

## TECHNOLOGY FOR CONCENTRATION OF THERMAL WATER

Thermal water is nowadays used in spa bath as well as drinking cure. In the manufacture of medicinal natural salt from thermal water has to be maintained all the beneficial and healing effects of the original mineral spring. Company MemBrain s.r.o. has launched technology which enable concentration of thermal water by **electrodialysis process (ED)** after water softening.

The technology is able to reach salt concentration up to conductivity of 60 mS/cm (8x higher) without using chemicals.

### References – Carlsbad thermal water treatment

The technology consist of these main parts:

- 1) Tank for raw water
- 2) Pretreatment with safety filter and pressure station
- 3) Tank of eluate
- 4) Retention tank with filling pump
- 5) Tank for diluate No. 1 and No. 2
- 6) Electrodialysis unit
- 7) Tank for concentrate
- 8) Sanitation tank
- 9) Pipe lines



There are installed ion exchange columns for water softening. After this pretreatment follows salt concentration through the electrodialysis process. The technology is in operation 20 hours a day and produces 1,3 m<sup>3</sup> of salt solution with conductivity of 60 mS/cm (approximately 61 g/l), power consumption is 4.5 kWh and loss of salt around 15 %. The final product (salt) is obtained using evaporators.

### TECHNOLOGY PARAMETERS

Item	Parameter
Input water	20 m <sup>3</sup> /d, 7.0 mS/cm (around 5.2 g/l)
Requirements for quality of incoming water	Fe < 2 mg/l, Mn < 0.2 mg/l
Product	1.3 m <sup>3</sup> /d, 60 mS/cm, 79 kg/d
Power consumption	4.5k Wh/d
Waste	Diluate ED: 18.7 m <sup>3</sup> /d, 0.9 mS/cm (around 0.7 g/l) Eluate IEX: 1.1 m <sup>3</sup> /d, 80 mS/cm (around 56 g/l)