

# PERLITE PRODUCT GUIDE

## PERLITE LIGHTWEIGHT HOLLOW SPHERES

### *What is Perlite?*

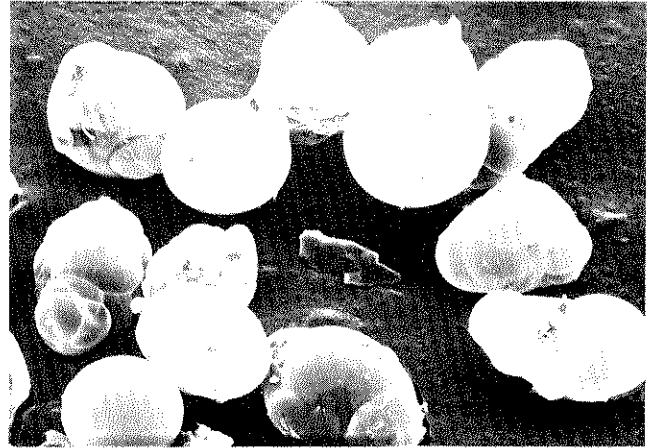
Perlite is not a trade name but a generic term for naturally occurring siliceous volcanic rock. The distinguishing feature which sets perlite apart from other volcanic glasses is that when heated to a suitable point in its softening range, it expands four to twenty times its original volume.

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 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 perlite rock may range from transparent to light gray to glossy black, the color of expanded perlite ranges from snowy white to grayish white.

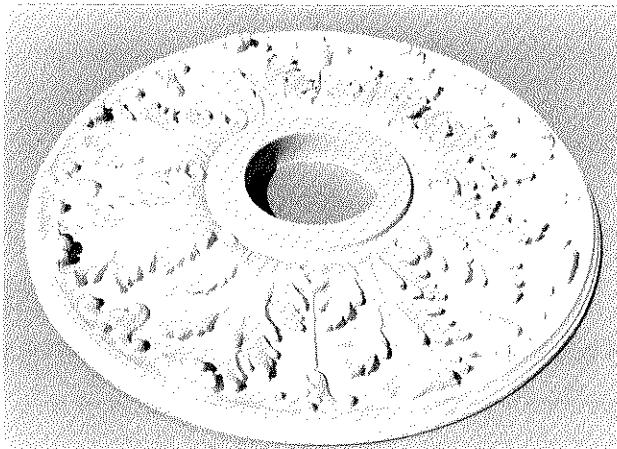
### *Perlite as a Filler*

There are several classes of perlite lightweight fillers. 1. What are often called ultrafine fillers are made by

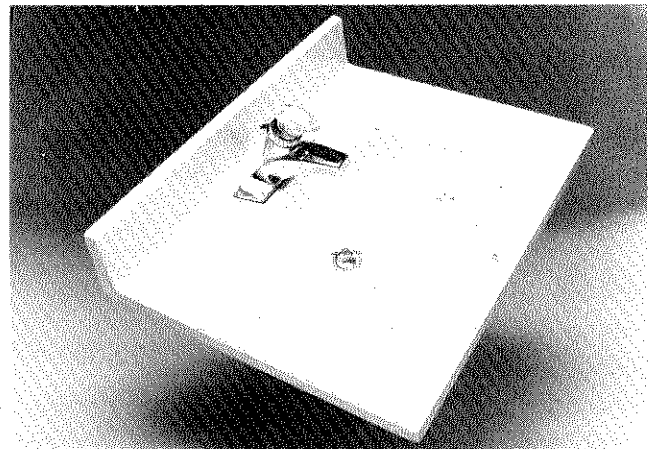


Photomicrograph of perlite lightweight hollow spheres.

milling and classifying expanded perlite under stringent quality control conditions to create particles with jagged interlocking structures. 2. What are called perlite bubbles or perlite hollow spheres are similar in size to ultrafine perlite fillers but they are discreet bubbles containing a multi-cellular core. They too are produced under stringent quality control standards to guarantee consistency and quality. In addition, they can be produced with special surface treatments to provide additional benefits in special mixes and formulations. 3. Finally, there are what might be called basic or general lightweight perlite fillers where traditional expanded perlite in sizes from 2000 down to 500 microns are used as fillers in products and mixes. This Product Guide deals with perlite lightweight hollow spheres or bubbles as fillers.



Decorative ceiling rosette manufactured with perlite filler.



Perlite filled cultured marble sink.

### TYPICAL CHEMICAL ANALYSIS\*

Silicon	33.8
Aluminum	7.2
Potassium	3.5
Sodium	3.4
Iron	0.6
Calcium	0.6
Magnesium	0.2
Traces	0.2
Oxygen (by difference)	47.5
Net Total	97.0
Bound Water	3.0
Total, %	100.0

\* All analysis are shown in elemental form.

### TYPICAL PRODUCT DATA

Bulk Density, lb/ft <sup>3</sup>	4-10
kg/m <sup>3</sup>	64-144
Alkalinity	.030-.035
Oil Absorption	175-350*
Thermal Conductivity, Btu•in/h•ft <sup>2</sup> •°F	.30-.40
W/m•K	.050-.057
Surface pH	neutral
Color	White
Average Particle Size, Microns	40-310
Effective Density, lb/ft <sup>3</sup>	as low as 12**
kg/m <sup>3</sup>	as low as 192**

\*Lbs (kg) of oil per 100 lbs (kgs) of filler

\*\*Varies with product and application

### *Advantages of Perlite Hollow Spheres or Bubbles as Fillers*

Because of their unique multicellular structure, these lightweight perlite fillers can provide many advantages.

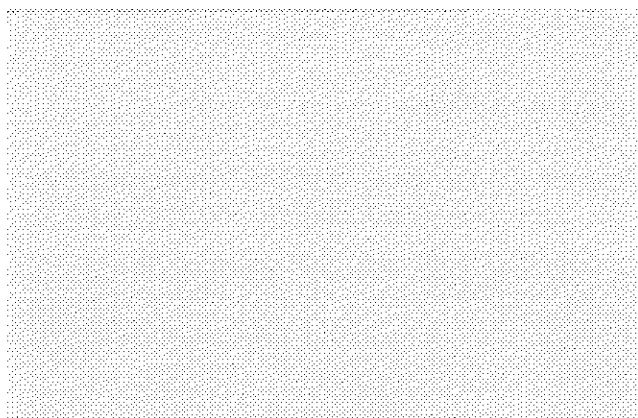
1. Lightweight perlite fillers are effective bulk fillers because of their low density.
2. Lightweight perlite fillers exhibit a uniform white color that has minimal to no effect on the color of the finished product.
3. The particle shape of lightweight perlite fillers promotes good bonding between the perlite and resins.
4. Some properties such as impact resistance and tensile strength may be enhanced by the particle shape and size of lightweight perlite fillers.
5. Lightweight perlite fillers can reduce raw material costs while improving workability.
6. When used with other fire retardant materials, lightweight, inert and inorganic perlite fillers can enhance fire resistance.
7. Perlite fillers are generally inert and perlite is listed in the U.S. Food Chemicals Codex.

Because of these characteristics, perlite lightweight hollow spheres or bubbles have been found to be cost

effective in a number of applications including the manufacture of adhesives, auto body putty, cultured marble, coatings, patching compounds and stucco.

### *Other Forms of Perlite Fillers*

Lightweight hollow perlite spheres or bubble fillers should not be confused with other types of perlite fillers. Hollow bubble fillers are produced under demanding quality control conditions utilizing special technologies. Only certain perlite filler manufacturers produce perlite bubble-type fillers. For additional information contact your local perlite supplier or the Perlite Institute.



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