

## SHC Task 48 Quality Assurance and Support Measures for Solar Cooling

### THE ISSUE

The demand for air-conditioning is rapidly increasing, especially in developing countries. And the potential for solar cooling to meet this demand is immense. The results of past IEA SHC work in this field (most recently, *SHC Task 38: Solar Air-Conditioning and Refrigeration*) have demonstrated the technology's potential for building air-conditioning, particularly in sunny regions, and identified work needed to achieve economically competitive systems that provide solid long-term energy performance and reliability.

### OUR WORK

Finding solutions to make solar thermally driven heating and cooling systems at the same time efficient, reliable and cost competitive is the goal of this Task. These three major targets should be reached thanks to four levels of activities:

1. Development of tools and procedures to characterize the main components of solar air-conditioning systems.
2. Creation of a practical and unified procedure, adapted to specific best technical configurations.
3. Development of three quality requirement targets — prescriptive and performance based.
4. Production of tools to promote solar thermally driven cooling and heating systems.

### Participating Countries

Australia  
Austria  
Canada  
China  
France  
Germany  
Italy  
United States

The scope of the work covers technologies for the production of cold water or conditioned air by means of solar heat, that is, starting with the solar radiation reaching the collector and ending with the chilled water and/or conditioned air transferred to the application. Although the distribution system, the building, and the interaction of both with the technical equipment are not the main topic of the Task this interaction will be considered where necessary.

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## KEY RESULTS OF 2014

### PISTACHE Tool (pre-sizing tool for solar cooling, heating & domestic hot water production systems)

The PISTACHE software is a tool to pre-size and evaluate the performances of solar installation for cooling, heating and domestic hot water preparation, with or without energy back-up system.



The tool aims to reach an easy and quick calculation of the solar installation for cooling, heating and DHW production. It helps the user to pre-size the installation and provides energy balance and annual performance indicators. The tool is composed of a user interface to upload an input file, to fill the parameter and to choose the main component characteristics. The tool also includes the calculation tables, the material databases and a step-by-step help file.

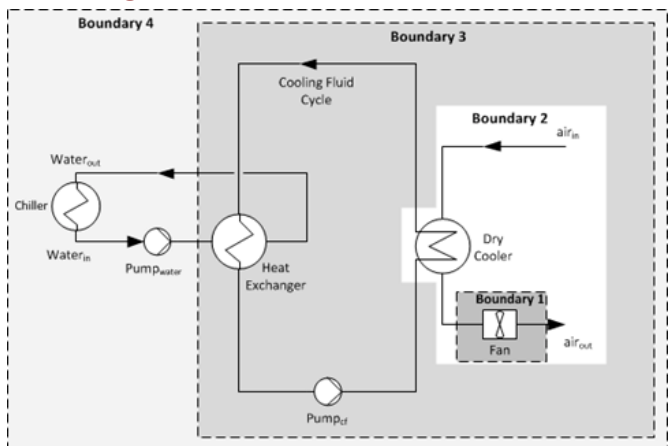
To find more information, please visit <http://task48.iea-shc.org/tools> and/or contact the support service by email at [pistache@tecsol.fr](mailto:pistache@tecsol.fr).

### Report on Heat Rejection Systems for Solar Cooling

This report gives an overview of existing and novel concepts for heat rejection devices in solar cooling systems and recommendations on which heat rejection measure should be used under different boundary conditions (climate, system concept, etc.) while achieving the 2 main objectives: 1) investment & operation costs minimization and 2) re-cooling performance and efficiency. For selected components, where it was possible, a performance characterization has been made in partnership with manufacturers.

This publication reports on:

1. A survey of market available heat rejection devices suitable for solar cooling applications; an added value to the survey work has been a categorization of the products.
2. A survey of available standards in Europe, USA and Australia to understand the limitations vs. opportunities of the different technologies.
3. “Real-life” examples/experiences from monitored solar cooling systems. Practical hints have been retrieved.



**Different boundaries for electrical power of a heat rejection device.**

A database of relevant standards, processes and incentives has been created and links to the needs of the solar heating and cooling industry analyzed.

To access the report visit <http://task48.iea-shc.org/publications>.

SHC Task 48 is a 3-year collaborative project that will be completed in June 2017.