Further systems are known, e.g., from the DE 197 20 863 A1 and the DE 10 2004 050 207 A1. The use for heating is generally the main focus.

A cooling element is described, e.g., in the DE 40 36 520 A1, which is equipped with a heat-insulating base panel, which has capillary tubes, through which a cooling medium is guided, wherein the base panel consists of a hygroscopic material.

The DE 10 2012 005 655 A1 describes the production of surface heating system or surface cooling system on on-site ground with a heat-insulating base panel and with capillary tubes, through which a cooling medium can be guided, wherein the base panel is made of calcium silicate and the base panel is provided with a loam rendering layer.

A room element for fastening to ceilings or walls is known from the DE 20 2006 000 201 U1. This room element is formed as laminar body and has a support shell as well as a functional layer, wherein the support shell comprises a building panel, which can consist of calcium silicate.

Moreover, an arrangement for air-conditioning rooms, which consists of prefabricated air conditioning panels and which can be configured in a layered manner in grid form underneath a ceiling, in front of a wall or above a floor in drywall construction is known from the DE 198 44 617 A1. Each air conditioning panel has a body made of mineral materials in the form of a hydrate mixture of different hydrate stages as well as mineralogical and/or metallic additives with dense structure, in which a fluid channel made of copper or a copper alloy is integrated.

Based on the known prior art, embodiments of the invention relate to an arrangement, which provides for a temperature-control, which is particularly energetically efficiently, of a room and which provides in particular for an economical cooling in environments with high temperatures and/or high relative humidity. In addition, the arrangement is to be constructed and capable of being mounted easily and economically.

Embodiments of the invention teach, in the case of a generic arrangement of the above-described type, that the piping system is formed as capillary tube mat and is arranged on the rear side of the calcium silicate panel between the supporting element and the calcium silicate panel. The calcium silicate panel therefore faces the room to be cooled or to be heated – with respect to the capillary tube mat.

According to a first aspect of the present invention, there is provided an arrangement for controlling the temperature of, in particular for cooling or heating, a room in a building, with a ceiling forming a supporting element, at least one calcium silicate panel arranged on the supporting element, which has a rear side facing the supporting element and a front side facing away from the supporting element and facing the room and at least one piping system, through which a temperature-control medium, e.g., water, can flow and is formed as capillary tube mat, wherein the capillary tube mat is arranged on the rear side of the calcium silicate panel between the supporting element and the calcium silicate panel, whereas the calcium silicate panel is fastened to the supporting element or to a substructure by interconnecting the capillary tube mat, which is loosely placed onto the panel.

According to a second aspect of the present invention, there is provided a method for the installation of the above temperature-control arrangement, wherein one or several calcium silicate panels are arranged to the supporting element by interconnecting at least one capillary tube mat, so that the capillary tube mat is arranged on the rear side of the calcium silicate panels between the supporting element and the calcium silicate panels and the calcium silicate panels face the room, whereas the calcium silicate panels are fastened to the supporting element or to a substructure by interconnecting the capillary tube mat, which is placed loosely onto the panel, and the piping system is fixed thereby.

According to a third aspect of the present invention, there is provided a method for controlling the temperature of a room, in particular for cooling or heating a room, by means of the above temperature-control arrangement, which is arranged in the region of at least a ceiling, wherein a temperature-control medium flows through the capillary tube mat and the temperature of the calcium silicate panel is controlled thereby.

The calcium silicate panel, which is a prefabricated, dimensionally stable and pressure-resistant building panel, which is manufactured on the basis of silicon dioxide and calcium oxide, is therefore an essential part of the invention. According to the invention, commercially available calcium silicate panels can be used, which are not used as base panel or supporting panel, respectively, on the side of the capillary tube mat facing the wall or the ceiling, respectively, but which are arranged on the side of the capillarity tube mat facing the room as cold transfer element or alternatively also as heat transfer element. As part of the cooling with the system, the cold supplied via the capillarity tube mats is transferred to the calcium silicate panel. The latter absorbs the cold, stores it within the panel and releases it from there to the room to be cooled (in that it extracts heat from the room). It is of particular importance that when falling below the dew point, the calcium silicate panel absorbs the condensate accumulating at the capillary tube mats and the panel and stores it in the calcium silicate panel, so that the panel does not only release the stored cold as “radiant cooling” but also as evaporation cooling to the room to be cooled. The high storage capacity of the calcium silicate is particularly