# Coverage Application Rates of DE and Perlite Filter Aids

## Introduction:

The amount of DE and Perlite Filter Aid added to a precoat process is critical for filtration performance. Adding too much filter aid results in a thicker precoat, which will reduce flow, and may reduce cycle times. Adding too little filter aid results in inadequate filter coverage, bleed through, unacceptable clarity, and possible reduce flow rates as well.

This document explains how Dicalite Minerals tests it's filter cake density (termed Permeability Cake Density or (PCD), and how to use this value to apply the correct amount (thickness) of filter aid to your filter and thereby maximize precoat performance. This document does not explain the correct dosing of body feed or the correct selection of filter aid for each application.

## Theory:

The most important parameter for a filter aid is it's flow rate. At Dicalite we measure the flow rate of our filter aids in water under controlled laboratory conditions. This results in the generation of the permeability of the filter aid, and it's wet cake density (density as a filter cake in water). The permeability is available on our TDS's (Technical Data Sheets) as PFRv (or Permeability Flow Rate by Volume). This can also be expressed in the standard engineering term of Darcies. When we measure the flow rate we measure the flow of water through a volume of filter cake which varies depending upon the type of filter aid and it's respective density. This volume is termed PCD or (Permeability Cake Density). This value of PCD is available on all Dicalite Filter Aid TDS's for customer reference.

## Using PCD to determine filter aid coverage and thickness:

The PCD is listed on our TDS's in lbs/ft3. This is a wet cake density and approximates what would occur on a customer's filter in a water matrix. Consider the following:

The Customer wants a 1/8" precoat on a 100 $ft^2$ area filter press using Dicalite 2500 DE Filter Aid. How much Dicalite 2500 must be added for this coverage?

The maximum PCD for Dicalite 2500 from the TDS is 23.1 $lbs/ft^3$. (The actual value will be less than this-check the COA for the product) - The thickness required is 1/8" (inch) or 0.0104ft.

Thus: $100ft^2 \times 0.0104ft$ = Volume of Filter Aid required.= $1.04(ft^3)$
$1.04ft^3 \times 23.1lbs/ft^3 = 24.02lbs$ of Filter Aid required.

Perlite is lighter than DE. For the same conditions above using Dicalite LD1006 Perlite Filter Aid the result would be:

$1.04ft^3 \times 12lbs/ft3 = 12.48lbs$ of Filter Aid required.

Note that these calculations are based upon **weight...not volume.**

For Further information contact Dicalite Technical Services at 575.838.4436 or www.dicalite.com on the web.