

## Calibration Procedure

DeFelsko Corporation

PosiTector 6000 F  
PosiTector 6000 FS  
PosiTector 6000 FRS  
PosiTector 6000 FXS  
PosiTector 6000 SPFS

Coating Thickness Gages

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# 1 Introduction and UUC Performance Requirements

1.1 This procedure describes the calibration of DeFelsko Corporation PosiTector 6000 F, 6000 FS, 6000 FRS, 6000 FXS and 6000 SPFS probes and gages. All gages have the following ranges:

Table 1-1 Measurement Ranges

Gage	Measurement Range
6000 F 6000 FS 6000 FRS 6000 SPFS	0-1500 microns (0-60 mils)
6000 FXS	0-2000 microns (0-80 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
6000 F 6000 FS 6000 FRS 6000 FXS 6000 SPFS	0 - 50 microns (0 - 2 mils)	$\pm$ (1 microns + 1% of reading) $\pm$ (0.05 mils + 1% of reading)	Compared to Reference Standards
	>50 microns (>2 mils)	$\pm$ (2 microns + 1% of reading) $\pm$ (0.1 mils + 1% of reading)	

Table 2-2 Minimum Use Specification

Range	Accuracy
0 - 50 microns (0 - 2 mils)	$\pm$ 0.25 microns ( $\pm$ 0.013 mils)
>50 - 2000 microns (>2 - 80 mils)	$\pm$ 0.62 microns ( $\pm$ 0.035 mils)

Table 2-3 Actual Equipment Specification

Equipment Generic Name	Range	Accuracy	Manufacturer/Model #'s Applicable
Coating Thickness Reference Standards	75 - 1500 microns (3 - 60 mils)	± 0.43 microns (± 0.017 mils)	DeFelsko Corporation, STD-S1
Coating Thickness Reference Standards (for FXS)	75 - 1900 microns (3 - 75 mils)	± 0.43 microns (± 0.017 mils)	DeFelsko Corporation, STD-S4

**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 2-4 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 Visually inspect the measurement face of the probe for signs of damage or excessive wear, this could impact probe accuracy.
- 3.2 Gage Reset: For bodies with serial numbers after 700000; when the unit is powered down, simultaneously hold the “+” and middle buttons until the reset symbol appears. All other bodies press and hold the “+” button.

**Caution:** Be sure to keep the probe well away from any metal surface during the RESET process.

#### 3.3 Probe Zero Calibration Adjustment

- 3.3.1 Select the Main Menu ZERO function and measure the uncoated Reference Standard. One measurement is sufficient.
- 3.3.2 Measure the zero plate again. If the reading is within +/- 1.0 microns (+/- 0.05 mils), proceed to section 4, otherwise repeat the 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.

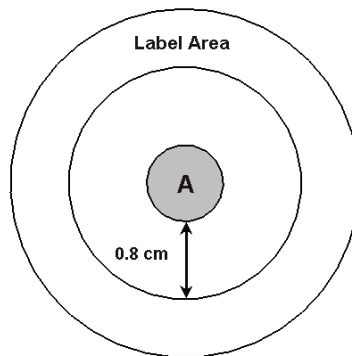
- 4.1 Review the Performance Requirements Table 5-1.

**Note:** The probe calibration may be verified in either normal or high-resolution mode. Accuracy is the same for both modes.

- 4.2 Record the thickness of the Reference Standards being used and determine the allowed range of readings for the UUC using the calculation methods shown in Table 5-1.
- 4.3 Use the UUC to take readings of all the reference standards. Verify that the readings are within the allowable limits determined in table 5-1. Record the readings.

**Note:** In taking readings the probe tip shall be centered on point A of the Reference Standard as shown below. Record all digits displayed on the LCD. This may vary depending on the resolution mode.

Figure 4-1 Measurement Area for Reference Standards



- 4.4 If readings are either too high or too low it is possible to adjust the readings. To do this simply press the “+” or “-” buttons until the reading is within tolerance. This adjustment will modify all subsequent readings and will require you to verify that any previous readings on the uncoated plate and other coated standards are still within tolerance. This adjustment may also be performed on the zero reading. Performing a factory reset will erase any adjustments made.

## 5 Performance Requirements

Table 5-1 Performance Requirements and Calibration Data for PosiTector  
6000 F, FS, FRS, FXS & SPFS

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

- ① Calculation  $\leq 50$  microns: (A times 0.99) - 1. Round up to the nearest 1 micron.  
 $> 50$  microns: (A times 0.99) - 2. Round up to the nearest 1 micron.
- ② Calculation  $\leq 50$  microns: (A times 1.01) + 1. Round down to the nearest 1 micron.  
 $> 50$  microns: (A times 1.01) + 2. Round down to the nearest 1 micron.
- \* For imperial/metric readings convert using 1 mil = 25.4 microns

