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Feature

Sonic Landscape in Japan

## ONSEN





# ONSEN

温泉

## The uncommon relaxation the hot springs provide

Chemicals and minerals in onsen can be therapeutic

Geological research suggests that in Beppu, Oita Prefecture, which is one of the most well-known onsen resorts in the country, hot water was springing from the ground as far back as around 50,000 years ago. Digs from Stone Age site have yielded evidence of people using onsen, meaning that onsen have enriched the lives of the Japanese people for several thousands of years.

Folklore abounds at older onsen resorts telling of people discovering springs and their effects after witnessing deer and herons bathing in the hot water and tending to their wounds. There are also numerous legends of high-ranking Buddhist priests either discovering them or striking their walking staffs into the ground, causing onsen to spring up and flow. This underscores the fact that, with their plentifully

【poka poka】 ～ポカポカ

*There are seven volcanic belts that traverse the islands of Japan. Many of the country's volcanoes remain active. When they erupt, volcano can pose a threat to people's lives and livelihoods, but living around volcanoes does have its benefits, one of them being the presence of hot springs, or onsen in Japanese. There are said to be over 3,000 onsen resorts in Japan, spanning from the island of Hokkaido in the north to the islands of Okinawa in the south. Onsen are basically springs of water heated by magma. Bathing in the hot water, which often contains chemicals and minerals that originate in volcanic gases, is said to improve blood flow, relieve muscle tension, and help treat certain illnesses and injuries. There is a mimetic phrase used in Japanese to describe the feeling of being warmed to the very core of your body... poka poka. Every year in Japan 100 million people bathe in onsen. For most Japanese, the time spent relaxing and experiencing that poka poka feeling is a very precious thing.*

flowing water—water that often exhibit distinctive colors and odors—onsen were thought of as mystical phenomena.

One would be hard pressed to find anywhere else in the world where the people enjoy bathing as much Japan. It is common to take baths daily, and many people are fond of taking long, hot baths. The practice prevalent in Japan of soak-

ing in bathtubs is sometimes contrasted with customs in Western countries, where showers have become more common. The bath is not just a way to cleanse the body of the day's sweat and dirt, it is also a way to relax, both physically and mentally.

Given the Japanese love of bathing, it is easy to see why onsen are truly spe-

cial places. Because of the chemicals and minerals present in the hot spring water, one warms up more quickly in an onsen bath than in an ordinary bath drawn from hot tap water. Many of those chemicals and minerals are beneficial to people with injuries and illnesses. In fact, before medicine was as developed as it is today, onsen were a common means of treatment and recuperation. To this day, many people stay for extended periods at onsen resorts to try out the healing and restorative powers of the springs. Onsen are categorized by spring type, which is determined by the chemicals and minerals present. The spring type is displayed in the bathing rooms.

### Enjoying onsen together with scenery of the changing seasons

A lot of onsen bathing facilities are centrally located so that people can go for a bath and be back the same day, but most onsen resorts that provide overnight accommodations are in idyllic mountain locations or in popular beach resort areas. Going to an onsen resort means enjoying uncommon environments. Most bathing rooms at onsen inns are designed so that guests can enjoy the view as well, which may be of mountains, a river, the ocean, or gardens. Also common are open-air baths. Guests can enjoy long baths while taking in views of cherry blossoms, new spring leaves, colorful autumn leaves, snow, and other sights that set apart the seasons.

Here is what a typical day on an onsen trip looks like. During the day people will go around to see popular sights in the area, and in the evening they check in to their inn. They first take a long bath at the inn's onsen. Afterwards they gather for dinner and enjoy dishes made with locally grown seasonal foods. After dinner, guests change into *yukata* (a kind of simple *kimono*) provided by the inn and go on walks (shown right), or perhaps take another bath. In the morning they take another onsen bath to wake themselves up, and then eat

breakfast. Guests who stay for more than one night often spend their time at the inn napping, bathing, and napping again.

In addition to their therapeutic and warming properties, onsen offer guests the kind of tranquility that is hard to come by in day-to-day life. This is the reason Japanese people sometimes feel the sudden desire to go to onsen.

### Typical spring types

#### Simple hot springs

"Clear" hot springs are colorless, clear, odorless and tasteless. They have few chemicals and minerals often present in onsen, but on the other hand they are easy on the skin because of their lack of irritants, making them ideal for children and the elderly. Alkaline springs have excellent skin beautifying properties.

- **Mainly good for:** Rheumatic disorders, cuts
- **Major onsen resorts:** Gero Onsen (Gifu Prefecture) Yufuin Onsen (Oita Prefecture)

#### Chloride springs

Chloride springs contain salt, so the water tastes salty. The salt content attaches to the skin and keeps the body from sweating, which helps the body's core retain heat.

- **Mainly good for:** Cuts, burns, neuralgia, chronic gynecological disorders
- **Major onsen resorts:** Atami Onsen (Shizuoka Prefecture) Shima Onsen (Gunma Prefecture)

#### Carbon dioxide springs

The water in these springs contains dissolved carbon dioxide gas, so when you get into these baths, bubbles attach to the skin. The carbon dioxide gas expands the capillaries and lowers blood pressure, hence their nickname "hot springs for the heart".

- **Mainly good for:** Hypertension, strokes, arteriosclerosis
- **Major onsen resorts:** Shikanoyu (Tochigi Prefecture) Tobira Onsen (Nagano Prefecture)



#### Acidic springs

The water in these springs is fairly acidic, giving these springs good antibacterial properties. They are effective in treating chronic skin diseases, but because the water can irritate the skin, these springs can cause sores on the skin. The elderly and people with naturally dry skin should avoid these springs.

- **Mainly good for:** Chronic skin diseases, eczema
- **Major onsen resorts:** Kusatsu Onsen (Gunma Prefecture) Tamagawa Onsen (Akita Prefecture)

#### Sulfurous springs

These springs are recognizable because of the odor from the hydrogen sulfide gas, which is the smell of rotten boiled eggs. They are effective in treating skin diseases, but because the water can irritate the skin, people with naturally dry skin should avoid them. Be careful of getting into these springs wearing anything made of silver, as the water will quickly oxidize it.

- **Mainly good for:** Chronic skin diseases, diabetes, hypertension, arteriosclerosis
- **Major onsen resorts:** Manza Onsen (Gunma Prefecture) Kurokawa Onsen (Kumamoto Prefecture)

#### Sulfate springs

Sulfate springs can be further divided into three types: springs with high calcium content, which has a calming effect; springs high in magnesium, which is good for healing external injuries, and those high in sodium, which helps combat hypertension.

- **Mainly good for:** Hypertension, arteriosclerosis, strokes
- **Major onsen resorts:** Tamatsukuri Onsen (Shimane Prefecture) Sagasawa Onsen (Shizuoka Prefecture)

#### Ferruginous springs

High in iron content, water from these springs is clear and colorless when it first leaves the ground, but it quickly oxidizes and turns brown or reddish brown in color. These springs are recommended for women who are slightly anemic.

- **Mainly good for:** Gastrointestinal disorders, menstrual disorders
- **Major onsen resorts:** Arima Onsen (Hyogo Prefecture) Yokoyakyo Onsen (Nagano Prefecture)

Beppu Onsen, which is referred to in the text, has about 3,000 separate springs. It has springs of nearly all distinct spring types.



### How to bathe in an onsen

1. You go into the changing room, remove all of your clothes, take a face towel, and enter the bathing room. Be sure to drink plenty of fluids before taking a bath. Drinking alcohol in baths is strictly prohibited.
2. Before you get into the bath water, take a pail, scoop up some hot water from the bath tub with it and rinse yourself off well. Rinse off from the bottom up, beginning with your feet, stomach, chest, and shoulders. This is to wash off dirt and to acclimate yourself to the temperature and spring type.

3. Gently halfway get into the bath at first (submerging yourself just to the point below where your heart is) so as not to expose your body to sudden changes in water pressure. Once your body has gotten used to the water, you can get all the way into the bath. Do not put your towel into the bath water.

4. Get out of the bath and rest as needed to keep yourself from overheating. After soaking for a bit, get out of the bath and wash yourself (outside the tub). It is okay to wash yourself before getting in the bath to begin with, but soaking in some types of spring water makes it easier to scrub off dead skin and cleanse your pores more thoroughly. Note: At some facilities you are asked to wash thoroughly before getting into the bath.

5. You shouldn't rinse off with a shower after finishing your bath. This is because washing away the chemicals and minerals of the spring water can reduce the beneficial effects they have after the bath. Wipe down with a cloth to dry yourself off in the bathing room before returning to the changing room.



# PT. Pertamina



**PT. Pertamina, which provides a reliable supply of energy for Indonesia's industries and everyday life, revamped its aging DCS while the plant was shut down for routine maintenance. This method enabled the company to modernize the system while minimizing production loss during system renewal. Going forward, the company is planning to implement energy-saving measures.**

**The problem of renewing a DCS in operation for 20 years**

PT. Pertamina was established in 1957 by the Indonesian government to provide stable supplies of oil and gas. In November 2001 the company was privatized with the aim to more effectively utilize energy resources; today, it has grown into Indonesia's largest oil and gas enterprise. Pertamina owns oil and natural gas reserves across Indonesia and handles a vast array of oil-related products; including the production of various fuels from gasoline and light and crude oils through to liquefied natural gas and jet fuel, and the production of non-fuel products such as asphalt and coke, and petrochemical products as benzene and paraxylene. Already well known throughout Indonesia, Pertamina is gaining recognition overseas. And in a bid to become

a leading enterprise representing Southeast Asia, the company is meeting the challenge of changing mindsets internally to tackle cost reduction, environmental measures, and other initiatives.

Pertamina currently operates six oil refineries, of which Refinery Unit IV at Cilacap is positioned as a strategically important production base. It boasts a production capacity of 348,000 barrels/day, and produces fuels such as gasoline, avtur, diesel, and LPG, paraxylene, lube base oil, and sulfur.

Mr. Sundhoro R said: "Cilacap's Refinery Unit IV consists of two oil refining plants that began operation in 1971 and 1983, and a paraxylene plant that started operation in 1990. Our challenge was updating the existing DCS\*1 used for operation and management of the paraxylene plant. So we asked several

vendors to draw up proposals for this project."

**System renewal during planned maintenance realized a changeover in minimum time**

Proposals for modernizing the aging system of the paraxylene plant were solicited from four vendors, with the condition that the renewal be completed in a short time. To mitigate the risk of production loss due to a delay in construction, Pertamina imposed a strict requirement for the vendor to pay a penalty should construction fall behind schedule. After carefully reviewing all vendors' plans, the company selected Azbil Corporation and its local affiliate, PT. Azbil Berca Indonesia (ABID), as partners for this project.

Mr. Ibnu Zaenal said: "Consumption of paraxylene continues to expand in Indonesia and surrounding areas



The Harmonas-DEO installed in the paraxylene plant.

such as Taiwan, so as a manufacturer we need to establish a framework for stable supply. It's our responsibility to minimize plant downtime for renewal of the system."

Azbil and ABID proposed revamping the DCS during the plant's planned maintenance\*2. Specifically, this meant performing a hot change over (HCO), or renewing part of the system while the plant remained operational; and a cold change over (CCO), or replacing the system during the plant's scheduled downtime for planned maintenance. The changeover required two days, but since it was carried out during planned maintenance while a section of the plant was shut down anyway, actual plant downtime for replacing the system was zero.

Mr. Dadi Sugiana said: "This method of combining HCO and CCO was in fact adopted in the late 1990's when the DCS was installed at Cilacap's two oil refining plants, and we were able to significantly reduce plant downtime compared with a conventional system changeover. Our partner at the time was Azbil. So we considered its track record, including its engineering capability to respond flexibly to unforeseen situations, and decided to award this project to Azbil."

**Raising operational efficiency is future issue of business management**

To shorten the switchover time and cut the renewal cost, any equipment such as sensors, valves, and terminal panels already installed and in good working condition were left in place, and only the DCS was re-

newed. Azbil's Harmonas-DEO™ monitoring and control system was introduced as the new DCS. It offers similar ease-of-use and is achieving the same operability and productivity after system switchover.

Mr. Erfan Gafar said: "The DCS was replaced while part of the plant was shut down for planned maintenance. So the timing of replacing the DCS would change depending on how the maintenance work progressed. Despite repeated schedule changes, the switchover was completed as originally planned without delay."

Following a pledge by Indonesian President Yudhoyono to reduce the nation's greenhouse gas emissions by 18% by 2025, Indonesia's key industries are now expected to implement measures to reduce carbon emissions. In response, Pertamina is taking initiatives to lower both carbon emissions and energy costs.

Mr. Imam Udiantoro said: "One of the targets in our performance contract with the Indonesian government is optimizing energy usage at the paraxylene plant. And we are aiming to achieve this by optimizing furnace operation and reducing heat source loss."

Mr. Dadi Sugiana said: "At Pertamina, all seven refineries are aiming to place in the top 25 percent for energy efficiency based on the Solomon Associates Energy Intensity Index, a benchmarking method for the oil refining sector. Among them, our Cilacap refinery has the highest ranking, in the top 30 percent worldwide, and we plan on improving it further. We look forward to continued support from the azbil Group, which is regarded highly for its control technologies."

**PT. Pertamina**



**Head office**

Jl. Medan Merdeka Timur 1A, Jakarta, Indonesia

**Established**

December 1957

**Business scope**

Production and sales of oil, gas, and processed products; geothermal energy business including geothermal power generation; and production of liquefied natural gas

**Refinery Unit IV, Cilacap (Paraxylene refineries)**

**Location**

Jl. Letjen Haryono MT. 77 Lomanis, Cilacap Jawa Tengah, Indonesia

**Start of operation**

December 1990



Mr. Dadi Sugiana  
Engineering & Development  
Manager

Mr. Erfan Gafar  
Deputy Section Head  
Project Engineering



Mr. Sundhoro R  
Facility Engineering



Mr. Ibnu Zaenal  
Section Head  
Paraxylene



Mr. Imam Udiantoro  
Deputy Section Head  
Paraxylene

**glossary**

**\*1 ▶ DCS (Distributed Control System)**

A system that monitors and controls the manufacturing process or production facilities in plants and factories. To achieve even distribution of load, the DCS distributes the functions of each device over a network, resulting in safety and excellent maintainability.

**\*2 ▶ Planned Maintenance**

Large-scale, scheduled inspection and repair work routinely carried out at production facilities and plants.

# Azbil Kimmon meets needs of local infrastructure market by entering joint venture with Taiwanese company

Azbil Kimmon Co., Ltd., a part of the azbil Group's expanding Life Automation (LA) business, in April 2011 formed Azbil Kimmon Technology Corporation together with Yung Loong Engineering Corporation in Taiwan. In consequence of a revision of the laws in Taiwan, a rapid rise in demand for intelligent gas meters is anticipated. The newly formed company is preparing a system for reliably and rapidly supplying these products and providing maintenance services for them.

## Responding to higher demand for intelligent gas meters, thanks to new legislation

Following upon its Building Automation and Advanced Automation businesses, in 2004 the azbil Group launched a Life Automation (LA) business to directly help people live active lives. Since then, the Group has been working to expand this business.

Within the azbil Group, Azbil Kimmon Co., Ltd. plays a key role in the LA business. This company, long known as Kimmon Manufacturing Co., Ltd., has been providing customers with measuring instruments such as gas meters and water meters for many years. In December 2005, Azbil Corporation (formerly Yamatake Corporation) acquired equity participation in the company. In April 2008, the company was made a wholly owned subsidiary of Azbil Corporation with the aim of boosting the azbil Group's LA business. Since then, Azbil Kimmon has been growing as Japan's leading manufacturer of gas and water meters.

In April 2011, to enhance the overseas LA business, Azbil Kimmon established the joint venture company named Azbil Kimmon Technology Corporation in partnership with Yung Loong Engineering Corporation. In Tai-



Azbil Kimmon Technology Corporation was formed in Miaoli County, Taiwan.

wan, Japanese domestic gas meters have been widespread since the 1970s, and many such meters manufactured by Azbil Kimmon have been sold through local dealers. Yung Loong Engineering, the partner of Azbil Kimmon, is a leading gas meter company having business relationships with all 25 gas companies in Taiwan. It is also well known because it is certified under Taiwan's measurement laws for autonomous calibration of gas meters.

Behind the establishment of the new company is the fact that in January 2011, a law came into effect in Taiwan

that requires all household gas meters to have safety features like automatic shutdown and a communications-capable microcomputer. The new company has been established to rapidly handle the expected increased demand for intelligent gas meters in Taiwan in the future.

Also important are the following factors: the quality of Japanese products is rated very highly by people in Taiwan, and there has already been a strong demand for gas meters featuring Japanese technology and know-how. Meeting such needs is another important



- 1 For maintenance of Type N meters, first a large amount of zinc shot is blown onto the meters to remove the paint. The device used for this procedure was brought from Azbil Kimmon in Japan.
- 2 Meters, now without paint, are disassembled, checked, repaired, reassembled, and repainted.
- 3 After maintenance, a calibrator is used to recalibrate the meters.
- 4 President Han-Hsiang Lu (right, on loan from Yung Loong Engineering) and Quality Manager Naoki Okazaki (on loan from Azbil Kimmon)

mission for Azbil Kimmon Technology.

## Azbil Kimmon's tangible and intangible know-how, accumulated through long experience in Japan, comes to the Taiwanese market

Azbil Kimmon Technology was established at a site of Yung Loong Engineering's 8000 m<sup>2</sup> factory in Miaoli County, Taiwan. In September 2011, 5 months after establishment, Azbil Kimmon Technology began full-fledged operation.

The Azbil Kimmon Technology factory is the sixth Azbil Kimmon gas meter factory (the other five being located in Japan) and can manufacture and maintain over 120,000 household and industrial gas meters per year. In addition, Azbil Kimmon Technology can calibrate its products on-site before shipment, which gives the company an important advantage in rapid production and repair services.

Azbil Kimmon Technology will be developing its business based on "Japan

quality," using the know-how accumulated in Japan by Azbil Kimmon. For this reason, various types of equipment needed for production have been brought from Japan.

The company's production and sales will focus on Type N (high performance membrane) gas meters. In the past, Yung Loong Engineering has sold and maintained various kinds of meters, including Type N. When Azbil Kimmon Technology was established, Yung Loong Engineering handed off its maintenance work for Type N meters to Azbil Kimmon Technology. Accordingly, the establishment of Azbil Kimmon Technology appears to be quite significant for Yung Loong Engineering.

## Aggressively entering infrastructure markets worldwide to develop the azbil Group's global LA business

Today Azbil Kimmon Technology has a total of 20 employees who handle the work of

production, quality control, financial affairs, etc. Most of the production staff members have received technical training from Azbil Kimmon in Japan.

Since the September 2011 start-up, Azbil Kimmon Technology has already received numerous orders, including orders for repair and new meters. The company's immediate goal is to produce and maintain a total of 100,000 gas meters as soon as possible.

The azbil Group has set the strengthening of overseas business as a key policy for the achievement of its medium-term plan that began in 2010. Promoting the LA business in the global market, focusing on aggressive entry into Asian infrastructure markets, the azbil Group continuously strives to contribute to people's lives based on its the philosophy of "human-centered automation."

## ACTIVAL VALVES and the VALVE SELECTOR PROGRAM

### ACTIVAL

#### Compact Control Valves Especially Designed for HVAC Applications

Azbil Corporation has a complete lineup of motorized control valves designed especially for HVAC control applications of all types, including air handling units, fan coil units, and

chiller plants. Its equal percentage characteristics make it suitable for AHU water coil controls.

ACTIVAL PLUS, the advanced control valve with water flow measure-

ment and control functions, provides more added value than regular control valves.



### VALVE SELECTOR

#### Valve Model Selection Software

You can determine the most suitable model from among these highly sophisticated control valves by using VALVE SELECTOR, the valve model selection software available from Azbil Corporation.

This software allows you to easily select the most appropriate model for your HVAC application, whether it is AHU, FCU, chiller plant, or something else. Valve models can be searched not only by specifications, but also by HVAC application.

VALVE SELECTOR can make painful valve model selection work fun. Please give this useful software a try.



For any inquiries, please contact: [team\\_valveselector@azbil.com](mailto:team_valveselector@azbil.com).



<http://www.azbil.com/>

Yamatake Corporation changed its name to Azbil Corporation on April 1, 2012.

#### Japan

- Azbil Corporation • Azbil Trading Co., Ltd.
- Azbil Yamatake Friendly Co., Ltd.
- Azbil Care & Support Co., Ltd. • Azbil SecurityFriday Co., Ltd.
- Azbil Kimmon Co., Ltd.
- Azbil Kyoto Co., Ltd. • Azbil RoyalControls Co., Ltd.
- Azbil Taishin Co., Ltd. • Tem-tech Lab.

#### Overseas

- Azbil Korea Co., Ltd. • Azbil Taiwan Co., Ltd.
- Azbil Kimmon Technology Corporation
- Azbil Vietnam Co., Ltd. • Azbil India Pvt. Ltd.
- Azbil (Thailand) Co., Ltd. • Azbil Philippines Corporation
- Azbil Malaysia Sdn. Bhd. • Azbil Singapore Pte. Ltd.
- PT. Azbil Berca Indonesia • Azbil Control Instruments (Dalian) Co., Ltd.
- Azbil Information Technology Center (Dalian) Co., Ltd.
- Yamatake Environmental Control Technology (Beijing) Co., Ltd.
- Beijing YTYH Intelli-Technology Co., Ltd.
- Azbil Control Solutions (Shanghai) Co., Ltd.
- Shanghai Azbil Automation Co., Ltd. • Azbil Hong Kong Limited
- Yamatake Automation Products (Shanghai) Co., Ltd.
- Azbil North America, Inc. • Azbil BioVigilant, Inc.
- Azbil Brazil Limited • Azbil Europe NV

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