DeFelsko®
CORPORATION

Management Procedure 2523
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Calibration Procedure

DeFelsko Corporation

DeFelsko/PosiTector 100 B (Multi-Layer)

Coating Thickness Gage

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 "B" type probe. The gage-probe combination has the following specifications:

Table 1-1 Measurement Ranges

Gage-Probe	Measurement Range *
100 B (Multi-Layer)	8 – 500 µm 0.3 – 20 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 ± 5° 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 100 B (Multi-Layer)	8 to 500 µm, ± (2 µm + 3% of reading) 0.3 to 20 mils, ± (0.1 mils ± 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 Environmental Requirements: Temperature: 23 ± 5° 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	
2.1 Coating Thickness Reference Standards	75 - 500 µm 3 - 20 mils	± 0.25 µm ± 0.01 mils	DeFelsko Corporation, Thickness Calibration Standards, Model CAL-A3

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:

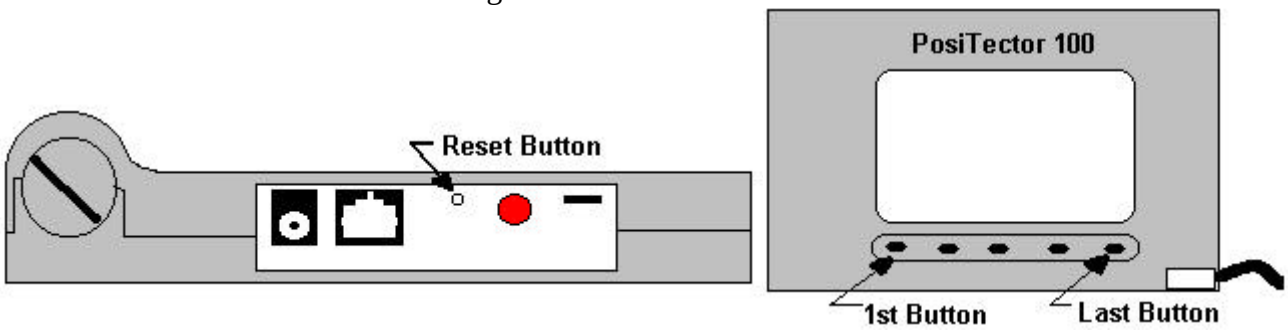
- Damaged LCD display
- probe wear
- cracked or broken case
- missing parts
- proper identification

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

3.2 Gage Reset

3.2.1 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

3.3.1 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 Setup menu, perform the Application Setup. Select “Substrate: Metal” and “Coat 1: Epoxy”.

4.1.2 Using the Mode menu, turn on Graphics.

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

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

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

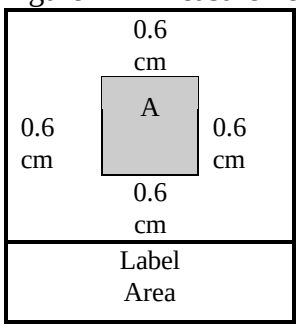
4.1.6 Using the Setup menu, select “Adjust Reading” and use the “+” and “-” buttons to adjust the thickness reading shown on the gage to the value given for the thickness calibration standards.

4.1.7 Use the UUC to make readings of the 3, 5 and 20 mil (75, 125 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. Record the Sound Velocity Constant, where all standards read in tolerance, on the Certificate of Calibration.

Note: The sound velocity constant may be adjusted slightly if necessary for all four standards to read in tolerance. The sound velocity constant should be in the range of 90 – 105 mils/μsec. If a value outside this range is obtained, after adjusting the gage to the thickness value on the standard, the gage is probably not operating correctly. Have it checked.

4.1.7 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 100 B (Multi-Layer)

		UUC Indication or Reading *		
Nominal Thickness	Reference Standard	Gage Measurement	Min. Reading Allowed	Max. Reading Allowed
A	B	C	D	E
3 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