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Press+LipidTech

Innovation for Increased Capacity and Yield.

Global demand for rendered products is increasing, leading rendering companies to examine the latest state-of-the-art technologies available to maximize possibilities and markets in the most efficient ways. Factors such as a global focus on sustainability, a growing interest in tallow as a feedstock for renewable diesel, and a worldwide increase in pet ownership, and thus pet foods, brought on by COVID-19 lockdowns are resulting in unprecedented demand for rendered products.

To implement any expansion/new development with the goal of ensuring the greatest return on investment, the starting point should be the primary equipment within the rendering process to ensure the optimum duty and key performance indicators are suitable for the business plan. Given that rendering is the separation of fats from the solids, the screw press is a key element in all rendering plants.

Screw presses are designed to mechanically separate solids and liquids. In rendering, this applies to separating the fats/lipids (liquids) from the protein meal (solids). As the material is fed into the press and moves along, there is a reduction in volume between the screw shaft/flights and a strainer cage that causes an increase in pressure on the solids. This forces the liquids through the gaps in the strainer cage before being collected in the base of the screw press and transported via a collecting screw. The remaining solids are then discharged out the end of the press cage.

If a screw press is not configured correctly, specifically the geometries of the screw outfit and the spacing of the gaps and the scrapers within the cage lining, there is a high possibility of fat losses within the protein meal since the residual fat will remain in the meal and not be recovered. Various factors around the raw material received can affect the efficiency of the fat extraction (i.e., moisture, temperature, solids content); however, in general, anything above 12 percent residual fat/tallow would be considered high within the industry.

New Direction for Increased Demand

Up until recently, the best solution to increasing the throughput at a plant was to add extra screw presses. The models that have been around for the past 30 to 40 years were rated at around 8 to 10 metric tons (17,637 to 22,046 pounds) per hour. By utilizing more than 150 years of experience in mechanical engineering and screw pressing applications, and calling on the know-how from supplying over 1,000 presses across all applications, HF Press+LipidTech has developed the new SP280R screw press that offers renderers the opportunity to process up to 50 percent higher throughput on a single machine. This creates an optimized solution from both a capital and operating cost analysis with the added benefit of a lower overall footprint.

TBN Zweckverband Tierkörperbeseitigung Nordbayern in Walsdorf, Germany, recently installed a SP280R screw press to replace a machine in operation since 1988 as part of an expansion and optimization project. The older machine had been a major bottleneck for the company's goals; however, using the same raw material always processed, the company managed to achieve the following results:

- an increase in throughput of 50 percent of semi-dried product from the dryer
- a reduction in residual fat/tallow of over two percent in the meat and bone meal
- an overall tallow yield increase by over 60 percent
- a project payback measured in months rather than years
- annual maintenance costs down by 30 percent, on average, combined with a reduced load on the maintenance team

Robert Schuster, operations and technical manager at TBN Zweckverband Tierkörperbesichtung Nordbayern, said, "The SP280R has helped us increase our yield and profitability, alongside the durability that we require from our machines to keep up with our demand. It has been instrumental in helping us stay one step ahead of the competition."

Benefitting from the same robust design principles as the previous model, the SP280R rendering press is capable of pressing up to 17 metric tons (37,480 pounds) per hour of raw or slaughterhouse material, which can equate to 6.5 metric tons (14,330 pounds) of dried semi-finished product. This is achieved with a footprint only 50 percent more than traditional models, with operating cost significantly lower per ton. In addition, the SP280R also offers the following features/benefits that are key to HF Press+LipidTech technical solutions to screw presses:

- *Proven screw pressing technology for processing dried semi-finished product* – Raw material coming into rendering plants can be of differing composition of moisture, solids, bone, and fiber. With over 1,000 screw presses in operation across numerous processes in different industries, the SP280R's various screw configurations available allow renderers to maximize their tallow/fat with any animal by-product mix.
- *Simple design for easy operation* – With plant operability at the forefront of the design, all pressing components are fixed around a single, rotating shaft, reducing the risk of failures and breakages.
- *Special self-centring, free-floating shaft* – Uniquely designed to cope with the demands of variable feedstocks, the SP280R benefits from the flexibility to center itself during operation.
- *Optimum access for maintenance/inspection* – With 360 degree access points for inspection and maintenance during both operation and shutdown, the SP280R allows maintenance schedules to be adhered to and planned accordingly.
- *Advanced hardfacing technology* – Every hour and day that a screw press is in operation is contributing to a renderers profitability and reputation, so the SP280R comes fitted with wear parts that are up to 100 percent hardfaced, extending the production time available between planned maintenance.
- *Unique mechanical design to connect to the drive system* – The SP280R comes equipped with a special shear pin and safety coupling arrangement to protect the integrity of both the shaft and drive.
- *Latest developments in high-efficiency drives* – With electrical costs globally continually fluctuating, renderers will benefit from the power efficiency offered by the proven belt-driven, frequency inverter compatible drive system provided with the SP280R, resulting in lower operating costs.
- *Inline monitoring of the screw press* – Automation is proving beneficial to plant operators and allows efficient data collection and trends to be analyzed, all of which can assist with preventative maintenance planning and process optimization. The SP280R allows for a series of parameters and measurements to be taken while the press is operation, in addition to several safety points to prevent harm to personnel.
- *Hydraulic foots shearing device* – With the aim of protecting downstream equipment, the SP280R can also be supplied with a hydraulically-operated foots shearing device to break away any large fragments of greaves/cake before being moving on to the fat filtrators.

Be Proactive, Be Preventative

The old saying "if you don't schedule your maintenance, it will schedule it for you" does not ring truer than in the rendering industry. With the high solids content in most raw material, what starts as a small amount of wear can soon escalate into an inefficient, or even worse, unusable screw press.

Therefore, it is important to have a robust, regular inspection schedule backed by a reliable supply chain so production can keep up with demand.

Given that demand for animal proteins and fats is forecast to increase year over year for the foreseeable future, forward-thinking renderers need to consider all options on how to stay at the forefront of their customers' minds. By combining the development mindset that is part of HF Press+LipidTech's fabric with the engineering know-how, the SP280R screw press continues to be a valued and key component for ambitious renderers.

By Paul Smith
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