Management Procedure 2532
Revision: E
Date Issued: October 23, 1998
Date Revised: March 2, 2009

Calibration Procedure

DeFelsko Corporation

PosiTector 6000 F0S
PosiTector 6000 F45S
PosiTector 6000 F90S

Coating Thickness Gages

Table of Contents

1 Introduction and UUC Performance Requirements

1.1 This procedure describes the calibration of DeFelsko Coating Thickness Gages, PosiTector 6000 gage probe combinations with the following specifications:

Table 1-1 Measurement Ranges

Gage	Measurement Range
6000 F0S 6000 F45S 6000 F90S	0-625 μm (0-25 mil)

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

Table 1-2 UUC Calibration Requirements and Calibration Description

UUC	Performance Specifications	Test Method
Thickness Accuracy	0 to 100 μm, ± (0.5 μm + 1% of reading) > 100 μm, ± (2.0 μm + 3 % of reading) 0 to 4 mils, ± (0.02 mils + 1% of reading) > 4 mils, ± (0.1 mils + 3 % of reading)	Compared to 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 required of the measurement standards system.

2.3 The uncertainty ratios applied in this Calibration Procedure are 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.

Table 2-1 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

Table 2-2 Minimum use specification

Minimum-Use-Specification		
Range	Accuracy	Construction
0 – 4 mils	± 0.005 mils	Epoxy on Steel
>4 mils	± 0.055 mils	
0-100 μm	± 0.125 μm	
>100 μm	± 1.25 μm	

Equipment Generic Name	Actual Equipment Specifications		Manufacturer and Model number
	Range	Accuracy	
Thickness Reference Standards	0-500 μm 0-20 mils	± 0.25 μm ± 0.01 mils	DeFelsko, CAL-S2

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 readout
- probe wear or coating
- cracked or broken case
- missing probe cover, battery door, or other 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 While the gage is powered down, hold the " +" button of the gage until the Reset symbol (2 arrows) appears.

Caution: Be sure to keep the probe well away from any metal surfaces during the Reset

process.

3.2.2 After Reset, select the Main Menu ZERO function and measure an uncoated Reference Standard, one measurement is sufficient.

3.2.3 Perform a zero check by measuring the same standard. If the gage does not read within tolerance, repeat the Main Menu ZERO function.

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: PosiTector 6000 gages with serial numbers greater than 40000 have a high-resolution mode. The gage may be calibrated in either normal or high-resolution mode. Accuracy is the same for both modes.

4.2 Using the appropriate Certificate of Calibration template for the UUC, record the thickness from the Reference Standard label.

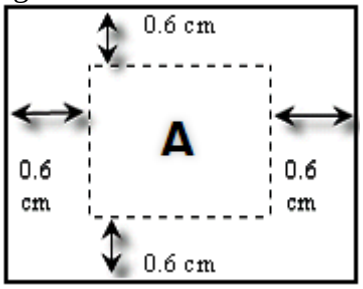
4.3 Determine the allowed range of readings using the calculation methods shown in Table 5-1.

4.4 Use the UUC to make readings of the applicable reference standard. Verify that the readings are within the allowable limits determined in section 4.3, record the readings on the Certificate of Calibration.

Note: Record all digits displayed on the LCD. This may vary depending on the resolution mode.

4.5 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 will collect the data needed to complete columns A and B of the appropriate table below. Do not write in this procedure.

Table 5-1 Performance Requirements and Calibration Data for PosiTector 6000 F0S, F45S & F90S

Thickness on Reference Standard Label (µm)	Min. Reading Allowed❶ (µm)	Max. Reading Allowed❷ (µm)	Actual Gage Measurement (µm)
A			B
Uncoated	- 0.5	+ 0.5	

❶Calculation 0-100 µm: A – (0.5 µm + (A times 0.01)) round up to nearest micron.
❶Calculation >100 µm: A – (2.0 µm + (A times 0.03)) round up to nearest micron.

❷Calculation 0-100 µm: A + (0.5 µm + (A times 0.01)) round down to nearest micron.
❷Calculation >100 µm: A + (2.0 µm + (A times 0.03)) round down to nearest micron.

For english/imperial readings convert using 1 mil = 25.4 microns

Management Procedure Change Notice

Procedure Number: MP 2532
Revision Level: E
Date of Change:
Title: Calibration Procedure for PosiTector 6000 F0S, F45S & F90S

Reason for Change: • Formatting changes • Add requirement to perform ZERO function every time gage is calibrated • Discrepancy in Table 2-1 Standard Range
Description of Change: • Deleted Sections 1.3 and 1.4 • Altered format of all Tables (1-1, 1-2, 2-1, 2-2, and 5-1) • Added Section 3.2 to describe Gage Reset procedure • Updated Section 4 per Red-lined draft • Changed Figure 4-1 to indicate desired central target area at **A**

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

Printed Name	Signature	Date

Management Form 0010.02-05/1998