

Evolution of Tube Digestion Technology for Alumina Refining

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Abstract

Refineries processing Boehmitic or Diasporic bauxites require a high temperature digestion circuit to extract the alumina. These circuits typically operate at between 250°C to 280°C. Since the 1960's, many of the worlds high temperature digestion circuits operated as dual stream circuits with the caustic liquor heated progressively through shell and tube heaters using regenerative flash steam. The liquor and bauxite streams were then mixed at the autoclave or digester vessels. With increasing focus on maximizing extraction, energy efficiency, process simplicity and plant utilisation, tube digestion technology has been increasingly the technology selected for refineries around the world. The tube digestion flowsheet preferentially combines the bauxite and caustic liquor streams together in a single stream prior to regenerative heating. This paper provides a brief overview of the technology, outlining its evolution with a review of past, present and future installations. A comparative review of key refinery process parameters using the technology is also provided with the impact on capital and operating costs for the refinery as the process design deviates from the tube digestion flowsheet.

Keywords: Tube digestion; single stream.