

## Calibration Procedure

DeFelsko Corporation

PosiPen A  
PosiPen B  
PosiPen C

Coating Thickness Gages

### Table of Contents

1	Introduction and UUC Performance Requirements .....	2
	Table 1-1 Measurement Ranges .....	2
2	Measurement Standards and Support Equipment Performance Requirements .....	2
	Table 2-1 UUC Accuracy Requirements and Description .....	2
	Table 2-2 Minimum Use Specification .....	2
	Table 2-3 Actual Equipment Specification .....	2
	Table 2-4 Calibration Environmental and Warm-up Requirements .....	3
3	Preliminary Operations .....	3
4	Calibration Process.....	3
	Fig. 4-1 Measurement Area for Square or Round Reference Standards.....	4
5	Performance Requirements .....	4
	Table 5-1 Performance Requirements and Calibration Data for PosiPen.....	4

# 1 Introduction and UUC Performance Requirements

1.1 This procedure describes the calibration of DeFelsko Corporation Coating Thickness Gages, PosiPen A, B and C. These gages have the following ranges:

Table 1-1 Measurement Ranges

Gage	Measurement Range
PosiPen A & B	5-500 microns (0.25-20 mils)
PosiPen C	0.25-20 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
PosiPen A & B	5 - 500 microns (0.25 - 20 mils)	$\pm$ (2.5 microns + 10% of reading) $\pm$ (0.1 mils + 10% of reading)	Compared to Reference Standards.
PosiPen C	0.25 - 20 mils	$\pm$ (0.1 mils + 10% of reading)	

Table 2-2 Minimum Use Specification

Range	Accuracy
5 - 500 microns (0.25 - 20 mils)	$\pm$ 0.75 microns ( $\pm$ 0.03mils)

Table 2-3 Actual Equipment Specification

Equipment Generic Name	Range	Accuracy	Manufacturer/Model #'s Applicable
Coating Thickness Reference Standards	15 - 100 microns (0.6 - 4 mils)	$\pm$ 0.43 microns ( $\pm$ 0.017 mils)	DeFelsko Corporation, STD-S3

**Caution:** The instructions in this Calibration Procedure relate specifically to the equipment and conditions listed in this section. 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 Visual Inspection

##### 3.1.1 Visually inspect the UUC for:

- Damaged movement
- Probe wear, pitting or coating
- Proper identification

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

### 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

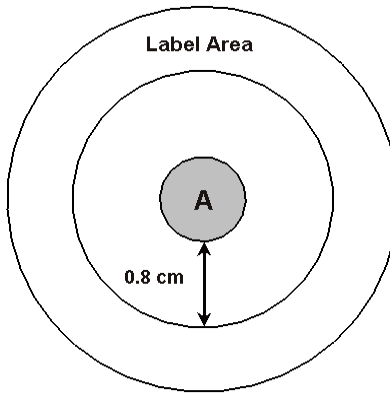
#### 4.2 Using the appropriate Certificate of Calibration template for the UUC, record the thickness from the Reference Standard label.

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

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

#### 4.5 In taking readings the probe tip shall be centered on point A of the Reference Standard as shown below.

Fig. 4-1



## 5 Performance Requirements

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

Table 5-1 Performance Requirements and Calibration Data for PosiPen

Thickness on Standard Label (microns)	Min. Reading Allowed <sup>①</sup> (microns)	Max. Reading Allowed <sup>②</sup> (microns)	Actual Measurement (microns)
A			B

① Calculation:  $(A \text{ times } 0.90) - 2.5$ . Round up to the nearest 1 micron.

② Calculation:  $(A \text{ times } 1.10) + 2.5$ . Round down to the nearest 1 micron.

\* For imperial/metric readings convert using 1 mil = 25.4 microns

Note: For PosiPen C, readings will be in mils and the calculations will be as follows:

① Calculation:  $(A \text{ times } 0.90) - 0.1$ . Round up to the nearest 0.1 mil.

② Calculation:  $(A \text{ times } 1.10) + 0.1$ . Round down to the nearest 0.1 mil.

## Management Procedure Change Notice

Procedure Number: MP 2501

Revision Level: B

Date of Change: November 20, 2015

Title: Calibration Procedure for PosiPen A, B & C

**Reason for Change:**

- New Reference Standards implemented.

**Description of Change:**

- General formatting changes
- Changed range and accuracy of reference standards
- Added round target to section 4-1
- Revised definitions in sections 2.1 and 2.3

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

Printed Name	Signature	Date

Management Form 0010.02-05/1998