

HARMON SENSOR'S PYROMETER THAT EMPLOYS EXERGEN'S IRT/C TEMPERATURE SENSOR RECEIVES PATENT AWARD FROM NASA

**Dr. Alex Stein's Patented Invention Measures Bridge Wire Temperature in
NASA Initiators**

WATERTOWN, Mass., and ZIJTAART, the Netherlands, January 5, 2016 - Exergen Global, an award winning thermal solutions provider, today announced that its Exergen micro IRT/c sensor was employed in a new pyrometer that received NASA's "Patent Award". The award was presented to Dr. Alex Stein, founder of Harmon Sensors, at NASA's Honor Awards Ceremony recently held at the Johnson Space Center in Houston.

The pyrometer, that Dr. Stein created by coupling the Exergen sensor to a standard NASA initiator, is designed to measure the temperature of the bridge wire in the initiator as a function of the electrical current going through that wire. The wire is mounted inside a metal shell close to an explosive charge and is connected to electrical feed throughs. When voltage is applied to the feed throughs, it sends a current through the wire and heats it, raising the wire temperature to a value at which an explosive charge is triggered to actuate functions such as shearing a bolt.

Since initiators are used extensively across the aerospace industry, it is important to understand how the electric current running through the bridge wire may impact its temperature. The bridge wire is extremely thin (2 mils diameter), which precludes the use of standard single color pyrometers as a measurement tool since they can not provide the required target resolution.



Two-color pyrometers are traditionally used for wire temperature measurements because they can determine a target temperature using the ratio of radiances at two different wavelengths (colors). This methodology does not require the measurement area to be within the wire's diameter. However, commercial two color pyrometers (operating near 1 micron) cannot measure the temperature of a 2 mil wire below about 700 C, because the radiance of the wire at the lower temperature is too weak for detection.

At lower temperatures the thermal radiance of the wire peaks in the mid infrared range, where the Exergen micro IRt/c sensor operates. Dr. Stein coupled the micro IRt/c to an initiator housing, allowing him to obtain a measurable signal from the Exergen sensor at the wire temperature of 300 C.

Following those steps, Dr. Stein still needed to calibrate the IRt/c signals in terms of wire temperature. This was done by measuring the wire temperature at the high value (near 700 C) once with a two-color pyrometer, and then again with the IRt/c pyrometer. At lower wire temperature (down to 300 C) the IRt/c was scaled to 700 C value via the Planck formula.

"Measuring the bridge wire temperature of a NASA initiator proved to be a challenging task because of the small dimensions of the bridge wire, and the tight space inside the initiator," said Dr. Stein. "Exergen's micro IRt/c offers the perfect solution to the challenge, providing the safety of a non-contact, self-powered sensor that is micro-sized and that delivers high repeatability and unmatched accuracy."

"Dr. Stein's use of the Exergen micro IRt/c in the NASA initiator is an outstanding example of the incredibly wide range of applications that can be efficiently and effectively developed using our non-contact, self-powered sensors," said Frank Pompei, CEO of Exergen. "Whether in space, measuring temperatures on a NASA aircraft, or on the ground, measuring engine temperatures in race cars, our customers rely on Exergen sensors to deliver the industry's highest accuracy, repeatability and dependability."

About Exergen Corporation and Exergen Global

Exergen Corporation, the global leader in industrial and medical non-invasive temperature technology, provides non-invasive temperature measurement devices providing lower cost, higher accuracy, less invasiveness, and greater reliability than ever previously possible. Exergen is well known for its award-winning temporal artery thermometer in the healthcare and consumer market. The company was founded by Harvard-research scientist Dr. Francesco Pompei who holds over 70 patents. Exergen Corporation is based in Watertown, Massachusetts, U.S. Exergen Global is the worldwide solutions provider of Exergen Corporation's industrial non-contact infrared temperature sensor solutions and the recipient of the 2015 Global Frost & Sullivan Entrepreneurial Company of the Year Award (<http://bit.ly/1YTSdkL>).

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