



Management Procedure 2524
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Calibration Procedure

DeFelsko Corporation

DeFelsko/PosiTector 100 C (Multi-Layer)

Coating Thickness Gage

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1 Introduction and UUC Performance Requirements

- 1.1 This procedure describes the calibration of the DeFelsko/PosiTector 100 (Multi-Layer) Coating Thickness Gage with a “C” type probe. The gage-probe combination has the following specifications:

Table 1-1 Measurement Ranges

Gage-Probe	Measurement Range *
100 C (Multi-Layer)	50 – 4500 μm 2 – 175 mils

* The range of the system depends on the coating material being measured. This range is based on a polymer coating.

- 1.2 The unit being calibrated will be referred to as the UUC (unit-under-calibration).
- 1.3 UUC Environmental Range:
- Temperature: $23 \pm 5^\circ \text{C}$.
 - Relative Humidity: Up to 95%
- 1.4 UUC Warm-up and Stabilization Period requirements: Does not apply.

Table 1-2 UUC Calibration Requirements and Calibration Description

(UUC) Function	Performance Specifications	Test Method
Accuracy Test 100 C (Multi-Layer)	50 to 4500 μm , $\pm (2 \mu\text{m} + 3\% \text{ of reading})$ 2 to 175 mils, $\pm (0.1 \text{ mils} + 3\% \text{ of reading})$	Compared to Coating Thickness Reference Standards.

2 Measurement Standards and Support Equipment Performance Requirements

- 2.1 Minimum-Use-Specifications are the calculated minimum performance specifications required for the measurement standards and support equipment to be utilized for comparison measurements required in the Calibration Process.
- 2.2 The Minimum-Use-Specifications are developed through uncertainty analysis and are calculated through assignment of a defined and documented uncertainty ratio or margin between the specified tolerances of the UUC and the capabilities (uncertainty specifications) required of the measurement standards system.
- 2.3 The uncertainty ratio applied in this Calibration Procedure is 4:1 or better.

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

Measurement Standards & Support Equipment
Environmental Requirements:

Temperature: $23 \pm 5^\circ \text{C}$.
Relative Humidity: Less than 95%

Measurement Standards & Support Equipment

Warm-up and Stabilization Requirements: Not Required

Table 2-1 Measurement Standards & Support Equipment Performance Requirements

Equipment Generic Name (Quantity)	Minimum-Use-Specifications		Manufacturer/Model #'s Applicable
	Range	Accuracy	
Coating Thickness Reference Standards	15 - 185 mils 325 - 4500 μm	± 0.1625 mils ± 4.0 μm	DeFelsko Corporation, Thickness Calibration Standards, Model CAL-P3

3 Preliminary Operations

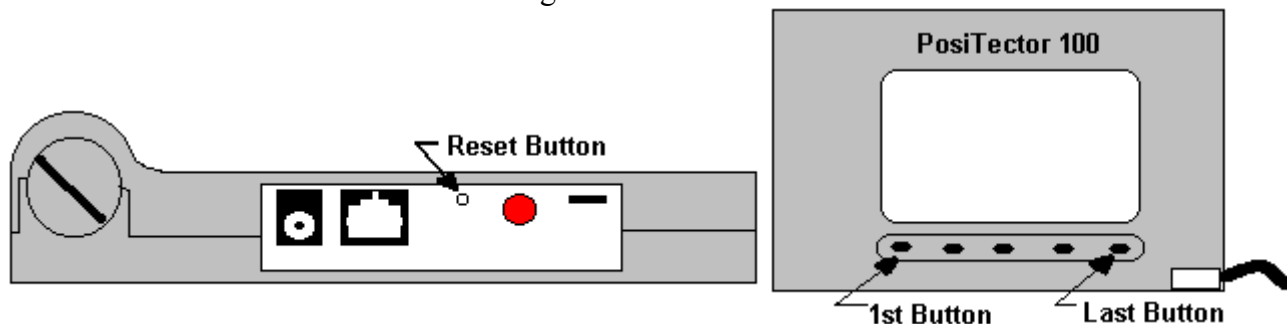
Note: Review the entire document before starting the calibration process.

3.1 Visual Inspection - Damage or excess wear should be repaired prior to beginning the calibration process. Visually inspect the UUC for:

- Damaged LCD display
- probe wear
- cracked or broken case
- missing parts
- proper identification

3.2 Gage Reset - Push the Reset Button on the top of the gage using a ball point pen or paper clip. Push the 1st and Last Button on the front of the gage simultaneously until you hear a beep. (see Figure 3-1).

Figure 3-1 Reset Buttons



3.3 Probe Zero - Using the Setup Menu, perform the Probe Zero function. Be sure the probe tip is clean prior to zeroing.

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 Accuracy Test

4.1.1 Using the Mode menu, turn on Graphics.

4.1.2 If the gage is to be calibrated in metric units, use the Admin menu to “Change to Microns”

4.1.3 Adjust the “A Gate” and “B Gate” as necessary to make readings. The gates may be adjusted at any time during the calibration process.

4.1.4 Measure the 100 mil (2500 micron) standard. Be sure to use couplant in making measurements.

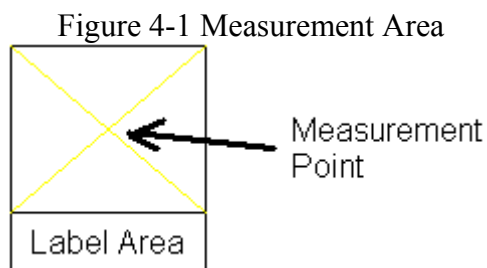
4.1.5 Using the Setup menu, select “Adjust Reading.”

4.1.6 Toggle selection to allow adjustment of the Sound Velocity Constant (Veloc).

4.1.7 Use the “+” and “-” buttons to adjust the sound velocity shown on the gage to the value given for each thickness calibration standard.

4.1.8 Use the UUC to make readings of each standard. Verify that the readings are within the allowable limits determined in Table 5-1. Record the reference standard values, the Sound Velocity Constants and the readings on the Certificate of Calibration.

4.1.9 In making readings the probe tip should be centered on the Coating Thickness Reference Standard as shown in Figure 4-1.



5 Performance Requirements

Note: The technician should collect the data needed to complete columns B and C of the appropriate table below. Do not write in this procedure.

Table 5-1 Performance Requirements and Calibration Data for DeFelsko/PosiTector 100 C (Multi-Layer)

Nominal Thickness	Reference Standard	Gage Measurement	UUC Indication or Reading *	
			Min. Reading Allowed	Max. Reading Allowed
A	B	C	D	E
15 mil			0.97 * B - 0.1 mil	1.03 * B + 0.1 mil
60 mils				
100 mils				
185 mils				

* For metric readings convert using 1 mil = 25.4 microns