ABEL 10
ABEL HEAT TESTER
Product Datasheet

Instrument **ABEL 10** for determination of thermal stability according to the Abel procedure is designed for evaluation of thermal stability of nitrocellulose, nitroglycerine, and nitroglycol, but is used for the testing of propellants stability as well. This test is based on the fact that nitrate esters decompose to produce NO_2. The rate of decomposition followed by production of "red fumes" rapidly increase in elevated temperature. The presence of gaseous decomposition products is determined by means of the change of colour of indicator iodid-starch paper. The result of this test is period of time from inserting sample to preheated heating block to change of colour of indicator paper.

APPLICATIONS

Abel test is one of several methods for determination of thermal stability of propellants based on change of colour of indicator papers beside Methyl violet test, Heat test or Vieille test. Mentioned tests work on a similar principle, but differ from each other in terms of the temperature of measurement, weight of sample, size and shape of heating tube, or kind of used indicator paper. Above mentioned tests can not be used to compare different types of energetic materials.

INSTRUMENT DESCRIPTION

The **ABEL 10** instrument consists of a heating block made of aluminium with 10 internal holes for glass tubes. The glass tubes with the tested samples are inserted to the holes in a heating block. The tubes are covered by a lid with hook. On the hook inside the test tube is hung indicator paper. The quality of indicator papers is guaranteed to meet Naval Powder and are currently used and accredited by the USA Military. The holes are filled with silicon oil for better heat transfer. Each block contains 2 independent temperature sensors.

The temperature of the block is controlled by a digital temperature controller. The controller unit contains an independent alarm circuit off the heating if the temperature accidentally increases above a specified safety limit (controlled by and the limit controller). Temperature in the heating blocks is controlled and corrected using calibrated mercury thermometers or calibrated digital thermometer.

This instrument enables measurement of up to 9 samples with individual time of exposure for each one, but further models of heating block with different number of the holes are available on the request.

TECHNICAL PARAMETERS

Temperature range:	30 - 180 °C
Accuracy:	±0.2 °C
Typical sample weight:	1 g
Potassium Iodide Starch strips:	Per U.S. Military standard (3/8 x 1 inch)

STANDARD INSTRUMENT PARTS

AB-HB10	Heating block, 10 holes (diameter 18 mm, depth 75 mm)
TC-LC-02HTH	Temperature controller including limit controller

CONSUMABLES

AB-GTT	Glass test tube O.D. x L: 17 mm x 150 mm
AB-LH	Stopper and hooks
AB-IS-GUN	Set of iodid-starch papers (specially prepared and used by the USA Military)

OPTIONAL ACCESSORIES

DIG-T200	Calibrated digital thermometer 0 - 200 °C / 0.1 °C - sensor Pt 100 (length 230 mm)

SHIPPING DATA

Package dimensions (W x L x H):	50 x 42 x 42 cm
Package gross weight:	20 kg
Custom code:	9027 80 97

INSTALLATION REQUIREMENTS

Space requirements (Heating block unit):
∅ x H: 290 x 290 mm; Weight: 20 kg

Space requirements (Temperature controller unit):
W x L x H: 21 x 30 x 14 cm; Net weight: 4.5 kg

Electric power source: 230 V / 50 Hz, 500W

Flameproof working desk for heating block unit

Fume hood or local exhaust for heating block unit

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