

## Calibration Procedure

DeFelsko Corporation

PosiTector 6000 FKS  
PosiTector 6000 NKS

Coating Thickness Probes

### 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 .....  | 4 |
|   | Figure 4-1 Measurement Area.....   | 4 |
| 5 | Performance Requirements.....  | 5 |
|   | Table 5-1 Performance Requirements and Calibration Data for PosiTector 6000 FKS & NKS..... | 5 |
|   | Management Procedure Change Notice .....   | 6 |

# 1 Introduction and UUC Performance Requirements

1.1 This procedure describes the calibration of DeFelsko Corporation PosiTector 6000 FKS & NKS probes with the following specifications:

Table 1-1 Measurement Ranges

| Probe    | Measurement Range |
|----------|-------------------|
| 6000 FKS | 0 - 13 mm         |
| 6000 NKS | (0 - 500 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 FKS<br>6000 NKS | 0 - 13 mm<br>(0 - 500 mils) | $\pm (0.02 \text{ mm} + 3\% \text{ of reading})$<br>$\pm (1 \text{ mil} + 3\% \text{ of reading})$ | Compared to Reference Standards |

Table 2-2 Minimum use specification

| Range                       | Accuracy   |
|-----------------------------|--|
| 0 - 13 mm<br>(0 - 500 mils) | $\pm 5 \text{ microns}$<br>$(\pm 0.25 \text{ mils})$ |

Table 2-3 Actual Equipment Specification

| Equipment Generic Name                | Range                          | Accuracy   | Mfr / Model #'s Applicable |
|---------------------------------------|--------------------------------|--|----------------------------|
| Coating Thickness Reference Standards | 1.5 - 12 mm<br>(60 - 480 mils) | $\pm (2.5 \text{ microns} + 0.05\% \text{ of thickness})$<br>$\pm (0.1 \text{ mil} + 0.05\% \text{ of thickness})$ | DeFelsko Corp.,<br>STD-P5  |

**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: $23 \pm 5^\circ \text{C}$ .<br>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 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 shall be repaired prior to beginning the calibration process.

#### 3.2 Gage Reset

3.2.1 For bodies with serial numbers after 700000; when the unit is powered down, simultaneously hold the “+” and middle buttons until the reset symbol (2 arrows) 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.

3.2.2 For FKS only: Measure a flat uncoated (zero) 1018 steel plate at least 4”x 4” x 0.2”. If the probe reads more than +/- 4 um reject the probe for characterization.

#### 3.3 Probe Zero

3.3.1 Measure a flat uncoated (zero) plate at least 4”x 4”x 0.2”. Use 1018 steel for a FKS probe and 6061 aluminum for a NKS probe. Compare the reading to the allowable limits in table 5-1. If it is within limits proceed to section 4 otherwise follow the zeroing process in 3.3.2 – 3.3.3.

3.3.2 Select The Main Menu “Zero” function and then indicate the number of readings (3) to be used to determine an average.

3.3.3 Measure the zero plate the require number of times then repeat step 3.3.1.

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

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

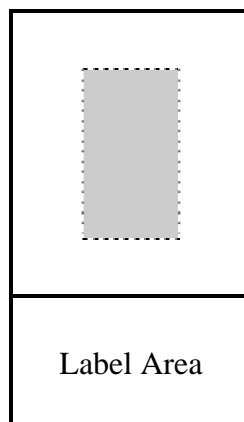
4.4 Place the Reference Standard(s) on the same uncoated plate used to zero the probe.

4.5 Use the UUC to take 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.

4.6 In taking readings the probe tip shall be centered in the shaded area on the 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 FKS & NKS

| Thickness on Reference Standard Label (mm) | Min. Reading Allowed <sup>❶</sup> (mm) | Max. Reading Allowed <sup>❷</sup> (mm) | Actual Probe Measurement (mm) |
|--|--|--|-------------------------------|
| A  |  |  | B                             |
|  |  |  |                               |
|  |  |  |                               |
|  |  |  |                               |
|  |  |  |                               |

❶ Calculation:  $(A \text{ times } 0.97) - 0.02$ . Round up to nearest 0.01 mm.

❷ Calculation:  $(A \text{ times } 1.03) + 0.02$ . Round down to nearest 0.01 mm.

\*For imperial/metric readings convert using 1 mil = 0.0254 mm  
Convert between mm and microns using 1 micron = 0.001 mm

