Hydrokapillare

Unique radiant heat exchange technology

Suitable for different types of premises

creates comfortable room conditions -

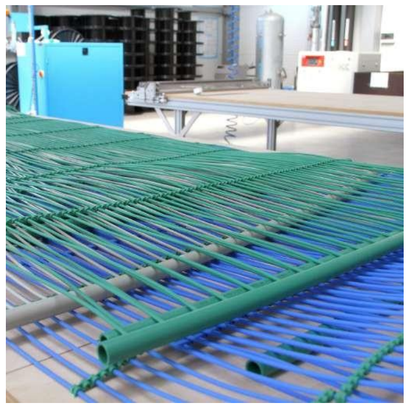
meets high hygiene requirements -

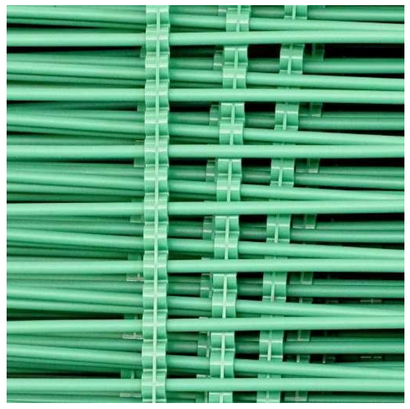
reduces energy costs up to 75% -

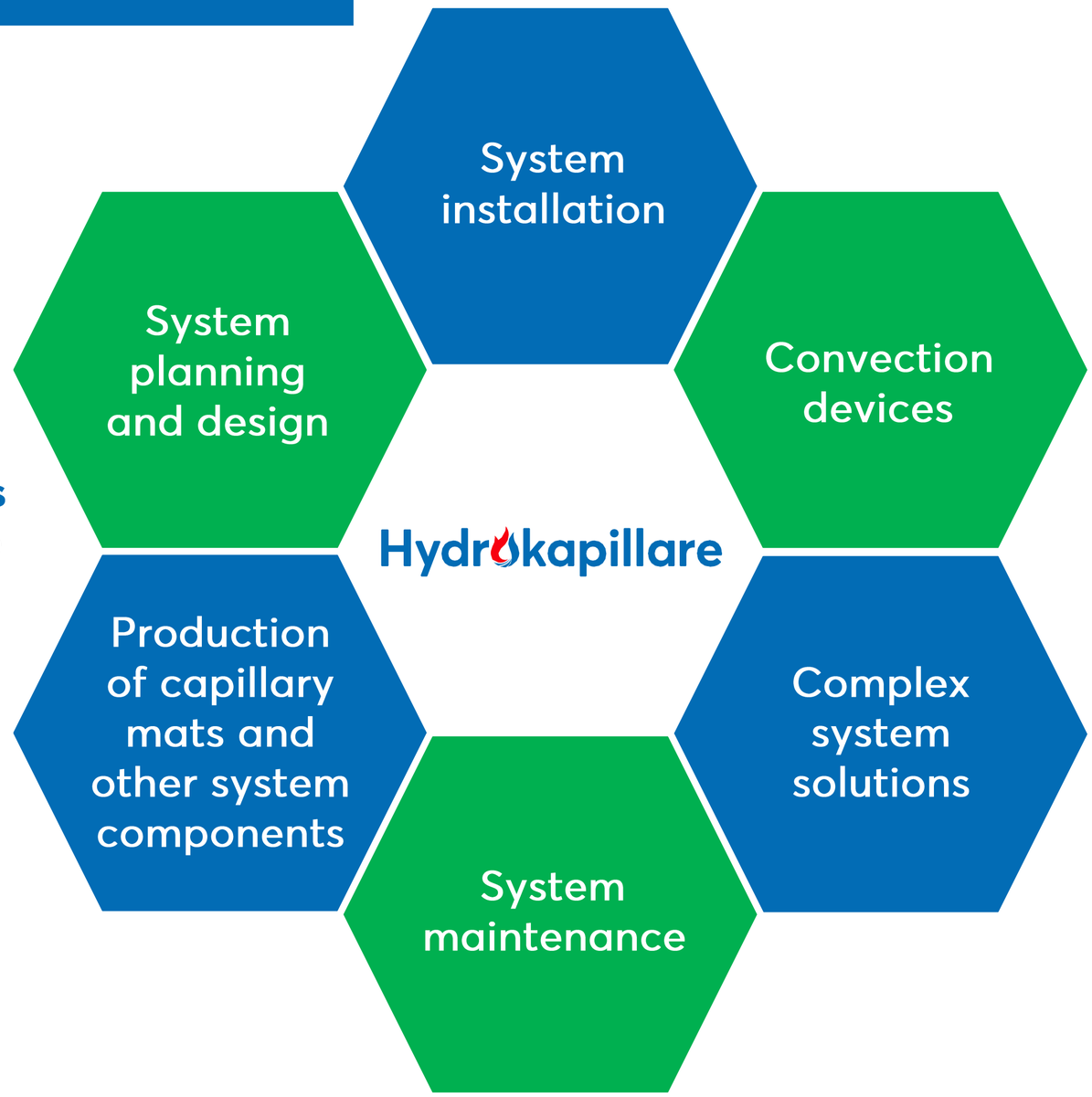
SIA Hydrokapillar Tech

SIA Hydrokapillar Tech offers a full range services for the implementation of a highly energy efficient and innovative water capillary mat heating and cooling system under the brand name **Hydrokapillare**.

360iResearch's Radiant Heating & Cooling Systems Market - Global Forecast 2024-2030 report lists the company among the 30 companies worldwide operating in the field of radiant heating/cooling technology.







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Different types of energy transfer in a building

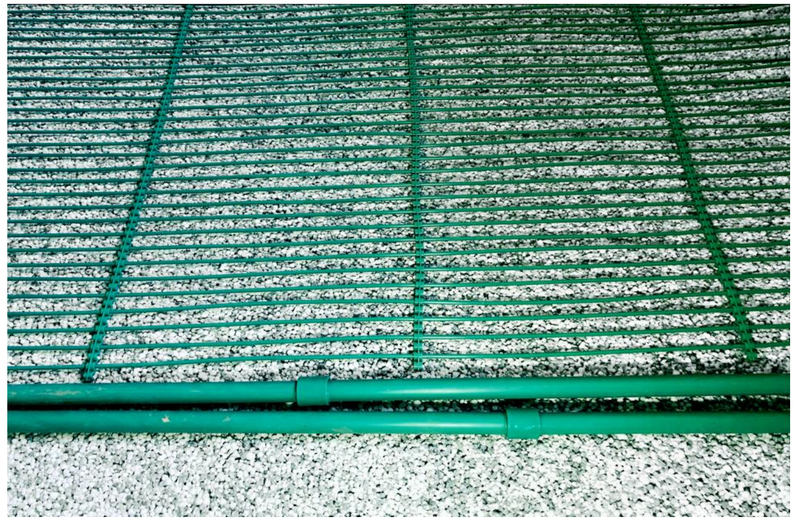
The surface area of heating elements determines the temperature in the heating system

+40-55°C

Radiator heating – 80% convection

+35-40°C

Underfloor heating with single pipe technology



+25-32°C

Hydrokapillare heating/cooling

Low temperature in the system determines the costs of primary energy and heating bills

Operational efficiency in heating mode

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Heating days	Outdoor t ^{0}C	Hydrokapillare		Classic, underfloor heating system		Metal radiators	
		COP at energy carrier t = 30^0 C	Expenses EUR/per.*	COP at energy carrier t = 40^0 C	Expenses EUR/per.*	COP at energy carrier t = 50^0 C	Expenses EUR/per.*
30	-15	2.73	342	1.96	476	1.56	598
30	-7	3.24	288	2.27	411	1.77	527
30	+2	4.36	214	2.81	332	2.17	430
30	+7	5.42	172	3.71	252	2.84	329
60	+10	5.62	332	3.83	487	2.94	635
Average expenses, EUR/month:		112		163		210	
Percentage:		100%		145%		187%	

Savings are generated due to a smaller ∆T between the outdoor t^0 and the t^0 of the energy carrier.

Heat source:
heat pump

Time period:
September – May:
180 days

Heating period in hours:
4320 hours

Price of electricity:
0,18 EUR/kWh

Heat loss: 80 W/m^2

Area: 180 m^2

COP – Coefficient of Performance – the generated heat capacity relative to the energy capacity consumed.

* Example from a project in North Germany

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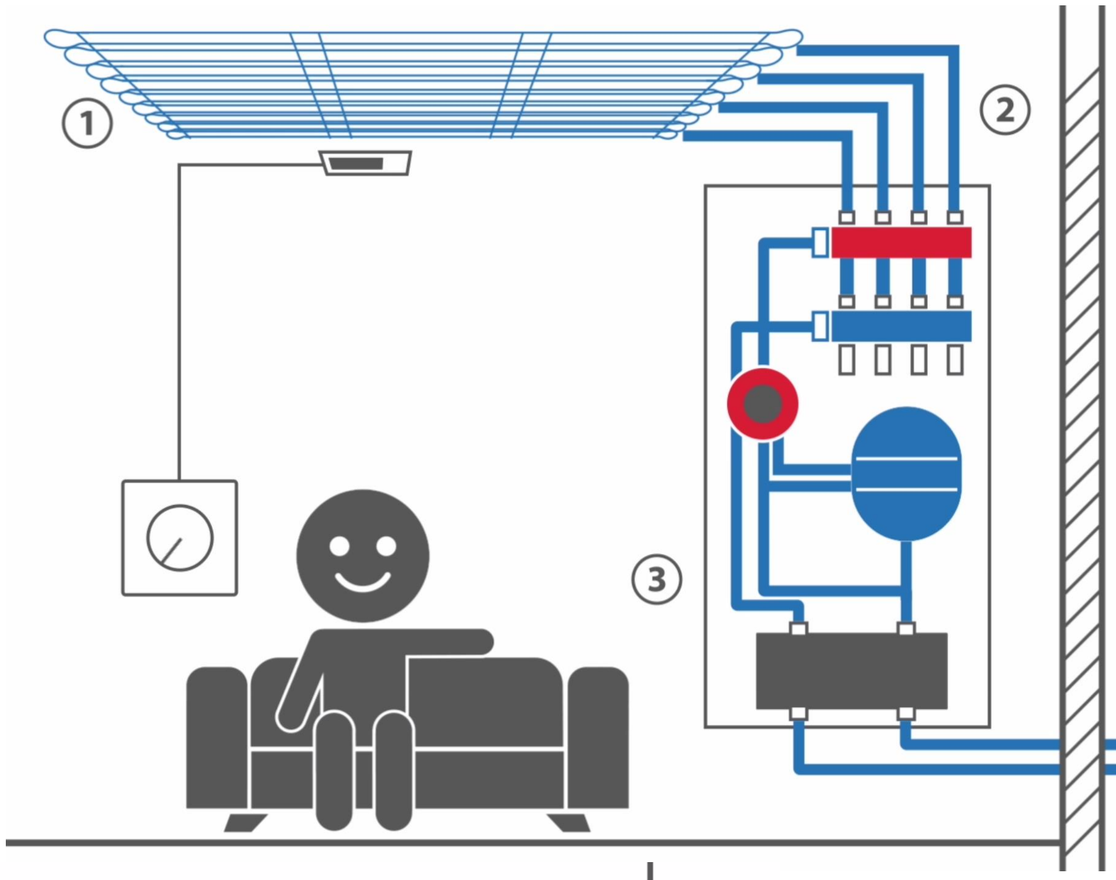
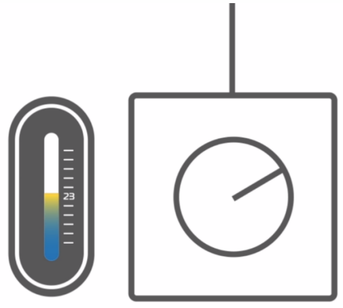
Efficient heating and cooling in one system



The water capillary mats system can be connected to various sources of heat/cold supply:

- Heat pump
- Gasboiler
- Pellet boiler
- Central heating
- Solar panels



Simply adjust to a comfortable temperature

and enjoy NATURE`S COMFORT

Installation of

Hydrokapillare capillary mats

Warm and cold
ceilings

Warm and soft cooling
floors

Cold and warm
walls

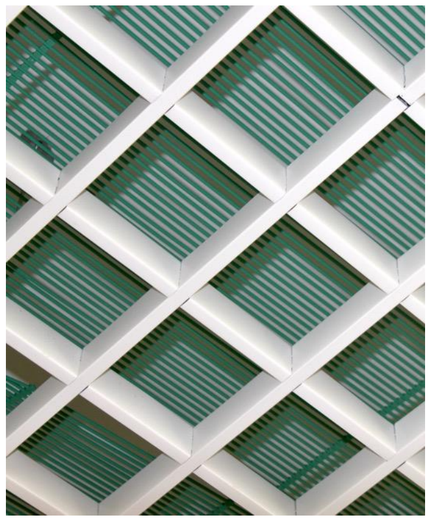
Hydrokapillare – a technology for any building (new or retrofit):

- Public and office buildings
- Residential, hotels, schools
- Historical buildings
- Industrial buildings
- Hospitals and clinics
- Cooling of PV panels, data centres and other processes,geothermal collectors









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“Based on the characteristics of the system, the amount of CO2 generated per year by the Hydrokapillare system is 3.25 kg CO2/m² less than that generated by classic under-floor heating system and 5.9 kg CO2/m² less than the radiator system.”

Ekodoma

Energy efficient

Ecological

No drafts

No noise

No condensation

Installation of the capillary system

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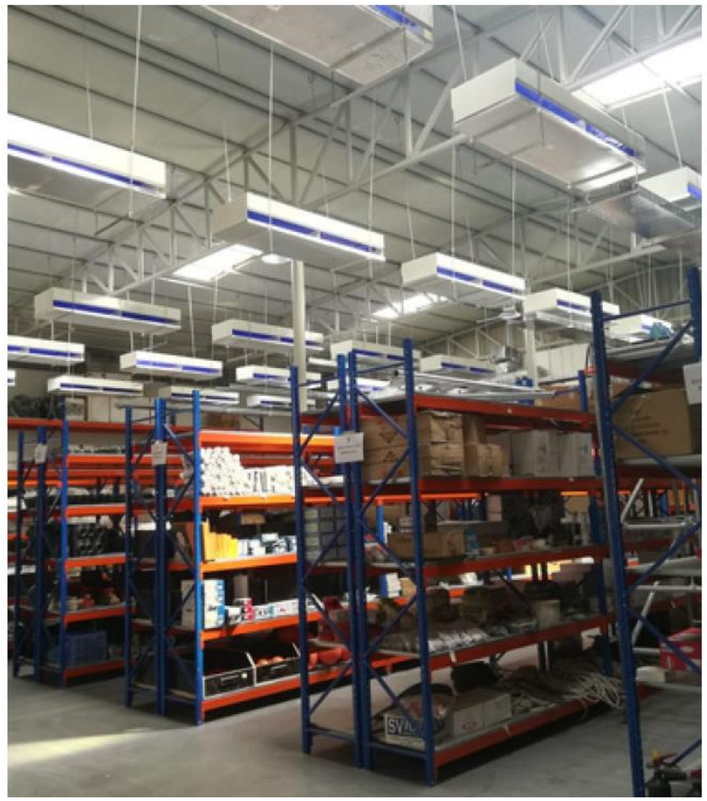
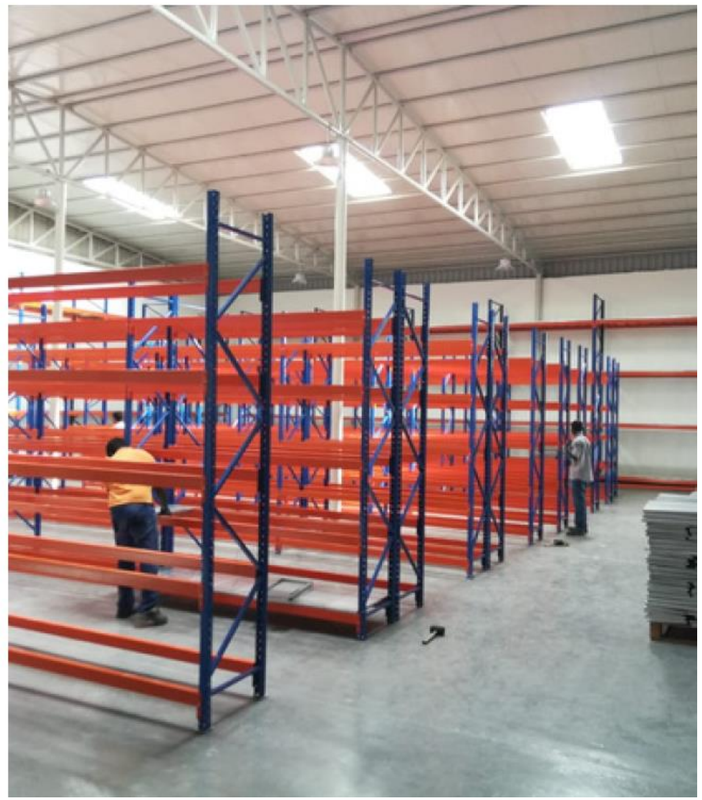
Analysis of energy consumption in cooling mode with the capillary system

- 500 m2 warehouse in Abu Dhabi, UAE
- Ceiling height: 8 m
- Radiant cooling solution with capillary mats that is designed to reach the required indoor temperature of +24°C
- 30 cooling units with the capillary mats within an aluminum frame were installed with 32 kW cooling capacity
- Cooling water temperature: +7-12°C
- Savings ~ 60% in comparison with the previous air cooling





Convective cooling and dehumidification with capillary system – for warehouses and industrial premises

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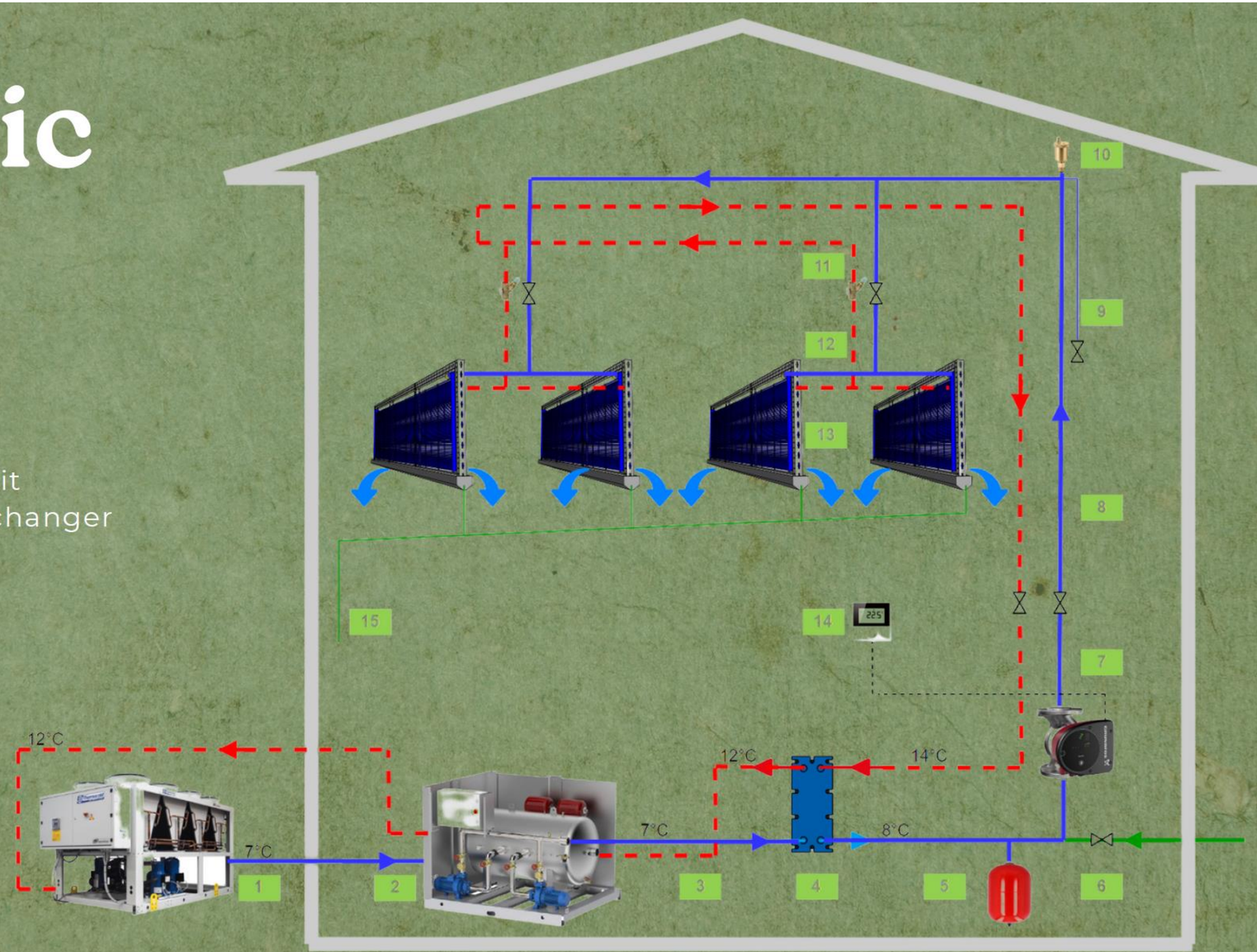
Schematic diagram

1. Chiller/Heat pump
2. Tank unit
3. Hydronic piping primary circuit
4. Stainless steel Plate Heat Exchanger
5. Expansion vessel
6. Fill set
7. Circulator pump
8. Polypropylene ppr-pipe
9. Drain valve
10. Air vent
11. Balancing valve
12. Flexible hoses
13. Climate baffle ceiling
14. Thermostat
15. PVC drain pipe system



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Different applications of hydrocapillary heat exchangers – in geothermal collectors, in greenhouses, for waste heat utilization

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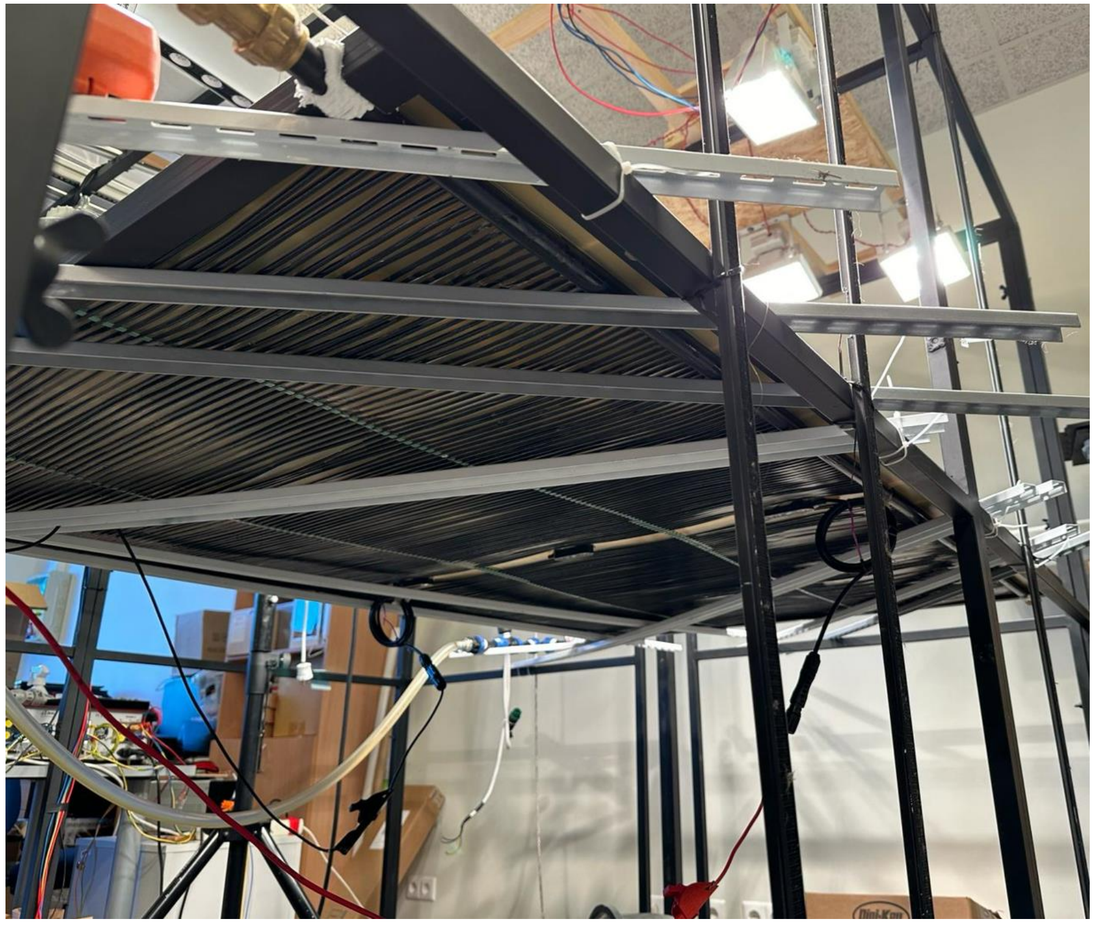
Hydrosolar panel with PE-RT capillary heat exchanger



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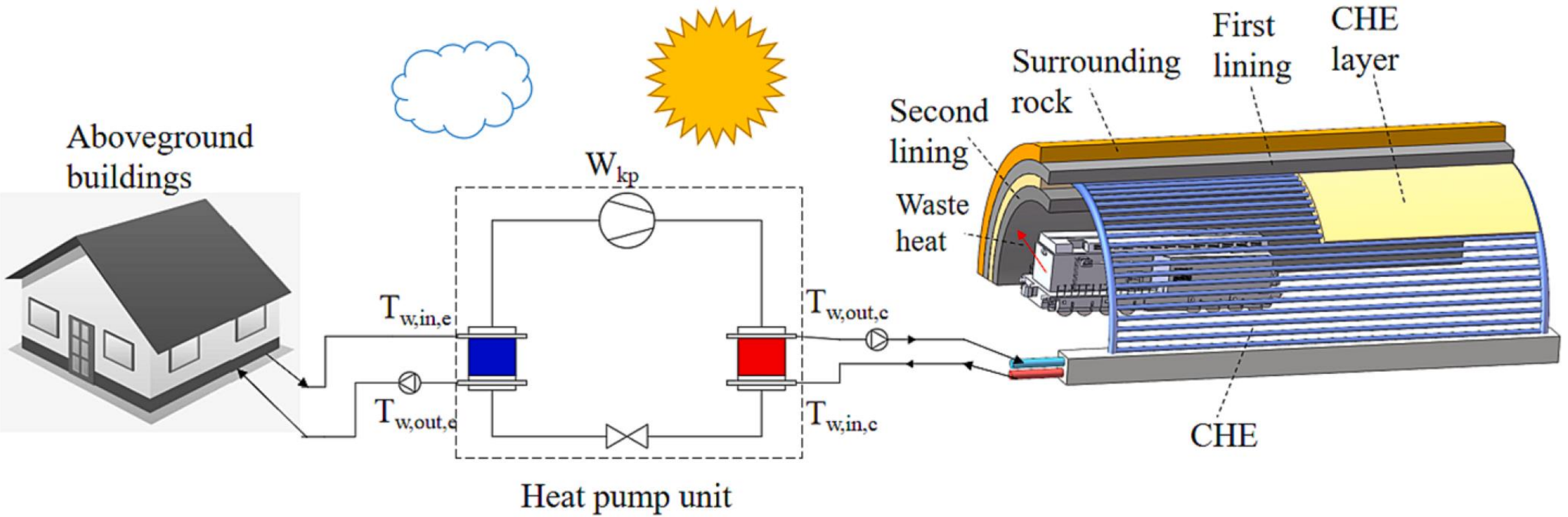
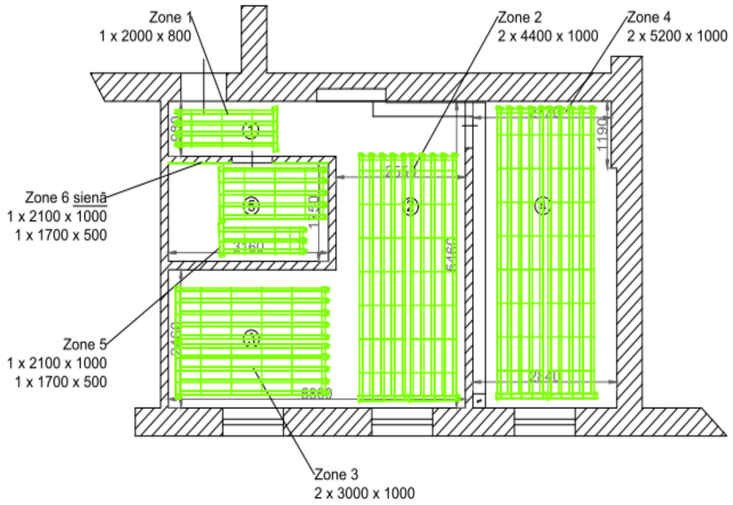
Using capillary heat exchangers for utilization of waste heat



Analysis of heating consumption

Hydrokapillare



- Art Nouveau style building, built in 1912, partially renovated in 2018-2019.
- Area of the apartment – 45.5 m^2; height of the room – 2.7 m.
- Building envelope - 60 cm brickwork, wooden windows with double glazing.
- Connection to the district heating network via a heat exchanger.
- Capillary mats are embedded in the floor of all rooms and in one bathroom wall.
- The temperature of the heat carrier in the capillaries is +25°C/+22°C for 3 heating seasons.
- Room temperature 21-22°C (depending on outside temperature).

5 loops of the capillary system

Heat exchanger

Analysis of heating consumption

Hydrokapillare

Measurements	
Sp1	26,5 °C
Sp2	45,0 °C
Sp3	26,0 °C

Parameters	
Emissivity	0.95
Refl. temp.	20 °C

Geolocation	
Compass	347° N

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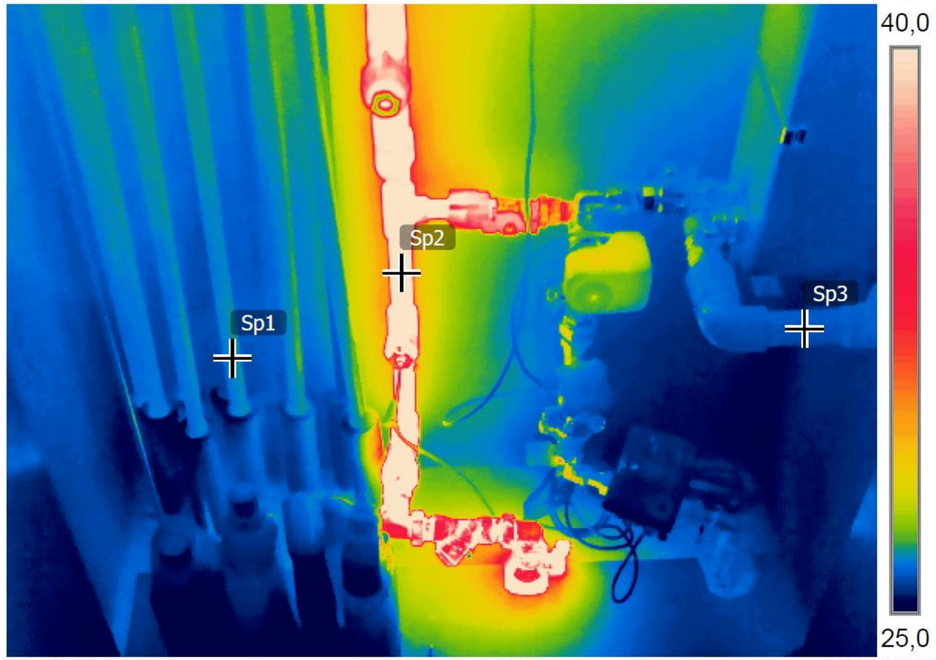

IR_1150.jpg FLIR T650 55905022

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Heat exchanger

Supply temperature from the district heating: +45°C
Supply temperature in the capillary system: +26.5°C
Outside air temperature: -5°C

Analysis of heating consumption

Hydrokapillare

Measurements	
Sp1	26,3 °C
Sp5	25,8 °C
Sp6	26,5 °C
Sp7	26,5 °C
Sp5	26,2 °C
Sp6	26,5 °C

Parameters	
Emissivity	0.95
Refl. temp.	20 °C

Geolocation	
Compass	321° NW

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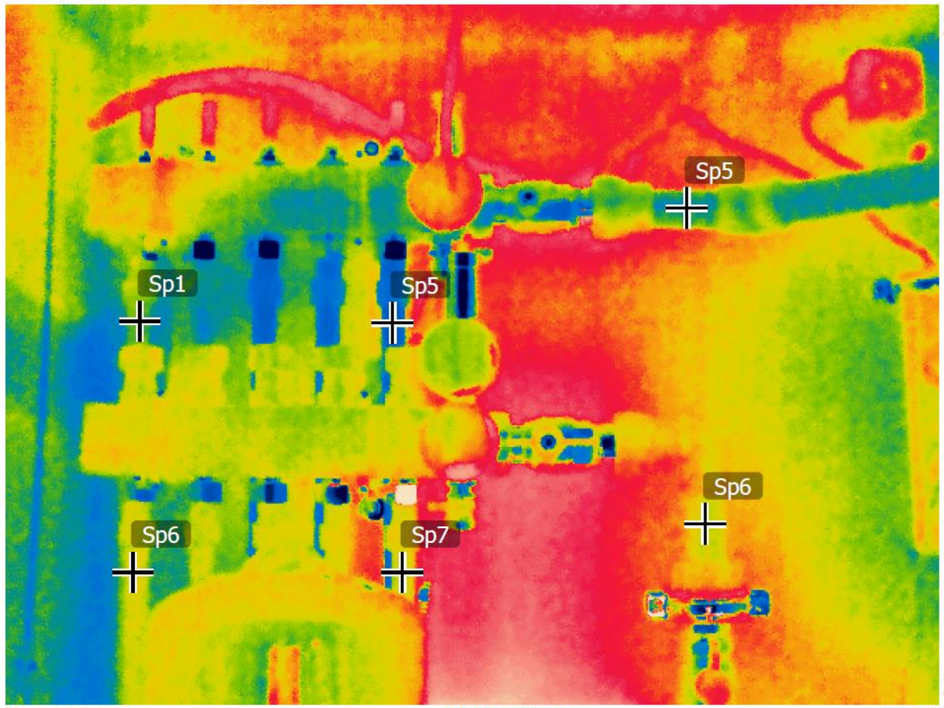

°C
28,0
24,0

IR_1146.jpg FLIR T650 55905022

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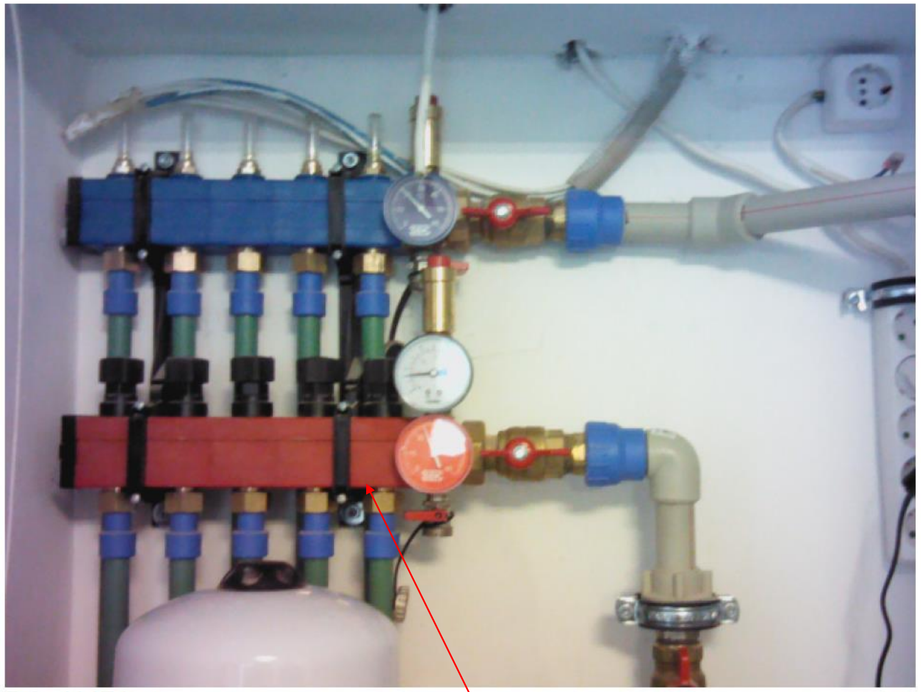

DC_1147.jpg

Manifold for the loops of capillary system

Supply temperature in the capillary system: +26.5°C
Outside air temperature: -5°C
Room temperature: +21°C

Analysis of heating consumption

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Measurements		
Bx1	Average	24,0 °C
Bx2	Average	24,5 °C
Sp1		23,7 °C

Parameters	
Emissivity	0.95
Refl. temp.	20 °C

Geolocation	
Compass	334° NW

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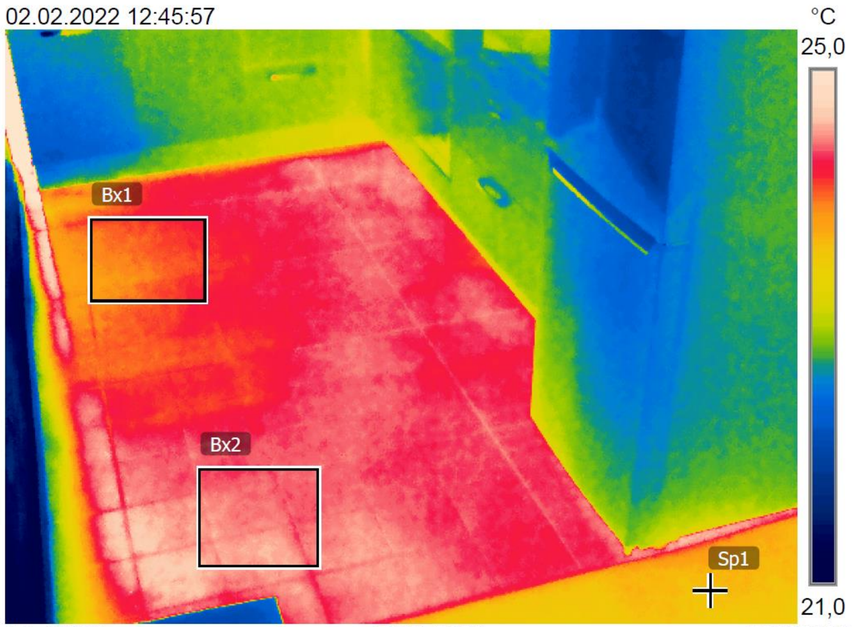

IR_1162.jpg FLIR T650 55905022

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DC_1163.jpg

Surface temperature (ceramic tiles and laminate): +23.7-24.5°C
Supply temperature in the capillary system: +26.5°C
Outside air temperature: -5°C

Analysis of heating consumption

Hydrokapillare

Measurements

Bx1	Max	26,2 °C
Sp1		24,0 °C
Sp2		22,8 °C

Parameters

Emissivity	0.95
Refl. temp.	20 °C

Geolocation

Compass	310° NW

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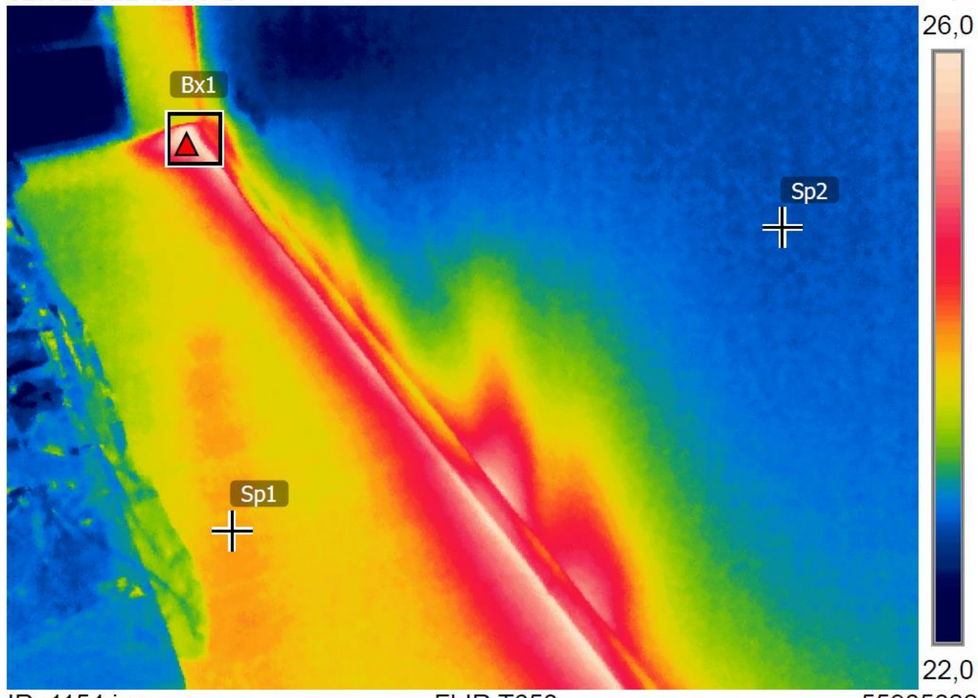

°C
26,0
22,0

IR_1154.jpg FLIR T650 55905022

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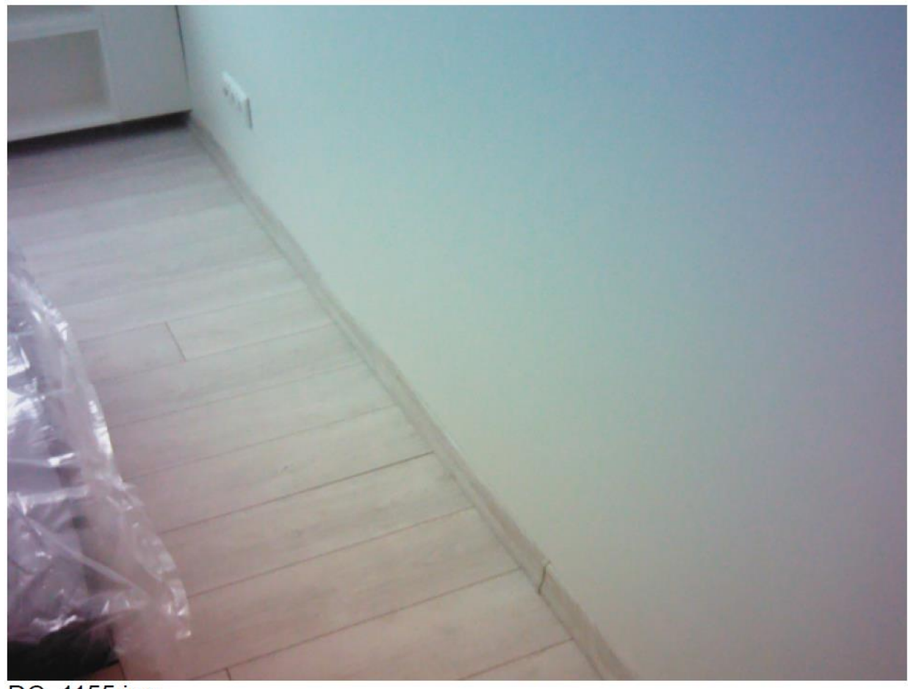

DC_1155.jpg

Floor surface temperature: +24°C; wall surface temperature: +22.8°C
Supply temperature in the capillary system: +26.5°C
Outside air temperature: -5°C

Planning of capillary system – models on MagiCad Cloud

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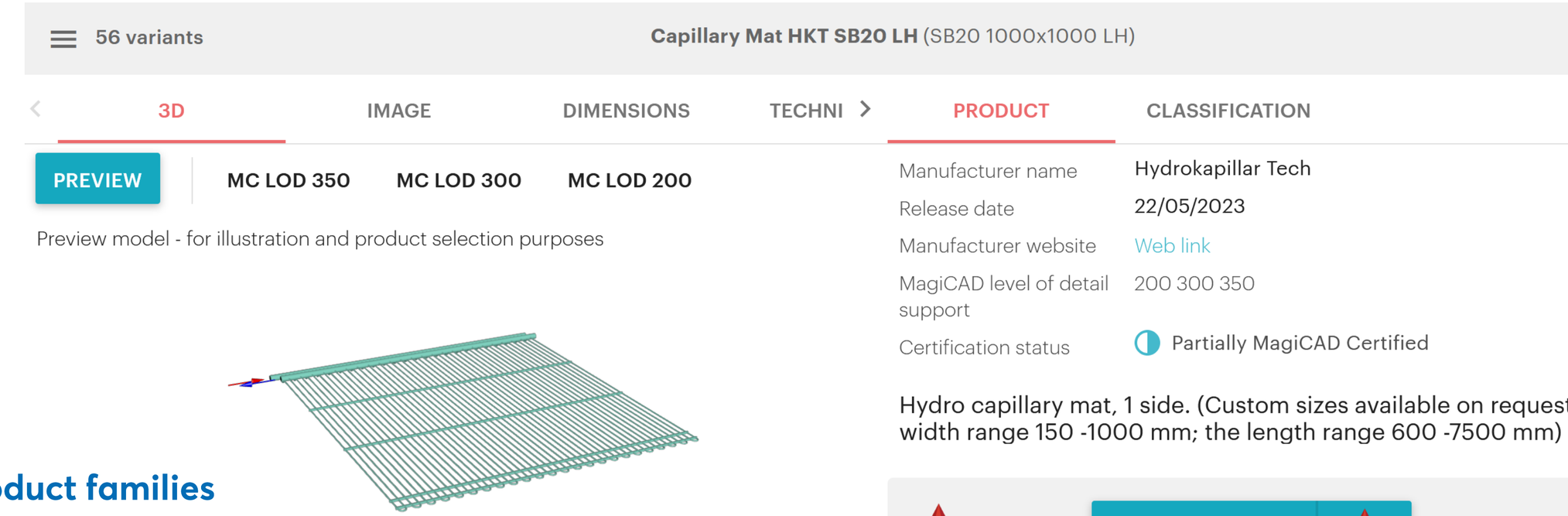

48 product families

6192 unique variants with hydraulic calculations

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