

ProExpertise - Reduction of baghouse filter operating costs through pressure drop estimation and energy demand optimization.

Dipl.-Ing. Tim Neuhaus, Dipl.-Ing. Peng Bai,

Dipl.-Ing. Theo Schrooten, Dr.-Ing. Gunnar-Marcel Klein

Intensiv-Filter GmbH & Co. KG, Voßkuhlstraße 63, 42555 Velbert, Germany

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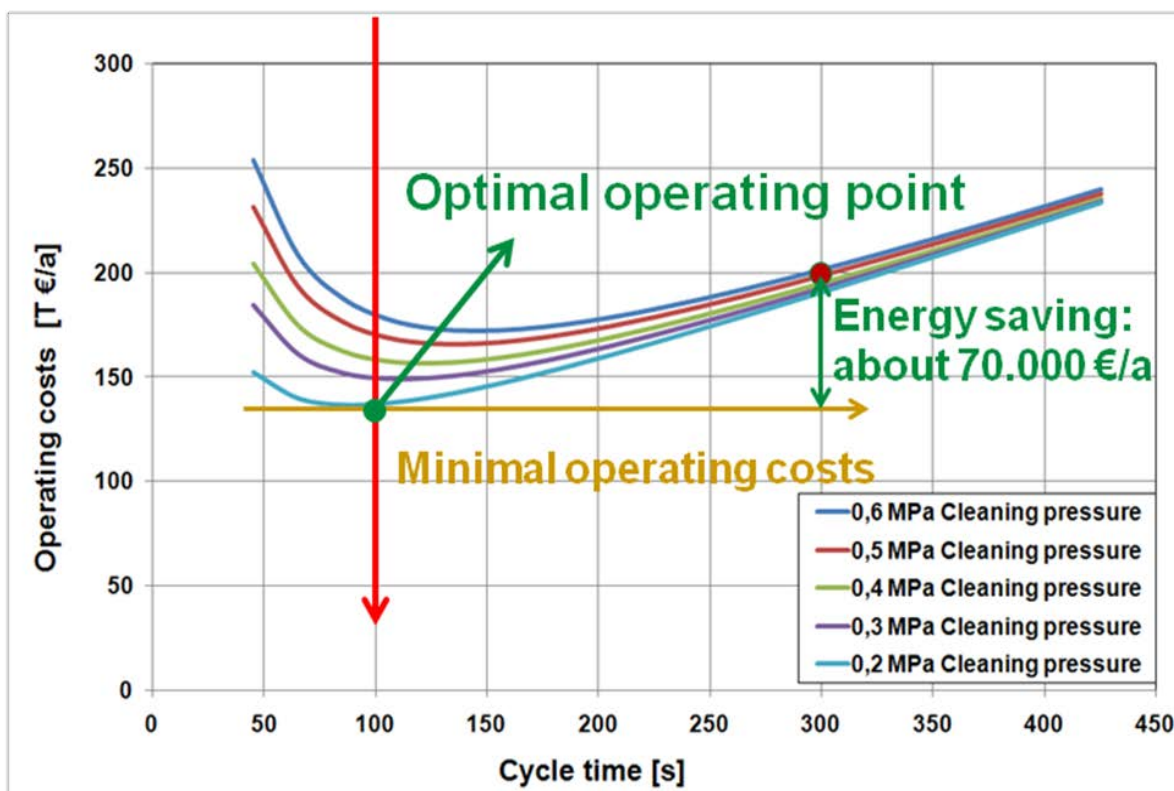
ABSTRACT

The minimization of the energy consumption of industrial plant equipment is today one of the main operator concerns. Regarding to jet-pulse bag filter, especially the power of the fan motors and the compressed air consumption is responsible for its life cycle cost (LCC).

Furthermore the interest of energy efficient process units is of great significance because the air flow volumes that need to be de-dusted have increased significantly in recent years. The ever-growing filter sizes necessitate increased bag lengths to reduce footprint areas and investment costs have risen to accommodate compact design. The installed cleaning system and its injector technology as well as the operation mode (online or offline cleaning) play the key role, when it comes to very long filter bags, but it has also a decisive influence to the energy consumption. In addition raw gas dust load, filter media type, cycle time and further parameter deciding the pressure drop respectively fan power of a jet-pulse bag filter and therewith its LCC.

Because all these factors are depending from each other the determination of the optimum operating set point of a jet-pulse bag filter is a complex challenge. Hence, Intensiv-Filter has developed the filter expert system "ProExpertise", which is able to calculate the differential pressure, the consumption of pressurized air and the energy demand for different operating parameters. The presented tool is able to predict the optimum cycle time, at which the sum of the energy consumption for the fan and for the jet-pulse cleaning has a minimum value. It provides even experienced filter experts valuable information to reduce the operating costs.

ProExpertise is based on the well known filter equations for cake filtration and contains experimental determined specific cake resistances and residual pressure loss values for typical application in practice. The expert system can be used to reduce the energy demands of existing and new filtering installations



Prediction of the optimum cycle time as a function of the applied air tank pressure by the filter expert system ProExpertise, case study: high dust kiln / raw meal mill bag filter, ProJet mega[®], 8 m bag length