

Heliac Fresnel Lenses

This may be of interest to UK solar experimenters looking for a winter project.

Fresnel lenses function like ordinary lenses, but they use much less material. This means that large lenses can be made much lighter.

Fresnel lenses are sometimes made of glass (e.g. in lighthouses), but more often of rigid Perspex. Some rear-projection TVs have a Fresnel lens within the screen, and several Youtube videos show how these can be removed and adapted for solar cooking. For example, this video shows the different characteristics of different TV fresnel screens: <https://www.youtube.com/watch?v=xExXjXm0YV0>

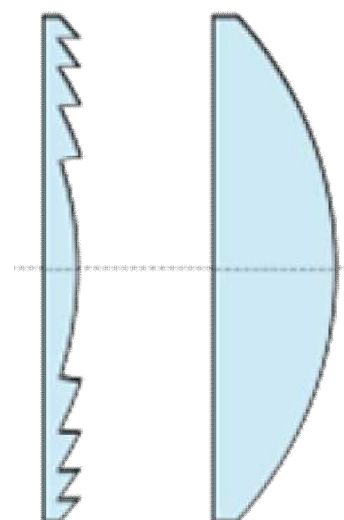
In 2014, a Danish energy company, **Heliac**, began producing Fresnel lenses by printing them onto flexible plastic. Their intention was to use them to concentrate sunlight to produce hot water and steam for industrial and other uses: <https://www.heliac.dk/utility-scale/>

They soon realised that they could make these cheap lenses available to the world at low cost, and that powerful solar cookers could be constructed by using one of these lenses within a framework made from locally available materials. They made the lenses available for between 10 and 15 Euros each. Several projects were set up in India, Kenya, Zambia, and Uganda. You can see examples by looking at Clement Musonda's posts on the Solar Cooking UK Facebook Group pages.

Plans for a cooker were devised by Sedi Byskov, an engineer then employed by Heliac. She bought a complete cooker for display at CONSOLFOOD2016. Heliac have since concluded that their design ought to be realised in metal instead of wood. This is because the wood could easily catch fire if the cooker were left unattended



Flexible plastic Fresnel lens mounted in a frame



The Fresnel lens on the left uses much less material than the conventional lens on the right, yet it bends and focuses light in the same way

Heliac claim that the lens will produce 'up to one kW' of power, and this is easy to believe, given the aperture of around 1.5 square metres.

At SLiCK, we are doing some experiments with these lenses, and we took the opportunity to import more than we needed. We therefore have a number available for sale to anyone in the UK who wishes to conduct their own experiments. If you only want to acquire one or two or three, they are cheaper than buying from Heliac.

Please note: These lenses must be held flat in some sort of frame, like the one pictured on the left. Only the lens is supplied, and be warned that it has a memory and wants to remain rolled up. The lenses are so potentially dangerous that Heliac require purchasers to sign a waiver, and so do we.

You can buy Heliac Fresnel lenses direct from Heliac by contacting Akiko Ishibashi (ai@heliac.dk) The lenses are 145 x 114 cms, the focal length is 2 metres and the spot size is 8 cm in diameter. They will supply a single lens and they ship globally.

