

# Finest apple juice ...

...from VOG with Flottweg presses and centrifuges

VOG Products' apple orchards cover a total area of 45,450 acres.

**The main product of the South Tyrolean fruit farmers is apples, which are primarily grown in the Überetsch-Unterland district, in the valleys between Bolzano and Merano and in Vinschgau. Apple production is of great importance in terms of quantity and economy. The apple orchards cover a total area of 45,450 acres and over 987,000 tons of apples were harvested in 2020. The VOG Products co-op is the largest fruit processor in the region, and one of its most important products is apple juice. Processing the enormous quantities of fruit requires machines that guarantee reliable and economical production and also ensure the apple juice quality for which VOG Products and the entire region are renowned. Production is realized with the help of belt presses and separators from the Bavarian centrifuge and press specialist Flottweg.**

South Tyrol and fruit growing are two things that have belonged together for decades. As a result, large fruit processing companies are also located in this region. VOG Products is a joint venture between 18 cooperatives and four producers that processes the harvests of roughly 13,500 fruit growers. In apple

juice production, up to 4,000 tons of fruit are processed into juice every day during the peak season, which of course can only be achieved with the most modern machinery offering high performance and reliability. Flottweg belt presses and separators are the main components for processing the large

quantities and, above all, ensuring consistent juice quality.

## **Maximum yield for maximum profitability**

When using large machines, two of the most important metrics are throughput and efficiency. In a short time, VOG Products aims to process as many apples as possible as well as obtain the maximum amount of juice from the fruit, while maintaining a consistently high product quality. VOG Products has been working with Flottweg machines since 2005. Flottweg belt presses are used for juicing, as they can handle enormous quantities without any problems and have proven for years to be reliable and economical.

In the production process, Flottweg belt presses form the central unit for juice extraction after washing, presorting and crushing the apples. Flottweg presses offer various special features



that are particularly important for fast and economical production at VOG Products. In particular, this includes the controlled charging of the fruit mash, the various roller profiles and the special belt guide, which ensure alternating pressure and shear loads and result in optimum yield – with an integrated cleaning function after the pomace has left the machine.

The fruit mash is added to the belt via an automatic and sensor-controlled feeding unit and partially juiced under the first roller. Depending on the quality of the raw goods, the width and height of the mash cake can be adjusted to optimize the processing. The L-profile roller then increases the pressure on the mash, followed by more rollers which further intensify the pressure. Control of the entire juice extraction process is fully automatic, for maximum yield with a constant load on the machine.

A key advantage of belt presses compared to other juice removal methods, such as hydraulic presses, is the con-



**The apples are first washed, pre-sorted and crushed before juice is extracted from them.**

tinuous juice extraction process. There is no need to interrupt production for mash and pomace exchange. The Flottweg belt press continually processes the fruit mash, almost non-stop.

“It is extremely important to us that this production step is as efficient as possible. This is where valuable apple juice is obtained from the raw goods. Flottweg belt presses achieve a yield of 75 percent with a very high quality. In peak periods, we process up to

25 tons of apples per hour, resulting in 19 tons of apple juice. That’s an extremely good ratio,” says Thomas Meran, Plant Manager at VOG Products. “Maybe we could press a little more juice out of the pomace with extremely powerful hydraulic presses, but at the cost of a much higher technical outlay and not in a continuous, fast run. We also found in tests that the naturally cloudy apple juice from the belt presses is of a higher quality than that from hydraulic presses.”

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At VOG Products, however, the economic efficiency of juice extraction is not solely attributed to the juice yield aspect. The better the fruit mash is juiced, the drier the remaining pomace. A pomace with low liquid content and therefore lower volume can be stored in significantly less space and can also be processed more easily for other products.

### Rotation follows pressure

Though in principle the apple juice is ready after pressing, it cannot be sent to the consumer yet. The end consumer demands that the juice always has

the same quality and turbidity depending on the variety and brand. Therefore the turbidity, and thus the particle size and quantity of the finest trub, in the apple juice must be adjusted to a consistent level. In addition, this removes the varying starch concentrations due to the different harvest times of the direct juice. At VOG Products, this step follows immediately after the juice removal using a fully automatic and highly efficient Flottweg separator.

The separator is a special centrifuge which ensures a very exact ratio of liq-

uid and finest solids with its horizontally arranged disc stack inside, and with very high speeds and G-forces. VOG Products feeds the raw juice directly into the separator. Centrifugal forces of up to 12,000 g are used to extract just as much solid and starch from the juice as needed to meet the specified quality. One special design feature of Flottweg separators is the Soft-Shot® function. Since the centrifuge has very high pressure ratios, the solids separated from the liquid must be discharged via this special mechanism while the process is running. Automatically, the drum floor is moved hydraulically in a vertical direction which opens up the solids discharge openings and releases the solids from the interior of the centrifuge. This solids ejection system allows any combination of partial and complete emptying. Depending on the product and the consistency of the solids, the adjustment of the discharge type enables optimum operation and thus an exact trub in the juice for VOG Products.

Another design feature of the Flottweg Soft-Shot® function is the opening of the discharge system. Here some of the control water acts as an opening damper. As a result, this process is gentle on the material, very quiet and without the typical discharge bang.



**The Flottweg separator for clarifying fruit juices.**

### The subtle difference between clean and pure

There is no doubt that special requirements and rules regarding purity and hygiene – also for apple juice – are rightly applied in the production of food. With over 60 years of expertise in the design of centrifuge solutions and presses, Flottweg supplies companies with technology that meets even the most demanding hygiene requirements. This expertise was one of the criteria for VOG Products to equip its production facilities with Flottweg machines.

Both machines are made of stainless steel, which greatly facilitates cleaning and hygiene. Flottweg engineers also took hygienic aspects into account during the design process. The belt presses, for example, are optimized for cleaning





**Flottweg belt presses form the central unit for juice extraction after washing, presorting and crushing the apples.**



**VOG Products has been using Flottweg machines since 2005.**

and can be washed from all sides with water or cleaning solutions. In addition, corners and places where material from the production process can accumulate were avoided.

To prevent the buildup of deposits, especially in the separator, the components inside the system are manufactured with a particularly smooth stainless steel. In addition, the structural design of the separators contributes significantly to compliance with hygiene standards. Bearings, connections and maintenance facilities are installed outside of the production space to prevent contamination.

"In addition to the large processing volume, the low energy consumption, the

high yield and the associated cost-effectiveness, we work with Flottweg for another important reason. The machines are extremely robust, and if service or a spare part is needed Flottweg always provides us with fast and very reliable support. Flottweg's service orientation is extremely important for us, which is why we have been happy to work with this company in the past and will continue to do so in future," Thomas Meran concludes.

**Flottweg SE**  
Industriestraße 6-8  
84137 Vilsbiburg  
Deutschland

## BREWING AND BEVERAGE INDUSTRY INTERNATIONAL

### Editor

Peter Neuner -317  
Staatlich geprüfter Produktionsleiter  
Brau- und Getränketechnologie  
Industriebraumeister (IHK)

Schloss Mindelburg  
St. Georgenberg 17  
D-87719 Mindelheim

Telephone + 49 (0) 82 61/9 99-0  
Fax + 49 (0) 82 61/9 99-3 91  
www.sachon.de  
www.freshlybottled.com  
info@sachon.de

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### Publication

VERLAG W. SACHON GMBH  
Schloss Mindelburg  
St. Georgenberg 17  
D-87719 Mindelheim

### Managing Directors

Sandra Wulkan -150  
wulkan@sachon.de

Dr.-Ing. Klaus Krammer -310  
krammer@sachon.de  
HRB 19790 Memmingen

### Head of Media Sales

Sabine Reggel -338  
reggel@sachon.de

### Advertising Administration, Coordination

Michaela Schölderle -361  
schoelderle@sachon.de

### Head of Distribution

Yvonne Musch -451  
y.musch@sachon.de

### Print

Holzmann Druck GmbH & Co. KG  
Gewerbestraße 2  
D-86825 Bad Wörishofen

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