

Prototype of a concentrating solar collector

by: Mihály Varga – Gabor Németh – Szabolcs Németh – Ferenc Divos
University of West Hungary, Faculty of Wood Sciences

Solar energy concentration is not a new idea. More than 100 years ago the first concentrating solar energy unit started to work. Recently solar energy plants are generating electricity by mirror concentration and achieve high temperature. One of the key component of the system is the mirror. We have developed a 5kW concentrating solar energy unit for research purpose. Different mirrors are tested and the best one is selected for the prototype system.

The prototype unit is designed for testing different mirrors. 70 mirrors as Fresnel mirror are focusing to an absorber surface. The whole system follows the sun. The prototype unit is shown on figure 1.

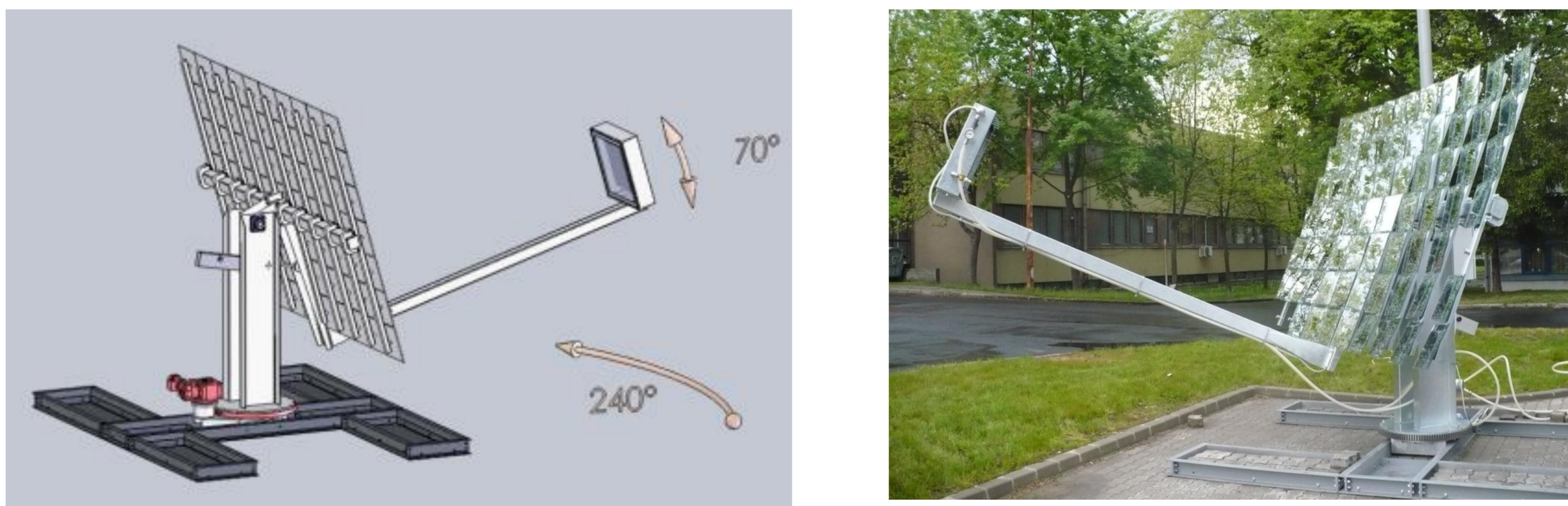


Figure 1. The concept and the realization of the concentrating solar collector.

The selection criteria of the mirror is the high reflectance in the whole visible light and the near infrared region. Conventional glass mirror with silver coating, aluminum, stainless steel material were tested. The reflectance measured in the 400 – 700 nm wavelength range, see figure 2. Finally the glass mirror is selected.

The concentrating solar collector is started to work. The first test run already started in Zalaegerszeg. More effort is necessary to improve the aluminium mirror reflectance, because it would provide a low weight and low cost mirror.

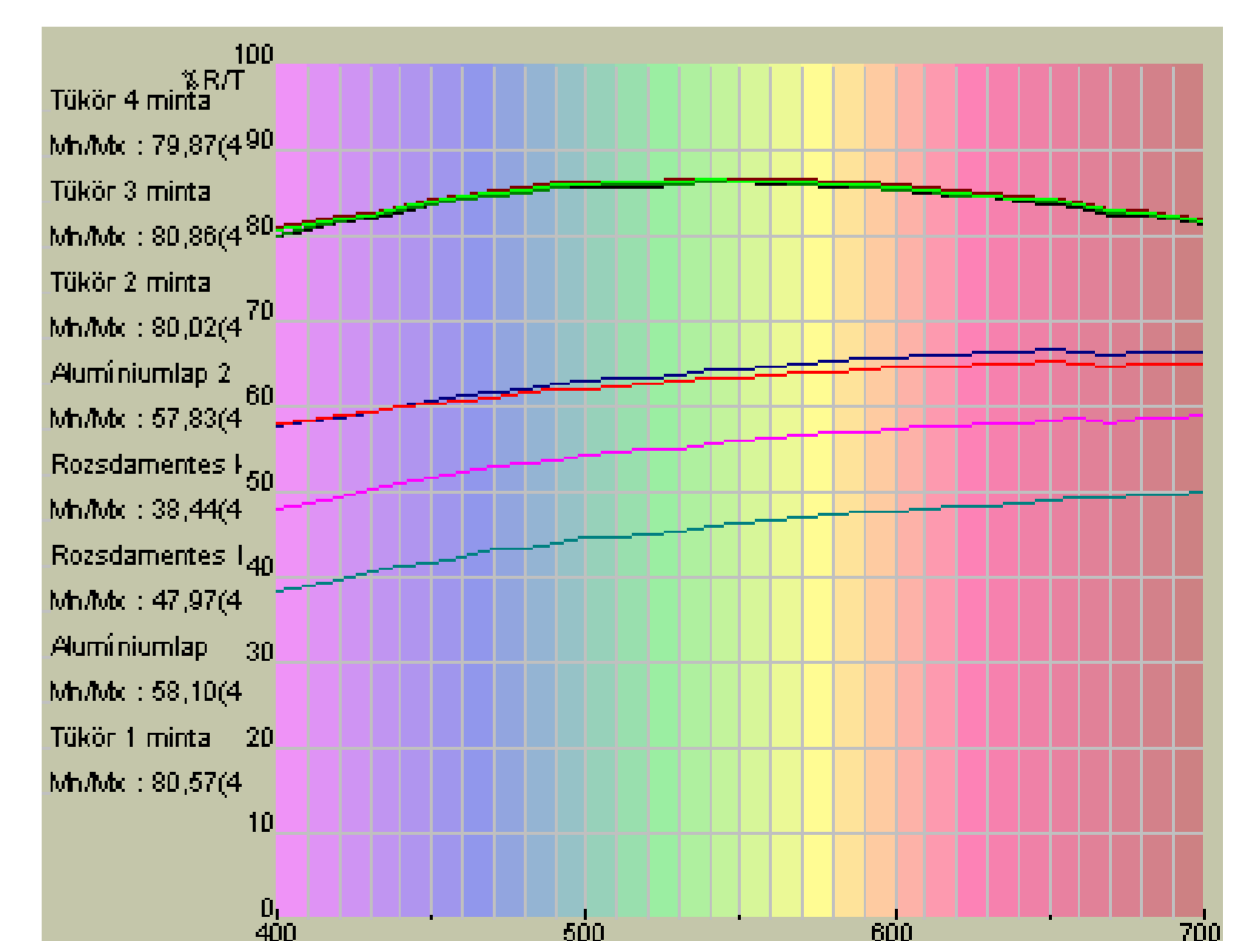


Figure 2. Reflectance test.