Development of Accelerated Aging Tests for Solar Thermal Collectors and their Components "SpeedColl"

Xx City/place of business, date – [*Name of the industry partner*] supports the research on the durability of solar thermal collectors. Within the joint research project *Speed*Coll solar thermal collectors and their components are exposed at different outdoor weathering sites with extreme climates. Based on the obtained data accelerated ageing tests, models and analytical methods for the estimation of the long term stability are developed. The main objectives are to detect potential weaknesses at an early stage and to significantly improve the long term reliability of solar thermal systems.

*Speed*Coll is organized as a joint research project between the Fraunhofer-Institute for Solar Energy Systems ISE in Freiburg and the Research and Testing Centre for Thermal Solar Systems (TZS) at the Institute for Thermodynamics and Thermal Engineering ITW of the University of Stuttgart, Germany. The project's objective is to significantly increase the relatively low level of knowledge about the ageing behavior of solar thermal collectors. The collectors have to bear high climatic and mechanical stresses such as high temperatures, UV-irradiation, wind and snow loads, humidity or saline and corrosive atmospheres. To assess the long-term durability of solar collectors, these environmental factors will be simulated in the laboratory by means of appropriate accelerated ageing tests.

To identify realistic stress factors long time exposure tests are carried out at different outdoor test sites of the participating research institutions in Freiburg and Stuttgart, Germany (moderate climates), on the Zugspitze, Germany (alpine climate), the Canary Islands, Spain (maritime climate), as well as in Kochi, India (tropic climate) and the Negev desert in Israel (arid climate) where single components (absorbers, reflectors and transparent covers) and complete collectors are exposed. The exposure test sites feature extensive monitoring systems that enable continuous measurements of the environmental conditions and microclimatic ageing factors affecting materials and components. Based on this data, the effects of particular stress factors and their combinations are evaluated for the development of ageing models and validated test sequences.

The results obtained from the outdoor exposure and the accelerated ageing tests are an essential step towards the optimization of the quality and durability of solar thermal collectors. As a valuable tool for further improvements in quality management for both consumers and industry they will be used to support European standardization activities in the area of solar thermal technologies.

The project is funded by the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB)/ Project Management Jülich GmbH (PTJ) (Fkz: 0325969 A/B) and by financial support of the associated industry partners.

Further information: www.speedcoll.de