The Hot and Cold Facts of Ceramics

Du-Co Ceramics Company has customers who approach us daily with problems they have using materials other than ceramics in their applications. They ask us if ceramics might solve their problems. In many cases, one of our ceramic materials has the properties that allow us to give our customer the proper engineered solution that they are looking for to fulfill their needs.

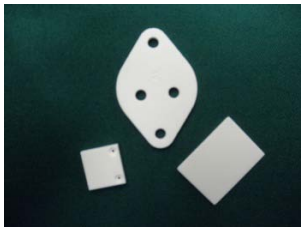
Sometimes a customer needs to remove heat from their assembly and sometimes they want to hold it back. We have helped customers in both cases develop a ceramic design to meet their needs. Ceramic Oxide materials do not conduct heat as well as most metals. We worked with one of our customers to develop a relatively low cost ceramic part that could be used to slow down the transfer of heat and therefore reduce the amount of heat that would be felt on the outside surface of their assembly. Our customer in this case manufactured steel steamtraps. People were getting burned when they touched the outside of the trap because the amount of heat that traveled through their steel assembly. We were able to design a steatite ceramic part in their assembly that would not conduct the heat and allowed the device to be touched without burning the person touching it. The customer hollowed out the steel piece to allow our ceramic part to sit inside of it and simply made the steel piece act as a cap around our ceramic. This new patented steam trap not only fixed the problem of people not burning themselves, but it also had the added benefit of helping to reduce the cycle times observed in the trap.

Portion of steam trap showing new ceramic insert.

Sometimes customers approach us looking for ways to remove heat from their assemblies. We worked with one engineering team who needed a high temperature material with good electrical insulating properties. Steatite Ceramics gave them both of these properties. They, however, also needed to remove heat from their assembly. The part was a high volume part where millions of parts would be used, so it had to be relatively inexpensive as well. Together we worked to develop a ceramic design that would allow heat to move through the assembly, in addition to letting the customer put a conductive coating on our ceramic to create the exact part required to fit in their digital display device.

New ceramic part used as an electrical insulating heat sink.

Our alumina ceramics have better thermal conducting properties than most of our other materials. It is used quite often in heat sinks where a high temperature material, with good electrical insulating properties and relatively good thermal conducting properties are necessary. Below are a few examples of these ceramics that are used as heat sinks in different electrical applications where these properties are critical.



Pressed alumina components used as electrical insulating heat sinks.