-102) with a tolerance of +/- 0.0002 in. (0,005mm)
- ² Base material of ETC (CDA-110) or OFHC (CDA-102) with a tolerance of +/- 0.002 in. (0,05mm)
- ³ Measured using a gage length of 4 inches (102mm) and a crosshead speed of 0.5 inch/min. (12,7mm/60sec)
- ⁴ Base material of ETC (CDA-110) or OFHC (CDA-102) with a tolerance of +/- 0.0005 in. (0,0127mm)
- ⁵ Base material of ETC (CDA-110) or OFHC (CDA-102) with a tolerance of +/- 0.005 in. (0,127mm)



Specifications:

Packaging: Level wound DIN 125; DIN 160; DIN 200; DIN 250 plastic spools
 Solder Thickness: 200 to 1000+ micro inches (5 to 25 microns) per side
 Solder Compositions Available: 100% Sn **** 62/36/2 SnPbAg **** 96.5/3.5 SnAg (Lead-Free)
 60/40 SnPb and ***Others on Request***