

TNT Soil Test System

Ensys® explosives kits are rapid field or laboratory colourimetric tests for the analysis of explosives in soil. The kits are based on a method developed by Dr. Thomas Jenkins at the US Army Corps of Engineers - CRREL.

Test result type

- Quantitative data

Samples per kit

- 20 soil samples

Assay range

- Soil: 1 ppm to 30 ppm total TNT
- Higher sample concentrations can be quantified by sample extract dilution

Sampling preparation

- Soil samples require prior extraction using the included extraction components
- Soil samples should be dried prior to analysis
- Soil sample extracts may be saved for use with the RDX soil test kit

Sampling time

- 'Dirt-to-Data' in approximately 30 minutes
- Typically about ten samples can be run in about 40 minutes
- Soil extraction time is typically 2 - 10 minutes per sample plus test run time of approximately 2 minutes

Specificity

The Ensys® TNT test is specific for TNT and related explosive compounds and exhibits the following sensitivities. The TNT test does not measure RDX or HMX.

MDL SOIL (PPM)	
Compound	MDL
2, 4, 6 trinitrotoluene	0.7
2, 4 dinitrotoluene	0.5
2, 6 dinitrotoluene	2.1
1, 3, 5 trinitrobenzene	0.5
Tetryl	0.9
2 nitrotoluene	>100
3 nitrotoluene	>100
4 nitrotoluene	>100
4 amino 2, 6 dinitrotoluene	>100
Nitrobenzene	>100

- » Detects TNT, DNT and related explosives
- » Convenient and rapid testing in the field or laboratory
- » Extractions can be performed simultaneously with analysis in singlicate
- » TNT extracts can be used with Ensys RDX test
- » Training available
- » EPA SW-846 Method #8515



Basic Test Procedure

- Clean cuvettes and set spectrophotometer
- Extract soil sample:
 - Weigh 10 grams of soil sample
 - Add sample to extraction jar
 - Measure 50ml acetone into 50ml tube
 - Pour acetone into extraction jar and shake for three minutes
 - Allow to settle for five minutes
- Draw 25ml liquid into the syringe from above the sediment layer in extraction jar
- Attach filter tip to syringe and transfer 25ml of sample extract into a cuvette.
- Place cuvette in spectrophotometer and record initial absorbance
- Add one drop of developer solution, cap and shake for three seconds.
- Remove stopper and place the 'sample' cuvette in cell holder and read sample absorbance.
- NOTE: For analysis of samples containing DNT, and/or where DNT concentration is of concern, samples must be allowed to develop for 10 minutes before reading sample absorbance. This will not affect colour development for other nitroaromatics.
- Record data and calculate results.

Test kit components

- » 20 weigh boats and wooden spatulas
- » 20 extraction jars
- » One 50ml graduated tube
- » 20 - 30cc syringes and syringe filters
- » 1 bulb pipette
- » 1 TNT control vial and ampoule cracker
- » Developer solution
- » Test kit instructions

Storage & precautions

- » Shelf life is typically one year from date of manufacture, with specific kit expiration date information provided on product packaging
- » Store at ambient temperature 64° to 81°F (18° to 27°C)
- » Operate the test at temperature greater than 40°F /4°C and less than 100°F/ 39°C (4°C)

Required test materials Part

- » EnSys TNT explosives soil test kit 7002000

Required test equipment

- » Ensys TNT accessory kit (rental, includes HACH DR2800) 6999700
- » Acetone: hardware or laboratory grade (min 50ml per sample)

Other recommended materials

- » Hach DR/2000, DR/2010 or DR/2800
- » 2 matched hach cuvettes
- » 2 cuvette stopper plugs
- » Balance
- » Tap or laboratory grade water for cuvette rinsing
- » Marker pen, calculator
- » Absorbent paper
- » Liquid waste container
- » PPE: Disposable gloves, eyewear