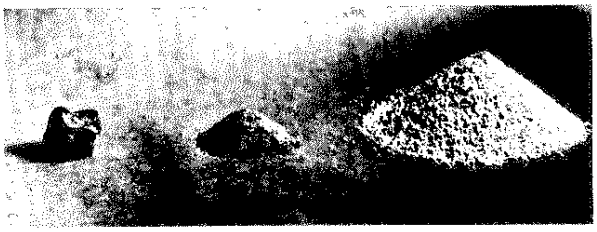
PERLITE IN SIMULATED STONE, MASONRY AND WOOD PRODUCTS

What is Perlite?
Perlite is not a trade name but a generic term for naturally occurring siliceous volcanic 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 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 (870°C) the crude rock pops in a manner similar to popcorn as the combined water vaporizes and creates countless tiny bubbles in the heat softened glassy particles. It is these tiny glass-sealed bubbles which account for the amazing physical properties of expanded perlite.

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



Crude Perlite | Crushed Crude Perlite | Expanded Perlite

Three stages of perlite production shown above illustrate the great increase in volume after furnacing. The same weight of perlite, 1 oz (28 gm) is shown in each photo.

Expanded perlite can be manufactured to weigh from 2 lb/ft^3 (32 kg/m^3) to 15 lb/ft^3 (240 kg/m^3) making it adaptable to numerous applications in the construction, industrial, chemical, horticultural and petrochemical industries. A unique use for perlite is in the manufacture of fire resistant, lightweight, rot proof, simulated stone, masonry and wood products for a multitude of exterior and interior applications.

Lightweight Perlite Molded Products
Perlite simulated stone may be molded to give the appearance of brick, stone or even wood products. A special advantage of perlite simulated stone is its light weight. Traditional stone and masonry products are heavy and require more expensive structural support. With simulated stone products, traditional framing and supporting materials are usually satisfactory and installation costs can be reduced. A further advantage of lightweight perlite simulated stone products is reduced shipping costs and ease of handling. In addition, perlite provides an insulating advantage and is rot, termite and fire resistant. Simulated stone products are excellent for hiding irregular wall surfaces and may be used in new construction, remodeling, and in exterior and interior applications, depending upon the binder used.

Lightweight perlite simulated brick is fire resistant and rot proof.

Mix Compounds
Perlite concrete and plaster aggregates conforming to ASTM specifications are commonly used in the manufacture of simulated stone. Binders and other components of perlite simulated stone usually include Type I or Type III portland cement, gypsum, lime, clay and castable or other resins. Other additions may include sand, shale, coloring agents, silicates, alkaline resistant fiberglass shorts and polypropylene or wood fibers. Mix designs for perlite simulated stone products range from 1:4 (binder: perlite) to 1:10 by volume. Mixing is accomplished with ribbon, plaster or other mixers having low shear action. Paddle type and size should be chosen for the lowest shear rate.

Stone Product Manufacture
Simulated stone products may be formed by pouring or pressing the molding material into relief molds, by extruding or vibrating into wood or steel molds or forms and by die cutting. Surface finish and configuration of the stone is determined by the mold being used.

Among the applications for lightweight perlite simulated stone are wood shakes, exterior siding fireplace logs and masonry block brick and tone for exterior and interior applications.

Perlite may also be used in the manufacture of adhesives glues, and mortars used to affix simulated stone to a variety of exterior faces. An advantage of perlite in these applications is its function as a filler replacing more costly resins.

Perlite Institute, Inc.
4305 North Sixth Street, Suite A, Harrisburg, PA 17110
717.238.9723 / fax 717.238.9985 / www.perlite.org