Successful practice run: Volvo Construction Equipment retrofits their painting system with new overspray filtration technology

Volvo Construction Equipment in Braås, Sweden was facing a hot summer. Before long, their painting system would be upgraded with a new overspray filtration system. Volvo and Keller Lufttechnik assembled the complete RECLAIM separation system in a plant in Kirchheim and put it into operation for preliminary testing. according to their statement, the subsidiary which is wholly owned by the Swedish Volvo Group, is one of the largest manufacturers of construction machinery, and is the largest producer of articulated haulers and wheel loaders. In Braås the number of haulers to be painted has increased up to 2,000 units per year. In order to fulfill this requirement, it became necessary to upgrade their painting system with new filtration technology.

Well considered decision in favor of the RECLAIM process

Volvo CE authorized a Swedish engineering firm to perform a survey of various manufacturers and their filtration systems. „During the final assessment, we paid attention to the total costs and how the new filtration technology suited our existing painting system“, informs Henrik Ohlin, Manufacturing Engineer of Surface Treatment. Keller Lufttechnik, with their RECLAIM dry separation system using energy-efficient recirculating air operation, ranked among our favorites. Keller took samples of the paint and determined that it dries very quickly and requires only a small amount of limestone powder as a binding agent for the paint overspray, thereby resulting in an overall reduction in operating costs.

The decision in favor of Keller Lufttechnik was made after a reference visit at Scania near Stockholm where truck components have been successfully painted with the same technology for eight years. „The RECLAIM process is a very ambitious technology, yet trouble-free, and its fully-automated operation convinced us“, states Ohlin.

Preliminary acceptance as a dress rehearsal

During project planning it became apparent that the 4-week shutdown in August would not be sufficient for the removal of the wet filtration system and replacing it with the new dry separation system. „Installation, wiring and testing of a filtration system with 16 filter modules (max. air flow 220,000 m³/h) and peripheral equipment would take us approximately two to three months, informs Dr. Nils Ohly, Keller Lufttechnik Project Engineer. To expedite completion, it was decided to perform a test run and to put the system into partial operation prior to delivery. Keller leased a vacant plant in the nearby industrial zone to avoid disrupting its own ongoing operations. Following installation of individual components and electrical assemblies, specialists also tested the signals transmission and successfully performed a practice run utilizing the automatic control process.

Another advantage of a preliminary commissioning: Keller experts could assess whether the system adhered to the comprehensive specifications supplied by Volvo CE. „Open issues were be addressed prior to delivery to Sweden in keeping with Ohlin’s checklist“, explains Dr. Ohly.

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Dust extraction at an extruder utilizing flexible air flow

Industry experts know that it has not been feasible to design wet separation systems in the plastics industry that are flexible enough for the air flow to adapt to the number of currently required extrusion systems. Keller Lufttechnik was able to solve this issue. At Leuna, Keller designed a system capable of precisely that, thereby achieving substantial energy savings.

BASF Leuna GmbH is headquartered at the well-known chemical site in Leuna, Saxony-Anhalt. The company and their predecessors total over 50 years of experience in the production of thermoplastic compounds. The production site in Leuna, part of the BASF Group since 2005, today produces Ultramid® and Ultradur® polyamide molding compounds with 110 employees as part of the corporate sector for Performance Materials in Leuna.

BASF’s Ultramid® molding compound is noted for its high tensile strength and thermal stability. Owing to its excellent properties, this material has become indispensable in most all engineering fields for a broad range of different components and machine elements, as a high-grade electrical insulation material, and for many specialty applications, according to the manufacturer.

Granulate production using extrusion systems
BASF Leuna produces the Ultramid® molding compound on several extrusion lines. During the compounding process Polymer is added which is then combined in the extruder and afterwards homogenized with various additives, fillers, and reinforcing material as well as a coloring agent. The molten composite is forced through a nozzle under high pressure, forming very thin strands which are cooled in a water bath and ultimately shredded into the final product, granulate.

Action required for air pollution abatement
During the extrusion process contaminated fumes are released into the air. There are legally set limit values for the maximum concentration of foreign substances in the plant air and exhaust air. „Our filtration systems have become outmoded over the years. In the meantime, legal requirements have increased, and we can no longer achieve our BASF factory standards. Consequently, there was an urgent need for action“, informs Kristin Lorenz, Project Engineer for new installations and retrofitting of systems. „Our goal is to continually reduce our emissions and invariably enhance our working conditions.“

Volvo CE attended the dress rehearsal at Kirchheim with a six-member team
The Volvo and Keller teams became acquainted with each other personally, and both teams concur that this will help simplify their collaboration during the Summer. Keller assemblers already communicated with Volvo technicians regarding the system installation. Michael Markert, Keller supervisor for commissioning, briefed the Swedish experts on system and process controls. „Team Volvo“ was already familiar with the operation and maintenance of the system in advance of activation in Brads.

„Such test commissioning is something out of the ordinary. We’ve never done this before, but it was the absolutely correct move with regard to the demanding Volvo project“, explains Markert, who has comprehensive experience in the commissioning of RECLAIM systems. He has installed 200 of these filtration systems worldwide.

The effort also proved worthwhile for Volvo CE: „We’ve been prepared in the best possible manner, and were ready for the hot summer“, mentions Öhlin. He could anticipate the actual commissioning with peace of mind.

Successful final commissioning
The system was put into timely operation in August, and Henrik Öhlin is pleased to state, „We only had to address a small problem with overspray collection, but overall, the final commissioning was trouble-free thanks to the advance teamwork.“

Contact: Dr. Nils Ohly
Phone: +49 7021 574-324
nils.ohly@keller-lufttechnik.de

Largest order for wet painting applications in company history
An automobile manufacturer will paint more than 300,000 car bodies on two lines in the future. Keller Lufttechnik received an order to separate the wet paint overspray through Geico, an Italian coatings manufacturer.

More than 56 VARIO filtration systems are utilized, which makes it the largest order in Keller company history in this area of application.