Solar selective coatings are considered a special case of optical coatings combining several layers with different properties, mainly: antireflection, solar absorbance and infrared mirror.

Nowadays the most demanding solar selective coatings are those used in tubes of hightemperature parabolic trough solar collectors. Coatings have to operate in an **aggressive environment**
(temperatures above 400ºC, thermal cycling) during 20-25 years. Homogeneity of the films along the whole distance of the tube and in its perimeter is critical to ensure a good performance of the coating. It is estimated that thickness should be controlled up to an accuracy of 5 nanometers (over the complete surface, 1 m2 in 3D) to ensure a correct function of the multilayer. Besides, further developments of these coatings in order to reach higher efficiency require resistance to higher temperatures, improved adhesion and scratch resistance and working under oxidant atmospheres (small quantities of water vapour and oxygen).

In this context the two main objectives of the NECSO are:

1. To correlate nanoscale structure related requirements (nanoroughness, nanohardness, crystallography, composition, vibrational spectra...) with performance requirements: optical and, more important, life expectancy.

1. To develop characterization and degradation protocols to serve as a powerful tool for coating developers, producers and end users for life prediction to push the collector parameters (temperatures and environments) to higher efficiency parameters.