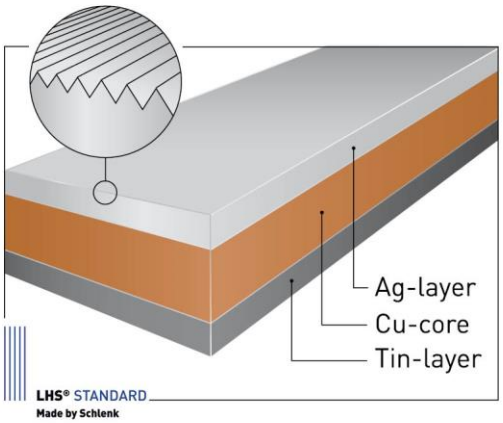
LHS® Standard

Light Harvesting String® is a roll-clad copper strip with silver on the top-side and tin on the reverse side. There are grooves precisely embossed length-wise into the silvered side.

Much as conventional wires used today, LHS® connects the top and back sides of adjoining cells. The great advantage LHS® has over standard connectors is that its structured surface reflects sunlight in such an angle towards the glass / air interface that it comes to a total internal reflection (TIR).

This accordingly redirects the light to the cell surface and leads to an increase of efficiency of up to 3%.

Cell-connectors for Solar Modules



Standard specification:

Base-material (core):	ETP Copper Foil E-Cu58, soft
Silver layer:	High reflective layer: 99.99% pure silver
Solder layers:	Tin Sn96.8% and anti-oxidants L-Sn96.5Ag3.5 (leadfree solder) L-Sn96.5Ag3.0Cu0.5 (leadfree solder) L-Sn60Pb40 L-Sn62Pb36Ag2
Layer thickness tin:	10.0% of nominal thickness (i.e. 15µm at 150µm)
Layer thickness silver:	3.5% of nominal thickness (i.e. 5µm at 150µm)
Strip thickness:	0.100 mm - 0.250 mm (incl. tin and silver-layer)
Width:	1 mm - 50 mm (depending on strip thickness)
Coil design:	available on coils or on spools

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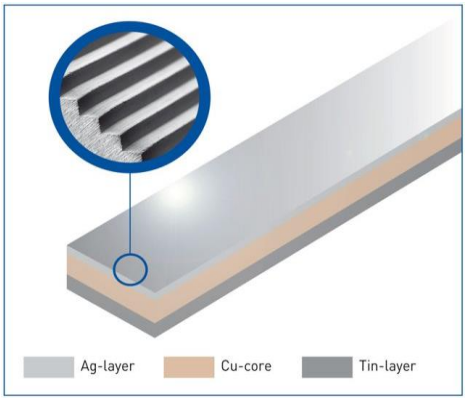
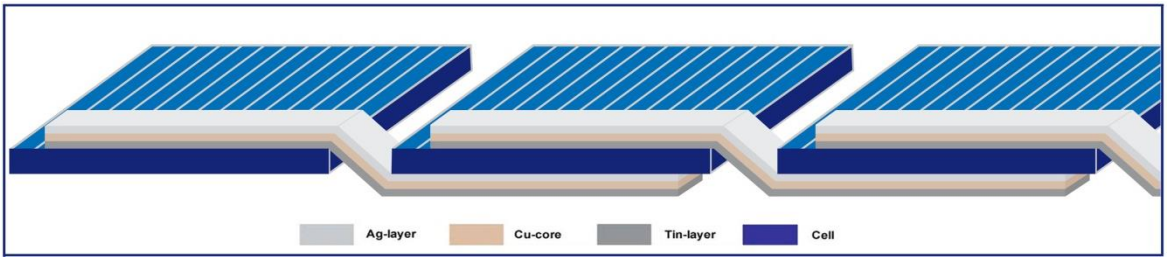


As silver is an excellent conductor, it can be included in the calculations towards resistance values.

When using LHS® material, the challenge is soldering to the back-side of the cells. As there is no tin-depot on the strip, tin needs to be added during the soldering processes. A number of solutions are currently being discussed to overcome this issue.



Advantages of Light Harvesting String®:

- module efficiency increased up to 3 % depending on module / cell configuration
- Reduced thermal stress: due to reflective properties of LHS®, dimensions of connectors may be chosen wider and thinner. Thermal stress put out by thinner and wider strips is less than that put out by thick narrow strips. LHS® is thus very well suited for next generation of larger and thinner cells.
- Visual appearance: dark uniform appearance, distinguishable from standard product, very suitable for building integrated design; can also be used for consumer products such as solar lamps, etc.
- LHS® is a cost effective alternative to all backside contact solutions, as existing cell design remains unchanged, only simple and small-scale change to existing processing equipment required
- available in all current sizes, tinning specs and coil designs

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