

DRIVE SYSTEMS FOR FILTRATION SYSTEMS

CASE STUDY: TMCI



**Authentic flavor ensured
by new filtration system.**



**Innovative cross-flow
filtration technology.**

**Optimized efficiency
and excellent availability.**



**Flexible adjustment
of process parameters.**



**Parallel shaft geared motors
with integrated controllers.**



Novel filtration systems developed by TMCI Padovan help an Italian producer make highly authentic, full-flavored fortified wines. The innovative systems rely on distributed NORD drives for highly efficient operation.



BEVERAGE INDUSTRY
Filtration systems



GEARED MOTORS
Parallel shaft geared motors



FREQUENCY INVERTERS
SK 200E

PROJECT CHALLENGE

Bent on replacing traditional vacuum filters with all too frequent cleaning requirements, a notable Italian producer of vermouth fortified wines sought to find an innovative filtration solution that would yield a more streamlined production process. Given the huge volumes in this application, a very reliable and energy-efficient machine was required. After a successful trial phase, beverage industry specialist TMCI Padovan was commissioned to supply solutions from their new Dynamos line-up – hygienic, closed systems with a small footprint that were easy to parameterize as needed.

New spin on the process. – Dynamos is the world’s first cross-flow filter with a calibrated back-pulse system for evacuating the filtrate. This design has been hailed as the most advanced technology for filtering musts with a high level of suspended solids that does not employ filter aids or modifying

agents. The system filters the medium via porous ceramic disks that are spinning inside a sealed chamber. The closed device provides excellent protection against oxidation for musts and juices in the process. Moreover, this gentle treatment as well as the lack of filter agents ensures that very few color compounds are lost.

Optimized efficiency. – Previous filter systems used to be fitted with belt drives, which were ill-equipped to achieve advanced levels of efficiency and availability. Instead, in order to keep energy consumption to a minimum as well as to ensure excellent reliability, the novel filter system was to be complemented by an equally state-of-the-art mechatronic drive solution.

FOCUS ON THE CUSTOMER



A leading manufacturer of machines for the food and beverage sector, TMCI Padovan Group is a notable player in the wine industry in particular. The company’s product portfolio includes a versatile range of machinery from clarification and filtration solutions, to pasteurization technology, to fermentation tanks. TMCI Padovan’s new Dynamo systems won the prestigious Innovation Award at the 2011 SIMEI show in Milan as well as the Palmarès de l’Innovation 2013 at the SITEVI in Montpellier.





“These drive solutions have given us greater energy savings, enhanced system reliability and availability, a simplified machine design, and substantially greater safety in the workplace.”

NARCISO GATTI, TMCI PADOVAN PURCHASE AND OPERATIONS MANAGER

APPLICATION SOLUTION

The novel filter system is equipped with compact, integrated drive systems comprising a geared motor and an intelligent frequency inverter. Depending on the size, each Dynamos system contains a number of parallel shaft geared motors – one per shaft, at up to 16 shafts – that rotate the filtration disks. In addition, every system has one or two tanks for the medium, equipped with four drive units each. Every such unit is an integrated drive solution fitted with a motor-mounted SK 200E series frequency inverter, which enables highly precise speed control with no the need for sensor feedback. Another integrated NORD drive serving the circulation pump completes the distributed drive setup.

Lower energy consumption. – The inverters’ field-oriented control technology allows for adjusting magnetic flux in the motor during partial-load operation, which

limits energy consumption to a fraction of the rated power. The drives provide flexible networking capabilities to accommodate the fieldbus of choice. For cost-saving networking, up to four drive units can communicate with the PLC using a technology option, with connections to each other via the inverters’ integrated, CANopen-based system bus. Safety features for SIL 3 applications in accordance with EN 61508 are also available on request.

Tried and tested cooperation. – NORD and TMCI Padovan have collaborated on a number of projects over several years: NORD has previously supplied drive solutions for other TMCI Padovan machines as well, e.g. for vacuum filter systems, vegetable oil processing machines, and tunnel pasteurizers.



Adaptive. – Integrated NORD drive systems conserve energy when running under partial load.

FOCUS ON THE PROJECT

The innovative filtration technique devised by TMCI Padovan for the Dynamos systems allows for very easy cleaning and ensures a particularly gentle treatment of aromatic and color compounds in the process. Intelligent mechatronic NORD drive systems achieve optimum efficiency and highly reliable operation even in

- long filtration cycles of up to 72 hours without interruptions and
- with high flow rates between 25 and 50 l/m²h with lees.



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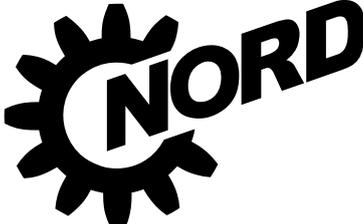


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