OZM RESEARCH
Instruments & Technologies for Energetic Materials

FSKM-10
BAM FRICTION APPARATUS
Product Datasheet

BAM Friction apparatus FKSM-10 is used for determination of friction sensitivity of energetic materials – solid primary and high explosives, propellants and pyrotechnics according to BAM standard procedure.

Friction sensitivity apparatus FKSM-10 is designed to fulfill all corresponding international standards of testing with special attention paid to precision *(highly-precise velocity control of the plate movement and the finest position accuracy thanks to digitally-controlled step motor, calibrated set of weights)*, safety *(protective shield and electrostatic-dissipative surface of working table)* , solid and corrosion-proof construction *(friction device, loading arms and all weights are made from stainless steel)*.

Its applicable wide range of friction loads (from 0.1 to 360 N) allows to measure friction sensitivity of large variety of energetic materials from high sensitivite primary explosives to relatively insensitive secondary explosives, propellants or pyrotechnics.

High precision in movement control is the unique feature of this instrument providing the extra-value over the standard instruments. This feature allow to obtain highly representative and reproducible results, which are in agreement with practical experience from production, handling and transportation.

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APPLICATIONS

Friction 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 characterization of new explosives, modified formulations or manufacturing conditions, as well as for defining influences of impurities or ageing. It is also used in quality control of manufactured explosives, surveillance of in-service explosives and transport/storage classification of explosive materials.

FKSM-10 is designed to comply with requirements of the following standards of testing:

- UN Recommendation on the Transport of Dangerous Goods, Manual of Tests and Criteria, United Nations, New York, 2003 [13.4.2 Test 3(b)(i)]
- EN 13631-3:2004 – Explosives for civil uses - High explosives - Part 3: Determination of sensitiveness to friction of explosives
- STANAG 4487: Explosives, Friction Sensitivity Tests
- European Commission Directive 92/69/EEC, method A14: Explosive properties

INSTRUMENT DESCRIPTION

BAM standard procedure determines friction load between a moving porcelain plate and a static porcelain peg sufficient for causing sample initiation.

The BAM friction sensitivity apparatus FSKM-10 consists of a friction device including digitally controlled step motor, a loading arm, a hook, a control touch panel with a switch board and a motor controller. The movement of the porcelain plate is carried out using a crank mechanism powered by a digitally-controlled step motor. Application of the digitally controlled step motor ensures highly precise velocity control of the plate movement and its stop position with the finest accuracy. Mass of weight and its position on the loading arm both determine the friction load between the porcelain plate and the peg.

A unique advantage of OZM's BAM friction apparatus FSKM-10 is the ability to interchange the whole loading arm, including peg holder and counter-weight as a unit, is what guarantees a solid design. It allows testing of high sensitive explosives (friction load under 5 N) as well as less sensitive explosives (friction load up to 360 N) on one testing aparatus. The apparatus can be supplied by one or both interchangeable loading arms with appropriate set of weights.

Standard 6-position loading arm BAM-6A along with a set of 9 pcs of standard BAM weights allow friction loads in the range from 5 to 360 N. The apparatus FSKM-10 in this configuration is fully in accordance with all the above-mentioned standards of testing and is suitable for testing less sensitive explosives. For orientation determination of the friction sensitivity of primary explosives the range of friction loads can be extended by the help of a small set of light weights PEx-4. Then the available range of friction load is from 0.5 to 360 N.

For more accurate measurement with very low friction loads the light 3-position loading arm PEx-3A has significantly lighter design than standard loading arm. Along with a large set of 14 pcs of weights PEx-14 allow friction loads in the range of 0.1 to 10 N. The apparatus in this configuration is suited to testing of high sensitive primary explosives.

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TECHNICAL PARAMETERS

Standard set of weights:	9 pcs according to BAM standard (from 0.28 to 10.08 kg)
Range of friction loads:	from 5 to 360 N
Volume of tested sample:	10 mm^3
Velocity of plate movement:	adjustable from 20 to 300 rpm (default 140 rpm)

STANDARD INSTRUMENT PARTS

BFST-FD	BAM Friction sensitivity apparatus - base and friction device, control touch panel with switch board and digitally-controlled step motor
BFST-BAM6A	Standard 6-position loading arm BAM-6A
BFST-BAMW	Set of standard BAM weights (0.28 to 10.08 kg) 9 pcs of weights/hook (designed for standard 6-position loading arm) (friction loads on the peg within range from 5 to 360 N)
BFST-T	Working table (60 x 120 x 80 cm) covered by electrostatic-dissipative rubber
BFH-SP-3	Set of sampling spoons 5, 10 and 40 mm^3

MAIN OPTIONAL ACCESSORIES

BFST-PEX3A	Light 3-position loading arm PEx-3A for testing of primary explosives
BFST-PEX14	Large set of weights for testing of primary explosives PEx-14 14 pcs of weight (designed for light 3-position loading arm) (friction load on the peg within range from 0.1 to 10 N)
BFST-PEX4	Small set of weights for testing of primary explosives PEx-4 4 pcs of weight (designed for standard 6-position loading arm) (load on the peg within range from 0.5 to 5 N)
BFST-PS	Protective shield
BFH-EPS	Explosion-proof suction device (if a flexible fume hood is not available at the working place)

CONSUMABLES

BFST-Pn-400	Set of 400 porcelain pegs
BFST-Pn-200	Set of 200 porcelain pegs
BFST-Pt-100	Set of 100 porcelain plates - double sided

SHIPPING DATA

Package dimensions (W x L x H):	760 x 1350 x 1120 mm
Package gross weight:	approx. 185 kg
Custom code:	9031 80 38

INSTALLATION REQUIREMENTS

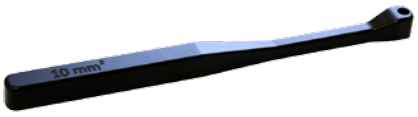
Space requirements: W x L x H: 650 x 1200 x 1300 mm; Weight: 76 kg

Electric power source: 230 V / 50 Hz or 120 V / 60 Hz (to be specified upon order), 500W

Local exhaust (replaceable by the Ex-proof suction device BFH-EPS as an optional accessories)

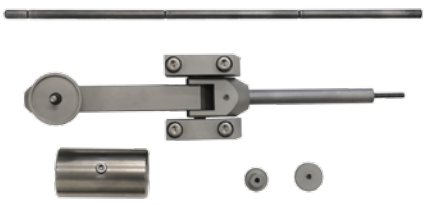
Set of standard BAM weights

Sampling spoon 10 mm^3
made from conductive plastic



Porcelain peg and plate

Light 3-position loading arm PEx-3A



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