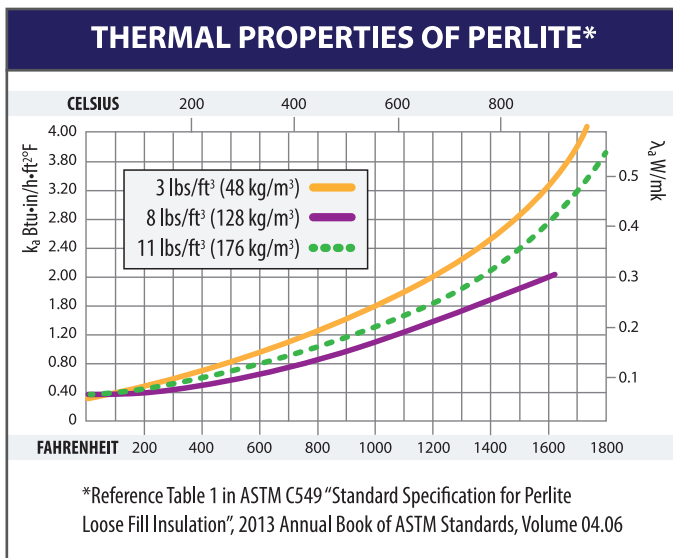


Perlite as High Temperature Insulation

Rapid heating expands perlite to produce extremely efficient high-temperature insulation.

Perlite ore, when expanded, takes on a low-density cellular structure that makes it an extremely efficient high-temperature insulation material. *For a detailed explanation of perlite expansion, see PDF info sheet: Why Perlite Works.*

Perlite gradation (particle size) has only a minor effect on the insulative value. The apparent thermal conductivity, k_a , of expanded perlite is shown in the following figure for temperatures up to 1800°F (980°C).



Perlite can safely be used over a wide range of temperatures as indicated by the physical properties in the following table.

TEMPERATURE LIMITS FOR PERLITE	
Softening Point	1600–2000°F 871–1093°C
Fusion Point	2300–2450°F 1260–1343°C

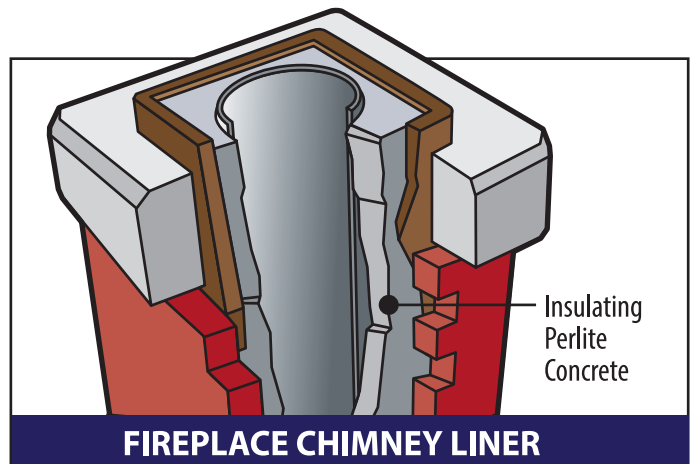
Expanded perlite is widely used alone or mixed with cement for perlite concrete and used for a variety of applications, including chimney liners.



This traditional wood-fired pizza/bread oven uses perlite as an insulator to hold and stabilize the heat.

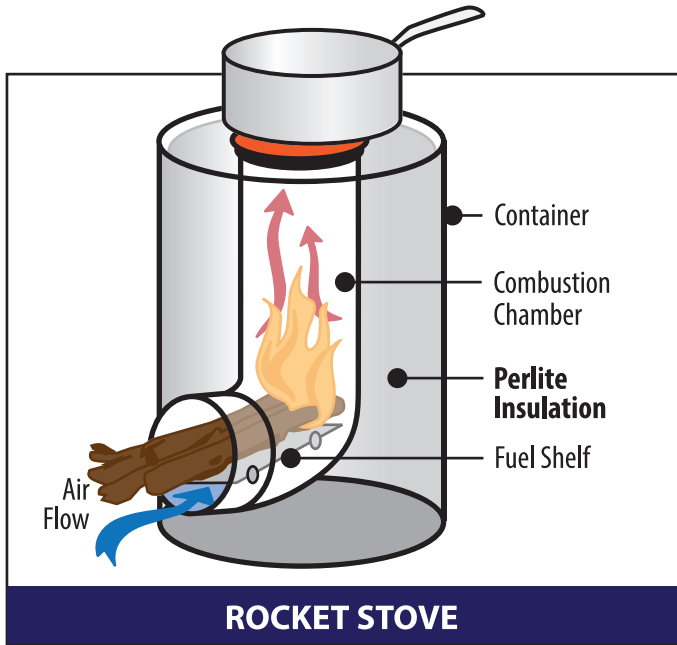
Residential and Recreational Uses

Lightweight, non-combustible, insulating perlite concrete—as well as loose expanded perlite—has been found to be useful in the construction of other products involving fire: fireplace chimneys, specialty stoves (such as fuel efficient rocket stoves used for cooking) and wood fired bread and pizza ovens.



Perlite as High Temperature Insulation

Temperatures in these applications are far below those experienced in foundry use.



The inexpensive rocket stove is easily insulated with loose perlite poured between the inner combustion chamber and the outer jacket.

Foundry Applications

Expanded perlite is used as an insulating cover on the surface of molten metal to prevent excessive heat loss during delays in pouring; to top off ingots; to produce refractory blocks and bricks; and in important foundry applications such as lightweight castables.

Perlite is often mixed (3-20% by weight) with exothermic powders and used in hot tops and risers to prevent shrinkage cavities in ingots and castings.

Formed shapes are often employed which take the form of hollow cylindrical sleeves for risers and panels for hot tops. These shapes perform essentially the same function as hot topping and risering powders and compounds.

Perlite is added to foundry core and molding sand mixtures as a cushioning agent to compensate for the expansion of crystalline silica as it goes through phase changes at temperatures in excess of 1000°F (540°C). Casting defects such as buckles, veining, fissuring and penetration are minimized and cleaning room costs are reduced. In addition, perlite improves permeability of core sands thus reducing defects attributable to poor venting.



Foundries take advantage of perlite's high temperature performance to improve energy efficiency.