Heat Capacity of Insulating Materials in

Solid Fuel Appliances

Insulating materials are commonly used in the design of solid fuel appliances to regulate the flow of heat from the firebox. These include fire bricks, insulating boards and insulating blankets.

The ability of these materials to store heat is a key factor in determining the performance of the appliance. Higher heat capacity products smooth the output of the appliance and help store heat which can aid the ignition of a new fuel load.

The heat capacity of insulating materials depends both on their specific heat capacity (the amount of energy stored per unit weight) and their density. The specific heat capacity is governed by the composition and structure of the material.

The heat capacity of insulating materials varies enormously. Some examples drawn from manufacturer's data sheets are given below.

Material	Specific Heat Capacity	Density	Heat Capacity
	kJ/kg K	kg/m^3	kJ/m^3K
Ceramic blanket	1.07	100	107
Calcium Silicate Board	0.84	475	399
Fire Brick	1.05	480	504
Fire Brick	1.10	1310	1441