OZM RESEARCH
Instruments & Technologies for Energetic Materials

DTA 552-Ex
DIFFERENTIAL THERMAL ANALYSER
Product Datasheet

DTA 552-Ex is a thermal stability testing instrument designed specifically for differential thermal analysis (DTA) of explosive materials which explosion may cause damage to standard commercial analyzers.

Its main features are represented by robust design resistant against explosion of several dozens milligrams of explosives (allowing analysis of truly representative samples), high sensitivity due to direct contact of a thermocouple with a sample, high precision and accuracy, large variety of accessories, user-friendly software for data acquisition, analysis and archiving, many testing modes, very low costs of investment and operation.

These features brought popularity of **DTA 552-Ex** at dozens of explosives laboratories of many countries, some of them operating the instrument for more than 10 years.

APPLICATIONS

DTA as a testing method is applied for evaluation of thermal stability of explosive materials, their purity (melting point, solidification point), compatibility and thermal decomposition parameters. It is used in characterization and qualification of new energetic materials, quality control of manufactured explosives, surveillance of in-service explosives, and many other testing programs.

DTA is a rapid test (its completion including data evaluation takes only 1 to 2 hours) needing only a small sample weight but giving important and precise information about the material thermal stability independent on other stability or purity tests.

DTA 552-Ex is designed to comply with requirements of the following standard of testing:

- STANAG 4515 Ed.2: Explosives, Thermal Analysis using Differential Thermal Analysis (DTA), Differential Scanning Calorimetry (DSC), Heat Flow Calorimetry (HFC), and Thermogravimetric Analysis (TGA)

INSTRUMENT DESCRIPTION

Instrument **DTA 552-Ex** detects and analyzes thermal changes (melting, polymorph transformation, evaporation, thermal decomposition) occuring in an explosive sample subjected to heating with constant heating rate or other test programs (isothermal heating). The instrument consists of an aluminum heating block (furnace) containing one glass test tube for the tested substance and another one for the inert reference material. The heating block is surrounded by stainless steel water-filled isothermal jacket and it is cooled automatically after the test allowing for quick preparation to another test.

Temperature changes in the sample and in the reference material are detected by a pair of sheathed thermocouples inserted directly into the samples (protected against corrosion by glass capillary tubes) and continuously recorded to a data acquisition unit (notebook computer) with a data recording and evaluating software MEAVY for Windows XP.

A programmed temperature controller with independent temperature sensor is used for heating the furnace with a constant heating rate or at isothermal conditions or with other temperature programs.

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TECHNICAL PARAMETERS

Temperature range:	20 – 550 °C
Heating rate:	from 0.1 to 20 °C.min^{-1}
Cooling rate:	approx. 500 °C.hour^{-1}
Accuracy:	±0.05 °C for 0.1 °C.min^{-1} heating rate ±0.2 °C for 5 °C.min^{-1} heating rate
Typical sample weight:	30 mg of non-primary explosive materials 10 mg of primary explosives 400 mg of non-explosive materials (test tube volume is 0.8 cm^3)

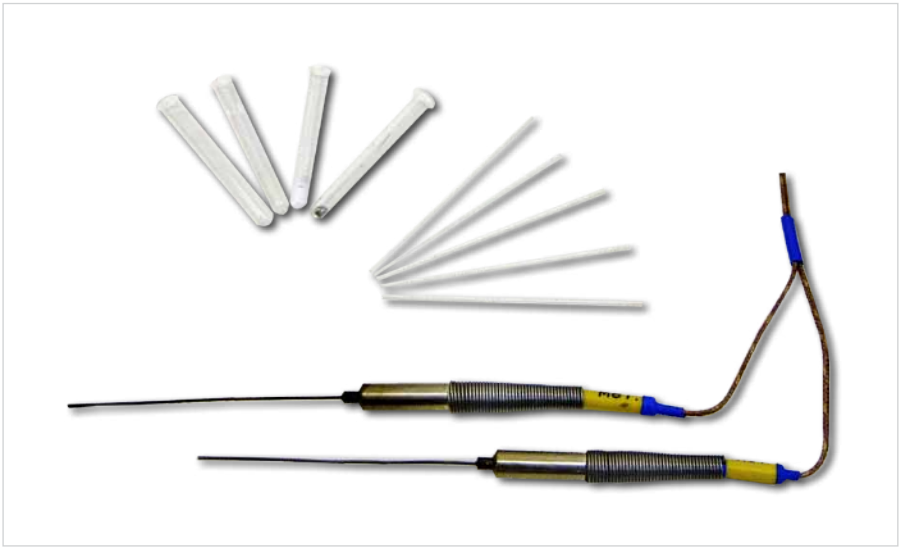
STANDARD INSTRUMENT PARTS

DTA552-HB	Heating block unit including water-cooler
DTA552-TC	Temperature controller
DTA552-DA	Data acquisition and evaluation unit *(notebook computer with this minimum configuration or higher: 17'' display, 2 GHz processor, 2 GB RAM, DVD-RW, HDD 160 GB, WLAN, BT, LAN, USB, Win XP)*
DTA552-TCP	Thermocouples (1 pair)
Meavy 2.0	Software MEAVY 2.0 Eng for Windows XP, database of thermograms of elementary explosives

CONSUMABLES

DTA552-GTT	Set of 100 glass test tubes
DTA552-GC	Set of 100 protective glass capillary tubes for thermocouples

Note: The glass test tubes can be effectively recycled after each test (if not crushed by explosion or by handling) by cleaning in a bath of nitric acid or chromosulphuric acid.



SHIPPING DATA

Package dimensions (L x W x H):	41 x 52 x 30 cm
Package gross weight:	14 kg
Custom code:	9031 20 00

INSTALLATION REQUIREMENTS

Space requirements - Main unit:
L x W x H: 30 x 30 x 14 (28) cm; Weight: 6 kg

Space requirements - Data acquisition unit:
L x W x H: 41 x 32 x 32 cm; Weight: 3.5 kg

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

Tap water source for cooling: min. 30 dm^3.hour^{-1}

Fume hood or local exhaust for heating block unit

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