

INVISIBLE SOLAR TILES IN ITALY

PROVIDING HISTORICAL CENTERS WITH GREEN ENERGY

Since 2016 the Dyaqua company based in Vicenza (Italy) produces the [Invisible Solar Rooftile](#) looking identical to classic terracotta roof tiles, finally bringing solar energy on heritage assets.

Invisible Solar is a new PV technology that takes on the appearance of any building material. Each Invisible Solar module is not only a photovoltaic panel, but also an active architectural element with various functionality.

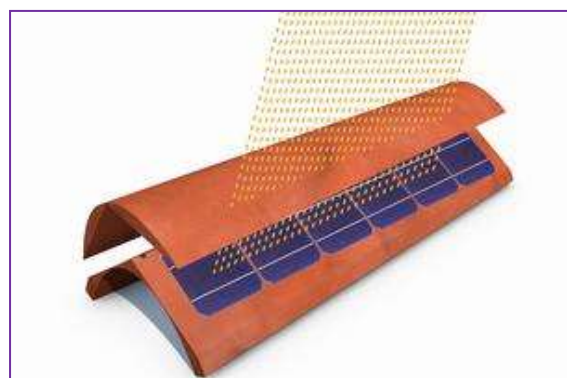
Many historical centers in Italy need to be renovated in a sustainable way, but the constraints of cultural heritage make these works difficult to implement. Starting in 2015 the Italian [Dyaqua Company](#) designed the *Invisible Solar Tile*, an impacting innovative solution allowing energy integration in buildings protected by architectural-landscape restrictions in historical centres

The *Invisible solar* is an innovative production process allowing to make photovoltaic modules in the form of traditional architectural or construction elements hiding silicon cells under a special surface, opaque in appearance and transparent to sunlight. The surface is capable to take the appearance of any building object, thus transforming the silicon cells in real architectural elements. The transparency of the surface-invisible allows sunlight to filter within the module.

[The Invisible Solar Rooftile is made by a unique indivisible piece](#), with a very high resistance that hides and protects the photovoltaic cells that are combined inside.

Invisible Solar operation is based on the low molecular density principle. Each module is made with a recyclable non-toxic polymeric compound that is specifically processed to encourage the photons absorption. Common monocrystalline silicon cells are incorporated inside the module, while a special surface, which is opaque for eyes but transparent for sunrays, allows the light to enter in it and feed the cells.

Made with non-toxic and completely recyclable materials, the photovoltaic tile is covered with a photocatalytic surface which allows the light to degrade the smog particles, while at the same time keeping the tile clean: dirt and air pollution are reduced into harmless salts which are dispersed in the environment with the simple action of wind and rain.



Main characteristics of the *Invisible Solar Tile* are as follows:

- It produces clean and renewable energy, using sustainable materials and purifying air from smog.
- It adapts to the roof covering and retains the aesthetics of the building;
- It can be installed as a normal brick tile, hence ideal to create installations on existing roofs;
- It has high resistance and provides a more efficient coverage than normal baked, and
- It is made of non-toxic, natural or reused materials being totally recyclable.

:

The Invisible Solar Rooftile installation requires few simple steps. The method is similar to the one used for classic clay roof-tiles and allows to replace the existing coverage without additional structures. It is easy to install. It replaces the existing roof-tiles and don't require additional structures.

Invisible Solar Rooftiles are artisan-made products, manufactured on order by using a production line with limited capacity. This means supplies gather modules that are very similar but never identical to each other. These slight differences create a more realistic effect - especially suitable for heritage assets. The aim of the company is to let the Invisible Solar production line grown - step by step - until all necessary improvement will be reached, and ensure the best ratio between quality, price and production timing

The Invisible Solar technology integrates aesthetics values of historic buildings, allowing their complete redevelopment. The Italian Ministry of Cultural Heritage (MiBACT) included the Invisible Solar methodologies in the *Guidelines for improving energy efficiency in cultural heritage*.

In 2018 the first installation using the Invisible Solar Rooftiles has been realized in [the Pompei Archeological Park](#) in the framework of the project named "Smart Archeological Park", which has been developed by the Italian Ministry of Cultural Heritage and CNR, creating an international reference model for other cultural heritage sites.

The Invisible Solar tiles will also soon be installed on the Maxxi, the famous museum of contemporary art in Rome. In the coming months, a more extensive installation will be carried out in Évora, Portugal, as part of a [EU-funded project](#) to help historical cities "become greener, smarter and more livable while respecting their cultural heritage. The project also planned to cover the roofs of some public buildings in Split, Croatia, as well as other historic buildings throughout Europe, as Bari in Italy Ioannina in Greece, Grenada in Spain, Celje in Slovenia, Hvidovre in Denmark and Újpest in Hungary.

Meanwhile, specialized international magazines have highlighted this innovation with articles that present the great contribution of the Invisible Solar Rooftiles as interesting technological tools for the sustainable development of historical sites.



To know more

[Dyaqua Company website](#)

[Invisible solar webpage](#)

[Invisible Solar installation guide](#)

[Dyaqua News](#)

[Article in dezeen 2023](#)

[Article in ceramics.org](#)

[Article in pocityf.eu.News](#)

[Article in edition.cnn.com](#)

[Article in thecooldown.com](#)

[Article in cleantechnica.com](#)

[Article in archiexpo.com](#)

[Article in inhabitat.com](#)

[Article in digitaltrends.com](#)

[Article in fastcompany.com](#)

[Article in plastics-themag.com](#)

[Dyaqua in facebook](#)

[Article in energoclub.org](#)

