Three Steps to Improved Filtration Performance and Reduced Cost in Times of Limited Capital

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Abstract

The optimization of the existing filters in an alumina refinery is a very economically attractive alternative to investment in new equipment, particularly in times of where available capital is limited. With the BOKELA filter revamping program, insufficient filter performance, excessive maintenance and the high operating costs of existing filters can be corrected quickly and at a reasonable price. The benefits of filter revamping include: increased filtration capacity by between 30 % to 135 % (as per assessment), improved cake moistures, improved filter operation, reduced maintenance, and a typical cost range between 20% to 40% of the cost of a new filter. The BOKELA filter revamping program comprises three steps: Diagnostic, Engineering and Realization. The program starts with laboratory and/or plant trials performed by BOKELA to assess the potential to increase filter capacity and to make proposals for modifications to the filter design. If the test results and the proposed design modifications are suitably attractive, the revamping project typically starts with the upgrading of a first filter in a step by step collaborative process involving BOKELA and the equipment owner.

Keywords: disc filter; pan filter; drum filter; filter revamping; filter capacity, filter cost reduction.

1. New Investment or Revamping?

The first step in choosing between a new filter installation and an existing filter plant optimisation is to verify the current performance and capability of the existing plant, and its improvement potential.

In many cases the revamping of running filtration plants improves the filter capability to such an extent that the required targets can be achieved as effectively and reliably as with new equipment. This requires that the revamping is informed by deep know-how and experience concerning the filtration process and filtration equipment. The upgrading of operating filter plants is realised much quicker and impairs the whole production process significantly less than the planning and implementation of new equipment. Capacity increases of 30 % up to 135 % can be achieved by revamping.

Investing in new equipment usually means a prolonged multistage procedure including:

- a time consuming pre-engineering phase to specify and pre-plan rebuilding measures, to work out a specification of the new technology, etc.
- technology screening to identify the best suited technology available on the market, which often demands the performance of tests or trials
- OEM screening, calling for bids, to compare and evaluate the competitive offers with respect to technical and economic criteria, and to carry out negotiations