

FOR THE  
**BEST**  
FILTRATION



**PERLITE FILTER AID FOR**

- EDIBLE OIL
- BIO-DIESEL
- BEVERAGES
- INDUSTRIAL FILTRATION



## What is Perlite Filter Aid?

Perlite in the natural state is a dense glassy rock formed by volcanic action. When crushed and treated under proper conditions, it pops like popcorn, expanding to 20 or more times its original volume. A special milling and classification process gives our perlite filter aids the structure and correct particle size range distribution needed for optimum performance.

## TECOLITE Perlite Filter Aids

As a TECOLITE MINERALS we manufacture 20.000 tons of Perlite Filter Aids under the name of TECOLITE and distribute all around the world. We use the Perlite Ore which is harvested from the Izmir-Bergama Deposits (World's Well known Perlite ore for filtration industry) We have got all grades for any type of Liquid Filtrations.

### Total Chemical Composition

SiO <sub>2</sub>	71 - 74
Fe <sub>2</sub> O <sub>3</sub>	0,4 - 0,9
Al <sub>2</sub> O <sub>3</sub>	12 - 14
Na <sub>2</sub> O	3 - 4
K <sub>2</sub> O	4 - 6
CaO	0,4 - 0,9
MgO	0,10 - 0,20
H <sub>2</sub> O(L.O.I)	3,5 - 4,5

## The Benefits Of TECOLITE Filter Aid

TECOLITE Perlite filter aids are lightweight, inert, impart no taste or odor to liquids being filtered, and are virtually insoluble in mineral and organic acids at all temperatures. Solubility in strong alkaline solutions varies depending on temperature and contact time. Without using a filter aid the solid particles in the liquid will soon accumulate on filtering surfaces and block them.

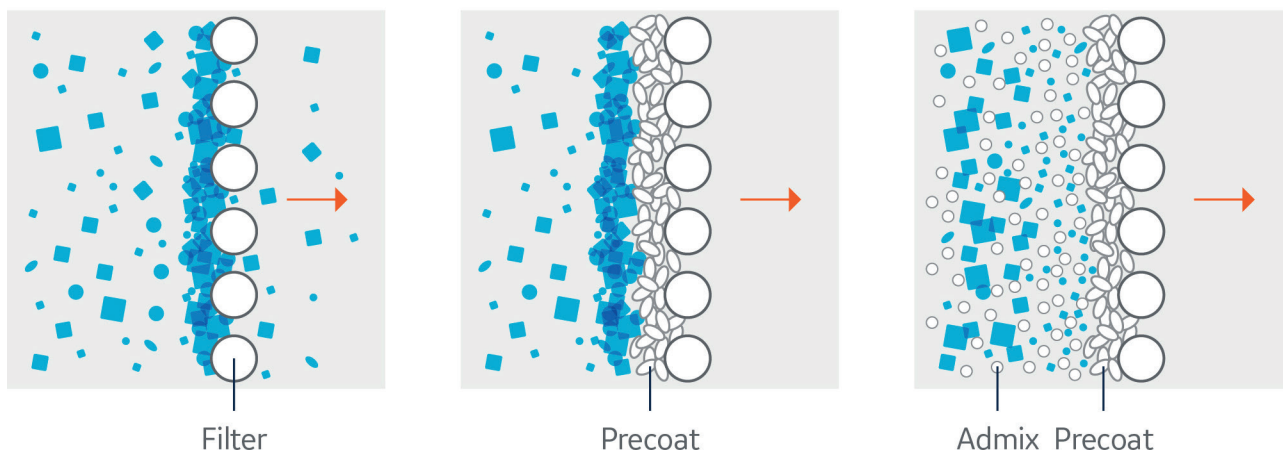
TECOLITE perlite filter aid makes a filtering layer (cake) that transfers the actual filtering from the septum to the whole mass of filter aid. Filtration occurs in the tiny pores formed by the fine particles of filter aid.

## Volume-Based Pre-coat Filtration

TECOLITE Perlite filter aids provide users with a lightweight material choice. Perlite filter aid grades provide the user with a density advantage from 20 to 50% over other types of filter aids. Perlite filter aid dry density ranges from 80 to 200 kg/m<sup>3</sup> and the filter cake density range is 100 to 260 kg/m<sup>3</sup>. In contrast, other filtration materials produce equal performance filter cakes in the range of 230 to 420 kg/m<sup>3</sup>. Expanded perlite provides larger volumes with low bulk density compared to other filter aids. Experience in a variety of applications has shown that most filter aid users can economically switch to perlite from other pre-coat filter aids without sacrificing performance.

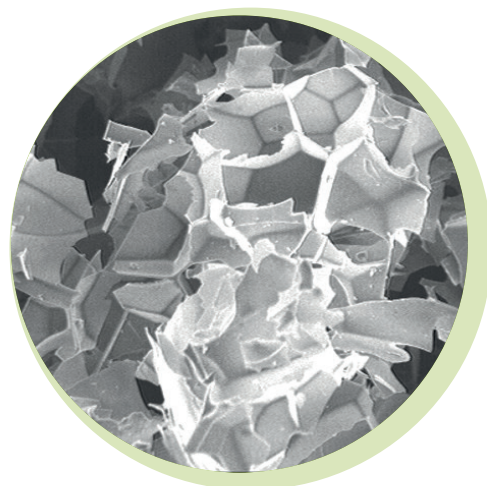
## Usable With Standard Equipment

TECOLITE Perlite filter aids can be used with either pressure or vacuum filtration equipment. Perlite generally replaces other filter aids on a one-to-one volume basis - for example; a cubic measure of perlite will replace the same volume of other filter aids. Selection of the optimum grade and dosage may require plant or laboratory filtration tests.



## Flow Rates of Grades

TECOLITE Perlite filter aid grades from various manufacturers range from 0.1 – 10 Darcies. (The Darcy is a common unit of flow rate for filter aids.) A material with a permeability of one Darcy passes 1 milliliter per second per square centimeter of a liquid of 1 centipoise viscosity (approximately that of water) through a cake 1 centimeter thick at a differential pressure of 1 atmosphere. The higher flow grades are especially applicable to use with highly viscous liquids such as syrup, resins or gelatinous slurries. Productivity, clarity and flow rates may be increased through the use of perlite filter aid grades. These traits are accomplished during the liquid's path through the channels created by the jagged, interlocking particles.



Microscopic View

## Easy Cake Release

Additional benefits of TECOLITE perlite filter aids come at the end of the filter cycle. Perlite filter cakes remain porous and do not compact. Filter cakes built up under pressure release easier when perlite is used. This release facilitates cleaning, potentially reduces manpower requirements, and increases productivity. The lower weight of perlite filter cakes may also reduce disposal costs.

## Inert-Codex approved

TECOLITE perlite filter aids are sterile and inert and are widely used for filtering liquids in the beverage, food and pharmaceutical industries. They do not impart taste, odour or colour and contains less than .1% silica (almost none)

Trace Elements	Percentage ( %)
Arsenic	<0.001
Barium	<0.1
Boron	<0.01
Chlorine	<0.0005
Chromium	<0.0075
Copper	<0.0015
Gallium	<0.05
Lead	<0.001
Manganese	<0.03
Molybdenum	<0.002
Nickel	<0.002
Sulfur	<0.2
Titanium	<0.1
Zirconium	<0.003

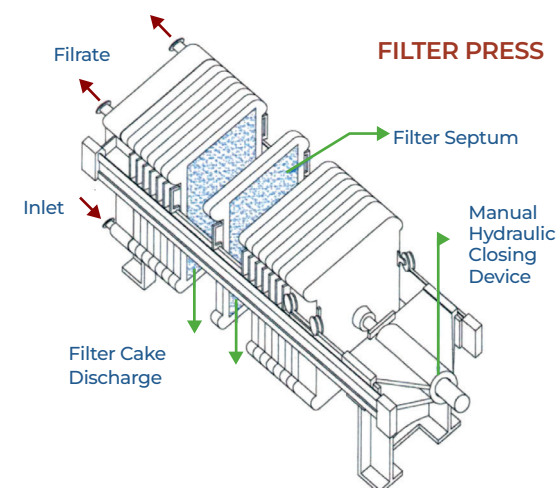


## General Operating Notes

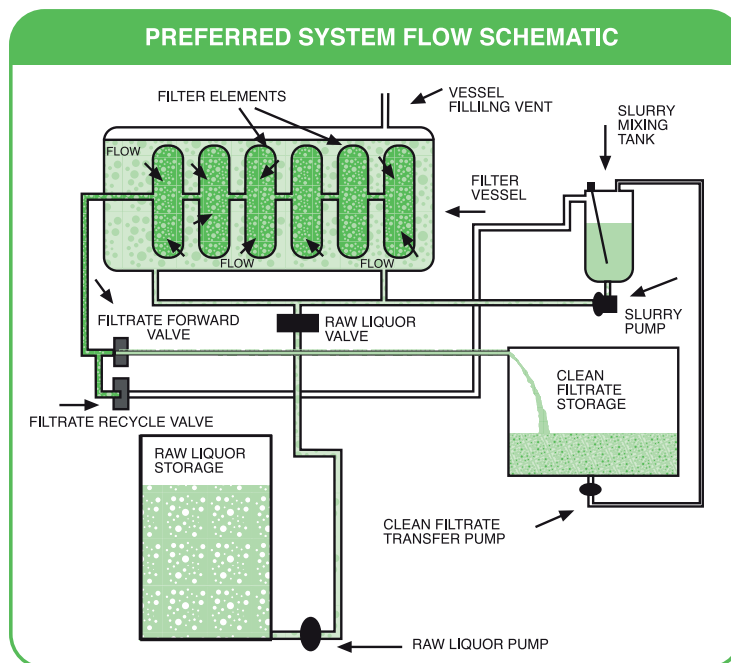
The filter septum serves principally as the support for the filter aid cake. However, the effect of the septum on performance is sufficient to warrant careful selection. The size of the opening should be fine enough to retain the filter aid particles and allow a firm cake to be formed quickly while at the same time giving a minimum resistance to flow. The material must be able to withstand chemical, pressure and temperature conditions existing during filtration. The two most widely used septa are metal and cloth. The most common metal screen is 24 x 110 Dutch Weave. Addition of TECOLITE Perlite filter aid will improve the precoat ability of the finer grades.

## Precoat

In most cases, the first step is formation of the precoat. It is a thin layer, 1.5 to 3.0 mm (1/16 - 1/8 inch), which protects the septum and ensures clarity by stopping the solids at the surface. The filter aid grade used for pre-coat must be carefully selected to allow the fastest possible flow yet trap the solids. A slurry is made from filtered liquid, or sometimes water, and filter aid. The concentration should be low as possible, 0.5% is typical. Agitation in the pre-coat tank should be sufficient to keep the filter aid in suspension. Excessive agitation



for extended time may break down the particles. Filter aids should be added at 500 to 1200 g/ m<sup>2</sup> of filter area. The pre-coat is formed by recirculating the filter aid slurry through the filter. The coarser particles deposit themselves first on the screen followed by smaller ones. Precoating rate of 40 litre/m<sup>2</sup>/min. (1 GPM/ft<sup>2</sup>) is normal. Much lower rates are used with higher viscosity liquids. There should be at least 0.07 kg/cm<sup>2</sup> (1 psi) differential pressure during the pre-coat process. Pre-coating liquor should clear up within 10 to 15 minutes.



## Body-feed

Addition of filter aid to the liquid to be filtered is referred to as body-feed. The type and grade as well as quantity to be added is vitally important to obtain the highest filtration flowrate consistent with the clarification required. Filter aid dosage varies with the solids content and other variables specific to each application. In general, a dosage of ½ of the percent solids by weight is close. Bodyfeed can be added directly to the tank of liquid to be filtered, or dosed from a slurry tank into the filter inlet.

## General Operating Notes

Rotary Vacuum Precoat Filters are typically used for thick, difficult to filter liquids or when the solids content is high. The precoat is formed on a drum with a cloth or metal-septum by recirculating a 2 - 5 % filter aid slurry. A 5 to 10 cm (2 - 4 inch) cake can be applied in an hour or less. Too rapid precoat rate and too high filter aid concentration can cause excessive cake cracking. The septum should be kept clean, as it can be a source of cake cracking and non-uniform thickness.

During the operating cycle, the process liquid passes through the cake leaving the solids on the precoat surface. A mechanically operated knife blade continuously shaves off the filterable solids and leaves a clean filtering surface. Selection of the proper depth of cut depends mostly on the nature and quantity of the solids. Cycle lengths vary from 8 to 24 hours typically, depending on depth of cut and cake thickness.

Flowrates are, for the most part, dictated by the filter aid solids and liquor viscosity. Common drum speeds range from 1 to 1/5 revolutions per minute. The optimum grade and type of filter aids is the grade which will maintain the solids on the surface of the cake. Optimum clarity occurs when solids are retained at the pre-coat surface.

TECOLITE perlite filter aids show superior performance in rotary vacuum filtration, with proven advantages in filter aid usage and resistance to cake cracking.

## Use of spent filter cake

A unique benefit to manufacturers using TECOLITE PERLITE filter aids in the food processing is that spent filter cake is used as a component in animal feed in many countries throughout the world. This reduces spent filter aid disposal costs. In the U.S., this application has been approved by the Association of American Feed Control Officials (AAFCO).



Best  
Consistency

Best  
Grades

## Grade Selection

Clarity is considered by many engineers to be the most important measure of efficiency in filter aid filtration. A high quality filter aid is most important for uniform results day after day. Selection of the particular type and grade of filter aid having the correct particle size and distribution is a major factor. After these come many considerations such as the quantity of filter aid to be used; flowrate needed to meet plant production schedules, equipment limitations and general filtration conditions. All of these can best be resolved by tests using the actual liquid involved.

The chart of the below lists some typical applications and grade selections for TECOLITE filter aid products. Many of these applications utilize more than one filtration step in the process and could potentially use different filter aid grades for these steps. The general rule of filtration will always apply to any of these applications. That rule is to utilize the fastest (coarsest) grade of filter aid that can give the desired clarity for the product produced. By following this rule, optimal filtration conditions can be achieved resulting in the most cost effective use of our filter aids.

## TECOLITE Perlite Filter Aid Grades

Grade	Bulk Density Kg/M3	Flow Rate Permeability	Permeability (Darcy)	Brightness %	Floaters %	Sieve Analysis (+325 mesh)
TS 10	150	26-53	0,3	82	<1	8%
TS 20	120	49-70	0,5	84	<1	12%
TS 20 LD	110	63-85	1,00	81	<1	15%
TS 30	120	78-110	1,6	86	<3	35%
TS 30 HD	160	102-128	2,2	80	<5	46%
TS 40 R	130	112-136	2,6	83	<5	51%
TS 40 BS	90	136-154	3,2	87	<10	54%
TS 40 S	120	152-165	3,70	85	<20	62%
TS 50 S	80	162-191	6,00	86	<40	67%
TS 100	60	186-221	10,00	88	<55	84%



## Applications of TECOLITE Filter-Aid

### FOOD PROCESSING

- Cider
- Corn Syrup
- Fruit Juices
- Sugar
- Pectin
- Citric Acid
- Vegetable Oils
- Wine
- Vegetable Juices
- Beer
- Lard
- Molasses
- Soft Drinks
- Casein



### CHEMICAL

- Inorganic Chemicals
- Resins
- Organic Chemicals
- Sulphuric Acid
- Polymers
- Polyethylene
- Tetramycin
- Antibiotics
- Brine
- Adhesives
- Titanium Dioxide
- Fertilizers
- Waste Disposal
- Enzymes
- Epsom Salts
- Penicillin
- Streptomycin



### PAINTS/COATINGS/TEXTILES

- Waxes
- Oils
- Varnish
- Gums
- Shellac
- Paint



### INDUSTRIAL

- Water Treatment
- Oil Recovery
- Pool Water Treatment
- Greases
- Solvent Recovery
- Disposal Wells





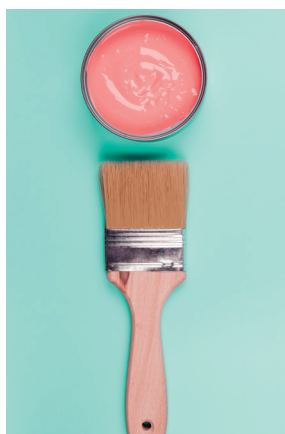
## Why Perlite is better than Kieselguhr?

### Diatomaceous earth / Kieselguhr

Kieselguhr, a diatomaceous earth (diatomite) is a form of silica composed of the siliceous shells of unicellular aquatic plants of microscopic size. It is a fossilized mineral of vegetable origin. It represents the accumulation of an enormous number of fossil diatoms. Diatoms are single cell plants of microscopic size. Diatomite or Kieselguhr is very dangerous to human beings. You get stone lungs from the dust. You can get cancer.

### Perlite

Perlite is a hydrated, naturally occurring volcanic rock. Its unique structure consists of numerous concentric layers, similar to the layers on an onion. Its natural colour ranges from white to off-white. This distinguishing feature which sets Perlite apart from other volcanic siliceous rocks is that when heated above 1000°C, it expands up to twenty times its original size. Perlite Filter Aids are amorphous in their structure, thereby not dangerous to human beings. Perlite Filter Aids are available in a full range of grades / permeability's with corresponding degrees of clarification. In principle you can use Perlite filter aid, instead of Kieselguhr or diatomite products and substitute without any problems – volume by volume. You can use Perlite filter aid in every filtration technology.



### Cost Savings

Filter aid powders are used as volume. This means that any one using Kieselguhr or diatomite today when changing to Perlite filter aid they will see a drop in his consumption of at least 35% because Perlite is 35 – 50 % lighter than Kieselguhr. 1 bag of Kieselguhr is around 23 kg. And a similar bag of Perlite filter aid is around 14 kg.

- Perlite filter aid is a safe product to use - Kieselguhr is a dangerous product to use.
- Perlite filter aid is cheaper in use.
- Perlite filter aid does not make anyone sick. Kieselguhr makes people cancer.



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