Technical Bulletin 101807

Calculating Precoat thickness for Dicalite Filter Aids

A common necessity when setting up a precoat cycle for filtration, or for troubleshooting an existing filtration process is the calculation of how much filter aid it takes to deposit a set amount of filter aid on a filter.

For example, how much Dicalite 4200 DE do I need to deposit a 1/8" precoat on a 200ft^2 horizontal leaf pressure filter?

Dicalites' TDS (Technical Data Sheets) list a value of PCD (Permeability Cake Density). This is the wet cake (with water) density used during our lab tests to test Dicalite flow rates. This value will closely approximate filtration cake densities with water solutions.

The PCD of Dicalite 4200 is 23lbs/ft^3. This means that 1 cubic foot of Dicalite 4200 will weight 23lbs in a water matrix.

The amount of Dicalite of any grade for a required amount of precoat, and a known amount of surface area on a filter can be determined as follows:

(1) Weight Filter Aid needed (lbs)=Precoat Thickness Desired (ft)*Surface Area on filter (ft^2)*PCD from TDS (lbs/ft^3)

We can now answer the question as posed above:

How much Dicalite 4200 DE do I need to deposit a 1/8" precoat on a 200ft^2 pressure filter?

From (1) =[(1/8)/12 (ft)]*[200 (ft^2)]*[23 lb/ft^3] =**Weight of Dicalite 4200 required=47.9lbs**

General Rules of Thumb for Precoat Thickness

The concept of precoating is to provide a barrier for the screen from filterable solids, and as protection (from plugging) for the screen.

It is generally considered that a very thin precoat is best. A thick precoat will slow filtration and waste filter aid. Although practices vary, precoats normally range between 1/16" to 1/8" , (1.6 to 3.2mm).

For commonly used Dicalite Filter Aids and precoat thicknesses, use the chart below:

Dicalite Product	**Amount Required for 1/8" Precoat (lbs/ft^2)[1]**	**Amount Required for 1/16" Precoat (lbs/ft^2)[1]**
Dicalite Speedflow	0.286	0.143
Dicalite Speedplus	0.26	0.13
Dicalite 2500	0.24	0.12
Dicalite 5000	0.22	0.11

[1] Based upon Typical PCD values for Dicalite grades