

MACRO DTA 552-REZ DIFFERENTIAL THERMAL ANALYSER FOR EXPLOSIVES

Product Datasheet

Macro DTA 552-Rez is a thermal stability testing instrument designed specifically for differential thermal analysis (DTA) of energetic materials which explosion, or composition 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), resistant against contamination or damages caused by boil up of high viscosity and corrosive 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 **Macro DTA 552-Rez** at dozens of research or production control laboratories for testing of parameters bitumen mixtures, glues or solutions of corrosive inorganic acids.

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.

Macro DTA 552-Rez 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)

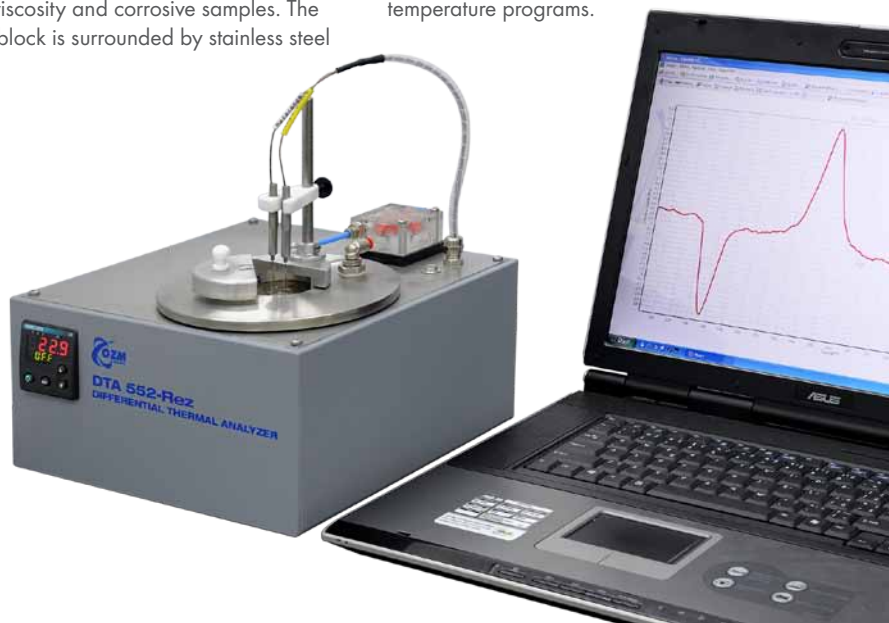
INSTRUMENT DESCRIPTION

Instrument **Macro DTA 552-Rez** detects and analyzes thermal changes (melting, polymorph transformation, evaporation, thermal decomposition) occurring 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. A corrosion of thermocouple inserted directly in the sample is prevented using stainless steel sheet and glass capillary. Higher amounts of measured samples eliminate influence of an inhomogeneity. Higher volume of test tubes enables also measurement of liquids, solutions and foaming substances including to high viscosity and corrosive samples. 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.



MACRO DTA 552-REZ

DIFFERENTIAL THERMAL ANALYSER FOR EXPLOSIVES

Product Datasheet

TECHNICAL PARAMETERS

Temperature range:	20 – 550 °C
Heating rate:	from 0.1 to 10 °C.min ⁻¹
Cooling time:	approx. 1 hour
Accuracy:	±0.2 °C for 1 °C.min ⁻¹ heating rate ±0.5 °C for 5 °C.min ⁻¹ heating rate
Typical sample weight:	50 mg of non-primary explosive materials 10 mg of primary explosives 1-2 g of non-explosive materials (test tube volume is 3.5 cm ³)

STANDARD INSTRUMENT PARTS

MDTA552-MU	Main unit - Heating block unit incl. water-cooler - Temperature controller and datalogger
PDP	Portable data processor (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)
MDTA552-TCP	Thermocouples (1 pair)
Meavy 2.0	Software MEAVY 2.0 Eng for Windows XP, database of thermograms of elementary explosives
MDTA552-SS	Starting set of consumables - 100 glass test tubes - 100 protective glass capillary for TC
DTA552-ACC	Accessories - Spatula - plastic hose (diameter 6 mm, length 4 m) - reference material 12 g - calibration substance Indium 3 g - power cable - ethernet cross cable - fitting 1/2"

CONSUMABLES

MDTA552-STCP	Spare Thermocouples (1 pair)
MDTA552-GTT	Set of 100 glass test tubes
MDTA552-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	