

ORIGIN AND CHARACTERISTICS OF PERLITE

Perlite is not a trade name but a generic term for naturally occurring siliceous rock. The distinguishing feature which sets perlite apart from other volcanic glasses is that when heated to a suitable point in its softening range, it expands from four to twenty times its original volume.

This expansion is due to the presence of two to six percent combined water in the crude perlite rock. When quickly heated to above 1600°F (871°C), the crude rock pops in a manner similar to popcorn as the combined water vaporizes and creates countless tiny bubbles which account for the amazing light weight and other exceptional physical properties of expanded perlite.

The expansion process also creates one of perlite's most distinguishing characteristics: its white color. While the crude rock may range from transparent light gray to glossy black, the color of expanded perlite ranges from snowy white to grayish white.

Expanded perlite can be manufactured to weigh as little as 2 pounds per cubic foot (32 kg/m³) making it adaptable for numerous applications.

Since perlite is a form of natural glass, it is classified as chemically inert and has a pH of approximately 7.

Typical Elemental Analysis	
Silicon.....	33.8
Aluminum.....	7.2
Potassium.....	3.5
Sodium.....	3.4
Iron.....	0.6
Calcium.....	0.6
Magnesium.....	0.2
Trace.....	0.2
Oxygen (by difference).....	47.5
Net Total.....	97.0
Bound Water.....	3.0
Total.....	100.0
<p>*All analyses are shown in elemental form even though the actual forms present are mixed glassy silicates. Free silica may be present in small amounts, characteristic of the particular ore body. More specific information may be obtained from the ore supplier involved.</p>	

Typical Physical Properties	
Color.....	White
Refractive Index.....	1.5
Free Moisture, Maximum.....	0.5%
pH (of water slurry).....	6.5-8.0
Specific Gravity.....	2.2-2.4
Bulk Density (loose weight).....	As desired, but usually in the 2-25 lb/ft ³ range (32-400 kg/m ³)
Mesh Size Available.....	As desired, 4-8 mesh and finer
Softening Point.....	1600-2000°F (871-1093°C)
Fusion Point.....	2300-2450°F (1260-1343°C)
Specific Heat.....	0.2 Btu/lb•°F (837 J/kg•K)
Thermal Conductivity at 75°F (24°C).....	.27-.41 Btu•in/h•ft ² •°F (.04-.06 W/m•K)
Solubility.....	Soluble in hot concentrated alkali and HF Moderately soluble (<10%) in 1N NaOH Slightly soluble (<3%) in mineral acids (1N) Very slightly soluble (<1%) in water or weak acids

USES FOR PERLITE

As the chart on page 2 indicates, there are many uses for perlite. These uses can be broken down into three general categories: construction applications, horticultural applications and industrial applications.

CONSTRUCTION APPLICATIONS

Because of perlite's outstanding insulating characteristics and light weight, it is widely used as a loose-fill insulation in masonry construction. In this application, free-flowing perlite loose-fill masonry insulation is poured into the cavities of concrete block where it completely fills all cores, crevices, mortar areas and ear holes. In addition to providing thermal insulation, perlite enhances fire ratings, reduces noise transmission and it is rot, vermin and termite resistant. Perlite is also ideal for insulating low temperature and cryogenic vessels.

When perlite is used as an aggregate in concrete, a lightweight, fire resistant, insulating concrete is produced that is ideal for roof decks and other applications. Perlite can also be used as an aggregate in Portland cement and gypsum plasters for exterior applications and for the fire protection of beams and columns.

Other construction applications include under-floor insulation, chimney linings, paint texturing, gypsum boards, ceiling tiles and roof insulation boards.

HORTICULTURAL APPLICATIONS

In horticultural applications, perlite is used throughout the world as a component of soilless growing mixes where it provides aeration and optimum moisture retention for superior plant growth. For rooting cuttings, 100% perlite is used. Studies have shown that outstanding yields are achieved with perlite hydroponic systems.

Other benefits of horticultural perlite are its neutral pH and the fact that it is sterile and weed-free. In addition, its light weight makes it ideal for use in container growing.

Other horticultural applications for perlite are as a carrier for fertilizer, herbicides and pesticides and for pelletizing seed. Horticultural perlite is as useful to the home gardener as it is to the commercial grower. It is used with equal success in greenhouse growing, landscaping applications and in the home in house plants.

INDUSTRIAL APPLICATIONS

Industrial applications for perlite are the most diverse, ranging from high performance fillers for plastics to cements for petroleum, water and geothermal wells. Other applications include its use as a filter media for pharmaceuticals, food products, chemicals and water for municipal systems and swimming pools.

Additional applications include its use as an abrasive in soaps, cleaners and polishes and a variety of foundry applications utilizing perlite's insulating properties and high heat resistance. This same heat resistant property is taken advantage of when perlite is used in the manufacture of refractory bricks, mortars, and pipe insulation.



Technical data given herein are from sources considered reliable, but no guarantee of accuracy can be made or liability assumed. Your supplier may be able to provide you with more precise data. Certain compositions or processes involving perlite may be the subject of patents.

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