



Management Procedure 2526
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Calibration Procedure

DeFelsko Corporation

DeFelsko/PosiTector 200

Coating Thickness Gage

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1 Introduction and UUC Performance Requirements

1.1 This procedure describes the calibration of the DeFelsko/PosiTector 200 Coating Thickness Gage. The gage-probe combination has the following specifications:

Table 1-1 Measurement Ranges

Gage-Probe	Measurement Range *
200	25 – 1000 μm 1 – 40 mils

* The range of the system depends on the coating material being measured. This range is based on an epoxy 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
1.1 Accuracy Test 200	25 to 1000 μm , $\pm (2 \mu\text{m} + 3\%$ of reading) 1 to 40 mils, $\pm (0.1 \text{ mils} \pm 3\%$ 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 2. If other equipment is substituted, the information and instructions must be interpreted accordingly.

Measurement Standards & Support Equipment Temperature: $23 \pm 5^\circ \text{C}$.
 Environmental Requirements: 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	
2.1 Coating Thickness Reference Standards	50 - 500 μm 2 - 20 mils	$\pm 0.25 \mu\text{m}$ $\pm 0.01 \text{ mils}$	DeFelsko Corporation, Thickness Calibration Standards

3 Preliminary Operations

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

3.1 Visual Inspection

3.1.1 Visually inspect the UUC for:

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

3.1.2 Damage or excess wear should be repaired prior to beginning the calibration process.

3.2 Gage Reset

3.2.1 Hold the “+” button of the gage until it powers up and performs a Reset.

3.3 Probe Zero

3.3.1 Select “Zero” from the gage menu. Be sure the probe tip is clean and hit the “+” button to zero.

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

4.1.2 Make a test measurement of the 10 mil (250 micron) standard. Be sure to use couplant in making measurements.

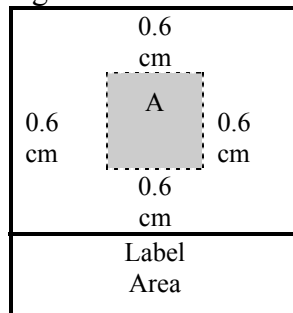
4.1.3 Using the Gage menu, select “Adj Thickness” and use the “+” and “-” buttons to adjust the thickness reading shown on the gage to the value given for the thickness calibration standards. When desired thickness is attained press the “+” and “-” buttons simultaneously to confirm.

4.1.4 Use the UUC to make readings of the 2, 5, 10 and 20 mil (50, 125, 250 and 500 micron) reference standards. Verify that the readings are within the allowable limits determined in Table 5-1. Record the reference standard values and the readings on the Certificate of Calibration.

Note: the reference standards must be of the same coating material to ensure their sound velocities are the same.

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

Figure 4-1 Measurement Area



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 200

Nominal Thickness	Reference Standard	UUC Indication or Reading *		
		Gage Measurement	Min. Reading Allowed	Max. Reading Allowed
A	B	C	D	E
2 mil			0.97 times B minus 0.1 mil	1.03 times B plus 0.1 mil
5 mils				
10 mils				
20 mils				

* For metric readings convert using 1 mil = 25.4 microns