

ANMELDUNG | SCHUTZ | VERWERTUNG



### Focus Sectors

- Energy Management
- Air-Conditioning

### Key words

- Geothermal Energy
- Adsorption
- Desiccant Wheel

### Development Status

- Prototype available

### Patent Procedure Status

- DE Patent granted
- FR Patent granted
- IT Patent granted

### Chances for Cooperation

- Licensing
- Patent Sale
- R&D Cooperation

TU023/12.10.2015

## Sorption-Based Conditioning of Indoor Air

### Innovation and Customer Benefit

Warm and fresh outdoor air must be cooled and dehumidified by air-conditioning systems to climatize buildings. Cooling with electric vapor compression chillers is closely associated with high energy consumption because the dew point has to be reached for dehumidification. An alternative represents the sorption drying by using a desiccant wheel coupled with e.g. geothermal energy. The energy demand is shifted from electrical to thermal systems with the benefit that primary energy consumption is reduced.

The main advantages of the system are:

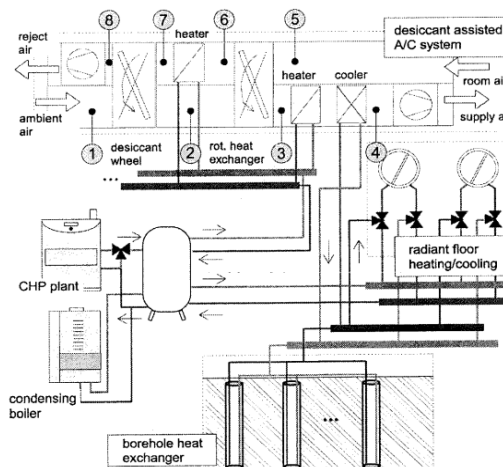
- Low Electrical Energy Demand
- Low Running Costs
- Increased Evaporation Temperature

### Possible Applications

Due to the lower price for cold production and the associated greater cost-effectiveness, this system can be used advantageously for air conditioning processes.

### Technical Description

The invention relates to a device for the sorption-supported air-conditioning of room air, wherein external air, which is dried and thereby heated in an adsorption wheel, is cooled down and then is supplied to the room. The waste air exiting from the room is heated and flows through the adsorption dryer for regeneration and is conveyed away as outgoing air. By the use of a refrigeration recovery, the colder outgoing air in comparison with the dried air can be used for passive cooling.



**Fig 1:** Schematic plant for a desiccant assisted HVAC System

(W.Casas, G. Schmitz, Energy and Buildings 37 (2005))