>> CUSTOMERS DISCUSSING KELLER PRODUCTS

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Giants of radiant beauty

MMG – Mecklenburger Metallguss GmbH, located in the heart of the German state of Mecklenburg-Vorpommern, has manufactured propellers for the shipping industry for more than 60 years. The market leader's requirements for modern, environmentally-friendly production as well as health and safety in the workplace are imposing. Keller air pollution control systems are operated in grinding and washing booths for sizable work pieces to separate metal cuttings from the fairly moist exhaust air so that the clean air can be recirculated back into the workbooths.

Enormous propellers with diameters measuring up to eleven meters and a weight of approximately 135 tons drive immense merchant and cruise ships across the oceans. MMG is the manufacturer of these propellers which depart the 20.000 citizen city in Mecklenburg-Vorpommern for China or Korea, before commencing their ultimate function underwater. "We are a world market leader and especially successful in Asia. Our propellers are notable for their high efficiency and energy-saving operation", reports Uwe Hemmann, the manufacturing manager at MMG. This was achieved through precise dimensioning and painstaking processes in their Waren plant.

Simulated air flows

Five years ago, company management decided to expand production at this site. "The grinding facility had to be enlarged and a new air pollution control system installed", informs Hemmann. "We investigated the market and surveyed our affiliate companies on which systems they use. It was demonstrated that the Keller systems were the overwhelming choice and their colleagues were very satisfied." Keller further persuaded with its efficient technology as well as a flow simulation for the work cabin. "The behavior of the dust particles was clearly depicted and its effect on the extraction process, in addition to the potential exposure for employees in the workplace, adds the plant manager. "The well-being of our employees is crucial for us. This is confirmed by our MMG management system for occupational safety and health, certified according to OHSAS 18001 (Occupational Health- and Safety Assessment Series). Measurements at the currently installed systems, by the way, indicate that the values calculated in the simulation were accurate."

Energy-saving air recirculation

Effective decontamination of the exhaust air was of primary importance for MMG specialists since they intended to return the air into the workplace. "It is no longer acceptable to operate such huge workbooths in exhaust-air-mode and to vent the heated ambient air outdoors. This is a huge waste of energy", adds Hemmann. Part of the energy could be recovered through a heat exchanger. The best approach, however, is to cleanse the existing, warm workbooth air thoroughly so that it can remain in the building. "This is no problem with our filters. We even fall below the permissible limit value, with 0.1 mg per cubic meter air", explains Keller's project manager of sales, Thomas Peine. The system achieves this excellent filtration efficiency with comparatively low filter resistance, so that the energy consumption of the compressed air for filter cleaning remains low. "Such energy-optimized systems can scarcely be surpassed", Peine states.

Comprehensive cost analysis

During the procurement process, Hemmann and his colleagues assessed not only the mechanical efficiency but also the start-up investment costs of the system. The ensuing costs for operation and maintenance were also of consequence. "Frequent filter exchange, for example, can significantly increase operating costs. Expensive downtimes because of work interruptions for filter exchange plus the expense of new filters can run costs up. Since we operate three shifts, downtimes are rare ", states Hemann. Keller guarantees filter lifetimes of 15.000 operating hours, or two years. "In practice, we have found that the filters last significantly longer", according to Peine. The system at the MMG grinding shop has been operating trouble-free since 2009. "We perform regular maintenance work and therefore never require any repairs ", informs Hemmann.

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The air to be separated is extracted rapidly through slots in the wall.

Air recirculation can be achieved effortlessly.

Additional systems chosen

In 2011 the company decided to relocate the washing station indoors, and Keller was charged with the responsibility of designing a suitable extraction system inside the workbooth. The propellers are cleansed with a graphite-based coating, which adheres to them as a result of the casting process. Any loose metal fragments are removed. "The air to be extracted contains water, adhesive particles, as well as metal dust – in varying ratios, depending on the process", explains the foundry engineer Peine. "We utilized our VARIO separators with rigid body filters that can withstand humidity, and are cleaned continuously with compressed air pulses." The filter assembly is integrated into the wall. Air is quickly extracted through slots, after which the air flow decreases. A large portion of the moisture content condenses into regulated liquid streams and which are drained from the system. "As soon as the air passes through the filter, it can be returned into the workbooth", states Peine. "The recirculation can be continuous. However, since the filtered air retains a fair amount of humidity, there may be too much residual moisture inside the workbooth, so it may be desirable to reduce the volume of air recirculation to achieve adequate climate control."

MMG promotes the sustainability and eco-friendliness in the manufacture of its propellers. In order to meet those requirements, the production technology must meet those standards, as well.
"It is important for us to utilize state-of-the-art systems for energy savings, seamlessly supporting our operating processes, and contributing to favorable work conditions in our company", asserts Uwe Hemmann, summing up their decision for choosing Keller air pollution control systems. <

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Uwe Hemmann, manufacturing manager at MMG