

## CF/LANR Excess Heat Activates Shape Memory Alloys

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Nitinol [1,2,3] is a Shape Memory Alloy [SMA, also known as Flexinol and Muscle Wire]. It was used here as sensor to detect CF/LANR activity based on its complex unique metallurgy and its response to heat. Several Nitinol devices were examined both for their responses to ordinary and CF/LANR-induced excess heat. Controlled heating was by electrically driving an ohmic control alternating with an active NANOR<sup>®</sup>-type component (#N7-24) with a ZrO<sub>2</sub>-PdD core [4,5]. The metrics measured were heat induced force, temperature, and changes in the Nitinol wire's length as determined by using *in situ* 3D accelerometers and gyroscopes, thermocouples, and a time-of-flight (TOF) optical reflection measurement along the nitinol itself, during the heating (Figure 1). The input electrical power (blue lines) to the ohmic control and NANOR<sup>®</sup>-type component, are shown as a function of time, along with the output thermal power (red lines) from each, and the kinematic responses. Observe the RMS force wrought (qualitatively determined by the response of accelerometers) during this time in the curve below (green line). In this run, it can be seen that there is LANR activity, and excess power (beyond that applied) can be easily seen. Note that, as usual, the incremental (excess) power curves rise in a supra-linear way to constant input power.

In summary, the nitinol LANR detectors are not selectively specific for LANR/CF-induced excess heat, but can detect the excess heat. They are also not as sensitive, nor as reliable, and also more difficult to use, than other methods described in the cold fusion literature, previously; and are probably limited to qualitative corroboration. By contrast, calorimetry (with ohmic controls and time integration), coherent antiStokes spectroscopy [6,7] and Deuterium Line RF spectroscopy [8,9] continue as the superior methods to selectively semi-quantitatively detect active LANR/CF states.

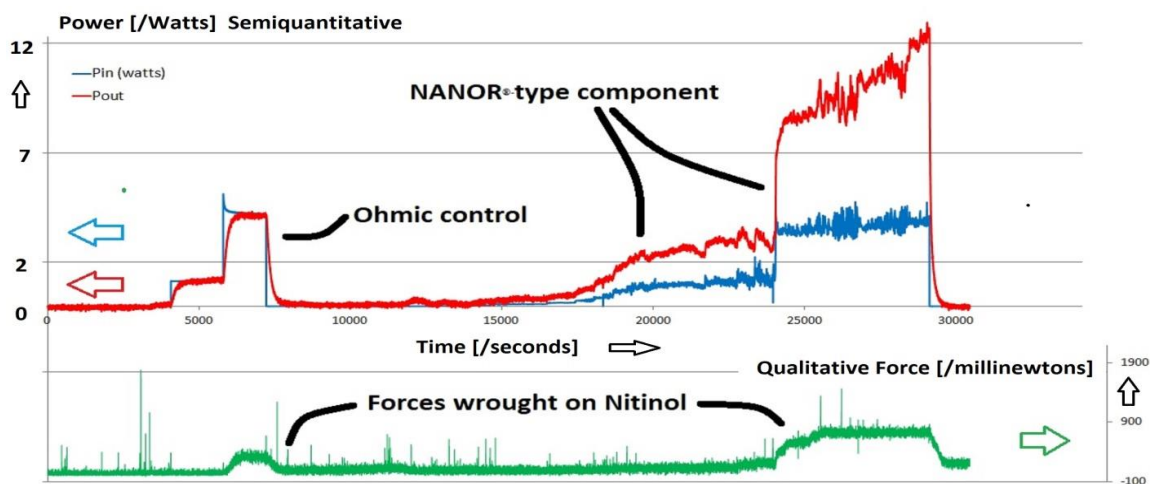


Figure 1—Input electrical power delivered to an ohmic control and then Nanor<sup>®</sup>-type component [7-24], and the resultant output thermal power and the force wrought upon the nitinol next to both.

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