

Redesigned TLT-Turbo fan range meets mining needs

Global ventilation fans and systems manufacturer, TLT-Turbo GmbH, has announced the redesign of its Auxiliary and Booster fan range. Developed in close collaboration with clients, the new designs address efficiency and cost-effectiveness, in a versatile product range that meets the specific ventilation requirements of the mining industry.

The development of the new fan range concept began in early 2015 following a lengthy global market study to gain an understanding of market requirements. In mid-2017, the range was defined with the fabrication of the first units taking place shortly thereafter.

"The development of the Auxiliary and Booster fan range would not have been possible without the input of clients. These ensured that we focused on key market-driven requirements including energy efficiency, noise reduction, cost-effectiveness and turnaround time. To sell these products we needed to ensure close customer relationships and visibility," says Michael Minges, technical director at TLT-Turbo Africa, who headed up the fans' designs.

According to Minges, the company strives to change the industry's mindset on the use of such fans to ensure proper fan selection for the ventilation required. He says, in optimising mine ventilation, efficient, high-quality Auxiliary and Booster fans can add as much value as surface fan installations.

Through its Africa office, TLT-Turbo started commissioning the first iterations of its fan

range within the sub-Saharan market towards the end of 2017. From there, it based the development of the various fan sizes within the range on market interest. The fan designs and their performance validation were completed at the end of July 2019.

Meeting identified market demands was the main focus of the improved designs. "Since energy efficiency is one of the main drivers of industrial equipment usage, and minimum efficiency requirements on certain equipment are often legislated, TLT-Turbo identified a need and opportunity in the market for more efficient mining fans," Minges explains.

The new designs include several innovative additions to enhance performance and provide exceptional underground ventilation. The fan range was developed using the latest in engineering flow technology, which allowed TLT-Turbo to improve the aerodynamics and thus the efficiency of the fans. This includes a unique stator design and aerodynamic fairings, all manufactured from wear-resistant composite materials, resulting in improved efficiencies and reduced noise levels.

The modularity of the fan casings allows



The first orders for the new range were received at the end of 2017.

for quick and easy assembly with interchangeable ancillary fan parts. The motor mounting in conjunction with a machined impeller track ensures low and controllable blade tip clearances for improved performance and efficiencies. Pad mount motors are used for all fan sizes and help to reduce vibration levels in the axial direction of the motor significantly. This leads to longer motor bearing life and lower maintenance requirements.

Minges emphasises that all possible measures are taken to ensure the highest quality and best possible performance of every fan supplied by TLT-Turbo. "All fans are ISO 5801 tested unless the client agrees to type testing on higher volume orders. We ensure that the client-quoted performance is met before the fans leave the factory," he says, adding that test certificates on both raw data and calculated performance can be provided on request.

"Clients are regularly invited to witness the performance tests, and to sign off on acceptance. Fan efficiency is determined with

the performance test, while the quality check ensures we deliver on what we promised the client. The fans also come with pressure ports that can be hooked up to a calibrated handheld measuring device to measure performance in-situ," Minges adds.

In addition to performance and efficiency, ease of maintenance was also a major consideration in developing the new Auxiliary and

Booster range. The modularity of the product design and the interchangeable standardised parts allow for quick turnaround time on parts supply.

"We only have two blade types for the full product range and generally only one motor barrel per fan size accommodating various motor sizes and types. Standardisation on the product is key to successfully managing maintenance and repair as it allows ample supply of spares for companies certified to do the repair work. The design track record has indicated a longer mean time between failure (MTBF) than previous products," Minges explains.

The fan range is being rolled out in phases. The preliminary testing at sites located in Sub-Saharan Africa has been launched successfully. The next phase is globalisation as the new range will be rolled out in the USA, Canada, Europe, Russia and Australia. Following this, product supply and support will be extended to TLT-Turbo offices in South America and India. In the interim, Minges says these fans can be supplied to clients worldwide from TLT-Turbo Africa.

TLT-Turbo Africa has received a number of orders for its fans since the end of 2017. These include South African clients seeking a solution for deepening a gold mine, and for Kamo Copper in the DRC as an exclusive supplier. "The feedback we have received thus far has been that the fans are meeting both our and the clients' expectations. One EPC consultant used the phrase 'superfan' to describe the new range, saying he had not heard such a quiet fan of this size before," says Minges commenting on the reception of the new range.

"The Auxiliary and Booster fan range was developed to enhance TLT-Turbo's mining ventilation product portfolio. The product is based on historic innovative designs by the TLT-Turbo Africa R&D team. Continual product development and keeping up to date with the latest technologies is ingrained within the engineering teams of TLT-Turbo. Ensuring that innovations are market and client-driven with the end result being a benefit to the industry, puts us in the forefront of advancement in ventilation solutions," Minges concludes. □

TLT-Turbo on-site test lab advances product quality

TLT-Turbo GmbH, has spent the past five years investing in and equipping its on-site test lab. The lab now provides streamlined processes for research, advancing product quality and expanded capabilities for material testing.

With a focus on particle impact wear testing, the new test lab is driving innovation forward at TLT-Turbo as the results help improve product reliability, quality and performance in their final operating environment.

Patrick Baumgärtner, research and development engineer and expert in wear and corrosion protection at TLT-Turbo, has played an instrumental role in building up the test lab located at the company's Development Centre in Zweibruecken, Germany – to its current capabilities. Together with industrial fans product manager, Sabine Groh, they have been spearheading the recent research.

Currently, the core field of research at the test lab is the testing of new wear-resistant materials and coatings for fan components. Baumgärtner says that the testing takes place in the lab's solid particle impact wear test bench. There, various types of dust or abrasive particles are blasted onto the test material, varying the angle and speed of the blasting to observe the resulting wear.

"We also carry out caking tests where we select, for example, anti-adhesive layers for our fans, in order to find suitable solutions

for customer applications. A further main focus is the analysis of process residues that can have an abrasive or corrosive effect. Here the composition, size distributions, pH value and conductivity in the eluate are determined," Baumgärtner explains.

TLT-Turbo's approach is to continuously test materials, coatings and components in order to produce fan components that are designed for performance excellence in any operating environment. The testing is applied to current and new products in development but also to samples that are brought in from client sites in order to establish the wear patterns caused by their specific environments. In this way, TLT-Turbo is able to provide each client with a custom-

ised solution that will last longer and require less maintenance.

The test lab offers facilities for metallography, a stereomicroscope, a pycnometer for determining the density of materials and coatings, and an automated solid particle impact wear test bench. "The capabilities of the test lab open a lot of doors for advanced research that will make a positive contribution to the engineering community at large as well," says Baumgärtner. "Under my supervision, studies and thesis research takes place in the laboratory in cooperation with local colleges and universities. For me, this is the basis for successfully researching and developing new solutions in our field," he concludes. □



A section of the materials testing laboratory in Zweibruecken.



The new TLT-Turbo Auxiliary and Booster fan range is available to clients worldwide.