

## Volcanic water

**The state-owned mineral water producer Jeju on the island of the same name off the Korean coast owns South Korea's most successful brand of water. Jeju uses a new Krones high-speed bottling line rated at 54,000 PET containers an hour.**

**T**he market for packaged water in South Korea is very young and growing fast. It was not until 1995 that South Korean legislators for the first time permitted water to be extracted and bottled on an industrial scale. And that is what JPDC (Jeju Special Self-Governing Provincial Development Corporation) did, a company owned by the independent provincial government of Jeju Island in the south of Korea.

In March 1998, the facility went into operation with two PET lines. JPDC was South Korea's 72nd registered mineral water company. Only three months after sales began, the Jeju Samdasoo brand had taken over market leadership in South Korea's water market, and has kept it ever since. In the very first year, Jeju Samdasoo was already filling 70 million litres, ten years later it was 313 million litres, while today it is 670 million litres, nearly ten times the original figure. In 2016, Jeju Samdasoo aims to sell more than a billion litres of water for the first time. Since the year 2000, Jeju Samdasoo has retained an average market share of 32% in South Korea's PET market.

### Rainfall-blessed

For many reasons, Jeju Island is predestined to be a source of natural water. The island (population: approximately 600,000) is of volcanic origin. During the course of the past two million years, there have been repeated volcanic eruptions, so that dozens of lava layers, averaging three to five metres in thickness, have been formed. These constitute a natural filter for rainwater, which falls abundantly on the island. The average precipitation totals more than 2,000 millimetres a year, three times as much as on the mainland. Thanks to the porosity of the lava rock, almost half of this soaks into the soil and becomes groundwater. On the Korean mainland, by comparison, the equivalent figure is only about 18%. The groundwater that JPDC extracts from a depth of 420 metres in several wells is 18 years old on average. Only about 0.1% of the groundwater is used for bottling. This natural volcanic water is exceptionally soft, slightly alkaline, and contains relatively large amounts of micro-components beneficial to the human organism, like vanadium and silicon.

### High-speed, high-tech line

When Jeju Samdasoo passed the 300-million-litre mark in 2007, it was time for a third PET bottling line, which went into operation in 2008. The same kind of situation occurred again in 2011, with capacity utilisation reaching its now 600-million-litre limit. Once again, a new bottling line was required. This time, JPDC wanted right from the start to use a high-speed, high-tech line. This new line went into operation at the end of 2012 – JPDC's only high-speed line, rated at 54,000 containers an hour. It fills 0.5-litre and 2.0-litre containers at a speed of 44,800 containers an hour.

JPDC also installed in-house preform production equipment, featuring a Netstal PETLine. The PET-resin preforms produced here are then immediately monitored in the same room by a Krones preform inspector. The PreformCheck rotary inspector uses high-resolution CCD camera technology and features darkened machine guards, so as not to falsify the results by influencing the light conditions. Features monitored include the quality of the neck finish, damage or irregularities on the sealing surface, and the length and colour of the preforms. Satisfactory preforms are then placed in aluminium containers for intermediate storage and, when they are needed, are dispensed into the blow-moulder's automatic preform feed unit in a separate room.

From here, they are passed to the bottling section where a Contiform Bloc produces the bottles, fills them and caps them. The Contiform Bloc consists of a Prejet linear preform rinser which uses ionised air to clean the preforms, a Contiform C324 blow-moulder with 24 modules, a volumetric, electronically controlled Sensometric VFJ filler, plus a screw-capper which is supplied with caps from a Capcade closure sorter located outside. Jeju also has an option for using an integrated Contipure module for preform treatment with H<sub>2</sub>O<sub>2</sub>. All these units are grouped together in a cleanroom. The fill level is then inspected by a Checkmat FM-IR using infrared technology. A Flowliner now distributes the filled containers from the single-line transport to the bulk conveyors. The bottles are passed to an Accutable buffer which ensures sufficient buffering time and provides a breathing space for the line as a whole. Then Jeju deploys a specially developed machine, a full-bottle inspector which examines the filled PET bottles for unwanted particles in the product, and monitors the fill level again.

**Top module with Contiroil stations and Multireel**

After this second inspection, the containers now leave the filling zone and are passed to an ancillary room where they are first blow-dried by a Linadry and then directly dressed on a Topmodule with two Controll HS stations for wrap-around labelling. Each of these stations is supplied from its own freestanding Multireel C magazine which holds eight label reels. This increases the uninterrupted running time eightfold without an operator having to intervene, which reduces the staff's workload and increases overall efficiency. Another Checkmat FEM-IR inspects the labels for correct positioning. Now the containers can be packaged at the end of the line. Here, Jeju uses a Variopac Pro FS film shrink-wrapper with a two-lane infeed for parallel handling of two six-packs at a time. A pack conveyor transports the six-packs to a higher level where a Robobox grouping station forms the required layer pattern. A Pressant 1AJ with a high-level infeed and a shutter-type gripper head then stacks pallets of fulls, by lowering one layer after another onto the individual pallet. On the lower level is the film hood application unit which completes the packaging of the pallet. Pallets of fulls are moved to the plant's courtyard for intermediate storage and dispatched as quickly as possible to the port of Jeju Island where they are put on the ferry to the Korean mainland. The line runs round the clock, 24 hours a day.

### **10-10-10 is the strategy**

JPDC is already exporting volcanic water to 24 countries (3.6 million litres in 2012) and intends to increase this figure still further: Together with its sales partner Kwang Dong Pharmaceutical, the state-run mineral water bottler has signed up to a policy of purposeful growth. "10-10-10" is the strategy's catchphrase, targeting annual growth of at least 10%. This is not likely to be a problem. In the years since 2000, Jeju's sales have risen by an annual average of 12.7%. To establish the necessary conditions for this, last year Jeju obtained permission from the Ministry of the Environment to increase its bottling volume from 630 million to 1.11 billion litres a year.

The two-litre PET bottle for Jeju Samdasoo is being offered in shops for about 900 Won (just under €0.70), and is thus in the upper price segment, topped only by the imported waters. In 2013, JPDC for the first time launched a second mineral water brand in addition to its Samdasoo flagship product, a premium-segment water called Hallasu, named after the Halla volcano and the Korean word Su for water, marketed in both PET and glass bottles. The striking glass bottle won immediate accolades - and the 2013 Red Dot Award and the 2014 iF Design Award. In a second facility on the island, JPDC also produces orange juice and a near-water product with added potassium called Vio Jeju V Water+. The latest product creation is Jespi beer which JPDC brews as five different variants - from Pilsner and ale to stout. This new brand currently has a production capacity of 1,000 hectolitres. It is brewed in cooperation with the US Brooklyn Brewery and distributed in South Korea.

"The success of our Jeju water and all the beverages based on it will continue on our chosen market", believes JPDC-President Oh Jae-yoon, who points out that the quality of the water is Jeju's best sales argument.