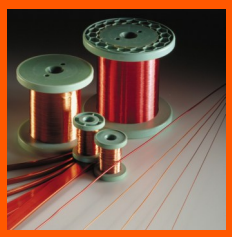
DSE
TEST SOLUTIONS

Ver. 04.07.00

TD5

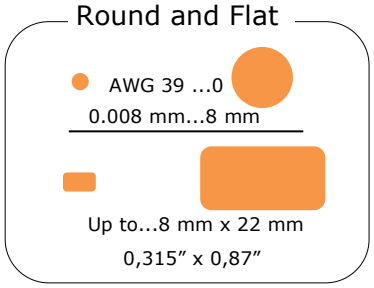


Data sheet
Tangent Delta tester

TD5 – excellently high repeatability and accuracy

TD5 – All the best in one unit

- High temperature oven—up to 500°C (932°F)
- High consistent of the measurements
- High accuracy
- Low maintenance needs
- Round and Flat wire can be tested in one system
- High speed
- Approve/reject function
- Reference wire in display
- DIN or Logarithmic scales
- Up to 99 pre-settings
- Multi user language
- IEC 60851-5 compliant



TD5 Tangent Delta Tester

TD5 is applicable for quality control of enamelled wire. During heat-up of the wire, the TD5 automatically calculates the Tangent Delta temperature (TgD).
With a full curve, it is possible to determine and display valuable information about the quality of the enamel, including:

- Enamel curing
- Enamel quality
- Residual solvent
- Absorption of moisture
- Enamel type ID, and combinations

Increased profitability in manufacturing of enamelled wire

Easy and fast test/analysis of the selected samples from the production means:

- Improved quality
- Time and cost savings
- Documented quality control
- Optimised production parameters
- Reduction of scrap

High Temperature oven

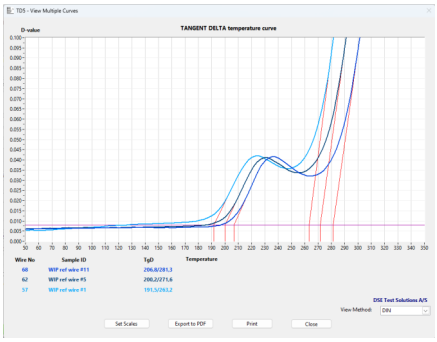
The central component in a TgD tester is the oven.
With a temperature range up to 400°C (752°F) (optionally 500°C/932°F) the TD5 is designed for testing copper, aluminium or other types of enamelled conductors.

For manufacturing

TD5 is designed to deliver fast consistent measurements with high reliability. Test results are ready after few minutes, depending of the size of wire.

For laboratory

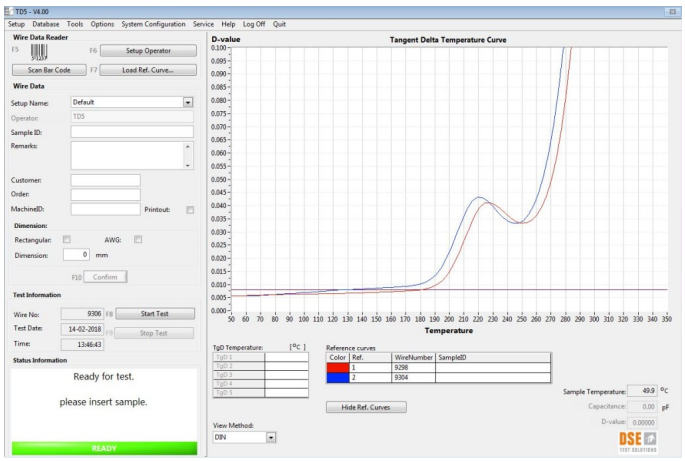
The accuracy in the measurements sets new standards for what is possible. The high-precision heating elements with IHR (Integrated Heating Regulation) and access to adjustment of parameters makes it the best oven for research and development application.



Easy operation and helpful features

TD5 is user-friendly and easy to operate.
During the measurement the curve is visible and combined with a reference wire the operator has the best possible overview.

Reference curves



Software option B

This software tool evaluates the PEI base coat on self-bond wires (XWE types). A mathematical evaluation of the PEI curve lies beneath the self-bond signal and the Tangent Delta curve.
This function eliminates the need for stripping self-bonding overcoat of the wire.

Data input

For fast and precise data input, production code and wire ID etc. can be entered into the database via barcodes.

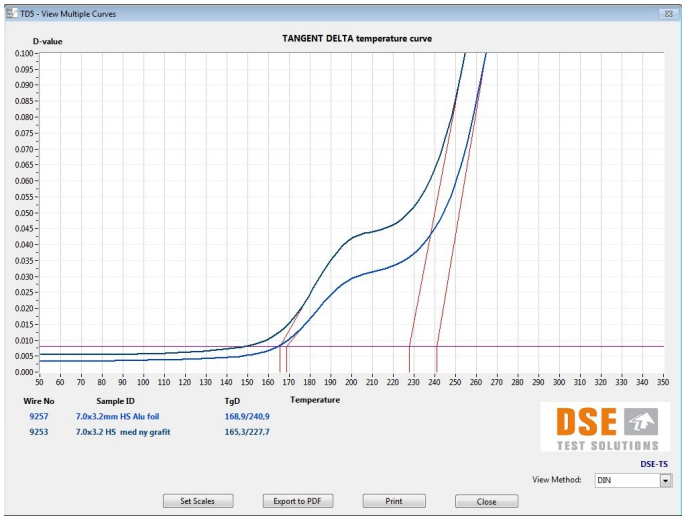
Set up menu

Up to 99 customised pre-sets can be stored, and easily found in the drop down menu at any time.

Compare results with multiple curves

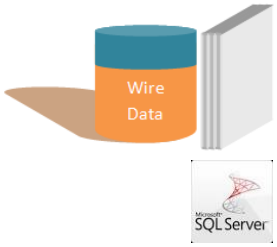
Results can be compared directly on the screen.
In multiple view up to 5 curves can be evaluated simultaneously.

Multiple Curves



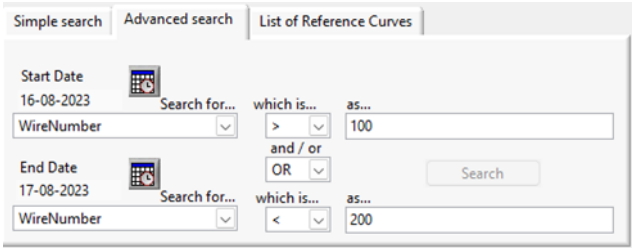
Handling of data

The use of Microsoft SQL database structure ensures easy saving and retrieving of wire data from a local PC or from a central server.



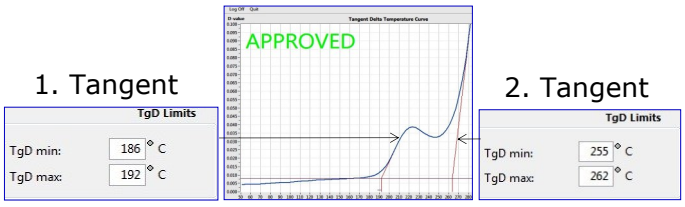
Advanced Database search function

Efficient search function makes it possible to find and compare data stored in the database. Retrieving data for e.g. a specific customer combined with result and time is simply done by means of few mouse clicks.



Approve/reject function

Limits for approval or rejection of a measuring can be set for two tangents for easy evaluation of the results.



Documentation of production quality

It is possible to make test reports in PDF format. Following information can be added to each individual sample: Enamel type, supplier name, order number, machine ID and other comments attached to the measurement in the remark field. Company logo can be imported and shown on pages. Updating information in the fields for remarks is possible also after the test is completed.

TD5 Features

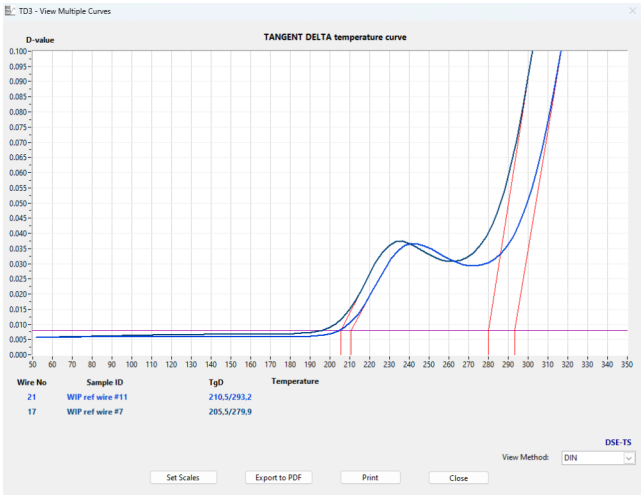
Multi-language
The control software is currently available in English, German, Chinese and Russian, contact DSE Test Solutions for updated information.

Calculation and presentation
TD5 starts to measure and calculate the TgD temperature automatically when the sample holder is loaded into the oven.

During the measurement, the development of the curve is displayed on the monitor.

The software enables setting limits for the minimum and maximum TgD temperatures.
In case TgD temperatures exceed the preset limit values, an "Approved/Rejected" window will appear.

Compare with reference wire
Up to 5 different curves can be displayed simultaneously. The possibility of comparing a new measurement with a reference wire is helpful in the interpretation of the result.



Sample holder
The sample holder simplifies sample preparation, and is designed for absolute minimum need of maintenance. The standard sample holder can be used for both round and flat wire.

Standard sample holder

Handle both round & flat wire

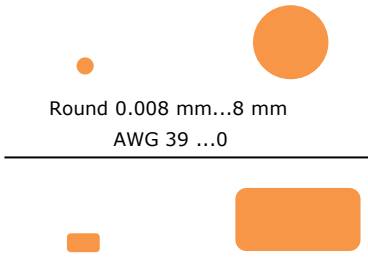
Fine wire sample holder

Sample holder for Ultra fine wire

0.008 mm...0.1 mm
Up to AWG38

Round and flat wire
TD5 is built to handle a wide range of dimensions in both round and flat wire.

Dimensions



Multiple frequencies
For maximum flexibility during research and development the following measuring frequencies can be selected: 100 Hz, 120 Hz, 1 kHz, 10 kHz and 100 kHz.
Default according to the Norm IEC 60851-5 the measuring Frequency is 1 kHz.

Technical specifications

TD5 measuring unit includes

Oven with high-precision temperature controlling unit, power supplies, precision analyser, interface for PC via USB.
Specifications:

- Temperature range standard:
  45 - 400°C (113 - 752°F)
  Optional: 45 - 500°C (113 - 932°F)
  Resolution ±0.1°C
- Readout ±0.1°C
- Dimensions (DxWxH): 440 x 530 x 360 mm
  (17,3 x 20,9 x 14,2")
- Ambient temperature: 10°C - 35°C
  (50 - 95°F)
- Net weight 33 kg

Implementation Standard: IEC 60851-5

Precision analyser

- Tangent Delta resolution:
  0.0005 at C > 100 pF
- Measuring frequency 100 Hz, 120 Hz,
  1 kHz, 10 kHz, 100 kHz
- Measuring voltage 1 Volt RMS

PC

- Type, size, RAM and hard disc according to current standards
- Flat-screen monitor
- Keyboard and mouse
- Windows 10/11

Mains supply

- 100..230 VAC ± 10% 50/60 Hz
  with protective ground
- Power consumption max. 600 W

CE

Standard wire sample holder

Wire range:
Round 0.02 mm...8.0 mm, AWG 38 … 0
Flat up to 8.0 x 22.0 mm (0,315 x 0,87")

Fine wire sample holder

Fine wire range: 0.008 mm...0.1 mm
Up to AWG 38

Software included as standard

- Multi curve function
- Comparison with reference wire
- Up to 99 pre-settings
- Scales, DIN or Logarithmic view
- Scaling D-values up to 1.0
- Programmable oven temperature range
- Password management
- Advanced Microsoft SQL data base
- Report in printable PDF format
- Test limits for automatic approval or rejection
- Automatic printout of the individual curves and the calculated data

Included accessories

- One standard sample holder, holder for sample holder
- Service kit and all cables
- 10 pcs graphite bottles, back of applicators
- Wire sample dryer
- Manual in English, application notes for evaluation of Tangent Delta Temperature curves in English

Optional accessories

- Fine wire sample holder
- Spare part kit
- Calibration tubes including certificate
- Software option B for automatic evaluation of self bonding wire
- High temperature - up to 500°C (932°F)

Calibration tubes

Holder " Third hand"

DSE TEST SOLUTIONS

FEATURES	TD5	TD3
Dimension range round wire (No off sample holders needed)	0.008…8 mm (2) AWG 39 … 0	0.05…6 mm (2) AWG 34 … 3
Dimension range flat wire maximum (No off sample holders needed)	8 x 22 mm (1) 0,315" x 0,87"	6 x 12 mm (2) 0,24" x 0,48"
Maximum measuring temperature	400°C (752°F) (opt. 500°C/932°F)	350°C (662°F)
Samples per test	1	1
Measuring time examples (0.5 mm PU120 / 2 mm PU 160)	1.30 / 2.30 minutes	1.30 / 2.30 minutes
Semi automation handling of sample holder	Included	No
Built in LCR measuring bridge and controller	Yes	Yes
Test frequency	Multiple	1 kHz
Reference wire for comparison on display	Included	Optional (A)
Preset's including reference wire	Included	Optional (A)
Multiple view of measuring's	Included	Optional (A)
Approve / reject function	Included	Included
Dual tangent evaluation (Approve/reject function)	Included	Optional (A)
Evaluation of bonding wire (option B)	Optional (B)	Optional (B)
Logarithmic or Linear scale on display	Yes	Yes
Password protection two levels	Included	Included
Multiple operational language	English- German Chinese- Russian	English- German- Chinese
Database local or on central server	Included	Included
Microsoft SQL database search functions	Included	Included
Windows PC system	Windows 10 & 11	Windows 10 & 11
Compliant IEC 60851-5	Yes	Yes

Selection guide DSE Tangent Delta testers

Tangent Delta Test means controlling the enameling process

The Tangent Delta Tester (TgD) from DSE Test Solutions delivers all the information needed for optimising and controlling the many production processes. The measured data are compressed and displayed in a full curve, showing the Tangent Delta as a function of the temperature.

Sample

Test

Result

More than just time and money saving

This method is the ultimate way of making a fast, accurate and reliable determination of the enamel curing, and at the same time, showing residual solvents or additives in the insulation.

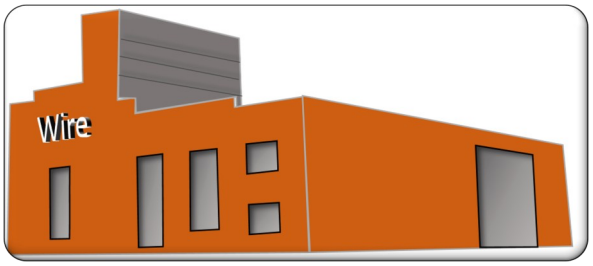
Investing in a TgD tester is fare more than just time and money saving, also other parameters are important to control after the wire has left the manufacturing plant.
Both residual solvents and curing state are factors that have high influence on temperature index, lifetime and physical behaviour of the wire.

Get valuable information in few minutes

- Knowing the enamelling process is correct
- Optimised production parameters
- Documentation of the quality control
- Time and cost savings
- Reduction of scrap
- Tool for research

Tool for research and development

Control the production & know the quality from enamelling to shipping



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Find your local contact for product availability and support at www.dsetestsolutions.com

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