



Hot spring resort doubles its visitors by using the power of nature

Myoken Ishiharasou, Kagoshima Prefecture

Myoken Ishiharasou aims to manage their hot spring resort in a sustainable way that makes use of the power of the Myoken spring. By introducing Alfa Laval's heat exchangers, they could repurpose heat from the hot spring to other areas of the resort, while also improving their operational efficiency. What's more, the heat exchangers allow bathers to experience the spring water in its pure state, for which the resort has gained high praise across the industry and doubled the number of visitors.

Making the most of Myoken's natural gift

Japan, situated on volcanic terrain, has over 27,000 hot springs. The temperatures of the springs range between 25°C to over 100°C, which makes temperature control an important factor in providing high-quality hot spring experiences. The operator must set the temperature at levels that ensure safety and comfort for bathers, while keeping the precious minerals intact.

The Myoken spring is located in the volcanic region of Kirishima, Kagoshima Prefecture in southern Kyushu. Operating on its grounds is the hot spring resort Myoken Ishiharasou, who were looking for ways to improve their facilities.



Exterior view of Myoken Ishiharasou

"The Myoken spring's temperature is approximately 55°C. Previously, we adjusted the temperature by mixing the spring water with other water and storing it, but this approach didn't do justice to its natural quality," says Yoshimichi Nakazaki, the manager of Myoken Ishiharasou. "Since ancient times, Myoken has been renowned for its therapeutic qualities, and we wanted to make the most of this rich natural gift."

Another challenge that the hot spring resort faced was clogged pipes.

"Myoken is a bicarbonate spring with high carbon content, so if the water comes into contact with air during its flow, scaling is formed. This scaling clogs the pipes, and we had to spend hours a day cleaning them, so we wanted to improve the efficiency as well," Nakazaki explains.

Meeting multiple needs with a single solution

To address these issues, Alfa Laval's plate heat exchangers were introduced.

Alfa Laval's unique plate design minimizes pressure drop losses, while maximizing turbulence for efficient heat transfer. This allows for temperature differences down to 1°C. The optimized plate design minimizes fouling, extending service intervals and reducing time, chemicals, and water needed for cleaning.

Myoken Ishiharasou has seven sources where the hot spring water emerges. To preserve the natural state of the spring water, they installed one heat exchanger by each source. The heat exchangers adjust the temperature of the spring water and keep it from coming into contact with air. In addition, the size of each bath is designed to match the flow of water from the hot spring source, so there is no need for additional water or a storage tank.

The hot spring adjacent to the source.

A heat exchanger is installed right next to it.



Energy savings through heat reuse

"Furthermore, the heat exchangers have enabled us to reuse heat. The heated mountain water is transferred to the boiler to support heating and pre-wash procedures. This process aligns with Myoken Ishiharasou's aim to make the most out of natural resources for sustainable facility management," Nakazaki adds.

Reusing heat is an efficient method for saving energy. A rough estimate shows that by using the energy from the hot spring water to heat up the mountain water, instead of using a boiler, the facility reduces energy costs by approximately 30%.

Nakazaki says that Myoken Ishiharasou's initiatives have attracted attention from the hot spring industry, with increasing requests for site inspections from peers. The introduction of plate heat exchangers has not only led to improved customer satisfaction, but also established the facility as a frontrunner in the industry.

Less maintenance work, more guests

The introduction of the heat exchangers has significantly reduced the time and effort needed for cleaning clogged pipes, as well as the associated downtime, resulting in improved operational efficiency. Nakazaki talks about the results after the installation:

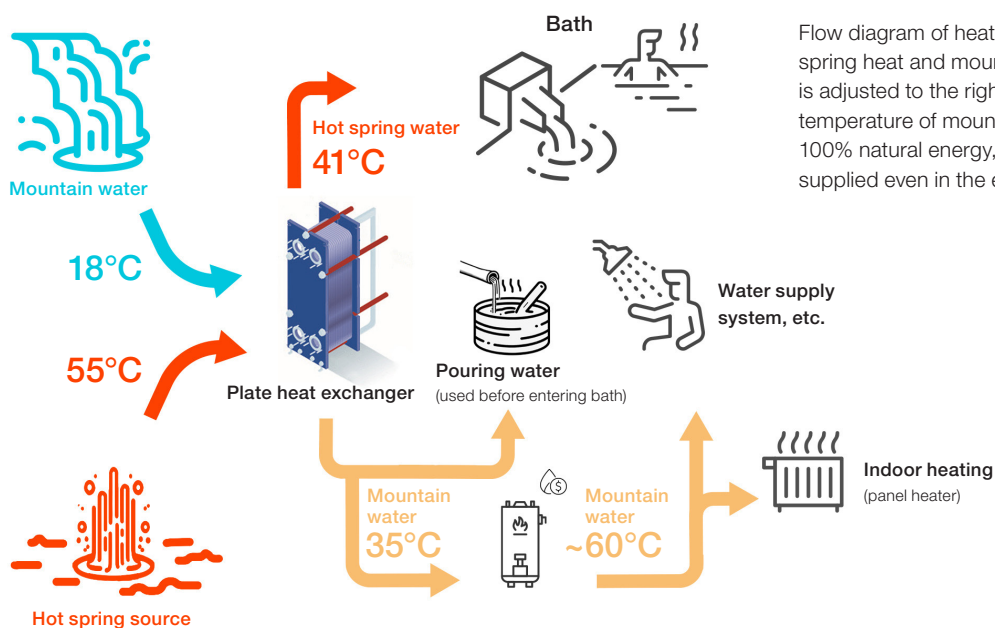
"After introducing Alfa Laval's plate heat exchangers, pipe clogging caused by oxidation has been eliminated. This has drastically reduced the daily time spent on cleaning, as well as the costs and burden on staff, allowing us to focus more on other important tasks. Despite being installed next to the river, where it's susceptible to natural influences like rising water levels, we've had no downtime due to equipment issues and are pleased with its robustness. After installation, our resort has received high praise within the industry for the purity of the hot spring water, raising our national profile and doubling our number of visitors."

Future utilization of heat exchangers as a frontrunner

By introducing Alfa Laval's heat exchangers, Myoken Ishiharasou has improved the purity of their spring water, increased operational efficiency, doubled visitor numbers, and reduced energy costs.

As a frontrunner in hot spring management in harmony with nature, Nakazaki envisions further use of plate heat exchangers in hot spring facilities:

"In the future, we'd like to install heat exchangers in each guest room, allowing guests to experience the benefit of the heat exchanger firsthand. Utilizing plate heat exchangers expands our facility's potential. Although many facilities in the industry are still unfamiliar with heat exchangers, I hope they will become widely used to maintain the quality of hot springs across Japan."



Flow diagram of heat transfer between hot spring heat and mountain water. The hot spring is adjusted to the right temperature using the temperature of mountain water. Powered by 100% natural energy, it can continue to be supplied even in the event of a power outage.

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