SDT 170 MTT. Ultrasonic system.

Tightness control of underground tanks and associated pipe work

with data backup.

The SDT TankTEST method for checking the tightness of underground flammable liquid tanks and their associated pipe work by introducing a vacuum and listening to the ultrasounds is:

- **the most reliable**
- **the most cost-effective**
- **the most rapid**
- **the most simple**
- **the most comprehensive**
- **the most accurate.**

With SDT's "Graphs & Measurements" software for the automatic creation of authenticated reports.

- All data and test measurements are stored in the detector.
- They can be transferred to a PC.
- They provide:
  - evidence of testing
  - measurement readings and graphics
  - archiving of the performances.

SDT® The Precision of Ultrasonics

SDT «Graphs & Measurements» software for the automatic creations of authenticated reports.

- **During testing, the operator enters the identity of tank, the vacuum level applied to the tank and the duration of measurement-taking into the SDT 170 MTT.**

- **One measurement per second is recorded during the set time*, with this time being divided automatically and equally between the sensors.**

* A running test can be paused or cancelled. All recorded data are saved in memory in both cases.

Traceability

The equipment automatically records the following information:

- **Test date and time.**
- **Serial numbers of the safety interface box and detector.**
- **The measurements taken.**

  One measurement/second for the total duration of the test, with identification of the sensor for each measurement.

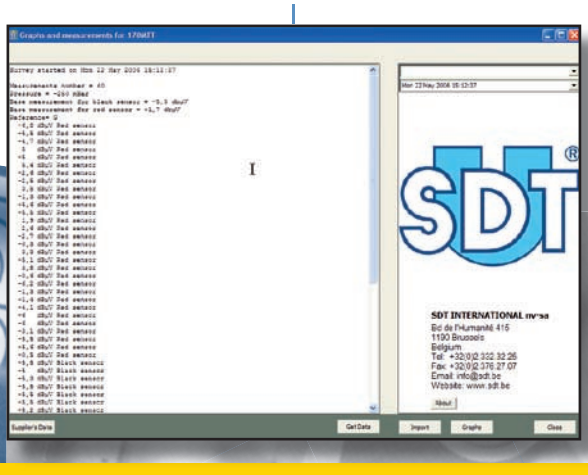
Personalization

- **Possibility of creating a PDF file for printing, with personalization of report page headers and insertion of company logo.**
- **Space for comments on test or tank.**

Automatic data processing

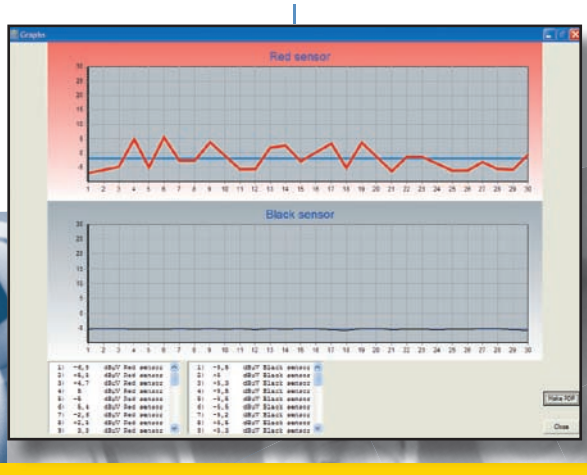
Window of imported data.

- Drop-down menus of the right allow test selection from file, either by reference or time and date line.
- The column on the left contains all the test measurements of the selected test, with each test being headed by its time and date line and by its identification details.



Graphic display of measurements.

- Measurements are displayed for each sensor, on a measurement scale from -10 to +30 dBµV.
- They appear in two drop-down lists in the lower part of the window.



Creation of authenticated reports

- **Each report consists of 3 sections:**
  1. Customer and operator details, identification details of the test and comments
  2. Graphics showing sensor readings
  3. Table of measurements by sensor in as many pages as needed.

Autonomy

- **Battery pack autonomy:**
  8 to 10 h without backlighting. Charge time 5 to 6 h.
- **Memory capacity:**
  20 h of measurement-taking, or 72,000 measurements (1 measurement/sec in recording phase).

Advantages of tightness control by ultrasound

Ecological

- Leaks are not aggravated by testing.
- Filling water does not have to be cleaned after testing.

Fast

- No filling or emptying of the tank, no waiting time, and no removal of manhole cover.
- Testing of the tank and its filler and bleeding pipes in a single operation.

Precise

- It detects even the smallest perforations or "mini faults" not yet causing a leak.
- It allows you to pinpoint the leak: on the tank itself, from the manhole cover, the pipe work and its joints, the flanges and valves.
- Unlike hydraulic testing, it is not influenced by the temperature differential between the tank and the test water, or the presence of residual air.

Economical

- Fast set-up.
- Robust equipment for work in the field and for carrying out thousands of tests.

Convenient

- The pump and the 2 boxes are easily transportable.
- The SDT 170 MTT measuring equipment weighs only 700 g.
- Rechargeable NiCd battery pack with 8 to 10 h autonomy.
- Ergonomic equipment.
- Easy to use with any installation configuration, height or stored product.

Complete

- Test confirmation procedure in recording mode, with display of the different test phases.
- Storage of test measurements and details. Transfer to PC for consultation, report publication and archiving.

Widely recognized and approved method.

The SDT TankTEST for testing underground tanks was developed by SDT.

- **Belgian accreditation**
  The SDT TankTEST method has been tested and approved since 1995 by various authorities, including AIB Vinçotte and Lloyd's Register in Antwerp. It meets the criteria of Walloon Government decrees of 3 July 1997 and 30 November 2000. It has also been approved by the Ministry for the Flemish Community (Aminal, number AMV/30.06.95/1).
- **French accreditation**
  In 1998, Cetim in Senlis tested the ultrasonic SDT TankTEST method on behalf of the French Ministry for Town and Country Planning and the Environment; it was approved. Compared with the hydraulic method (pressurizing the tank after filling it with water), the SDT TankTEST has been recognized as being more sensitive in its detection, easier to implement, faster and more economical.
- **US accreditation**
  The SDT TankTEST method has been tested successfully by Ken Wilcox Ass., an American company licensed by the EPA, the only organization in the world to have defined the minimum level of sensitivity to be met by a technique destined for use in the American market.
- **Unique experience in this kind of service**
  SDT International has participated directly or indirectly in the testing of several thousand tanks in Belgium and numerous other countries. The company employs a team of technicians and specialists with solid experience in this kind of service.

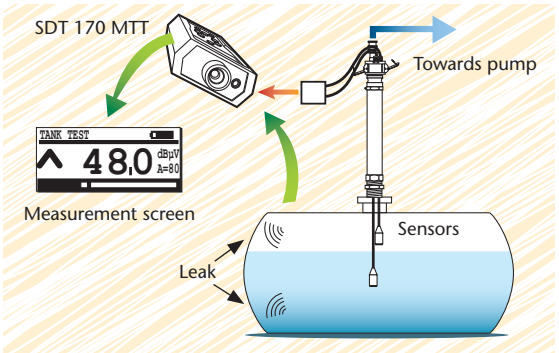
Ultrasound: listening is understanding!

Ultrasound

- Sound is generally produced by a vibrating body. The surrounding air participates in this movement, creating waves around it which transmit the sound energy.
- Ultrasound is a vibration of the same nature as sound but at a frequency above 20 kHz and inaudible to the human ear. It is produced naturally by friction, including turbulence in fluids caused by pneumatic or hydraulic problems such as leaks.

Control principle

- The use of ultrasonic frequencies means a far higher level of sensitivity than is possible with audible sound.
- The pressure in the tank is reduced, and the ultrasonic vibrations caused by the passage of water, air or other substances through a hole in the tank wall are detected by two sensitive sensors, one in the liquid and the other above the level of the liquid.
- The SDT 170 MTT detects the typical frequencies of leaks in underground tanks. It measures them and converts them to audible frequencies. These are fed back to the operator in three forms: visually and measured in dBµV on the detector display, and audibly through his headphones.



Any leak will produce a signal detectable by the SDT 170 MTT.

How does the SDT 170 MTT work?

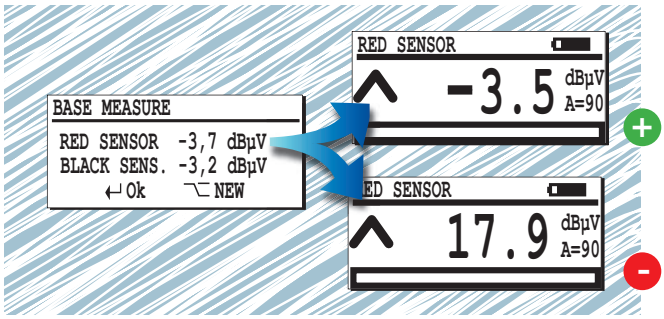
The vacuum pump creates a gradual vacuum in the tank

- As soon as the vacuum created is greater than the hydrostatic pressure (max. 250 mbar) due to the height of the liquid, any leaks generate ultrasonic signals.
- The 2 sensitive sensors placed in the tank (one above, the other in the liquid) detect even the tiniest leaks, thus allowing the checking of flammable liquid tanks or tanks containing products harmful to the environment.

And the SDT 170 MTT detector measures the ultrasonic signals

(+) If the tank **is tight**, no signal will be detected by either of the sensors. The value displayed will be equal or close to the reference value measured before the tank was put under vacuum.

(-) If the tank **is not tight**, the vacuum will cause the suction of air, material or liquid through the leak site, above or below the level of the liquid. Audible and measurable signals are detected, and the value displayed is higher than the reference value.



The Precision of Ultrasonics

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SDT 170 MTT. Ultrasonic system.

Tightness control of underground tanks and associated pipe work

with data backup.

Equipment contents:

The full equipment consists of the following items, most of them contained in 2 transport cases

SDT 170 MTT detector, supplied with one battery block in the unit, rubber protection and user's manual, plus: • Headphones, noise isolated • Flexible rod with open sensor • Battery charger • Precision connection + 3 ad hoc accessories • Graphs & measurements software for transferring data from the equipment to the PC (CD ROM) • RS232 cable	1
Two 32 mm diameter ultrasonic sensors, watertight, explosion-proof and impervious to hydrocarbons	2
Intrinsically safe interface box (Switchbox), link between the sensors and the appliance	3
Mechanical bush to be fitted to the manhole panel	4
Camlock to connect vacuum pump to mechanical bush	5
Suction hose (5m)*	6
Drain hose (5m)*	7
Tube of water-detection paste	8
Vacuum pump with safety valve calibred to ± 250 mbar*	9

*explosion-proof version or not, depending on use.

EXPROOF explosion-proof equipment:

For tanks containing flammable and/or explosive liquids, the pump and the hoses are replaced by the following explosion-proof equipment:

- BUSCH ENIVAC, ATEX certified explosion-proof vacuum pump
- Explosion-proof suction and drain hoses (5 m) in antistatic rubber.

SDT TankTEST 170 MTT options:

- Box of conical rubber sealing plugs of various diameters.
- Wheeled trolley for pump.
- Three screwable one-meter long cylindrical gauges with sliding reference piece.
- Two ultrasonic sensors complete with cables protected by a VITON sheath for frequent use in petrol and for use in aggressive liquids (solvents, etc.).
- Cable for recording sounds on auxiliary device, plus "Y" connector.

Main technical features of SDT 170 MTT system

SDT 170 MTT DETECTOR

Function	Multifunction detector.
Display	LCD graphic display with backlighting.
Keyboard	Eight (8) function keys.
Ultrasonic sensor	Integrated.
External sensor	Through dedicated connector (7-pin LEMO connector).
Data logger	For tank tightness tests in data recording mode: Identification of the tank, vacuum level, test duration, measurements in dBµV. Memory capacity: 20 hours of measurement-taking or 72,000 measurements; as the device makes one measurement per second during the recording phase.
Communication	RS 232 C communication interface (19.2 kB). For tank tightness tests in data recording mode: Graphs & measurements software for data transfer from detector to PC, supplied on CD ROM.
Battery pack	NiMH (Nickel Metal Hydrate) rechargeable. Autonomy 8 to 10 hours without backlighting Recharge time : 5 to 6 hours Nominal capacity : 1.5 Ah. Life span : 500 to 1000 charge/discharge cycles Charging only with dedicated SDT charger.
Auto stop	Auto power down after time predefined by user.
Operating temperature	-10 °C to +60 °C (14 °F to 140 °F).
Housing	Extruded aluminium.
Weigh	750 g (26.45 oz) (with battery and protection).
Dimensions	225 x 90 x 40 mm (8,86 x 3.54 x 1.57 inches) (L x W x H).
Protection holster	Rubber resistant to hydrocarbons (fluor silicone).
Headphones	130 dB, noise isolating.

EXTERNAL ULTRASONIC SENSORS

Sealed sensors	Type OQBP2501.
Certification	Sensors certified in accordance with Directive 94/9/CE (ATEX).
Resistance	To hydrocarbons: Yes To hydrostatic pressure: 1 Bar.
Operating temperature	-30 to + 80 °C.(-22 °F to 176 °F).
Sensitive element	Piezo-electric (f resonance = 40 kHz).
Sensitivity	- 67 db / V / µ Bar.
External diameter	32 mm (sensor 25 mm).
Housing	Aluminium.

INTERFACE BOX (SWITCHBOX)

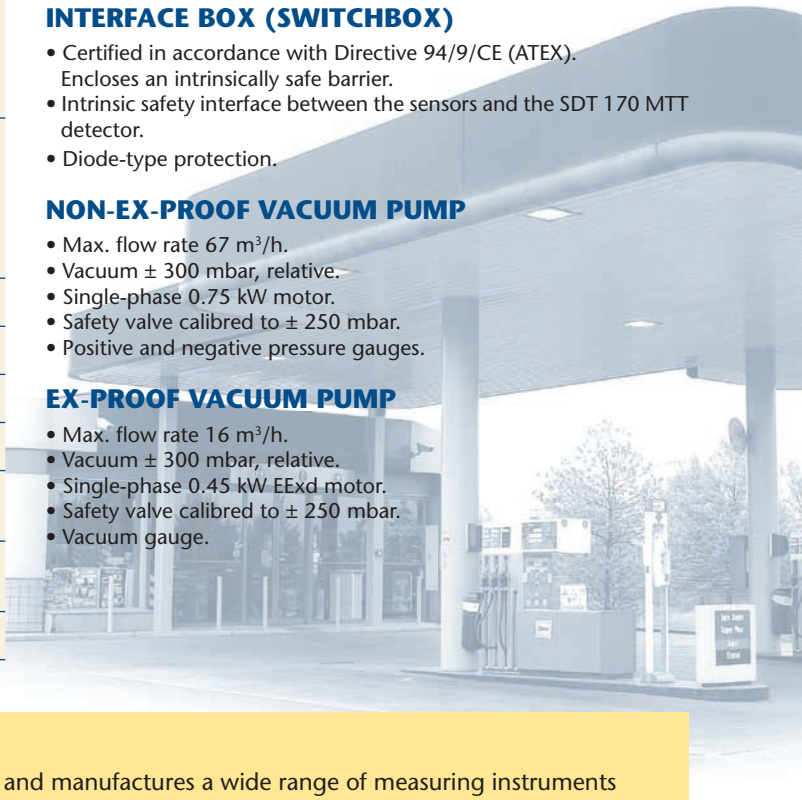
- Certified in accordance with Directive 94/9/CE (ATEX). Encloses an intrinsically safe barrier.
- Intrinsic safety interface between the sensors and the SDT 170 MTT detector.
- Diode-type protection.

NON-EX-PROOF VACUUM PUMP

- Max. flow rate 67 m^3/h.
- Vacuum ± 300 mbar, relative.
- Single-phase 0.75 kW motor.
- Safety valve calibred to ± 250 mbar.
- Positive and negative pressure gauges.

EX-PROOF VACUUM PUMP

- Max. flow rate 16 m^3/h.
- Vacuum ± 300 mbar, relative.
- Single-phase 0.45 kW EExd motor.
- Safety valve calibred to ± 250 mbar.
- Vacuum gauge.



SDT, undisputed leader in ultrasonic detection
The undisputed leader in its field, SDT International designs and manufactures a wide range of measuring instruments for the ultrasonic detection and evaluation of various physical parameters.

Wide range of applications
SDT International's expertise covers a wide range of applications such as tightness tests on large and small volume and underground tanks, leak detection on any pressurized circuit, production quality control, and the detection of wear and anomalies in the predictive maintenance of mechanical installations.

The success of SDT International is based on its philosophy and willingness always to respond to customer problems with the most efficient and cost-saving solutions.

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