

## **Rossi's Scientific Failure in Seven Steps**

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Andrea Rossi is the creator of a device he calls the Energy Catalyzer, or E-Cat. Together with Sergio Focardi, professor emeritus at the University of Bologna, and Giuseppe Levi, a professor in the university's Department of Physics, the trio claimed a low-energy nuclear reaction device that produced extraordinarily large amounts of excess heat. In fact, Rossi had promoted the idea as a soon-to-be-available commercial device. The complete list of *New Energy Times* reports on this topic is [here](#).

The Rossi group's primary energy claim was based on its assertion that virtually all inlet water vaporized into steam. The group had two primary measurement methods from which to choose.

Method 1 was to perform condensing calorimetry to measure the heat output directly. The group made no such measurements. The characteristics of steam output observed in the June 14, 2011, and April 28, 2011, experiments were consistent with much lower levels of heat output than the group claimed.

Method 2, which the group attempted, was to confirm that no unvaporized water left the device. This method required the group to check two things. First, it needed to measure steam quality to confirm that no unvaporized water left in the form of tiny droplets. However, the group used a device that, according to the manufacturer, was not designed or suitable for measuring steam quality. That device was designed to measure only the humidity of air. The group also needed to check that liquid water did not flow out of the device and down the drain. It did not attempt to check this.

Thus, the group had no accurate measurements of the heat output or the quality of steam produced and therefore no experimental evidence on which to base its extraordinary energy claim.

The group ran one experiment below the boiling point of water; however, it did not write and does not intend to release a report on the results of that test.

### **Seven Steps**

#### **1. Rossi Group's Extraordinary Claim About Energy Production**

The Rossi group's primary energy claim was based on its assertion that virtually all inlet water vaporized into steam.

## **2. Video Recordings of Steam Production**

The characteristics of steam output observed in the June 14, 2011, and April 28, 2011, experiments are consistent with substantial amounts of unvaporized inlet water present in the output. This means that the experiments produced much lower levels of heat output than the group claimed.

## **3. Presence of Unvaporized Water in Device Output**

- Water can leave as liquid by overflowing through the outlet hose.
- Water can leave as tiny droplets, thus lowering steam quality.

## **4. No Condensing Calorimetry to Measure Heat Directly (Method 1)**

No condensing calorimetry measurements were performed to measure the heat output directly.

## **5. Claims of Steam Quality Measurements (Method 2)**

The Rossi group claimed to have accurately measured steam quality. The chemist it used to perform these measurements did not use a detector that was designed for or capable of measuring steam quality. The group also needed to check that liquid water did not flow out of the device and down the drain. It did not attempt to check this, and thus any steam quality measurement was irrelevant.

## **6. Device Used to Attempt Steam Quality Measurement (Method 2)**

- Question to manufacturer: "What is the capability of this device to measure steam quality?"
- Response from manufacturer: "None. It is not suited for steam quality measurement."

## **7. Conclusion Without Sufficient Experimental Facts**

Because a) the group did not perform condensing calorimetry, b) it used an unsuitable device to measure steam quality, c) it did not check that liquid water did not flow out of the device and down the drain, and d) it did not write a scientific report about its one experiment below the boiling point of water, it had no quantitative facts about the amount or quality of steam.

As a result, the group could not know the amount of energy production within an order of magnitude.

As with any scientific claim, the burden to provide convincing evidence rests with the claimant.

*[Ed: This document was updated on Aug. 9, 2011 to improve the clarity of the two measurement methods.]*