



Eaton's filtration solution keeps it natural

Location:

Jaén, Spain

Challenge:

Remove up to 100% vegetative water and particles from early harvested high-class Extra Virgin Olive Oil (EVOO) to achieve longer shelf-life and storage periods

Solution:

Filtration with high-purity cellulose BECOPAD® 550 depth filter sheets capable to meet the strictest standards of microbiological safety while preserving the valuable colors, flavors and aromas

Result:

A higher quality EVOO due to up to 100% removal of vegetative water and particles thanks to high-purity cellulose filtration with BECOPAD

"BECOPAD 550 is the most suitable technology that offers maximum respect to the quality attributes of our rare and unique EVOOs - one of the most awarded brands in the world."

*José Miguel Sabaleta,
Quality Manager, ACEITES ORO
BAILÉN GALGÓN 99, S.L.U.*

Background

Extra Virgin Olive Oils (EVOOs) are the premier products in the olive oil range, and the premier location for their production is Jaen, the northern gateway to Andalucía, in Spain. EVOOs coming from this region are known to be some of the best in the world. The superior quality of these high-class extra virgin olive oils comes from an early harvest. This is when the olive fruit is at its ideal ripeness to provide the best attributes in an olive oil.

The Galvez-González family started their olive oil business in 1999. ACEITES ORO BAILÉN GALGÓN 99, S.L.U. stands out among EVOO producers and is widely recognized for its ORO BAILÉN brand. ORO BAILÉN has received many international awards, including:

- The best Picual EVOO from Spain in the National Guide Iberoleum
- First prize Spanish Food Award "Best Sweet Green Fruity EVOO 2016" by Spanish Ministry of Agriculture
- The EVOOLEUM World's TOP100 Extra Virgin Olive Oils Guide as the best 2020 EVOO in the world

The company produces about 300,000 bottles per year of their premium quality brand ORO BAILÉN which includes the four different monovarietal EVOOs Picual, Arbequina, Frantoio and Hojiblanca. They take pride in the quality of their high-class olive oils, especially their appearance and their fruity and aromatic flavors.

All highest quality EVOO productions begin by strictly monitoring the olive trees in the field. Early harvested Extra Virgin Olive Oil is the first and richest olive oil. When harvest time comes, around the second half of October, olive oil production starts with pressing the olive fruits, followed by a cold beating process, centrifugation, a brief storage period and then a filtration process to remove impurities. The early harvested EVOO is the most difficult to filter. The filtration process has the potential to alter the EVOO yield and organoleptic profile significantly. Low yields affect the production capacity and the profitability of olive oil producers.



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Challenge

Early harvested EVOO characteristics are highly sensitive to impurities. Their appearance, taste and shelf-life all depend upon the effectiveness of the filtration processes. Filtration should remove all traces of water and particles to enhance the quality of the bottled product. These contaminants don't only affect the immediate appearance, aroma and flavor of the oil, they also promote enzyme reactions that reduce the EVOO shelf-life and negatively influence its most admired characteristics by creating off-flavor reactions. Even a 0.2% water content in the finished product diminishes its appearance. It causes turbidity in the EVOO, making it less appealing to the connoisseur of olive oils. Small particles and water also affect aroma and taste as they lower the fruity and pungency expression in the oil. Water stimulates enzyme actions that degrade C6 aldehydes, which are responsible for the "green" aroma of premier EVOOs. Additionally, it is important to the producer of EVOO that no valuable oil is lost during the filtration process.

Filter media used for filtering olive oil in a two-step filtration process are generally filter sheets of pure cellulose fiber, with or without mineral components (diatomaceous earth) due to their excellent clarification performance. The filtration mechanisms in the depth filter sheet are both mechanical and adsorptive. Particles and microorganisms are mechanically retained on the surface and in the inner hollow space structure of the filter media. Due to the asymmetric pore structure large particles are retained on the surface, and small particles in the tighter spaces inside. Particles that are significantly smaller than the pore structure will also be retained by adsorption on the inside.

Due to the composition of the depth filter sheets with mineral components, they retain a certain amount of oil resulting in loss of valuable olive oil inside the matrix of the filter media. In addition, they can also remove valuable aroma components due to their higher adsorption effect. Early harvested EVOO is a specialized product with high demand and

limited availability. Finding the right media capable to combine the strictest standards of microbiological safety while maintaining the valuable colors, flavors and aromas of the EVOO was the challenge for ACEITES ORO BAILÉN GALGÓN 99, S.L.U. that was addressed with the Eaton team of filtration specialists.

Solution

Eaton has been working with ACEITES ORO BAILÉN GALGÓN 99, S.L.U. since their beginning, especially in the area of filtration technology. Eaton proposed the use of BECOPAD 550 premium depth filter sheets made of high-purity cellulose because of their excellent performance. Working with the Spanish distributor, AGROVIN, Eaton technical specialists explained the BECOPAD filter technology and conducted trials on site. The moment the results became evident, the solution was adopted and has been in place ever since.

BECOPAD depth filter sheets are made of high-purity cellulose fibers and don't rely on mineral components such as diatomaceous earth. The type of filter used to produce ORO BAILÉN is the BECOPAD 550, which comes in sheets of 23.6 x 24.2 inches (600 x 615 mm). The fibers form a special cellulose matrix with a retention range of 2 to 3 microns. The resulting high filtration performance allows BECOPAD depth filter sheets to remove up to 100% of vegetative water from the EVOO. In this application BECOPAD depth filter sheets offer excellent performance, even in the most challenging context of the early harvest period.

The Eaton BECOPAD solution is also very efficient for particle removal. With no added mineral components these depth filter sheets have low charge-related adsorption. As a result, valuable aroma components and color remain in the product. Due to the characteristic of the cellulose matrix, particles are reliably separated by mechanical depth filtration and therefore do not affect the quality of the EVOO.

With regards to managing filter sheets and service life, BECOPAD depth filter sheets are offering additional advantages in olive oil filtration. Usually the operator has to check regularly through the filtration gauge viewer to see if the olive oil is cloudy. With BECOPAD depth filter sheets, differential pressure can be used as turbidity is retained until a ΔP of approximately 21.8 to 29 psi (1.5 to 2.0 bar) is reached. This is when the depth filter sheet is saturated and due to the increased differential pressure, water is not retained anymore. In olive oil filtration the flow rate will then decrease significantly when the saturation point of BECOPAD depth filter sheets is reached. Operators will easily perceive the proximity of saturation point by checking the differential pressure and seeing the decrease of the flow rate.

Compared to other filter technologies BECOPAD depth filter sheets provide a high mechanical resistance that enables them to deal with higher pressures in olive oil filtration without losing their high-quality consistency.

Result

ACEITES ORO BAILÉN GALGÓN 99, S.L.U. implemented the BECOPAD 550 solution for their premier ORO BAILÉN production line from the very beginning. BECOPAD is the ideal choice for this application.

Using 100 BECOPAD depth filter sheets, 23.6 x 24.2 inches (600 x 615 mm) in size, allows the company to increase the filtration volume of their early harvested EVOOs to up to 4.9 gal/ft² (200 l/m²) in one batch. Thus, achieve an approximately 30% longer filter service life compared to standard depth filter sheets. Additionally, a higher production yield was achieved by reducing drip losses and decreasing the amount of oil remaining in the filter sheets after filtration. All these results are, of course, dependent on the olive fruit varietal, the pre-filtered product characteristics and the filtration temperature.

"All our extra virgin olive oil produced under the brand name ORO BAILÉN come from our olive groves. Our oils are made 100% from the Picual, Arbequina, Frantoio and Hojiblanca olive varieties. Their singular and peculiar fruity and aromatic notes gives them a very marked personality, but without any doubt the most outstanding quality is their harmony, a perfect conjunction between fruity, bitter and spicy," stated José Miguel Sabaleta, Quality Manager at ACEITES ORO BAILÉN GALGÓN 99, S.L.U. "BECOPAD 550 is the most suitable technology that offers maximum respect to the quality attributes of our rare and unique EVOOs - one of the most awarded brands in the world."



In biodegradable BECOPAD premium depth filter sheets high-purity cellulose fibers form a special structure, which does not require mineral components – even for microbial removal. Its main characteristic is maximizing purity while increasing performance and flow rates. BECOPAD depth filter sheets are available in all standard sizes, e.g., 15.7 x 15.7 inches (400 x 400 mm) and 23.6 x 24.2 inches (600 x 615 mm). Special formats are available upon request.

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