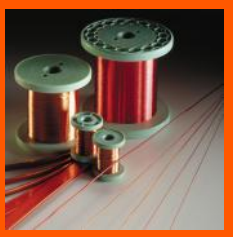
DSE
TEST SOLUTIONS

Ver. 04.06.00

TD3



Data sheet
Tangent Delta tester

TD3 High repeatability - Low maintenance

TD3 – Cost efficient TgD tester

- High repeatability of the measurements
- Compare results with multiple curves
- Round and Flat wire in one system
- Multi language user interface
- Reference wire in display
- Approve/reject function
- Up to 99 pre-settings
- Compact and low weight
- Portable
- IEC 60851-5 compliant

TD3 Tangent Delta Tester

TD3 is applicable for quality control of enamelled wire. During heat-up of the wire, the TD3 automatically calculates the TgD temperature (Tangent Delta temperature). With a full curve, it is possible to determine and display valuable information about the quality of the enamel, including:

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

Product description
The combination of reliable technology and the use of non toxic passive neutral graphite as external conductor ensures high reliability in all types of enamel.

TD3 sets new quality standards with respect to low maintenance needs. Extended service intervals are ensured by using innovative mechanical design and combined with its top quality metal hardware, the number of samples which can be handled between each service is very high.

Easy operation
TD3 offers user-friendly operation, thus minimising the need for operational training. Because the calculated results are displayed as curves on the monitor, the subsequent analysis of test results is easily made.

TD3 is designed for fast delivery of reliable test results, when testing copper, aluminium or other types of enamelled conductors.

Oven and Controller built in one compact unit
The oven, controller, precision analyser, and power supplies are all built together in one stable metal cabinet. The compactness and low weight of the complete system makes it portable and easy to move around inside a production plant.

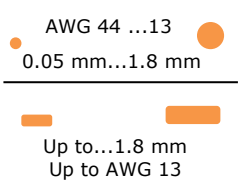
For obtaining flexibility the system operates with a standard configured Windows PC.

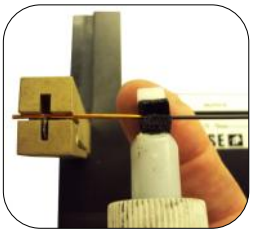
Communication between the PC and TD3 measuring unit is handled via USB.

Sample holders

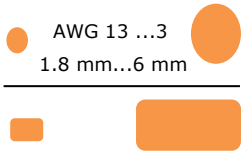
The design of the sample holders for TD3 ensures easy applying of graphite combined with low need for maintenance.

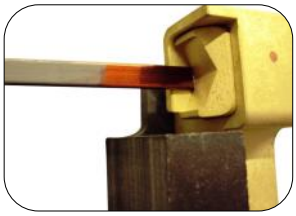
Standard wire





Heavy wire





Easy access for applying graphite

The zone for applying graphite is shown directly on the sample holder. Innovative design of the contact blocks make the inserting of the wire very easy and ensures a reliable contact to the wire.

Software description

Fast measurements

TD3 is designed for quick heat-up, a full Tangent Delta curve is produced in few minutes, depending on enamel type and wire dimensions. Example: PU wire of 0.5 mm (0.02"/AWG 24) wire including time for cooling @ start temperature of 50 °C (122°F) and ambient temp of 20°C (68°F) is < 5 minutes.

Basis software for TD3 includes

- Temperature range 45 - 350°C (113 - 662°F)
- Automatic calculation of TgD temperature
- Printout of each curve and calculated data (manual or automatic)
- Report in PDF format
- User-interface in English, German & Chinese
- D-value axis scalable up to 1.0
- Multiple tangent calculation
- Approve/Reject function for the 1. Tangent
- MS-SQL database function
- Windows 10/11 operation

Optional features

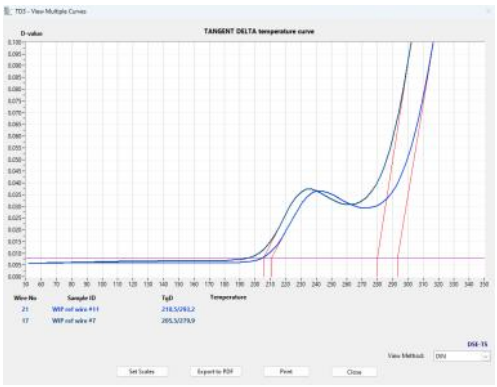
Besides the standard software package two options are available.

Software option A with additional features

- Compare result with multiple curves
- Use of reference curves
- Approve/reject function also for the 2nd Tangent
- Up to 99 pre-settings

Compare results with multiple curves

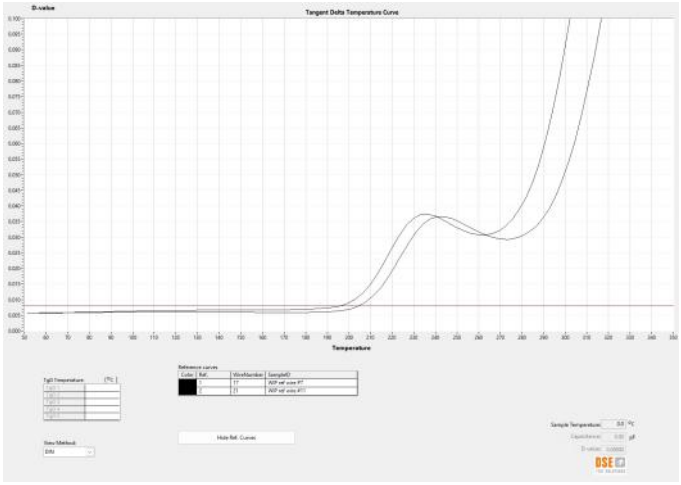
Results can be compared directly on the screen.
In multiple view up to 5 curves can be evaluated simultaneously.



TD3 Features

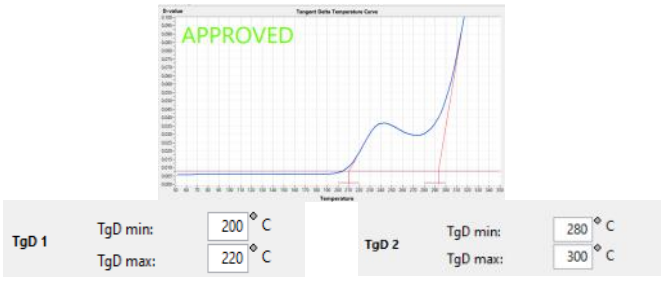
Reference curves can be selected and up to 3 reference curves can be attached to each Set up. A reference curve is visible during the complete measurement.

Reference Curves



Approve/reject function

Limits for approval or rejection of a measurement can be set in order to avoid mistakes. Optional also for the 2. tangent.



1. Tangent

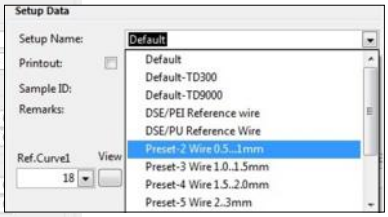
2. Tangent

Set up menu

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

Set up menu

Drop-down box



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 the self-bonding overcoat of the wire.

TD3 measuring unit includes:

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

- Temperature range 45 -350°C (113-662°F) with resolution ±0.1°C
- Readout ±0.1°C
- Dimensions (DxWxH):500 x 360 x 280 mm (19,7 x 14,2 x 11.0")
- Ambient temperature: 10-35°C (50-95°F)
- Net weight 15 kg
- Mains supply 100..230 VAC ± 10%, 50/60 Hz with protective ground.
- Power consumption max 500 W

Implementation Standard: IEC 60851-5

Precision analyser

- Tangent Delta resolution 0.0005 at C > 100 pF
- Measuring frequency 1 kHz
- Measuring voltage 1 Volt RMS

Included accessories

- One standard sample holder

Sample holder

TD3 Basic includes one sample holder.
Wire range: Round 0.05 mm - 1.8 mm (AWG 34 ...13)

Sample holder for Heavy wire (optional)

Wire range: Round from 1.8 mm - 6.0 mm (AWG 13 ...3)
Flat up to 6.0 mm x 12.0 mm (0.24" x 0.48")

- Cables, plugs and sockets, wire sample dryer
- 10 pcs. graphite bottles and pack of applicators
- Application notes for evaluation of Tangent Delta Temperature Curves in English
- User manual in English

Optional accessories

- Heavy wire sample holder
- Spare part package
- Calibration blocks including certificate
- Software option A
- Software option B

		
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

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.

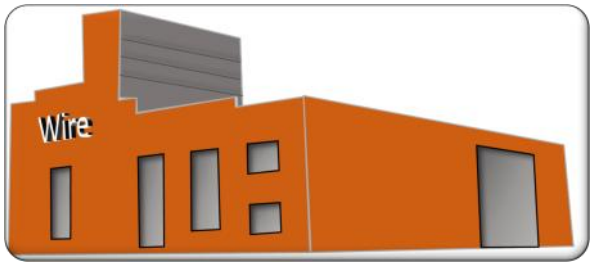
Investing in a TgD tester is fare more than just time and money saving, also other parameters are important to control after the wire has left the manufacturing plant.
Both residual solvents and curing state are factors that have high influence on temperature index, lifetime and physical behaviour of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