Influence of the contact material on the performance of temperature-dependent switching controllers in household appliance

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Due to their design the switching behavior of temperature-dependent electro-mechanical switching controllers is completely different to electromagnetically driven devices (especially with regard to opening operation). Usually the expansion of a medium (e.g. liquid, bimetallic strip etc.) is used to initiate the switching operation. Sticking or welding of the contacts results in troublesome exceeded temperature or reduced service life.
In electrical tests with various contact materials performed in a model switch silver/tinoxide containing merely 2 percent by weight of metal oxide (tin oxide + additives) shows significant tendency to low opening forces.
The reliability of a real power control could be clearly improved by the application of this special silver/tin oxide contact material. The way this doped tin oxide works is tried to be explained by means of metallographic investigation.