

Explosives Measurement And Test
Instrumentation:
BAM Friction Test Apparatus

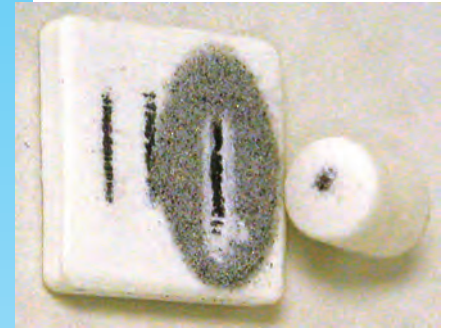
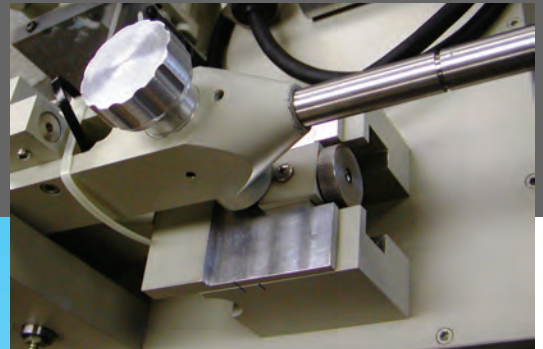


The most common test method used to identify and measure the sensitivity of a substance to frictional stimuli is the BAM Friction Test Apparatus. The friction sensitivity of explosives between hard surfaces is one of the most frequent causes of accidental explosions. Determination of friction sensitivity is thus a necessary part of explosive or energetic materials characterization, as well as that of modified formulations or changes in manufacturing conditions, and for defining influences of impurities or ageing.

The BAM Friction Testing Apparatus was developed by the German Federal Institute for Testing and Materials (BAM).

The testing and evaluation of the response of solid, liquid or composite explosives, propellants, pyrotechnics and other energetic material substances to impact, friction, and/or thermal stimuli is required by various international standards.

The BAM Friction Test is used to determine the sensitivity to friction of solid, liquid or composite substances according to the BAM method. It consists essentially of a cast steel base plate, a loading arm with notches, weights and the friction device with fixed porcelain pin and moving porcelain plate. The plate is fixed on a table that is moved once, by a motor, 10 mm forward and back, one time.



By using nine different load weights in different notches enables one to vary the loading force from 0.5 up to 36 Kg. The porcelain friction plates and pins are made of pure technical porcelain. The porcelain friction plates surface roughness is between 9 and 32 μm .

The BAM Friction Test sample is placed on a rough ceramic plate and a force is loaded on the sample through a stationary ceramic pin, in contact with the plate. The plate is motor-driven through a complete cycle pass beneath the pin. The test sample is subjected to the friction created by the rubbing of the pin against the plate. This method allows for ambient temperature tests of powders and various substances.

Test criteria and method of assessing results are on the basis of:

- Whether an “explosion” occurs in any of up to six trials, at a particular friction load
- The lowest friction load at which at least one “explosion or event” occurs in six trials

A test result is considered “positive” if the lowest friction load at which one “event” occurs in six trials is less than 80 N; thereby classifying the substance as too dangerous for transport in the form in which it was tested. Otherwise, the test result is considered “negative.” If the BAM Friction Test yields a value > 360 Newton then it is generally accepted that the material will not ignite or decompose when subjected to frictional forces between two surfaces in a lab, plant, or in transportation.

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BAM Friction Test Apparatus

Designed and manufactured to meet requirements of:

- Test method 3(b)(i) as detailed in the United Nations test manual
- Test method 1024 as detailed in MIL-STD 1751A
- Section 5-3d in TB700-2 (DOD Hazard Classification Procedures)