National Aeronautics and
Space Administration

Sensors

Infrared Real-Time Pyrometer

Reusable and portable sensor to monitor stray current in pyrotechnic systems

Innovators at NASA Johnson Space Center have developed a prototype infrared pyrometer sensor system that tests pyrotechnic initiators for stray energy induced by electromagnetic interference (EMI). Portable and compact, the system is palm sized and takes real-time measurements of stray energy. Stray energy can cause inadvertent initiation of an initiator loaded with explosives if it entered into the firing circuitry. The pyrometer is used for safety testing to ensure each setup is sufficiently shielded from EMI. The system monitors the energy radiating from the bridgewire, which requires the use of an initiator assembly without a loaded charge. This new technology can be used to test rockets, missiles, and air bag deployment systems.

This patented NASA technology is available for your company to license and develop into a commercial product. NASA does not manufacture any products for commercial sale.

BENEFITS

- Portable: device can fit in the palms of your hand
- Reusable: not exposed to explosives
- Data Storage Capabilities: developed with a data acquisition system

technology solution

THE TECHNOLOGY

This technology was developed by NASA engineers to test pyrotechnic initiated systems for stray current before the explosive material is loaded in the devices. This system provides a portable and reliable safety check for equipment to pinpoint insufficient EMI shielding. Instead of a binary pass/fail test, it will enable engineers to determine precisely how close they are to the no-fire threshold. The pyrometer calculates the amount of stray energy by measuring small amounts of thermal radiation emitted by the bridgewire during test. The data collected by the pyrometer data acquisition system can be used to determine the resultant stray current value.

Existing technologies can only determine the minimum threshold of current required to ignite an explosive but not the actual measured current present in the system. By contrast, this technology provides users a measurement of how much stray energy is present and if the stray current exceeds or meets the acceptable threshold. Commercial companies can use this technology to measure the amount stray current present to quantify the risk before loading explosives initiators to be used in space and commercial systems.

Infrared Real-time Pyrometer can be used to test automobiles air bags for Electromagnetic Interference (EMI).

APPLICATIONS

The technology has several potential applications:

- Rocket Launch System Testing
- Automotive Airbag System Testing
- Missiles or Explosives Testing

PUBLICATIONS

Patent No: 9028135

More Information

National Aeronautics and Space Administration

Agency Licensing Concierge

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