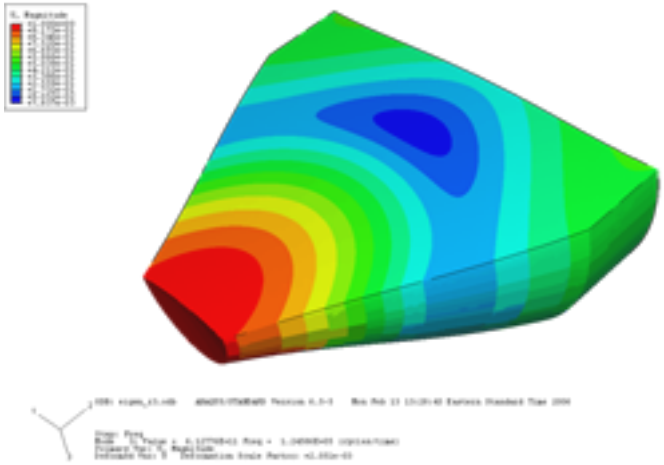
Co-fired PZT bimorphs ideal for use in high temperature applications



Morgan Technical Ceramics' ElectroCeramics business (MTC) announces that it designs and manufactures co-fired piezo (PZT) bimorph elements for use in aerospace, medical, automotive and general industrial sensor and actuator applications. The co-fired PZT bimorph elements are more mechanically stable than a conventional bimorph and are ideal for harsh environments. They are increasingly being used in critical aerospace applications, where mechanical and electrical stability are key performance attributes.

A key use of co-fired PZT bimorphs is in high temperature applications, including oil exploration, machine and equipment monitoring, automotive engine, feedback sensors and high temperature accelerometers. Other common uses include rate and gyroscope sensors for aerospace and automotive applications, intrusion alarms and actuators within fine micro-manipulation mechanisms, including computer hard drives and aerospace valves.

MTC's co-fired PZT bimorphs are a two-layer PZT device, configured with a central encapsulated electrode region. Similar in construction to a conventional bonded bimorph, the co-fired bimorph is fired at a temperature that sinters the two PZT layers into a monolithic structure separated only by the inner electrode. This construction makes the bimorph more mechanically stable. It also facilitates their use in harsh environments, since there is a uniform mechanical interface at the edges, with no seams for potential infiltration. In addition, the device behavior will have similar characteristics to the bulk PZT properties.

MTC manufactures the co-fired bimorphs from PZT5A3, PZT702, and PZT5H2.

Among the PZT materials used, MTC's PZT702 has excellent aging characteristics, low signal to noise ratio and high sensitivity for impact and sound sensing.

The bimorphs are available in a variety of configurations, including squares, rectangles, discs and rings. They are offered in a range of sizes, from 6 to 74 millimeters (mm) in length and 1 to 43mm in width, to reflect the variety of applications in which they can be used.

Co-fired PZT bimorphs are available on a custom basis and MTC works with each customer individually to create the best possible solution for a particular application.

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