

Verringerung des Energieverbrauchs und der Feinstaubemission von industriellen Schlauchfilteranlagen - LOW-E & LOW-D FILTER

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Baghouse filter systems are common for filtering, purification of gas, and dedusting in various industrial processes. However, issues of selective emission reduction have gained attention only recently. It is already known that particularly high emission occurring during the cleaning phase can be reduced by suitable process control and high-quality filters. To derive optimum methods for reduction of particulate emissions, this project has investigated the influence of different process parameters. Tests were carried out on an industrial multi-baghouse system both with clean filters and aged filter media to obtain statements on long-term behavior that are particularly relevant to industrial applications. Prior to these tests, relevant emission mechanisms were identified to enable efficient emission reduction measures. For time-resolved emission measurement, a commercial scattered-light particle counter was calibrated for test dust Pural SB in such a way that it was possible to directly convert the measured distribution of the emitted particles into mass distribution and mass concentration. The tank pressure and, consequently, the intensity of both clean and aged filter media regeneration were found to be relevant factors of influence on the operating and emission behavior. Given optimized operating conditions, low-emission filters made of needled felt with melt-blown layers are able to compensate a higher filter medium resistance and thus achieve a considerable reduction of particulate emissions while requiring little more energy. The worked-out solution, which can be universally applied to different types of dusts and filter media, allows a better understanding of emission mechanisms and enables selective emission reduction measures by means of the developed measuring method.