



Management Procedure 2529
Revision: B
Date Issued: July 22, 2013
Date Revised: October 30, 2017

Calibration Procedure

DeFelsko Corporation

PosiTector 6000 FT, FTRS, FTS, NTS & FNNTS Coating Thickness Probes

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1 Introduction and UUC Performance Requirements

1.1 This procedure describes the calibration of DeFelsko Corporation PosiTector 6000 FT, FTRS, FTS, NTS & FNTS probes with the following specifications:

Table 1-1 Measurement Ranges

Probe	Measurement Range
6000 FT 6000 FTS 6000 NTS 6000 FNTS 6000 FTRS	0 - 6 mm (0 - 250 mils)

1.2 The unit being calibrated will be referred to as the UUC (Unit-Under-Calibration).

2 Measurement Standards and Support Equipment Performance Requirements

2.1 The UUC accuracy requirements are based upon the published UUC performance specifications.

2.2 The test uncertainty ratio applied in this Calibration Procedure is 4:1 unless otherwise stated.

2.3 The Minimum-Use-Specifications are the minimum test equipment specifications required to meet all the UUC accuracy requirements and the test uncertainty ratio applied.

Table 2-1 UUC Accuracy Requirements and Description

UUC	Performance Specifications		Test Method
6000 FT 6000 FTS 6000 NTS 6000 FNTS 6000 FTRS	0 – 2.5 mm (0 - 100 mils)	± (0.01 mm + 1% of reading) ± (0.5 mils + 1% of reading)	Compared to Reference Standards
	> 2.5 mm (> 100 mils)	± (0.01 mm + 3 % of reading) ± (0.5 mils + 3 % of reading)	

Table 2-2 Minimum use specification

Range	Accuracy
0 - 2.5 mm (0 - 100 mils)	± 2.5 microns (± 0.125 mils)
>2.5 mm (>100 mils)	± 21.2 microns (± 0.875 mils)

Table 2-3 Actual Equipment Specification

Equipment Generic Name	Range	Accuracy	Manufacturer / Model #'s Applicable
Coating Thickness Reference Standards	0.375 – 6.5 mm (15 - 250 mils)	± (2.5 microns + 0.05% of thickness) ± (0.1 mil + 0.05% of thickness)	DeFelsko Corporation, STD-P1

Caution: The instructions in this Calibration Procedure relate specifically to the equipment and conditions listed in Section 2. If other equipment is substituted, the information and instructions must be interpreted accordingly.

Table 2-4 Calibration Environmental and Warm-Up Requirements

Measurement Standards & Support Equipment Environmental Requirements:	Temperature: 23 ± 5° C. Relative Humidity: Less than 95%
Measurement Standards & Support Equipment Warm-up and Stabilization Requirements:	Not Required

3 Preliminary Operations

Note: Review the entire document before starting the calibration process.

- 3.1 Visually inspect the measurement face of the probe for signs of damage or excessive wear, this could impact probe accuracy.
- 3.2 Gage Reset: For bodies with serial numbers after 700000; when the unit is powered down, simultaneously hold the “+” and middle buttons until the reset symbol appears. All other bodies press and hold the “+” button.

Caution: Be sure to keep the probe well away from any metal surface during the RESET process.

3.3 Probe Zero Calibration Adjustment

Note: The FN type probe uses separate ferrous and non-ferrous zero settings. The zero calibration adjustment needs to be done prior to calibrating each portion of the system. Use separate uncoated substrates for the two zero points. Adjustments are made to the currently displayed substrate only.

- 3.3.1 Select the Calibration Menu “Zero” function and then indicate the number of readings to be used to determine an average, 3 is recommended.
- 3.3.2 Measure a flat uncoated (zero) plate at least 4” x 4” x 0.2” (10cm x 10cm x 0.5cm) the require number of times. Use 1018 steel for a FT, FTRS or FTS probe, 6061 aluminum for a NTS probe and both steel and aluminum for a FNNTS probe.

3.3.3 Measure the zero plate again. If the reading is within +/- 0.01mm (+/- 0.5 mils), proceed to section 4, otherwise repeat steps 3.3.1 – 3.3.2.

4 Calibration Process

Note: Whenever the test requirement is not met, verify the results of each test and take corrective action before proceeding.

4.1 Review the Performance Requirements Table 5-1.

Note: The probe calibration may be verified in either normal or high-resolution mode. Accuracy is the same for both modes.

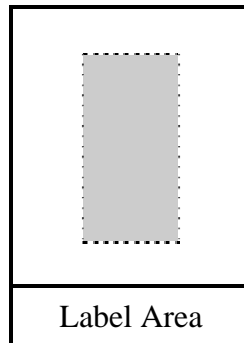
4.2 Record the thickness of the Reference Standards being used and determine the allowed range of readings for the UUC using the calculation methods shown in Table 5-1.

4.3 Place the Reference Standard(s) on the same uncoated plate used to zero the probe.

4.4 Use the UUC to take readings of the applicable reference standard. Verify that the readings are within the allowable limits determined in table 5-1. Record the readings.

Note: In taking readings the probe tip shall be centered in the shaded area on the Reference Standard as shown below. Record all digits displayed on the LCD. This may vary depending on the resolution mode.

Figure 4-1 Measurement Area



4.5 If readings are either too high or too low it is possible to adjust the readings. To do this simply press the “+” or “-” buttons until the reading is within tolerance. This adjustment will modify all subsequent readings and will require you to verify that any previous readings on the uncoated plate and other coated standards are still within tolerance. This adjustment may also be performed on the zero reading.

5 Performance Requirements

Table 5-1 Performance Requirements and Calibration Data for
PosiTector 6000 FT, FTRS, FTS, NTS & FNTS

Thickness on Reference Standard Label (mm)	Min. Reading Allowed ^① (mm)	Max. Reading Allowed ^② (mm)	Actual Probe Measurement (mm)
A			
Ferrous			
Non-Ferrous (NTS & FNTS only)			

① Calculation 0-2.5 mm: $(A \times 0.99) - 0.01$. Round up to nearest 0.01 mm.
>2.5 mm: $(A \times 0.97) - 0.01$. Round up to nearest 0.01 mm.

② Calculation 0-2.5 mm: $(A \times 1.01) + 0.01$. Round down to nearest 0.01 mm.
>2.5 mm: $(A \times 1.03) + 0.01$. Round down to nearest 0.01 mm.

*For imperial/metric readings convert using 1 mil = 0.0254 mm
Convert between mm and microns using 1 micron = 0.001 mm

Management Procedure Change Notice

Procedure Number: MP 2529

Revision Level: B

Date of Change: October 30, 2017

Title: Calibration Procedure for PosiTector 6000 FT, FTRS, FTS, NTS & FNTS

Reason for Change: <ul style="list-style-type: none"> • Add FTRS code
Description of Change: <ul style="list-style-type: none"> • Added FTRS product code throughout

I confirm I have read and understand the procedure and the change described above.

Printed Name	Signature	Date

Management Form 0010.02-05/1998