

ENGINEERING
TOMORROW

Danfoss

Case story | Bem Brasil

Bem Brasil **gains efficiency in potato freezing process** by opting for a modern line of valves and controls



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Bem Brasil Alimentos is the first Brazilian manufacturer of frozen French fries. The company combines its experience in growing selected potatoes with a modern industrial production structure.

One of its key differentiators is the guaranteed excellence of its products thanks to its industrial process. In other words, the strict control of the production process is capable of offering top-quality products. To maintain this mission, control of the refrigeration system plays a crucial role.

In order to obtain control of the refrigeration system, Bem Brasil sought equipment and technology solutions by Danfoss that were more modern and efficient. By using automatic valves and controls, which result in more efficient operating conditions, Bem Brasil achieved energy savings of approximately 12% when compared to conventional systems, in addition to safer operations.



We searched the market for a supplier that could offer state-of-the-art technology, which at the same time would bring us safe and effective operational confidence, with technical assistance that was qualified and present whenever needed,

commented Célio Zero, Chief Operating Officer of Bem Brasil Alimentos.



Because it is an integral plant, involving freezing and storage of natural products, Bem Brasil needed all the automatic valves and controls for the refrigeration plant, for both the machine rooms and the valve stations for temperature control, defrosting chambers, and continuous freezing tunnels,

explained José Faria, Engineer at Frio Plus Refrigeração, Danfoss' technical commercial representative.



Every industrial refrigeration system is designed from the get-go in a unique way, in which the needs of the project and its equipment are assessed first,

followed by a search for the best technological solutions.

Among the devices implemented, for the liquid separators, the proportional feeding system was used, using ICM motorized expansion valves, AKS 4100 level transmitters, and EKE 347 electric level controllers. The advantages of proportional feeding include the stable control of ammonia levels and reduced energy consumption of the compressors, as there are no abrupt increases in pressure.

In the valve stations, two types of technologies were used, having been chosen according to their refrigerating capacity. For smaller-capacity tunnels, the concept of defrost control by condensate drainage was applied. In this case, ICF-type single-block valves were used with the ICFD module, a type of float that allows only the liquid to return to the separator, preventing the migration of superheated steam, which would require additional work from the compressors.

In stations with greater capacity, the soft defrost concept was applied, which starts with an injection of hot gas limited to 15%, followed by a release of the total gas flow. This provides more safety and allows users to expedite the process in the evaporator draining phase. Consequently, it was possible to reduce the defrost time while increasing the level of operational safety.

To complete these automatic defrosting systems, new EKE 400defrost controllers dedicated to each station

were assembled. These controllers were developed based on the characteristics of Danfoss valves and have a program ready to command various types of defrost processes, being interconnected to Bem Brasil's PLC system for monitoring and changing settings. Because the EKE 400 controllers are fixed to rails inside the electrical panels, the MMIGRS2 displays (remote HMI) were mounted on the panel door, concentrating several EKE 400 controllers and facilitating the monitoring of the entire system operation.



For the success of this project, one crucial aspect was the combination of the very latest in terms of valves and controls in industrial refrigeration and the proximity to the Bem Brasil engineering team, which pursues excellence in its refrigeration processes,

concluded Faria.



About **Danfoss**

Danfoss develops advanced technologies that enable us to build a better, smarter and more efficient tomorrow. In growing cities, we ensure the supply of fresh food and the best comfort in our homes and offices, meeting the need for energy-efficient infrastructure, connected systems, and integrated renewable energy. Our solutions are used in areas such as refrigeration, air conditioning, heating, motor control, and mobile machinery. Our innovative engineering dates back to 1933, and today, Danfoss occupies leading positions in the market, employing more than 28,000 people and serving customers in more than 100 countries. We are a private company controlled by the founding family. Read more about us at **www.danfoss.com.br**.

About **Bem Brasil**

Bem Brasil Alimentos, a 100% Brazilian company of frozen pre-fried potatoes, has been operating in the market for 16 years, being a pioneer in the activity. The brand is the sole leader in the penetration of frozen pre-fried potatoes in Brazilian homes – it holds a 47% share, according to Estatexport research – and has the highest frequency of purchases in supermarkets, according to consulting firm Kantar. The company has two manufacturing units in the state of Minas Gerais, Brazil: one in Araxá and one in the municipality of Perdizes, which generate more than 1,200 direct jobs and 4,000 indirect jobs. The company's production capacity is 500,000 metric tons of products per year, being able to meet up to 55% of domestic demand.

Its mix includes more than 20 products aimed at food service and domestic retail. In addition to market recognition for the quality of its products, over the years, Bem Brasil has won a number of awards for its excellence in food safety and people management. The company strives for sustainability, with actions focused on social and environmental responsibility and corporate governance, which has also resulted in several certifications, including the 2021 Mais Integridade Seal and the ISO 14001 international environmental management certificate.

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