

Cost Effective Application of Filter Aids in Industrial Waste Dewatering

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Abstract

Filter aids are widely applied for process or waste fluid filtration in broad areas such as chemical, environmental, drilling, mining, metalworking, food, drink, winery, pharmaceutical, biochemical, and pool industries. They are used to improve filtrate rate, filtrate quality, or cake dryness of difficult to be filtered materials. Industrial waste or sludge dewatering normally involves flocculation and mechanical filtration. Efficiencies of dewatering are limited by the flocculated sludge characteristics and compactibility. Addition of filter aids can condition the sludge and reduce cake compactibility, therefore greatly improve dewatering rate and cake dryness. However, benefits of filter aids may be offset by increased volume of final sludge to be disposed. Cost analysis should be conducted to select an optimized filter aid dosage to ensure both operational and economical benefits. In this paper, different scales of dewatering tests were conducted on two industrial sludge samples using rice hull ash filter aids at different dosages. Filtrate flow rate, cake moisture content, total cake volume are obtained and material balance and cost analysis involving both transportation and incineration cost are conducted on each tests. Results show 50% of total sludge solid MaxFlo dosage yields a 33% cake moisture content reduction, 3.5 times filtrate rate increase, and around 20% total cost reduction. Under proper dosage, filter aids can be successfully applied to sludge dewatering applications to improve dewatering efficiencies and decrease total disposal cost.