

Adsorption Cooling Technology

CLEAN ENERGY FOR YOU

Adsorption chillers with water / silica gel or water / zeolith generate cold via a closed, periodical cycle.

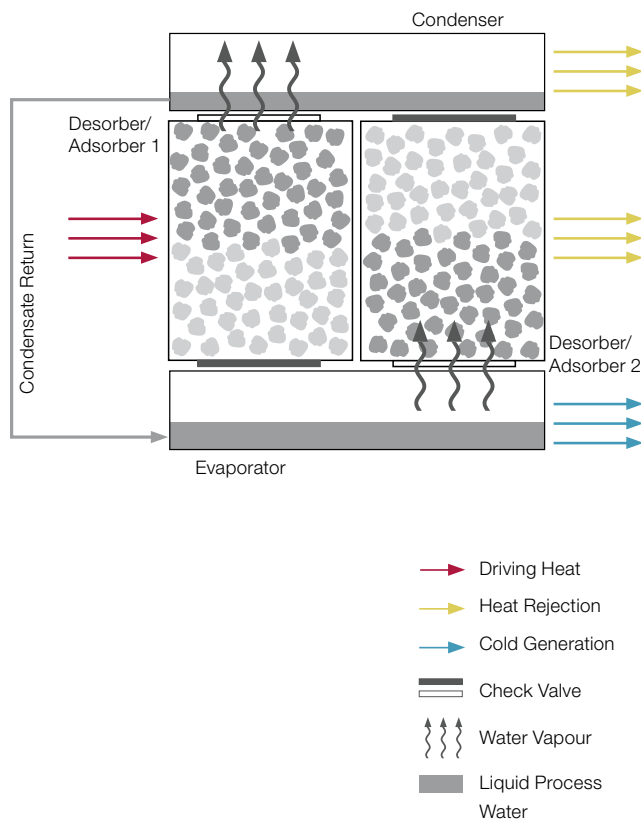
Using water as refrigerant, the evaporator temperature is limited to temperatures above freezing point down to 5 - 6 °C. Using silica gel adsorbers, the water is being desorbed at low temperatures between 60 and 70 °C; using zeolite adsorbers, higher temperatures above 90 °C are required.

Schematic description exemplified by our chillii® STC (water / silica gel):

The adsorption chiller consists of four main components: the desorber / adsorber 1, the condenser, the evaporator, and the desorber / adsorber 2. The adsorbent (silica gel) is dried out by applying heat. Vapour is generated, flows into the condenser, and is liquified, while heat is being rejected. When the material is sufficiently dried out, the heat input into the adsorber stops.

After the cooling phase, the liquid condensate re-reacts and evaporates. The dried adsorbent aspirates the vapour. Chilled water is generated via evaporation, and can be used for air-conditioning. During the adsorption process heat is being produced, which has to be removed by a cooling tower.

In a final step the condensate is conducted to the evaporator and the cycle is closed. To generate cold continuously, two adsorbers are driven anti-cyclic, which means that during desorption of one adsorber, the other one absorbs and generates cold.



Why adsorption technology ?

- Adsorption chillers are practically maintenance free (few mechanical parts)
- The service life of adsorption chillers is at least 20 years, but can also be significantly higher
- Adsorption chillers consume almost no electrical energy
- Using heat instead of electricity as driving energy reduces CO₂ - emissions
- Adsorption chillers use water as natural refrigerant which has no global warming potential (GWP)