

NIST, industry produce improved shock tests

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Extensive National Institute of Standards and Technology work with industry, government, professional societies and standards developing organizations contributed to the release recently of an international standard for characterizing mechanical vibration and shock, and how systems from computer components to airframes and armored vehicles respond to specific kinds of shocks.

The new standard published by the International Organization for Standardization (ISO) should be especially useful in environmental testing of products and components in high-technology industries such as computer and aerospace manufacturers.

NIST, as convener of the ISO working group that coordinated development of the standard, played an essential role in keeping United States industries informed of developments and encouraging U.S. industry participation in the international technical discussions to formulate the new standard.

The "shock response spectrum" (SRS) was developed originally as a method to describe the shock-like motions associated with earthquakes, explosions, impacts and other sources of mechanical shocks. An SRS shows graphically the relative strength of a shock pulse across a range of frequencies. For a mechanical system, such as an airframe, it can indicate how the system responds to a well-defined shock pulse. SRSs are used to describe both the severity of mechanical shocks and the ability of mechanical or electronic systems to tolerate them. They are widely used to test airframes and aerospace instrumentation systems,

military vehicles and instrumentation systems used in them, mechanical isolation provided by shipping containers, the durability of hard drives, and to characterize explosive shock events.

In the past, shock tests used a variety of analog and digital algorithms to synthesize SRS, which often produced significantly varying results. The new standard is based on standardized, well-defined digital techniques. It is a first step towards ensuring that the results of tests using an SRS can be compared reliably when performed at different laboratories.

Source: National Institute of Standards and Technology

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