



Technical Article

Mechanical Dewatering of Fine Coal and Refuse Slurries

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Alternative solid/liquid separation techniques offer a wide range of equipment for the dewatering of fine coal slurries. The importance of selecting the most effective combination of dewatering methods is underlined by the increasing costs of thermal energy required by conventional drying operations. The objective behind choosing a particular flowsheet is to obtain maximum moisture reduction rather than maximum effluent clarity (although both should be attainable). To this end any slurry thickening technique may be preceded by flocculant and/or surfactant addition, and followed by filtration or centrifugation.

The cake post-treatment process of dewatering is to minimise final cake moisture contents, but the available methods are wide and dependent on the type of filter initially selected for the duty. The ultimate aim of effective dewatering is to eliminate any subsequent thermal drying of the coal product and to render the refuse in a suitable form for disposal. Flocculating agents may be used to improve the settling/filtration characteristics of the slurry, and surfactants to reduce the residual moisture, but such additives can also be expensive relative to the value of the final product. Steam filtration/dewatering offers a technical alternative and can be useful when a steam supply already exists on plant. Other more esoteric techniques such as electrokinetic dewatering are being investigated and may offer yet further alternatives in the future. This paper will collate the literature

pertinent to the mechanical dewatering of fine coal and refuse. The possible alternatives available for coal slurry dewatering will be outlined and put into perspective, and a critique of the relative merits of the procedures involved will be presented.