

Origin and Characteristics...

Perlite is not a trade name but a generic term for naturally occurring silicious 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 |

*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.

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 |

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PLANT & OFFICE:
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WHITTEMORE TECHNICAL DATA SHEET

Product: Whittemore Perlite
Grade: SC
Composition: Perlite, Amorphous Alumina Silicate
Density: 5-8 lbs per cubic foot (loose)
PH Range: 6.5-7.3

Sieve Analysis (% retained)

| Plus 6 | Plus 16 | Pan |
|-----------|------------|------|
| 25-55 | 75-95 | 0-25 |

Market Applications: Industrial (Absorbent), Construction (Insulation), Horticultural (Lt. Wt. Soil Amendment)

Handling: Respiratory protection suitable for inert dust.

The physical properties of Whittemore Perlite products represent typical values obtained from accepted test procedures and are subject to manufacturing variations. Technical data supplied as a technical service and subject to change without notice.

Amended 3/20/12

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WHITTEMORE TECHNICAL DATA SHEET

Product: Whittemore Perlite
Grade: Medium Grade
Composition: Perlite, Amorphous Alumina Silicate
Density: 5.0-7.0 lbs per cubic foot (loose)
PH Range: 6.5-7.3
Sieve Analysis: (% retained)

| | | |
|-----------|-----------|------|
| Plus | Plus | Pan |
| <u>12</u> | <u>50</u> | |
| 0 | 20-100 | 0-25 |

Market Applications: Industrial (Absorbent, Abrasive, Filler), Construction (Insulation, Lt. Wt. Aggregate, Acoustic), Horticultural (Lt. Wt. Soil Amendment, Covers Seedlings)

Handling: Respiratory protection suitable for inert dust.

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WHITTEMORE TECHNICAL DATA SHEET

Product: Whittemore Perlite
Grade: Concrete Grade
Composition: Perlite, Amorphous Alumina Silicate
Density: 7.5-12 lbs per cubic foot (loose)
PH Range: 6.5-7.3
Sieve Analysis: **Weight Percent Passing Sieves**

| No. 4 | No. 8 | No. 16 | No.30 | No.50 | No.100 |
|-------|--------|--------|-------|-------|--------|
| 100 | 85-100 | 40-85 | 20-60 | 5-25 | 0-10 |

Market Applications: Construction (Lt. Wt. Concrete Aggregate)

- Manufactured to comply with the Requirements of **ASTM C 332-82** (Group I-Perlite Aggregate) as Standard Specification for Lightweight Aggregates for Insulating Concrete.

Note: The Construction Specifications Institute Format-Spec Data Sheet written for conformity for: Concrete Aggregate –Perlite (Published by the Perlite Institute)

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WHITTEMORE TECHNICAL DATA SHEET

Product: Whittemore Perlite
Grade: Loose Fill Insulation
Composition: Perlite, Amorphous Alumina Silicate
Density: 2-11 lbs per cubic foot (loose)
PH Range: 6.5-7.3
Sieve Analysis (% Retained; by weight)
Sieve # 4 (4.75 mm)-----5 % Maximum
Plus
 $\frac{4}{0-5}$

Market Applications: Construction (Concrete Block, Insulation)

- Complies with the Requirements of **ASTM C 549-06** Standard Specifications for Perlite Loose Fill Insulation.

Note: The Construction Specifications Institute Format-Spec Data Sheet written for conformity for: Perlite Loose Fill Insulation (Published by the Perlite Institute)

- **Perlite Loose Fill Insulation**-Product Application and Marketing Brochure is available from Whittemore Company, upon request.

Handling: Respiratory protection suitable for inert dust.

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WHITTEMORE TECHNICAL DATA SHEET

Product: Whittemore Perlite
Grade: 50-100
Composition: Perlite, Amorphous Alumina Silicate
Density: 2-11 lbs per cubic foot (loose)
PH Range: 6.5-7.3

Sieve Analysis (% retained)

| | |
|-----------|------------|
| Plus | Plus |
| <u>16</u> | <u>100</u> |
| 0-10 | 40-60 |

Market Applications: Industrial (Absorbent, Abrasive, Filteraid), Construction (Insulation, Lt. Wt. Aggregate, Texture, Acoustic), Horticultural (Lt. Wt. Soil Amendment)

Handling: Respiratory protection suitable for inert dust.

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WHITTEMORE TECHNICAL DATA SHEET

Product: Whittemore Perlite
Grade: #146
Composition: Perlite, Amorphous Alumina Silicate
Density: 13-18 lbs per cubic foot (loose)
PH Range: 6.5-7.3

Dry Sieve Analysis (% retained)

| | | |
|---------|-------|-------|
| Plus 30 | +100 | +200 |
| 0-15 | 15-30 | 30-70 |

Market Applications: Industrial (Absorbent, Abrasive, Filler, Filteraid), Construction (Texture, Acoustic)

Handling: Respiratory protection suitable for inert dust.

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WHITTEMORE TECHNICAL DATA SHEET

Product: Whittemore Perlite
Grade: #000
Composition: Perlite, Amorphous Alumina Silicate
Density: 9-14 lbs per cubic foot (loose)
PH Range: 6.5-7.3

Dry Sieve Analysis (% retained)

| Plus 100 | -100 200 | -200 325 | Pan |
|-------------|-------------|-------------|-----------|
| 0.0-0.5 | 0.0-1.0 | 0.0-10.0 | 90.0-99.0 |

Market Applications: Industrial (Absorbent, Abrasive, Filler, Filteraid), Construction (Texture, Acoustic)

Handling: Respiratory protection suitable for inert dust.

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