



Perlite Products for Industrial Filtration



What is Perlite?

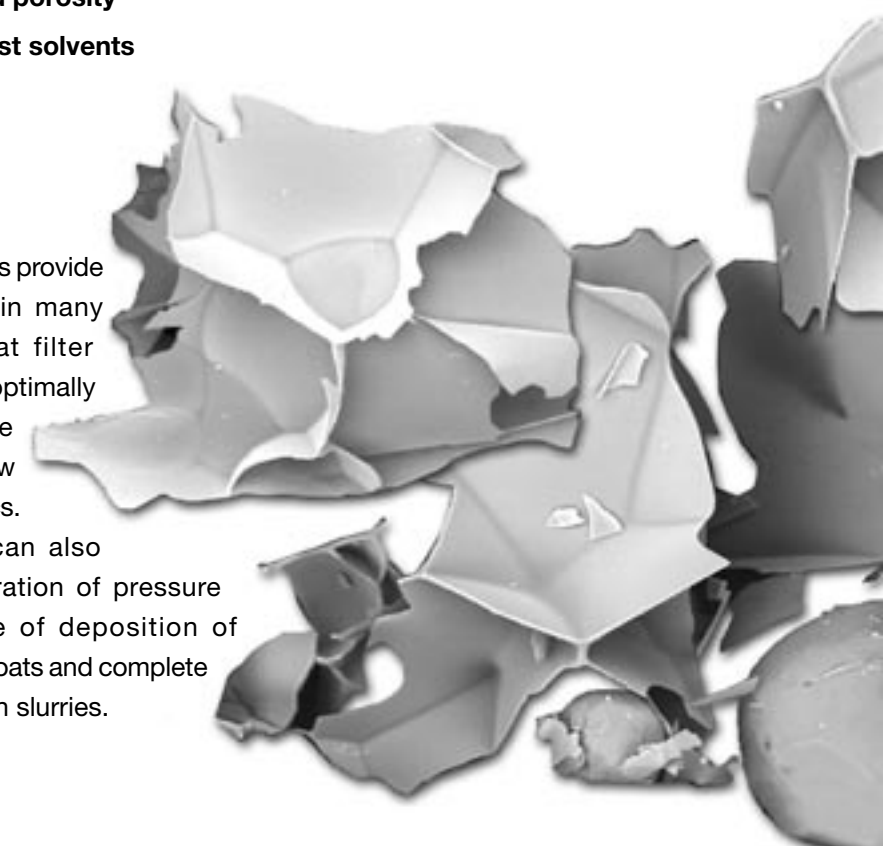
Perlite is formed from a volcanic magma flow of pure alumina silicate glass deposited onto the surface of the earth where the molten glass cools and subsequently hydrates water. The purity of the perlite mineral itself, and the extent to which it is intermingled with pre-existing surface materials, vary considerably from deposit to deposit.

Multifunctional Product Properties

Harborlite® brand filter aid products have been produced for the U.S. marketplace for nearly 50 years, and have been used across a broad spectrum of industrial filtration applications. Among the features that make Harborlite® perlite an outstanding filter aid are:

- **Unique multihedral morphological structure**
- **Low bulk density**
- **High void volume and porosity**
- **Relatively inert in most solvents**
- **Neutral pH**
- **Hydrophilic**
- **Low crystalline silica**

Harborlite® perlite filter aids provide excellent performance in many rotary vacuum pre-coat filter operations, forming an optimally thick permeable filter cake due to exceptionally low cake density characteristics. Harborlite® filter aids can also often enhance the operation of pressure filters due to the ease of deposition of uniformly distributed precoats and complete dispersion of body feed in slurries.



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Harborlite Perlite Processing

Harborlite® perlite ore is mined in the United States from world class deposits in Superior, Arizona and No Agua, New Mexico. After careful milling to control particle size, the ore is shipped to one of six domestic Harborlite plants for processing into finished filter aid products. Harborlite's North American perlite expanding plants are strategically located in Escondido, California; Green River, Wyoming; LaPorte, Texas; Vicksburg, Michigan; Quincy, Florida; and Youngsville, North Carolina.

When granulated Harborlite® perlite ore is heated to 1,600 – 2,400 degrees Fahrenheit, it becomes molten glass, and the water of hydration within each granule is released as expanded water vapor. Accomplished rapidly and under carefully controlled conditions, this combination glass liquefaction/water vaporization event results in the virtually instantaneous explosive formation of partially fractured, low bulk density multicellular particles. Harborlite's manufacturing processes exploit the expansion characteristics of Harborlite® perlite ore, ensuring the consistent production of thin-walled particles which can be milled and/or air classified into very low density filter aids with highly predictable physical and chemical properties.

Typical Perlite Photomicrograph (300x)

Harborlite® perlite's intricate multihedral morphology is illustrated in the photo at right. Particle size reduction by milling, in combination with Harborlite's proprietary separation technology, yields individual filter aid grades with very specific permeability and particle exclusion characteristics.



Perlite Filter Aid Grade Selection

The range of Harborlite® filter aids is primarily characterized by carefully controlled particle size distribution. This is accomplished by appropriate use of milling, screening and pneumatic separation technology during the manufacturing process. The result is a series of filter aid products with well-defined porosity and density to meet the needs of a wide variety of filtration applications. On rotary vacuum pre-coat filters, the objective of proper grade selection is to identify the product with the lowest density and highest permeability which prevents excessive penetration of suspended solids below the surface of the filter cake. On pressure filters, the optimum pre-coat grade is one which effectively protects the filter septum from blinding with a minimum of resistance to flow through the filter. The optimum body feed grade on pressure filters is one which provides the highest possible flow rate while removing a sufficient amount of suspended solids to yield filtrate of acceptable clarity.



Packaging & Handling

Harborlite® perlite products are available in 2.8 or 4.0 cubic foot multi-walled kraft paper bags, 50 cubic foot woven poly flexible intermediate bulk containers (FIBC's), 1,500 to 2,600 cubic foot bulk pressure differential trucks, and 5,700 cubic foot bulk pressure differential railcars. Weight per package varies by grade.

Approximate Bag Weights, All Grades



Grade	Pounds/Paper Bag		Pounds/FIBC
	2.8 cubic foot	4.0 cubic foot	
Harborlite® 200	35	-	700
Harborlite® 500	40	-	780
Harborlite® 600	38	50	650
Harborlite® 635	35	47	700
Harborlite® 700	30	43	600
Harborlite® 700S	35	50	740
Harborlite® 800	27	35	540
Harborlite® 900	25	34	500
Harborlite® 900S	31	-	615
Harborlite® 1500	23	31	460
Harborlite® 1500S	30	-	600
Harborlite® 1800	22	27	440
Harborlite® 1800S	25	-	500
Harborlite® 1900S	22	27	440
Harborlite® 1950S	19	-	380
Harborlite® 2000	16	21	320
Harborlite® 2000S	19	-	380
Harborlite® 2100S	16	21	320
Harborlite® 5000	16	-	320

Total Product Support

A Harborlite sales and technical service specialist will be pleased to provide further information on bulk and semi-bulk handling systems, and guidance as needed on the optimal use of Harborlite® perlite filter aids in specific applications. Our Technical Services Department experts have experience in proper grade selection for many commercial applications. A variety of lab scale and pilot scale test filters are at their disposal to identify and optimize specific customer requirements.

Visit our website at www.worldminerals.com for more information or to contact us.

Harborlite Perlite Filter Aid Applications

Harborlite® perlite filter aids have been widely used in industry for nearly 50 years. Listed below are just a few of the products being filtered by Harborlite® filter aids today:



Acids

Alginates

Beer

Beet Sugar

Cane Sugar

Corn Sweeteners and Starches

Drinking Water

Fruit Juices and Concentrates

Industrial Enzymes

Inorganic Chemicals

Oil Well Injection Fluids

Organic Chemicals

Pharmaceutical Fermentation Broths

Rolling Mill Oils

Swimming Pool Water

Vegetable Oils

Wastewater

Waxes

Wine

Typical Physical and Chemical Properties*

Typical Physical Properties

Grade ⁽¹⁾	Loose Weight, lbs/cubic foot	Wet Density, lbs/cubic foot	Permeability, D'Arcys	Median Particle Size, Microns	Alpine Screen Retention, Weight %		
					+70 mesh	+140 mesh	+325 Mesh
Harborlite® 200	6.0	15.6	0.07	17.0	0	trace	1
Harborlite® 500	9.1	14.2	0.5	32.5	1	5	26
Harborlite® 600	8.6	13.6	0.8	33.2	2	8	31
Harborlite® 635	8.1	12.5	1.2	33.4	2	8	31
Harborlite® 700	6.9	10.8	1.3	35.6	2	8	35
Harborlite® 700S	8.2	12.5	1.2	33.0	2	7	29
Harborlite® 800	6.2	9.8	1.7	36.5	3	10	42
Harborlite® 800S	7.6	11.8	1.6	34.4	3	10	33
Harborlite® 900	5.8	8.9	1.9	37.4	3	11	43
Harborlite® 900S	7.5	11.1	1.9	35.3	3	12	42
Harborlite® 1500	5.5	8.2	2.3	40.3	4	15	49
Harborlite® 1500S	7.2	10.8	2.8	37.6	4	15	44
Harborlite® 1800	5.1	7.8	2.8	41.8	5	17	49
Harborlite® 1800S	6.2	8.9	3.2	38.2	4	16	50
Harborlite® 1900S	5.2	7.8	3.5	41.8	5	17	52
Harborlite® 1950S	4.8	6.9	4.0	42.5	8	32	60
Harborlite® 2000	4.3	5.7	7.0	43.1	31	51	77
Harborlite® 2000S	4.6	6.8	4.0	45.0	17	38	68
Harborlite® 2100S	4.9	5.7	8.2	48.4	31	51	77

Typical Chemical Analysis (%), All Grades

pH	LOI	Water Solubles	SiO ₂	Al ₂ O ₃	K ₂ O	Na ₂ O	Fe ₂ O ₃	CaO
7.0	<1.0	<0.1	76.8	12.8	5.3	3.7	0.6	0.5

* The physical properties of the products represent typical values obtained in accordance with Harborlite Corporation test methods and are subject to manufacturing variations. They are provided here as a general reference only, are subject to change without notice and should not be relied on for any particular application.