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High-Tech plastics are economical and environmentally friendly

One of the greatest advantages of plastic is that it can replace heavier metal – resulting in more lightweight automobiles. DuBay Polymer GmbH is one of the world's largest plants for the production of High-Tech plastic. During the refinement process of compounding, a variety of dusts and fumes are created which must be reliably extracted.

DuBay Polymer in Hamm-Uentrop annually produces up to 80.000 tons of polybutylene terephthalate (PBT). The polymer is the primary component of premium plastics which are utilized in numerous industries because of their flexibility. DuBay was established in 2001 as a joint venture between LANXESS and DuPont and has been experiencing steady growth in recent years.

The trend is toward lighter plastics

A driving force behind this development is the current trend towards replacing metals with durable and versatile high-performance plastics, or utilizing both materials as a composite (hybrid technology). "One advantage of plastics compared to metal is the fact that the components are lightweight, resulting in lower fuel consumption, lower costs for the automobile owner and reduced CO₂ emissions. A significant advantage for the budget and for the environment", stresses Michael Pasch, the materials processing engineer responsible for the compounding system. By adding a bulking agent, fibers and other additives, the PBT polymer achieves certain targeted characteristics in such a treatment process. DuBay employees can to produce plastics sturdy enough for use as components capable of withstanding heavy use loads such as hinges, housings, heavy foot traffic or ease of access devices. "Because of their heat resistance, automotive suppliers also utilize these plastics in components which are subjected to high temperatures, such as headlight mounts", adds Pasch.

DuBay trusts in dual-stage separation technology for enhanced production

In the beginning of 2012, DuBay introduced a second compounding system and thereby doubled its capacity for high-end plastics. During the planning stages, the system operators requested improvements to the existing labor-intensive extraction process. The key recommendation was provided by Lanxess, the parent company, which has experienced excellent long-lasting results with Keller separators, especially for plastic refinement processes.

The requirements of Pasch and his colleagues are consistent with the two-part filtration technology used by Keller for compounding processes. "First we separate dry dusts created during the weighing, mixing and adding of additives by utilizing a dry separator. Then, any adhesive aerosols released during extrusion processes are separated by a wet separator", explains Mario Borst, sales project manager of Keller Lufttechnik.

Decreased sludge facilitates disposal

There is a frequent risk of deposit build-up and fires inside the ductwork. To offset this risk, Keller employs spray nozzles which rinse the dirty air duct with water over the entire surface. The evaporative cooling creates a sudden temperature change which results in the condensation of high boiling point solvents", mentions Mario Borst. The subsequent wet separation removes liquid in addition to solid particulate from the exhaust flow and separates them from the waste water in the sedimentation basin. The resulting sludge is discharged automatically and continuously by a sludge remover and sinks into an adjacent disposal container. "We are pleased that we no longer remove the sludge manually – the operation is now much simpler and a cleaning is seldom necessary", according to Pasch.

"The fact that dust generated at the mixing platforms is extracted by a separate dry separator further reduces the amount of sludge that accumulates in the wet separator. This facilitates disposal and is more economical. In addition, the dry separator is very easy to maintain. The filter element cleaning is controlled automatically by differential pressure or at pre-set time intervals. Full disposal containers can be emptied during operation. The level monitor indicates – normally after an interval of some weeks – that the container can be emptied.

"The separation operates smoothly nearly without supervision"

Michael Pasch, materials processing engineer at DuBay Polymer GmbH

Dry separation process must meet ATEX guidelines

The requirements of the ATEX guidelines apply to the operation of a compounding system (explosion protection guidelines of the European Union). The VARIO dry separator is equipped with a high-quality pressure relief valve which can flamelessly absorb any energy created in the unlikely event of an explosion. One of Keller's patented back pressure flaps can prevent the spread of the shock wave and flames into the workplace.

DuBay's management attaches great importance to explosion protection measures since occupational safety assumes an essential function in the company. The large sign at the entrance bearing the slogan "SAFE and successful into the future" refers to the impressive number of more than 500 days without any occupational accident.

Reliable filtration technology provides high system reliability

Pasch and his colleagues manage the compounding system from their control station. A number of monitors and displays assist them. "We only leave if a malfunction message is displayed and this rarely occurs", states Pasch with pride. The high reliability not only facilitates the operator's work but also boosts the rate of production. "The separation operates smoothly nearly without supervision", asserts Pasch. When asked if Keller would be considered for the potential purchase of a

third compounding system Pasch responded: "Keller is one step ahead as far as filtration technology is concerned. Of course they would be in contention." <

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Dry and wet separation during compounding processes