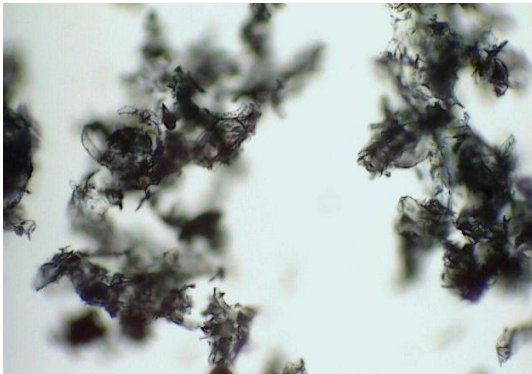


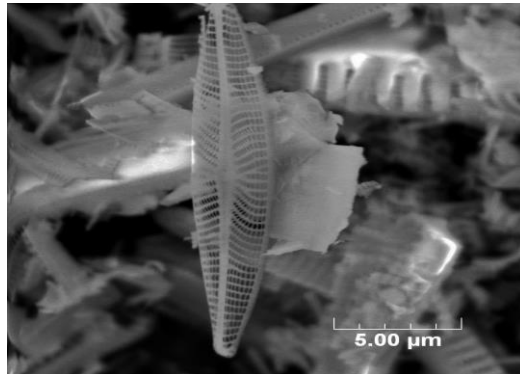
Dicalite™

HIGH PERFORMANCE FILTER AIDS

PERLITE FILTER AIDS



DE FILTER AIDS



CELLULOSE FILTER AIDS

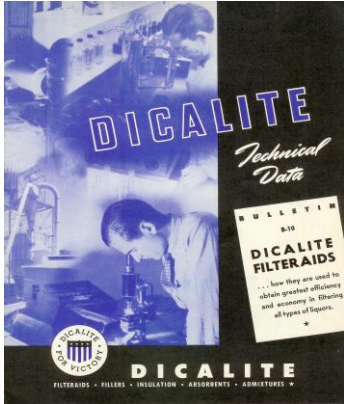


Dicalite/Dicaperl Minerals Corp. 1 Bala Avenue, Suite 310, Bala Cynwyd, PA 19004
610-660-8840 Fax: 610-660-8817

On the Web: www.Dicalite.com www.Dicaperl.com



Dicalite/Dicaperl Minerals Corp. provides high quality Diatomaceous Earth (DE), Perlite and Cellulose filter aids to industry worldwide.



Dicalite and Dicaperl facilities are located across North America to provide our customers with worldwide service. Dicalite Europe, located in Ghent, Belgium, a division of Dicalite Minerals, is the largest perlite filter aid plant in the world and provides perlite filter aids for industries across Europe, Asia, and the Middle East. www.dicalite-europe.com.

Filtration

Filtration is the separation of solids from liquids by forcing the liquid through a porous medium and depositing the solids on the medium.

A filter aid is a finely divided material which, when added to the filtrate

(the material being filtered), helps control flow and solids removal. The septum, usually a screen or cloth, serves principally as a support for the filter cake formed by the filter media. The filter aid forms a porous layer on the septum and thus the filter aid is the filtering medium that traps the solids being removed and prevents them from blinding the septum. Filter aid filtration is mechanical and not chemical in nature. Dicalite DE and Perlite filter aids are incompressible, highly porous 85-95% voids or open spaces and irregularly shaped, which makes for excellent filter aids.

Good filter aids must be light in weight, chemically inert, and form high porosity (high flow rate) filter cakes to maintain free flow of the liquid. The structure of the particles must be such that they will not pack too closely. This not only permits high initial liquid flow, but also provides pore spaces to trap and contain the filterable solids and leave a high percentage of channels remaining open for flow. Particle size distribution must be adjusted to permit precoating on coarse wire, and yet give the desired flow rate and clarity. Dicalite/Dicaperl Perlite, Diatomite and Cellulose filters aids meet these criteria.

There are many different types of filtration. However, the reason DE, Perlite, and Cellulose filter aids have been, and are still in use, is their flexibility and robustness with regard to process variations. When there is a process upset using filter media, the material is simply discarded as usual and re-applied. Little or no production time is lost since application is a normal part of the procedure. With other filtration methods such as cross-flow filtration, a process upset can take the entire process down for hours or more until the system can be cleaned and restarted.

Grade Selection

Dicalite/Dicaperl offers over 30 different grades of DE, Perlite, and Cellulose filter aids to meet any industrial filter media process. Selection of the proper grade is critically important to ensure design flow rate, clarity, and to maximize performance and minimize total filtration costs.

Dicalite provides Technical Services for our customers worldwide through our Technical Services Dept. located at our Dicaperl Perlite Mine in Socorro NM. USA. Consultation and testing services are available to assist in grade selection and troubleshooting if necessary. Lab filtration equipment is available to simulate customer processes before startup or during process changes to maximize filtration and process performance.

**Dicalite/Dicaperl Minerals Corp. 1 Bala Avenue, Suite 310, Bala Cynwyd, PA 19004
610-660-8840 Fax: 610-660-8817**

On the Web: www.Dicalite.com www.Dicaperl.com



Typical Properties Dicalite Diatomite Filter Aids
(As produced-not specifications)

Dicalite Grade	Color	Bulk Density (lbs/ft3)	Flow Rate Darcies	Wet Cake Density (lbs/ft3)	% Retained U.S.Sieve No. 150	MPD (um)	pH 10% slurry	% Moisture
----------------	-------	------------------------	-------------------	----------------------------	------------------------------	----------	---------------	------------

Basalt NV Calcined DE

215	Pink	13-15	<0.02	NA	<3	10-13um	5 to 10	<0.5
Superaid	Pink	13-15	0.02-0.05	NA	<5	10-15um	5 to 10	<0.5
UF	Pink	13-15	0.05-0.13	NA	<5	10-15um	5 to 10	<0.5
Speedflow	Pink	13-15	0.13-0.27	27.5	<5	10-16um	5 to 10	<0.5

Burney Calcined DE

UF	Pink	15	<0.13	NA	<3	16-18	5-10	<0.5
Speedflow	Pink	15	0.13-0.27	<27.5	<5	16-19	5-10	<0.5
231	Pink	15	0.27-0.43	<27.5	<5	18-22	5-10	<0.5

Flux-Calcined DE

341	White	15	0.49-0.65	<25	<8	25-27	8-11	<0.5
Speedplus	White	15	0.65-1.1	<25	<8	30	8-11	<0.5
375	White	15	1.1-1.4	<23.5	<8	36	8-11	<0.5
Speedex	White	15	1.4-1.8	<23.5	<12	38	8-11	<0.5
2500	White	15	2.0-2.9	<23.5	<15	50	8-11	<0.5
Swim-Pool	White	15	2.0-3.6	<23.5	<15	50	8-11	<0.5
4200	White	15	2.6-3.6	<23.5	<15	52	8-11	<0.5
4500	White	15	3.6-4.4	<23.5	<18	64	8-11	<0.5
5000	White	15	4.4-5.3	<23.5	<25	68	8-11	<0.5
6000	White	15	6.7-9.0	<23.5	<30	86	8-11	<0.5
7000	White	15	8.4-11.6	<23.5	<40	102	8-11	<0.5

*Dicalite/Dicaperl Minerals Corp. 1 Bala Avenue, Suite 310, Bala Cynwyd, PA 19004
610-660-8840 Fax: 610-660-8817*

On the Web: www.Dicalite.com www.Dicaperl.com



Diatomite

Diatomite or Kieselguhr has been used as a filter aid for over a century. The ore is a soft, friable siliceous mineral. It is composed of the skeletons of microscopic plants (diatoms) deposited on the bottoms of lakes and oceans probably during the Miocene age. Freshwater DE refers to diatomite that was deposited in a freshwater environment, whereas saltwater DE was formed in an ocean. Most commercial DE is freshwater DE.

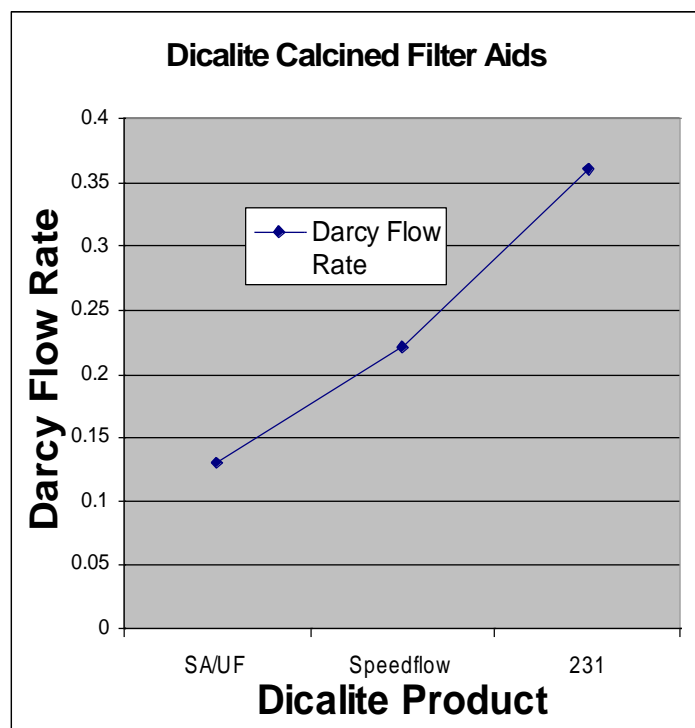
Under the microscope the particles of diatomite show up in a variety of forms; symmetrical figures resembling disks, rods, cylinders and snowflakes. The shapes of the diatoms (*the morphology*), their rigidity and their microstructure is what makes DE such an excellent raw material for the production of filter aids.

There are three types of commercially available DE: Natural DE, which is the material in its raw form and is simply dried and sized; calcined DE, which is usually pink or orange in color, and is processed at temperatures of over 1000F to agglomerate and purify the material; and flux-calcined DE, which is processed at temperatures of over 1500F with a fluxing agent which further agglomerates the particles, and turns the material bright-white.

Natural DE is not recommended for filter aids due to their small size and limited permeability. Calcined DE is normally used for fine filtration where clarity of the filtrate is most critical. Flux-calcined DE is generally used where high flow rates and high solids removal is critical.

Filtration Clarity

For maximum performance and lowest cost in filtration the highest flow rate that will achieve the desired clarity is required. Dicalite Calcined DE provides better clarity at lower flow rates compared to Dicalite Flux-Calcined DE.



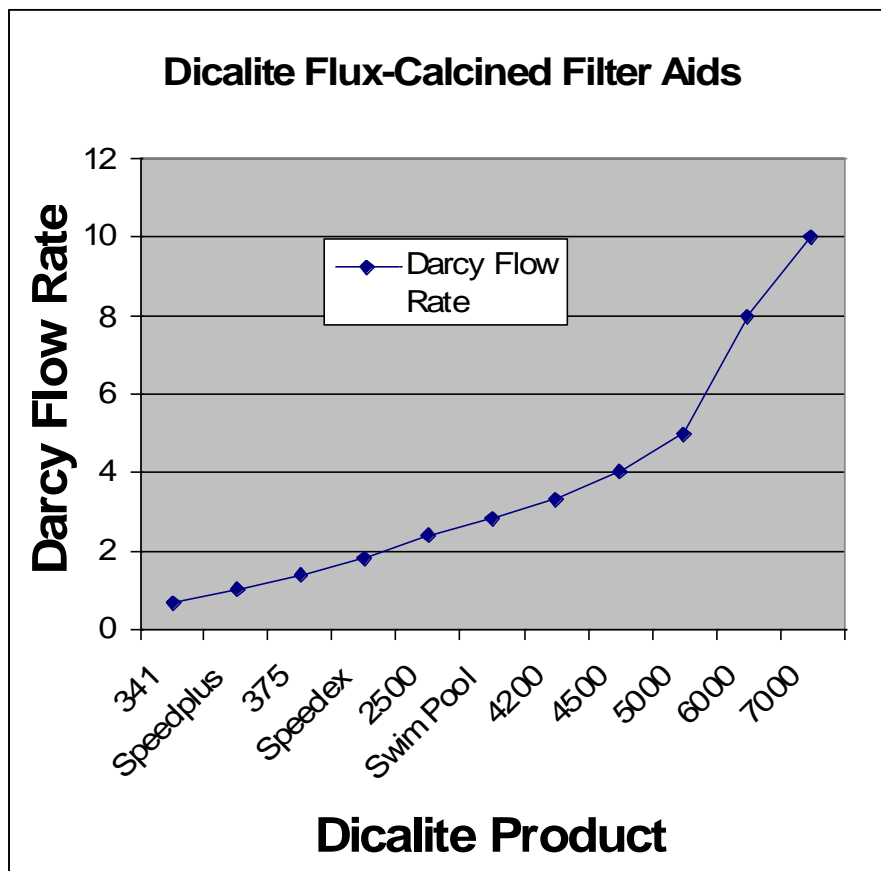
It is generally accepted that the limit of removal efficiency for DE filter aids is approximately 0.3um (millionth of a meter). These removal efficiencies occur while using calcined filter aids where flow rate is secondary in importance to clarity. Calcined filter aids are normally used on vertical, or horizontal leaf filters, and also on candle type filters. Calcined filter aids are best suited to high clarity, low solids applications where removing the smallest particulate contaminant is paramount.

Dicalite Flux-Calcined DE provides the highest flow rates with the best possible clarity. Removal efficiencies vary depending upon customer application, equipment and process, however, it has been reported by one customer that Dicalite Speedplus removes particles down to 0.5um!

Flux-Calcined DE is normally used on Rotary Vacuum drum filters and Filter-Press equipment where high solids loading, high flow rates, and excellent clarity are required. Flux-calcined DE is also used on vertical and horizontal leaf filters, and candle filters where higher flow rates are required.

**Dicalite/Dicaperl Minerals Corp. 1 Bala Avenue, Suite 310, Bala Cynwyd, PA 19004
610-660-8840 Fax: 610-660-8817**

On the Web: www.Dicalite.com www.Dicaperl.com



Filter aids are classified by permeability, which is normally expressed in Darcies. A darcy is defined as the property of a porous material which will allow a flow rate of 1ml of water under standard conditions through 1cm² of area under one atmosphere of pressure. Dicalite uses a unit termed PFRv (permeability flow rate by volume) to measure our filter aids. PFRv can easily be converted to Darcies, and we report both properties to our customers worldwide. It is important to note that a filter aid permeability value cannot be used to determine filter flow rate under process conditions in that, among other variables, it does not include the dominant effect of the particulate matter which is being filtered. It is not, in fact always the case that changing to a faster flow rate filter aid will increase the flow rate on your industrial filter! For more information on grade selection for your process contact our Technical Services

Department.

Pore Size Analysis:

Pore size directly affects the removal efficiency of a filter aid. There are a number of methods to report the pore size of a filter aid including pore size by volume, and pore size by surface area. Usually results are reported in Median Pore Size (MPS) which means there are an equal number of pores smaller than the MPS as there are pores which are larger than the MPS. There are also other reporting parameters including average pore size and maximum pore size.

Permeability, particle size, and pore size are all correlated for the same DE deposit. The slower the permeability, the smaller the particle size, and the smaller the pore size. For example, the permeability, particle size and pore size for Dicalite Speedplus are all smaller than the same values for Dicalite 6000. Since all DE is unique and has unique morphology (size and shape), it follows that you cannot compare permeability, particle size, and pore size from one DE supplier to another. More specifically, you can compare permeability between vendors, but the particle size and pore size will be different for the same permeability values.

**Dicalite/Dicaperl Minerals Corp. 1 Bala Avenue, Suite 310, Bala Cynwyd, PA 19004
610-660-8840 Fax: 610-660-8817**

On the Web: www.Dicalite.com www.Dicaperl.com



The MPS (median pore size) does not determine the removal efficiency of a filter aid. The removal efficiency of a filter aid can only be accurately determined in a specific process (or by lab testing using certified particle size standards). The MPS of Dicalite SA/UF, our finest calcined filter aid is 1.6µm. However, the removal efficiency of Dicalite SA/UF, is perhaps 0.5µm. The MPS is not the particle size that will be removed by a given filter aid, this value can be ten times less than this value. The particle size that can be removed by a given filter aid is controlled by the distribution of pores, including pores much smaller than the MPS. As an example, Dicalite Speedplus has a MPSsa of approximately 7µm, yet customers routinely report particulate removal efficiencies of <1µm.

As particles are retained in a filter aid during filtration, the effective pore size changes, and thus pore size analysis is helpful, but not deterministic in assessing the removal efficiency.

Pore Size Analysis:

Median Pore Size Analysis(MPS):

Size (µm) with Pores(v) less than

Dicalite Grade	MPSv	MPSsa	Size (µm) with Pores(v) less than			
			5%	10%	15%	20%
Basalt NV DE						
215	NA	NA				
Superaid	NA	NA				
UF	NA	NA				
Speedflow	NA	NA				
Burney DE						
UF	6.1	1.6	0.6	1.4	2.2	3.1
Speedflow*	6.2	3.4				
231	6.3	5.1	4.3	4.8	5.1	5.3
341*	9.9	6.2				
Speedplus	14	7.0	5.9	8.2	10.1	11.5
375*	18.2	7.8				
Speedex	20.1	8.4	6.9	9.2	10.8	12.4
2500*	26.3	9.0				
4200	30.3	9.6	7.1	8.0	11.1	13.6
4500*	34.6	9.8				
5000*	35.2	10.2				
6000	38.1	10.4	7.5	10.5	15.1	18.7
7000*	42.3	11.2				

MPSv=Median Pore Size by Volume

MPSsa=Median Pore Size by surface area

Size (µm) with Pores(v) Distribution: The Pore size by volume in (µm) microns at each level of distribution size- i.e. 5% of the pores are smaller than this value.

**From curve fit of representative data.

Analysis performed by PMI Ithaca, NY (USA) by mercury porosimetry.

For more information on Dicalite brand filter aids please contact our Burney facility at 530-335-5451 or Technical Services at 575-838-4436, or visit us online at our websites.

**Dicalite/Dicaperl Minerals Corp. 1 Bala Avenue, Suite 310, Bala Cynwyd, PA 19004
610-660-8840 Fax: 610-660-8817**

On the Web: www.Dicalite.com www.Dicaperl.com



Perlite Filter Aids (PFA) Grades

Product	PFRv (Darcy)	PCD lbs/ft3	Floats ml	Typical Use
416	<35 (<0.12)	<35	14	Stone Grinding Water Recycling, Fine Filtration (FP)
426	35-50 (0.12-.25)	16-26	16	Beer Filtration, (PF-BF)
436	50-65 (0.25-0.43)	13.5-18.5	22	FP, PF, Fine Wine Filtration, Lightweight Filler
456	65-80	13.5-17	30	FP, PF, RVDF, Lightweight, Filler-Texturing
476	80-95	13.5-17	35	Citric Acid, Cutting Oil Recycling Filtration, Corn Syrup, (FP), RVDF, FP
476SP	95-105	13.5-16.5	40	Activated Carbon Removal (FP), RVDF, PF
4106	105-120	13.5-16.5	45	Medium Wine Filtration, (FP), Waste Water, RVDF, PF
4156	120-140	14-16	50	(FP), RVDF, PF Precoat, Completion Fluids
LD1006	95-130	10.5-13.5	85	Beet Sugar Debris Removal (PF), RVDF, FP
LD1106	130-150	8.5-11.5	85	Waste Water, Coarse Food and Beverage Filtration (FP)

FP=Filter Press Type Filter PF=Pressure Filter, either Horizontal, or Vertical Plate RVDF=Rotary Vacuum Drum Filter RVDF*=Rotary Vacuum Drum Filter with adequate vacuum on certain applications. BF=Body Feed HFCS=High Fructose Corn Syrup



Typical Properties for DICAFLOCK® Cellulose Filter Aids and Fillers

Dicaflock® meets or exceeds the FCC (Food Chemicals Codex) monograph for powdered cellulose. Dicaflock® is a white to cream colored, fibrous powder containing no obvious foreign material. Dicaflock® is composed entirely of purified cellulose.

Typical Chemical Properties*

Assay, % Cellulose	>97.0%
pH	5.0-7.5 (10% suspension)
Loss on Drying	<8.0%
Water Soluble Substances	Not more than 1.5%
Ash (total)	Not more than 0.3%
Lead	Not more than 3.0 ppm
CAS Number 9004-34-6,	Cellulose, Fine white powder

Typical Microbiological Properties*

Standard Plate Count	Not more than 1,000 per gram
Yeast and Mold	Not more than 100 per gram
Salmonella	Negative (25 gram sample)
E.Coli	Negative (25 gram sample)
S. Aureus	Negative (25 gram sample)

Typical Physical Properties*

Grade	Fiber Length ⁽¹⁾	Permeability (darcies) ⁽²⁾	Bulk Density (lbs/ft ³)	Wet Bulk Density (lbs/ft ³)	40 Mesh Retained %	100 Mesh Retained %	200 Mesh Retained %	Water absorption (% by weight)	Oil Absorption (% by weight)
DF5	200	20	7	8.5	<35	<70	<85	650	600
DF10	120	16	8	9.5	<10	<55	<80	620	580
DF20	100	9	9	11.5	<20	<50	<65	600	550
DF40	65	6.5	12	13.5	<5	<30	<60	500	400
DF100	50	4.5	14	15.5	<1	<20	<55	450	370
DF200	35	2.5	18	19	<0.5	<10	<25	350	300
DF300	30	2	18	20	0	<2	<15	350	300

*Information presented by manufacturer does not represent a material specification. No warranties, expressed or implied are made. CAS Number 9004-34-6, Cellulose, Fine white powder

- (1) Fiber Length by Rotap Screen Analysis
- (2) Permeability by EBC method 20 gram sample 5psi.

For Further information on Dicaflock® cellulose material contact your sales representative or technical services at 575.838.3042.