

MACKS ØLBRYGGERI

BEVERAGES SECTOR

AS L. Macks Ølbryggeri og mineralvannsfabrikk
Nordkjosbotn, Norway

25,200 BPH PET LINE:

- Smiform ECOBLOC®14-78-14 LG-VMAG integrated system
- Smiline conveyor belts
- Smiflexi SK 802 F Shrinkwrapper
- Smipal APS 3080 P Palletizer
- High pressure compressor, CIP, premix, rotary labeller, control systems, coder



VIDEO



GEO LOCATION

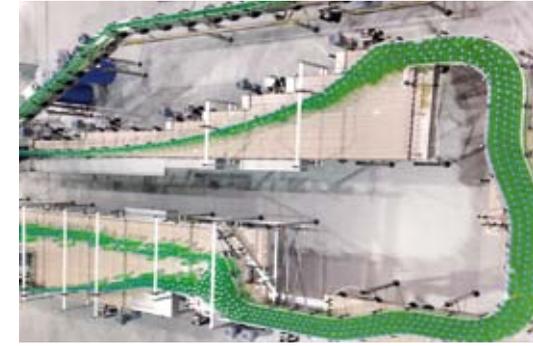
INSTALLATION / Macks Ølbryggeri



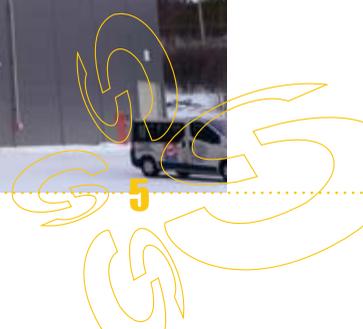
The Norwegian Macks Ølbryggeri brewery, the most northerly one in the world, boasts a long tradition in the production of excellent quality beer with a unique taste, just excellent, unique and unforgettable as are the Aurora Borealis, Northern Cape, the midnight sun and any other genuine thing from northern Norway.

Macks Ølbryggeri has recently invested in the expansion and modernization of the plant in Nordkjosbotn, a small village 70 km south-east of the city of Tromsø.

For this project, the Norwegian company relied on SMI technology and experience for the design and supply of a complete new PET line for the bottling and packaging of products of the "soft drinks" line, bottled and marketed under licence of the Coca-Cola Drikker Norway company (CCDN).



The new production plant is the most modern and innovative one on the market and is an exceptional springboard for the future growth of Macks Ølbryggeri.



Mack®

THE WORLD'S NORTHERNMOST BREWERY HAS CHOSEN SMI

All products leaving the Macks Ølbryggeri facility of Nordkjosbotn undergo stringent quality controls throughout the production process since the Norwegian company wants to offer its consumers only excellent, carefully packaged products.



The new bottling and packaging line supplied by SMI runs at a rate of 25,200 bph and includes a Smiform ECOBLOC® 14-78-14 LG-VMAG integrated stretch-blow moulding, filling/capping system, a Smiflexi SK 802 F shrinkwrapper model, a Smipal automatic palletizer system APS 3080 P and Smiline conveyor belts that handle the bottles and packs inside the production line.

This facility also includes complementary machines and equipment, made by SMI leading partners, ensuring efficient and smooth operation of the whole system.



The primary objective of devising and designing the new soft drinks bottling line was the quality of Macks Ølbryggeri's final product, by



implementing a series of innovative solutions to effectively meet the demands of efficiency and flexibility expressed by the customer.

The production unit is sized to provide an hourly output of 25,200 bph and can be used to bottle multiple types of carbonated beverages into 0.5 litre and 1.5 litre containers.

The aim set by Macks Ølbryggeri to SMI for this supply was fully achieved, as the new line has a lower TCO (Total Cost of Ownership) than that of a conventional system of equivalent capacity, thanks to the machines' greater degree of efficiency, the optimization of the flow of materials used and a wide operative flexibility that allows the company to easily adjust the output to market demands.

Smiform's compact ECOBLOC® 14-78-14 LG-VMAG integrated system is the "heart" of the Nordkjosbotn



system because, by concentrating the stretch-blow moulding, filling/capping functions in a single machine, it allows them to save energy, cut maintenance costs and protect the environment.

The special attention this Norwegian company pays to the absolute quality of its products is also emphasized by the presence, in the new 25,200 bph system supplied by SMI, of a series of systems that control the containers and monitor the production line, as well as systems that inspect the raw materials used.

Among these, of particular importance is the system that checks the integrity of the PET preforms (before they enter the ECOBLOC® integrated system), checking their size, injection point and presence of any foreign matter on the bottom and on the walls of the preforms.



In addition, other automatic devices installed in different points of the line check for empty containers, filling level, correct application of caps and

weight of the cardboard blank or pack in order to ensure production batches absolutely free of imperfections or irregularities.



INSTALLATION / Macks Ølbryggeri

THE ADVANTAGES OF THE INTEGRATED SOLUTION

S miform's ECOBLOC® integrated system offers numerous economic benefits to the end user.

For example, thanks to this machine's modular and compact design (which combines in a single block the stretch-blow moulding, filling/capping modules), you can do without the connecting belts between blow moulder and filler and even, except in rare cases, the bottle rinsing machine.

This innovative solution also makes it possible to reduce the consumption of water and energy, maintain low running and maintenance costs,

safeguard the environment thanks to the use of eco-friendly technologies and benefit from an excellent price/quality ratio.

The stretch blow-moulding and filling modules of the ECOBLOC® system are designed according to criteria that favor the reduction of costs and consumption.

Among the innovative solutions with which these machines are equipped, the "Baseless" technology of the filling module is definitely one of the most important.

The feature of this constructive technology is the fact that the motors and transmission components

are placed in the upper part of the system, thus leaving the base completely empty.

This ensures ease of access to the filling carousel and utmost cleanliness of the area below the bottles, as well as the reduction of maintenance time, reduced use of water during the washing operations and, above all, an environment devoid of contamination.

Smiform's ECOBLOC® integrated system can also be equipped with accessory devices that further increase savings and benefits, such as the optional ARS device (Air Recovery System), which is available for the



LINE END FLEXIBILITY

SMI has paid special attention to designing the line end machines of the new Macks Ølbryggeri plant. In fact, the automatic APS 3080 P Smipal palletizing system was devised to respond effectively to the Norwegian company's logistics and distribution needs. Equipped with a dual motorized inlet, the palletizer installed at the Nordkjosbotn facility is able to handle both the half pallet and the whole pallet. The latter is created starting from the single packs arriving from the Smiflexi packers or two previously composed half pallets. The dual motorized inlet system, consisting of two dual rubber-coated cadencing devices and two layer pre-composition motorized conveyors, receives the packs from the SK 802 F shrinkwrapper, groups them in the layer pre-composition area and then palletizes them on half pallets. Then, a roller conveyor system brings the newly formed half pallets to the automatic two-arm rotary system that wraps the pallets in stretch film. Subsequently, a specific labeller applies an identification label to each half pallet to ensure its traceability throughout the distribution stages. At the end of this operation, two half pallets advance together on appropriate roller conveyors up to a robot that lifts and positions them on a "mother" pallet having the size of a Euro-pallet (which in turn is wrapped in stretch film and labelled). This line end packaging solution guarantees greatest operating flexibility to Macks Ølbryggeri. Once the Euro-pallet made up as described above reaches the mass retail point of sale, it can be easily opened and the two half pallets it contains are handled according to that moment's logistic requirements, even for different points of sale, thanks to the label that identifies each pallet. Furthermore, the half pallets can be used as a display unit inside the supermarkets, avoiding to have to remove the packages from the pallet and place them onto the shelves.



stretch blow-moulding module. The aforesaid device saves up to 40% of the high pressure compressed air used in the PET bottles production process and up to 20% of energy needed to run the system.

The stretch-blow moulding, filling/capping modules integrated in an ECOBLOC® system are governed by a single automation and control system that allows the management of the system by only one line operator through a simple and user-friendly man-machine interface.

Smiform's ECOBLOC® integrated system greatly reduces the risk of contamination of the bottles on their way from the blow moulder to the filler; in fact, the passage of bottles between these two modules takes place by means of a star-star system enclosed inside a cavity, i.e. a hollow joining section with steel guards.

To further increase the separation of the "dry" area of the stretch blow-moulding module from the filling module's wet area, an overpressure airflow, obtained from the blow moulder's air recovery system, can be injected into the cavity.

MACKS ØLBRYGGERI: FROM POLE TO POLE

The Macks Ølbryggeri company, specifically AS L. Macks Ølbryggeri og mineralvannsfabrikk, was founded by Ludwig Markus Mack in 1877, a baker of Brunswick who, at the age of 35, gave birth to what would soon become the most industrial "business" of the Norwegian city of Tromsø. The first beer marketed by the company was "Potøl", followed by the "Bayer" beer launched in 1878 during the Norwegian National Holiday (17 May). Then in 1883 came the "Bokøl" beer, whereas the company's lager and pilsner beers were introduced in 1891. In 1895 the company experienced a significant expansion after starting the production of soft drinks and mineral water. From its very beginning, Macks Ølbryggeri's beer had received wide acclaim among the population of Tromsø and surrounding areas thanks to its quality and unique taste. In 1910 the beer production division was united to that of the soft drink production, thus giving rise to a single business unit that took the name of "L. Macks Ølbryggeri & Mineralvandfabrik". Further to the expansion and modernization of its systems, between 1920 and 1922, the company's turnover quadrupled in a short time. In 1939 most of its facilities were destroyed by a fire but reconstruction was rapid, demonstrating once again this



Norwegian company's remarkable capacity for reorganization and development. Another important event in the history of Macks Ølbryggeri was the opening of a canning factory in 1946 for the production of many kinds of jams and marmalades; all products containing quality ingredients with a unique taste, as evidenced by the text on the labels: "fruits of the north, ripened in the glow of the midnight sun in the plains of northern Norway".

MACKS CHOOSES ECO-SUSTAINABILITY: A WINNING SOLUTION

For over 135 years the absolute quality of the product is one of the cornerstones of Macks Ølbryggeri's business, which is also very attentive to the impact its production facilities may have on the environment. Hence the choice of the Norwegian company to invest increasingly in innovative technologies that allow company sustainable development and the preservation of the natural resources offered by the environment. Attention to these issues is reflected in the way all the product lines are managed, from beer to soft drinks bottled under license from Coca-Cola Drikker Norway (CCDN). Macks Ølbryggeri's entire production organization is based on sustainable development and works very hard to reach quality levels of excellence in full compliance with agreements with Coca-Cola. Moreover, in recent years great changes have affected internal and external logistics, backed by substantial investment both for the modernization of the production departments and staff training. But after 135 years of honorable business, the "historical" plants of the Norwegian company could not be further expanded and renovated, so Macks Ølbryggeri started looking for a new area that could accommodate a brand new production facility. This search lasted several years. After careful consideration, the choice fell on the Nordkjosbotn area, 70 km south-east of Tromsø. Construction work began in May 2011 and on 2 September 2012 the new 16,800 m² plant produced the first bottle while the company's administrative headquarters remained in the "historical" premises in Tromsø. Macks is now one of the most modern and "virtuous" companies of Norway, thanks to the use of plastic eco-friendly and recyclable bottles that reduce CO² emissions by one third compared to traditional ones. AS L. Macks Ølbryggeri og mineralvannsfabrikk employs a staff of 45 people and is still owned by the family of the founder, Ludwig. In fact, the current Managing Director, Harald Bredrup, belongs to the fifth Macks generation. Even the company "vision" has not changed and is still that of its origins: to provide high quality beer to every single consumer! Along with leading products, such as those with the Bayer, Bokøl and Mack Pilsner brand, others have joined the portfolio of the Norwegian company over the years. For this reasons it is said that "a lot has changed in Macks, but the quality remains excellent; simply excellent, as the Aurora Borealis, Northern Cape, the midnight sun and genuine like everything else in the North of Norway".



INSTALLATION / Macks Ølbryggeri



TROMSØ: THE GATEWAY TO THE NORTH POLE AND THE CITY OF THE AURORA BOREALIS

Tromsø is a fascinating city, located along the rugged coast of the north-western fjords of Norway, among a handful of islands with spectacular contours. Due to its position, it is considered the gateway to the North Pole and was chosen as the starting point for several Arctic expeditions. Tromsø lies mostly on the island of Tromsøya, connected to the mainland by a bridge and many tunnels. Despite being at the same latitude as Greenland, Tromsø is not covered by ice but enjoys a rather mild climate thanks to the gulf current that keeps the temperature of the waters of the Norwegian Sea above freezing. This city is nicknamed the “Paris of the North” for its liveliness, and is mostly visited for its natural beauty and the fact that here you can enjoy wonderful spectacles created by light and darkness. Tromsø is a unique place, characterized by very particular seasons that do not follow the traditional cycle but are linked to long periods of darkness that alternate with long periods of light. The polar night lasts 2 months, from November to January, while the period of the “Midnight Sun”, from mid-May to mid-July, is so called because the “gold disc” never sets during this season. Since 1989, a marathon is organized every year in the month of June under the midnight sun, which combines the breathtaking spectacle of the Aurora Borealis with the possibility of doing outdoor sports.



The region of "North-Norge"

Untouched nature, midnight sun, Aurora Borealis, high fjords, beautiful mountains, delightful fishing villages, timeless traditions: this, and much more, is Northern Norway. Northern Norway is the largest region of Norway by extension (175,246 km², equivalent to about one third of the whole country) and includes the territories of the Finnmark, Troms and Nordland counties. The coastline is characterized by numerous fjords and a myriad of islands and islets while the landscape becomes Alpine all along the border with Sweden: dense forests alternate with high mountains and expanses of snow. The Norwegian fjords are considered the landscape element symbol of Scandinavian countries; but what exactly is a fjord? It is a stretch of sea that creeps into the coast (up to several kilometers), flooding an ancient glacial or river valley and creating a magnificent natural spectacle. If the longest fjord in the world (350 km) is in Greenland, the Norwegian ones are in any case worthy to stand on a "podium". The longest fjord in Norway, and the second in the world, is the Sognefjord, which extends for 204 km near Bergen and that, surrounded by unspoiled nature, embraces spectacular mountains and stunning waterfalls on its long route.



The Aurora Borealis

"One of the greatest and most beautiful natural phenomena, a magnificent spectacle with the right atmospheric conditions": with these words, the Norwegian scientist Kristian Birkeland was the first to give the world a scientific explanation of this phenomenon at the end of the nineteenth century.

He discovered that the sun's rays follow the earth's magnetic field up to its magnetic poles when they collide with it, thereby creating the spectacular dance of light and colors famous worldwide.

In Norway you can see the Aurora Borealis anywhere, at least in theory. Obviously the best places are those of the northern regions, since the boundary of the Aurora Borealis touches the north of the country along the Lofoten Islands and continues along the coast to North Cape.

There is no exact time in which to enjoy this incredible spectacle but it should be noted that the phenomenon is more frequent in late autumn and at the beginning of spring because



smi
now

during that time the climate is more humid and rarely snowy, and darkness falls around six o'clock in the afternoon.

The midnight sun

The midnight sun is another, wonderful astronomical phenomenon typical of the polar regions. Scientifically, this phenomenon

is explained by the fact that, on approaching the summer solstice, the Sun never sets below the horizon (and thus night never falls) at latitudes over 66° 33' due to the tilting of the Earth's axis of rotation.

Scientific notes aside, witnessing this phenomenon is a magical and evocative experience, at times surreal, giving anyone unique and unrepeatable emotions.



THE WORD TO THE CUSTOMER

Interview with Roger Karlsen, Chief Operating Officer of AS L. Macks Ølbryggeri og mineralvannsfabrikk



From right: Harald Bredrup, Managing Director and CEO of Mack; Petter Nome, Director of Bryggeri og Drikkevareforeningen and Christian Ringnes, Real Estate Investor



Roger Karlsen, Chief Operating Officer of AS L. Macks Ølbryggeri og mineralvannsfabrikk

In 135 years many things have changed in Macks' business but the quality of your products has always remained excellent. What is the secret of this success?

"Macks' customers are very demanding and their expectations are very high in terms of quality and product performance. Therefore, the quality of the raw materials we use in the production of our beverages is essential, primarily



that of water. We are the most northerly brewery in the world and fortunately we have natural, fresh, genuine and pure ingredients, among the best that the earth can offer. Such an abundance of absolutely exceptional raw materials gives us quite an advantage on other beer-producing companies in terms of quality. Today, one of Macks Ølbryggeri's main objectives is to start exporting to other countries so that many more consumers can try the exceptional quality of our products".

Macks Ølbryggeri has recently invested in the purchase of a whole new line, supplied by SMI, for the bottling of soft drinks in PET NR (Non Returnable) bottles. What do you ask your suppliers of bottling and packaging machines in terms of efficiency, flexibility and innovation?

"We rely heavily on a close and fruitful collaboration with our suppliers, because only by obtaining from them that which the company needs can we continue to be competitive in the market and offer high quality products much appreciated by our customers.

For example, the project that involved SMI as sole supplier concerned a new bottling line of PET NR bottles, which had to be able to cope with the entire output of the existing line of PET REF (Refillable) bottles and package them in the same formats.

For these reasons, we commissioned SMI to implement a system, the priority features of which were production efficiency, operative flexibility, ease of use and use of advanced technologies; all, of course, without giving up a cost/benefit ratio in line with our economic parameters".

Today, your company is the most modern and eco-friendly brewery in Norway; how important are aspects such as sustainable development and technologies that respect the environment for Macks Ølbryggeri?

"They are priority values of our company "vision", which is based on the responsible use of Mother Nature's resources.

In fact, only by respecting the environment can we continue to provide our customers high-quality, healthy and wholesome products, which safeguard the health of consumers and allow us to enjoy the trust of strategic partners such as Coca-Cola".

What role does environmental sustainability play in the beverages industry in general?

"The environmental sustainability of processes and productions is the basis for every decision we take at Macks Ølbryggeri in terms of new medium-to-long term investments.

In fact, the entire industry in which we operate will continue to grow and prosper only by adopting efficient and "smart" production systems, able to combine business needs with the protection of the territory and the preservation of vital natural resources such as water".

What role did SMI's collaboration have in the success of your new bottling line?

"In the new Nordkjosbotn plant we switched from PET REF to PET NR bottles; this not only involved a change in the packaging material but also an actual "cultural revolution" for our company and our customers. It was therefore necessary to rely on an experienced partner in this sector,

who was capable of providing us with all-around support to ensure that this important change could take place without too much inconvenience. SMI has lived up to the task assigned to it, both when the line was designed and during the system's installation and start-up. In the end, the close collaboration between the Macks Ølbryggeri and SMI staffs enabled us to successfully overcome the many challenges we had to face".

