HEAT4COOL

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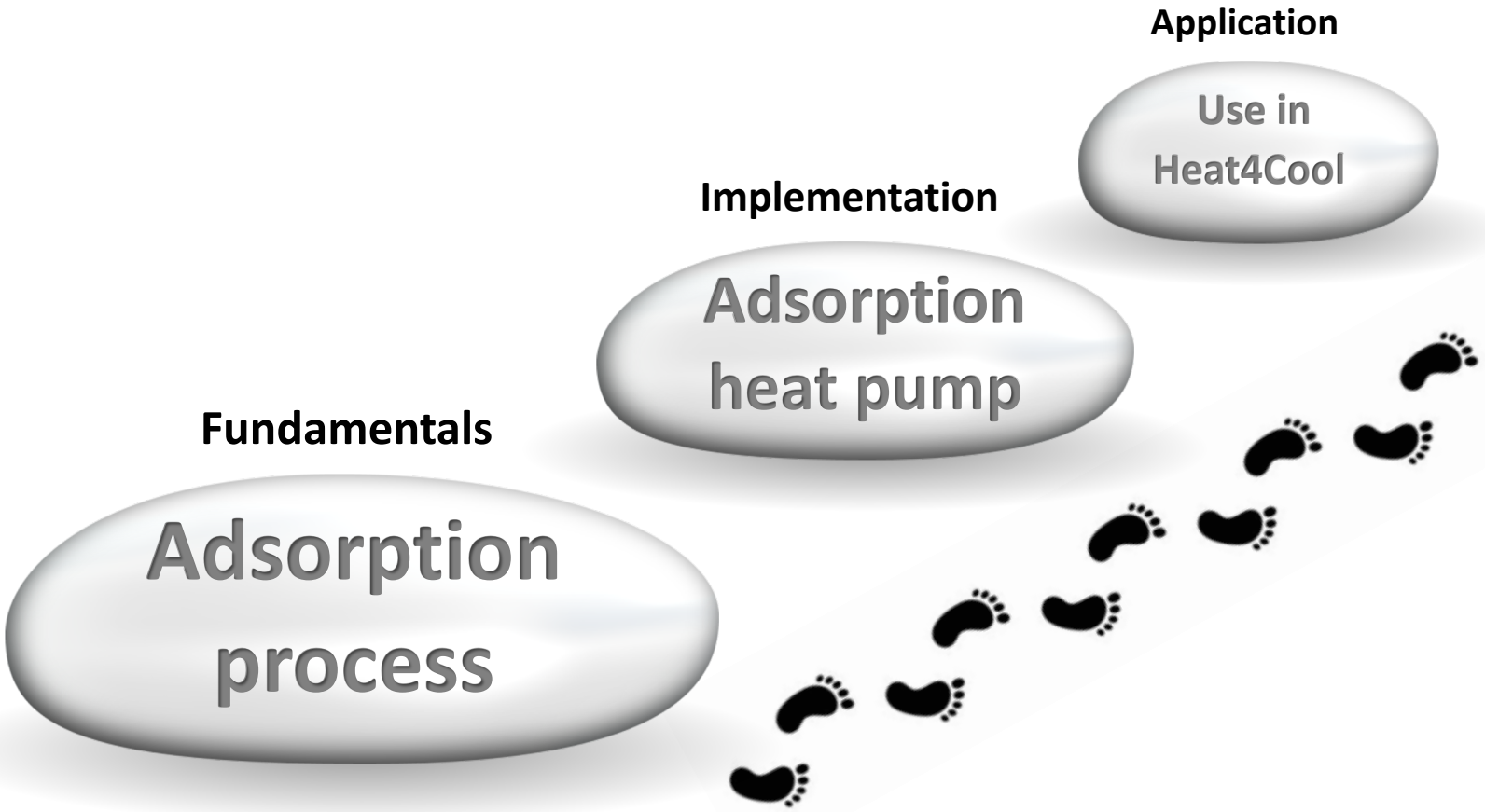
Project Development Engineer

“Adsorption Heat Pump”

Heat4Cool Online Training

Heat4COOL project has received funding from the European Union’s Horizon 2020 research and innovation program under grant agreement No 723925

Webinar agenda



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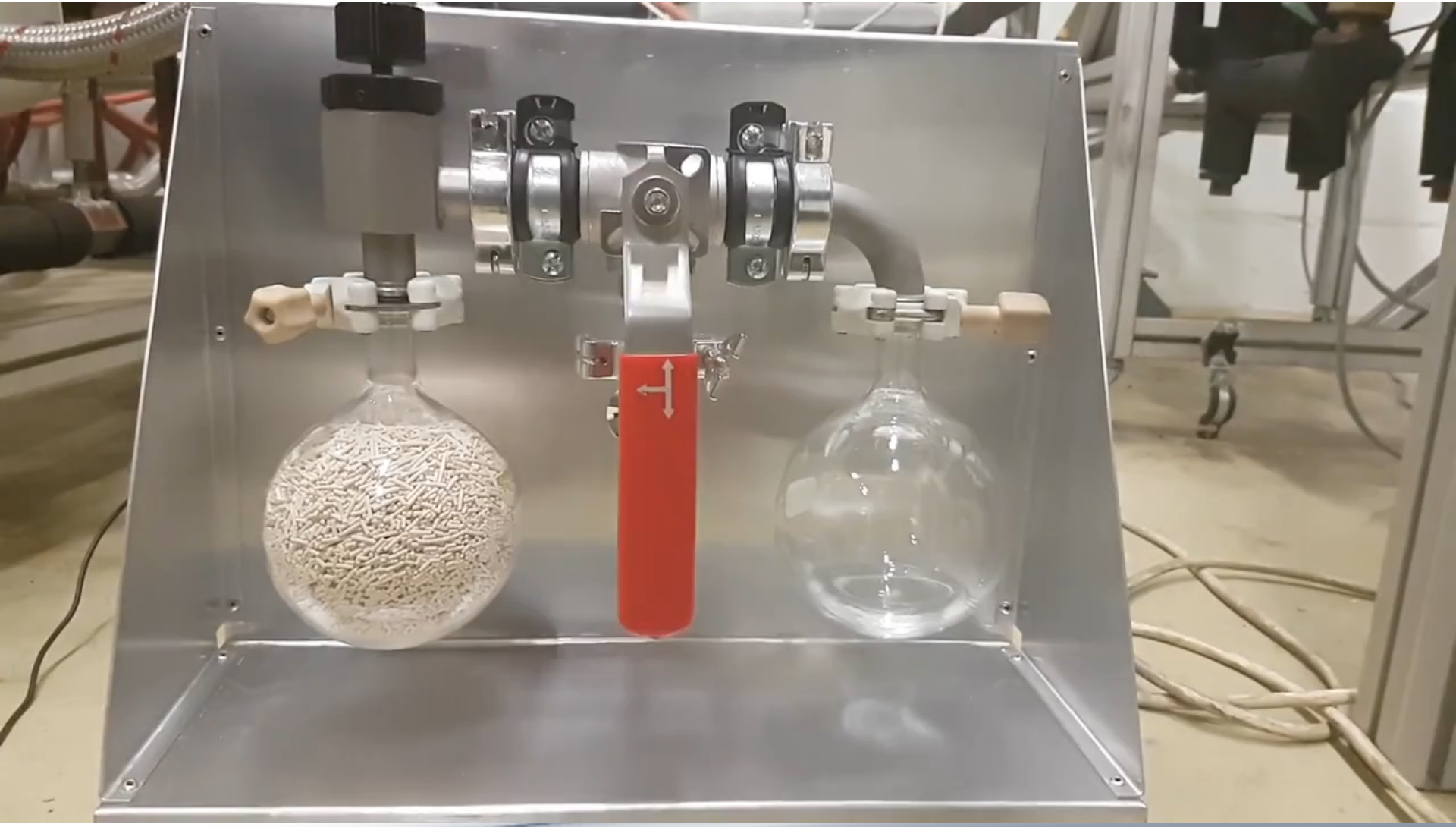
Adsorption Process



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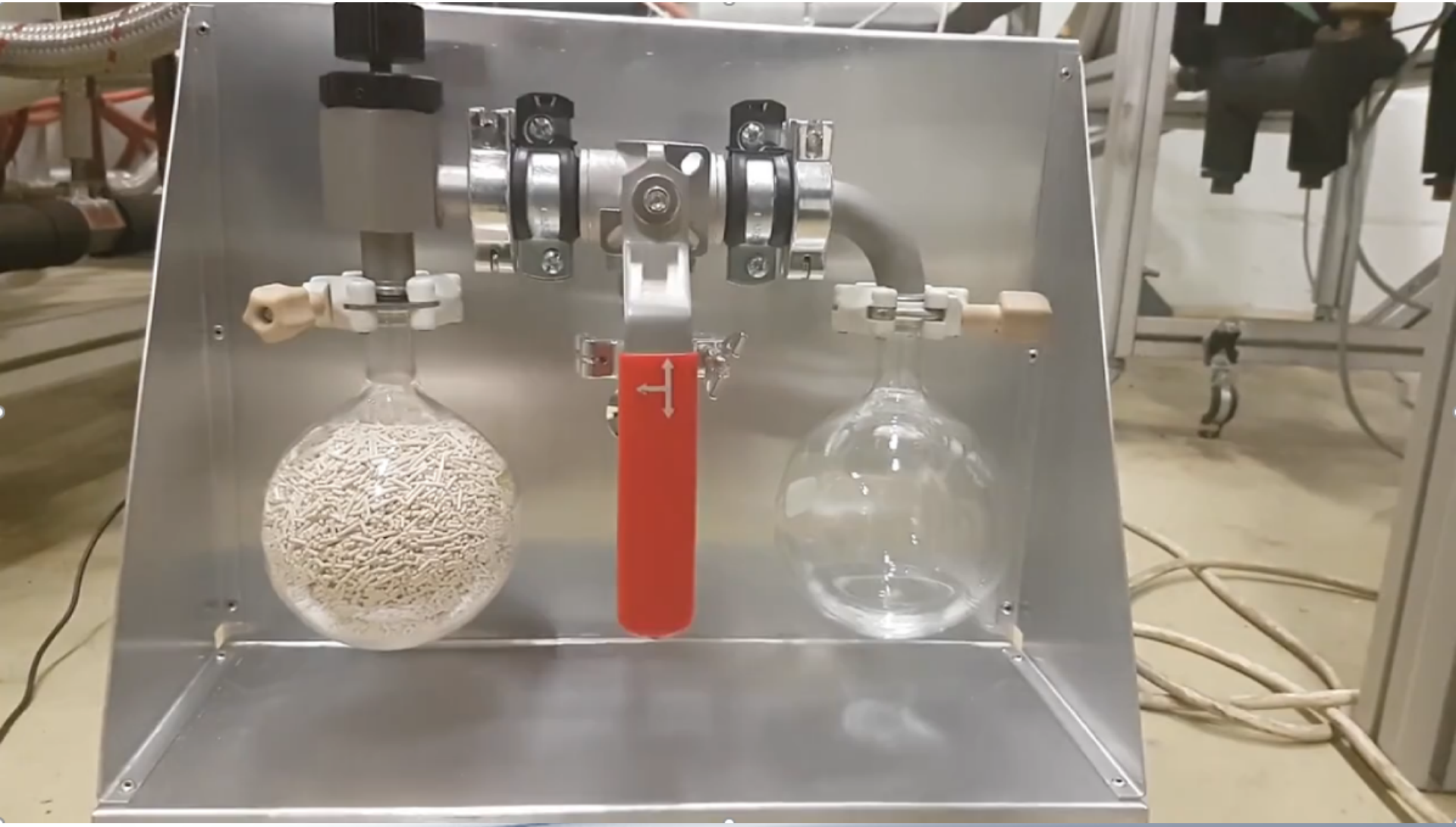
Adsorption Process



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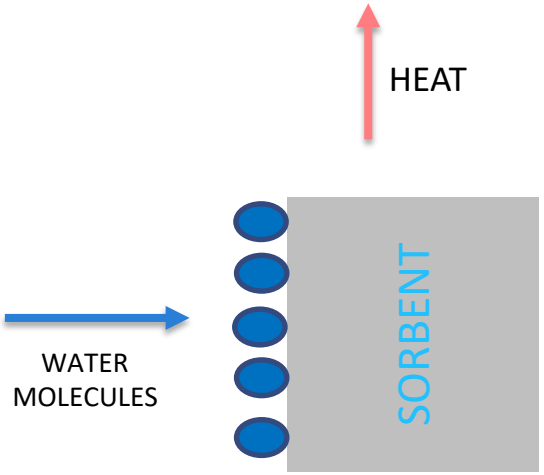
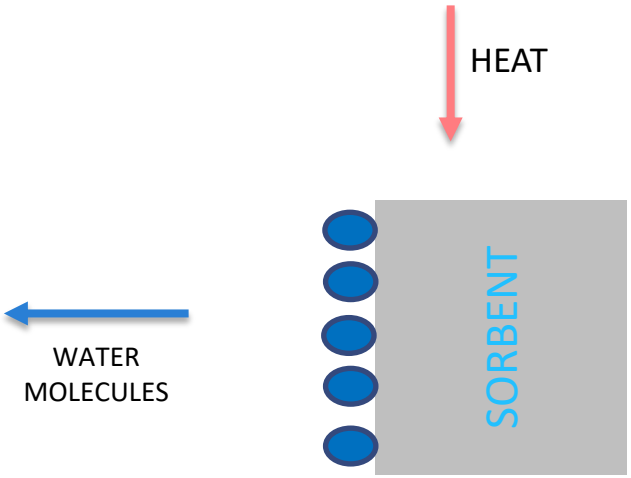
Adsorption/Desorption Processes



ADSORPTION

- Vapour is sucked - water molecules are attracted by the sorbent
- Heat is released to the ambient – exothermic process



DESORPTION (REGENERATION)

- Heat is supplied to the sorbent – endothermic process
- Vapour is released - water molecules are expelled from the sorbent

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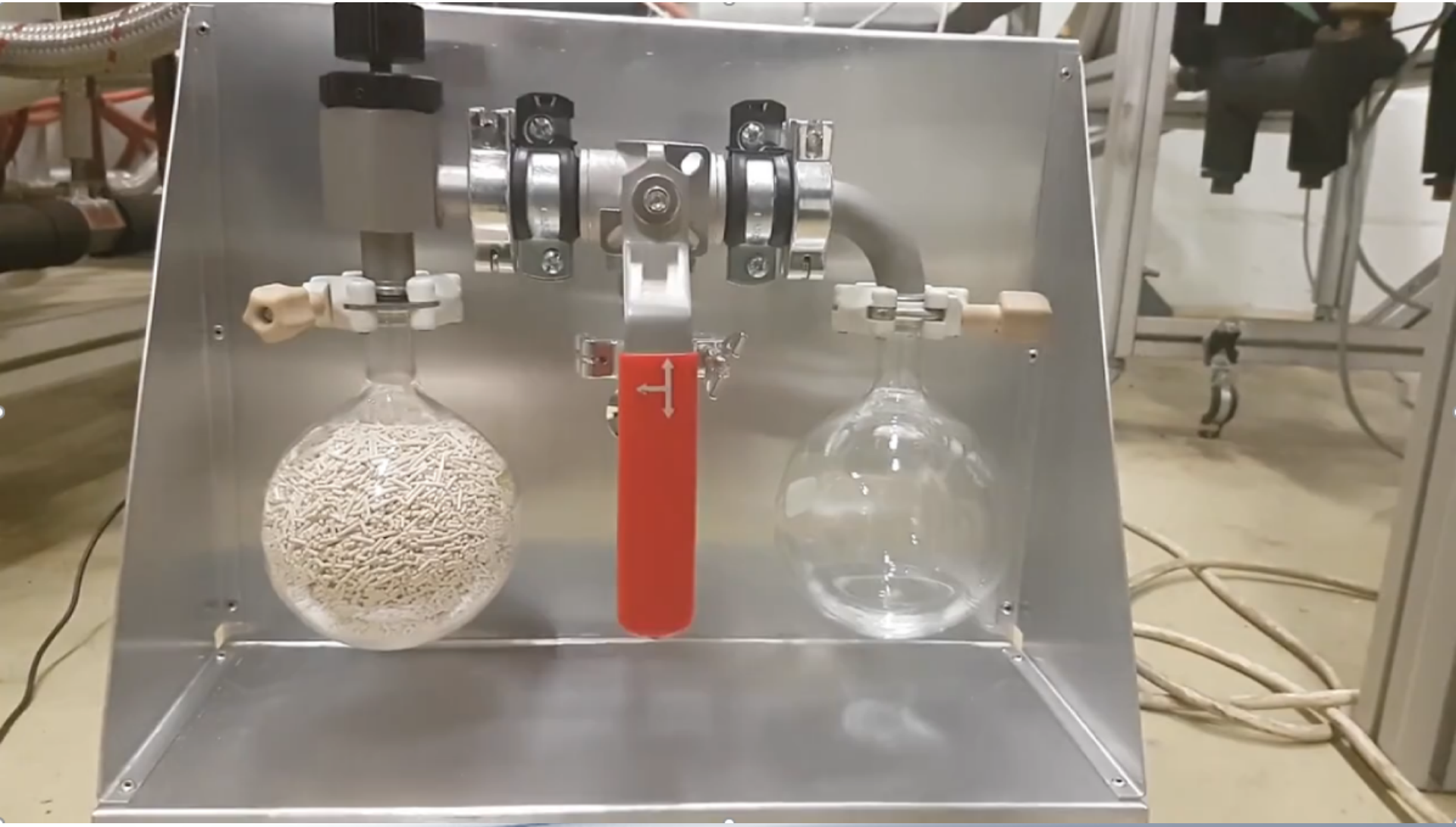
Adsorption Process



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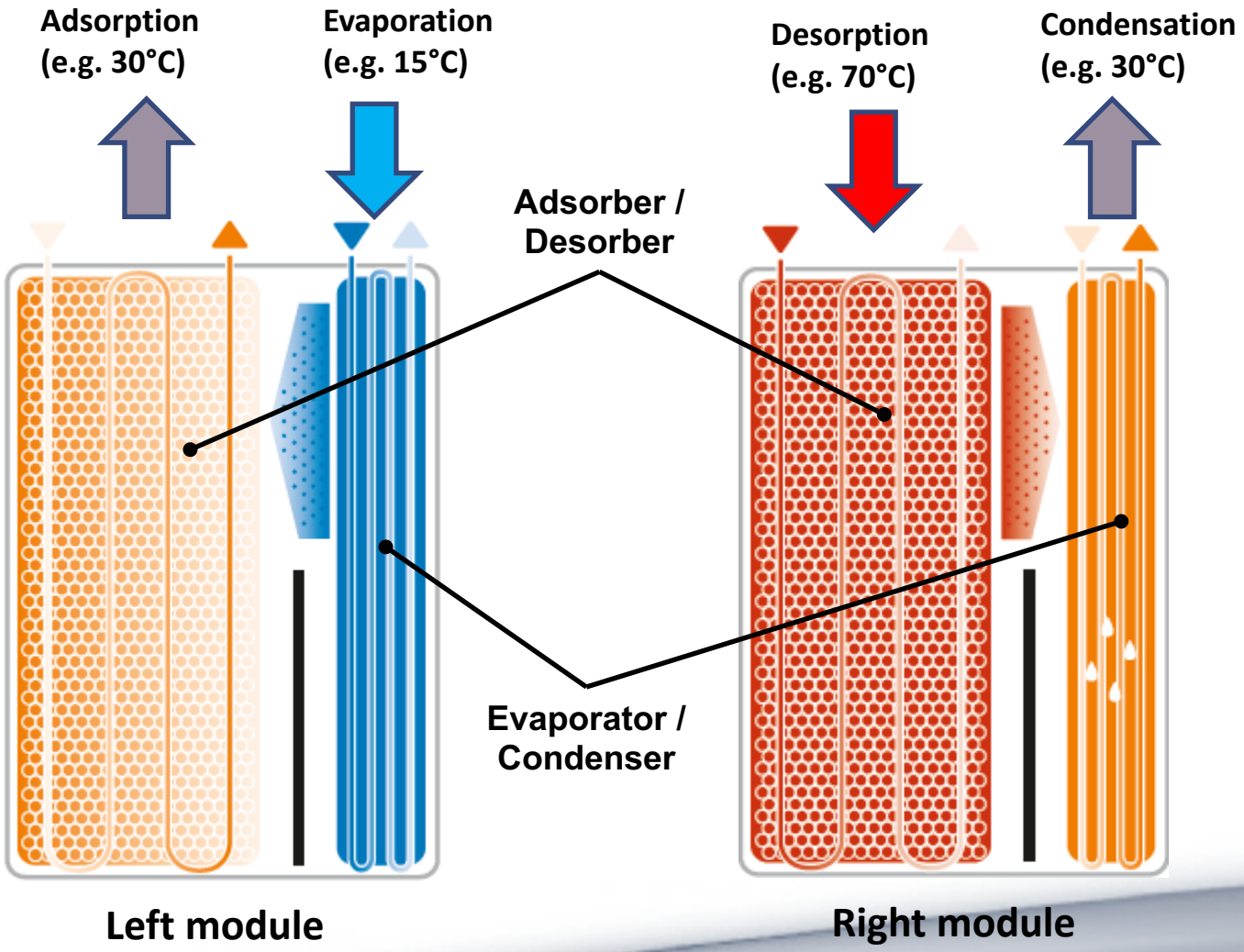
Adsorption Heat Pump



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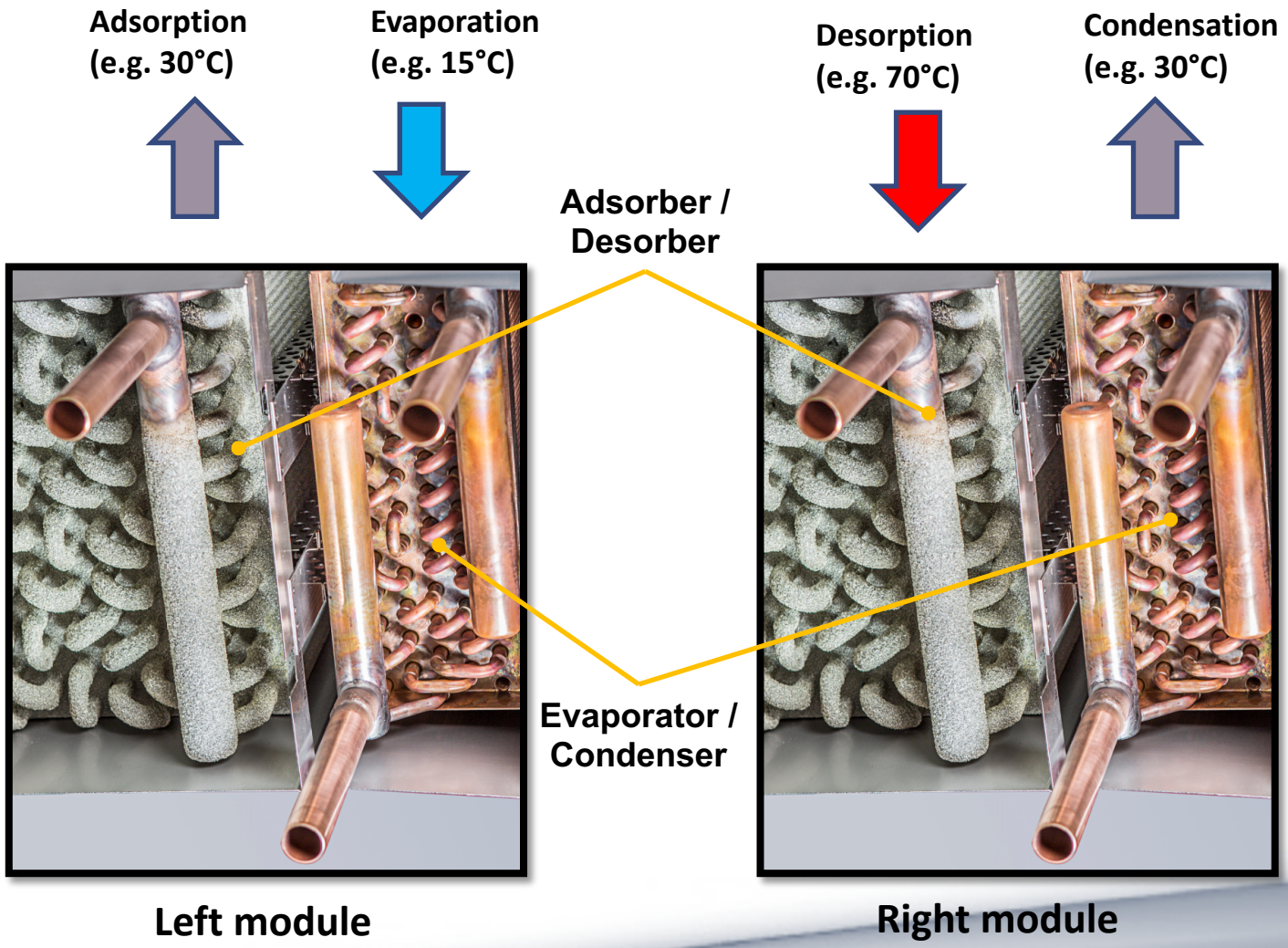
Adsorption Heat Pump



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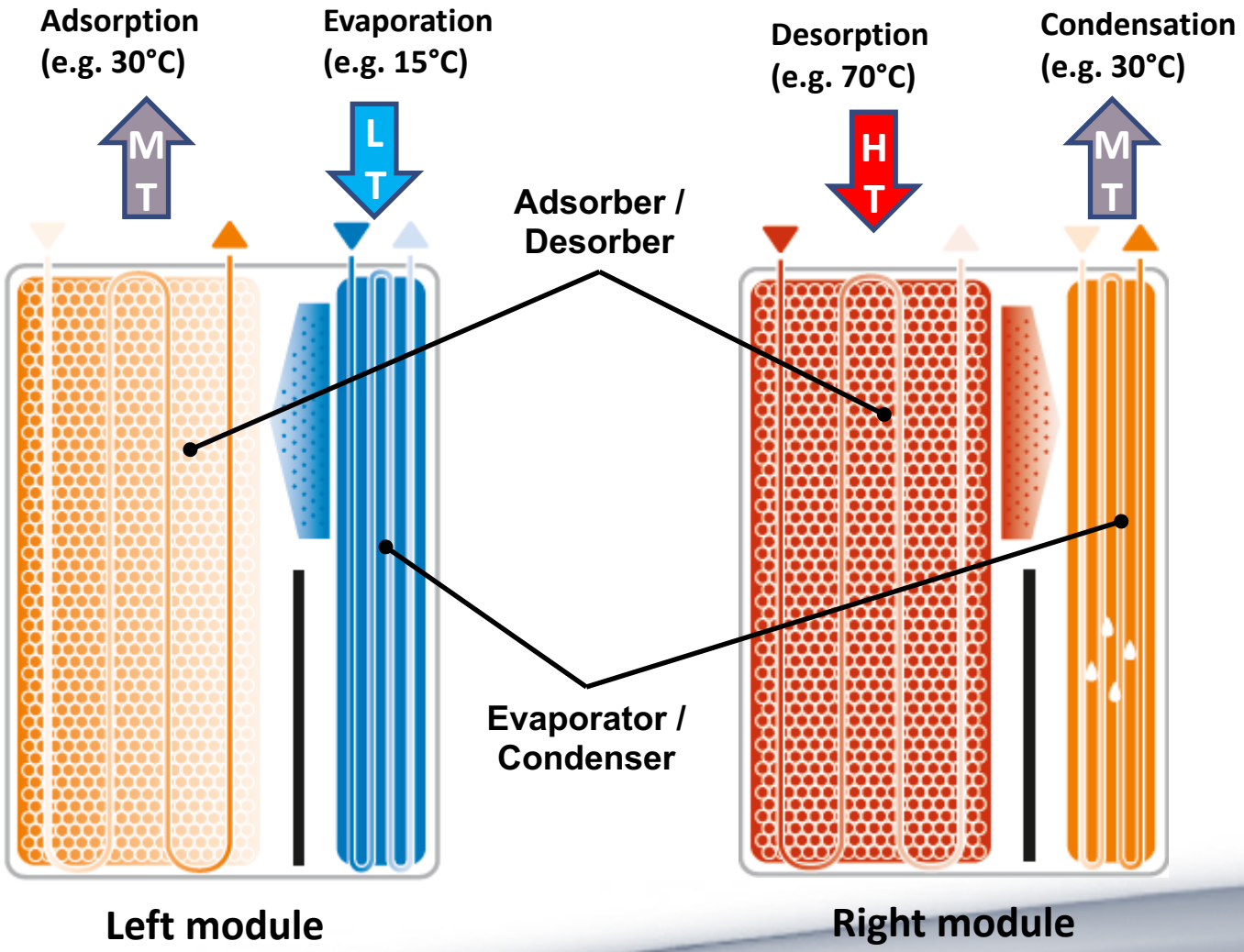
Adsorption Heat Pump



HTF = Heat Transfer Fluid

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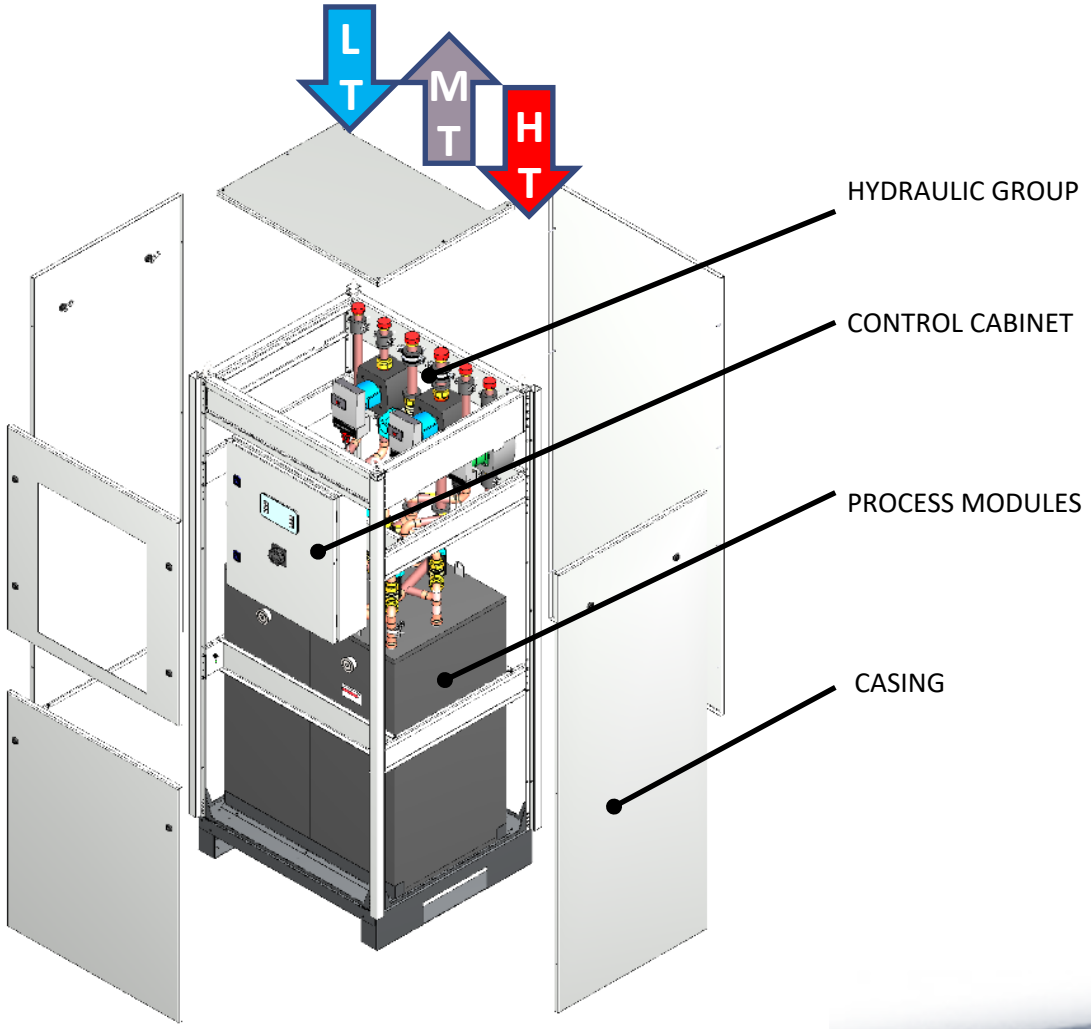
Adsorption Heat Pump



- **LT** (low temp.) circuit → heat of evaporation e.g. from the cooled room
- **MT** (medium temp.) circuit → dissipation of adsorption and condensation heat
- **HT** (high temp.) circuit → hot water from the drive source, heat for desorption process

HMI = Human Machine Interface

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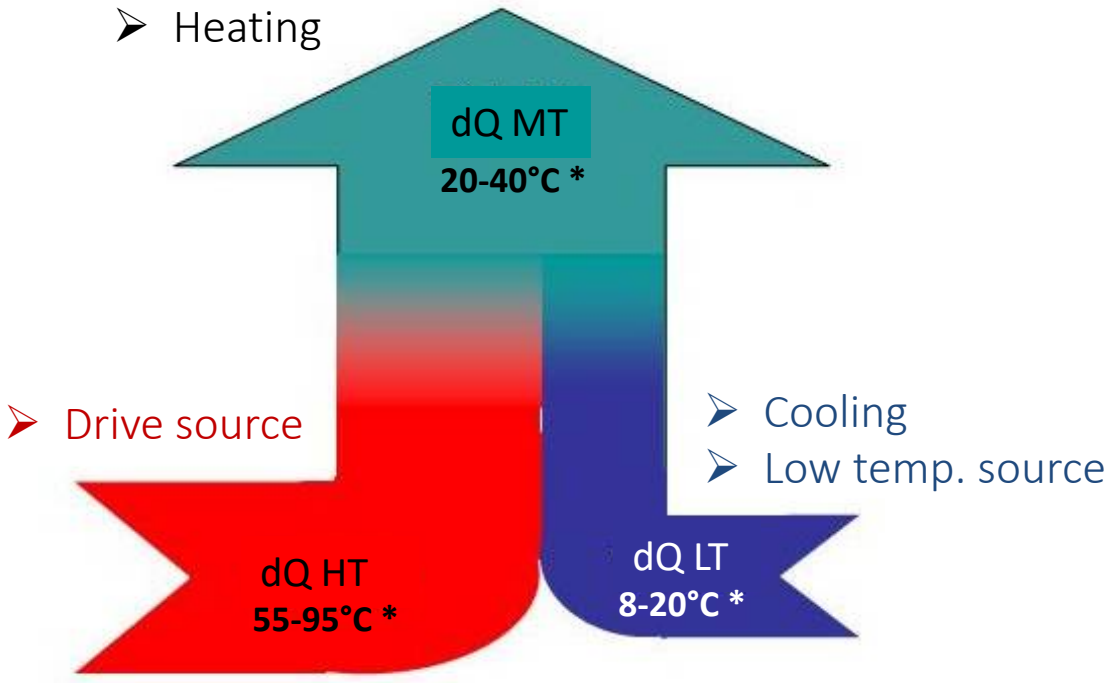
Adsorption Heat Pump

Implementation

Adsorption heat pump



COOLING MODE

- LT circuit is connected to cold distribution system e.g. fan coils
- MT circuit is connected to a heat dissipation device e.g. dry cooler

HEATING MODE

- LT circuit is connected to low temperature source e.g. air
- MT circuit is connected to the heating system e.g. floor heating

*Temperature ranges typical for silica gel sorbent.

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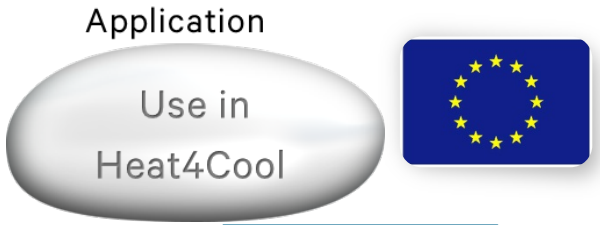
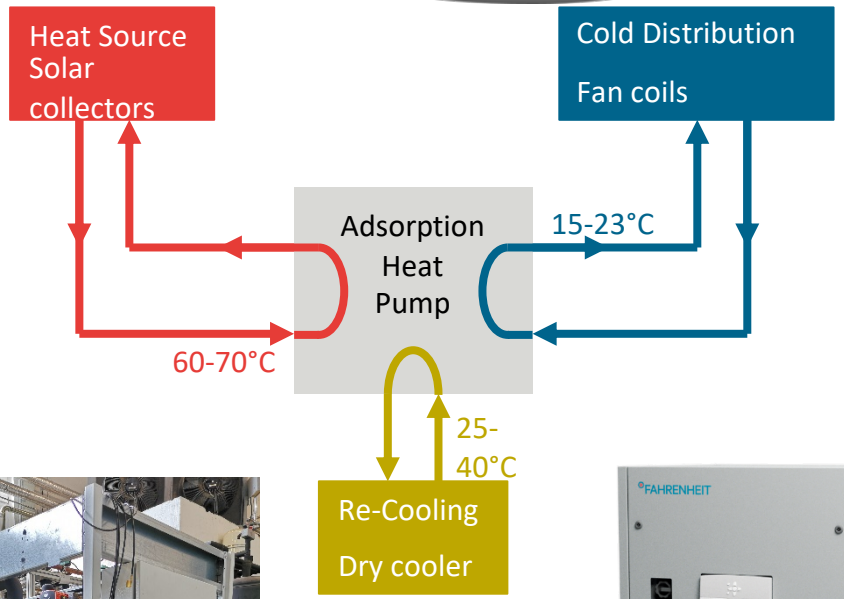
AdHP in Heat4Cool



Why is this technology innovative?

- It uses heat instead of electricity to provide cooling.
- It uses the aDsorption process, not aBsorption (lower drive heat temp. possible).
- Pure water as refrigerant.



Role in H4C

- It is a part of solar cooling system – adsorption heat pump enables the use of solar heat in summer to keep the aparments cool.
- Installed at the demo site in Valencia

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