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DeFelsko®

Management Procedure 2541
Revision: I
Date Issued: September 26, 2011
Date Revised: July 21, 2023

Calibration Procedure

PosiTector SPG, SPG-S, SPG-OS, SPG-CS & SPG-TS
Surface Profile Gage

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1 Introduction and UUC Performance Requirements

1.1 This procedure describes the calibration of DeFelsko Corporation PosiTector SPG, SPG-S, SPG-OS, SPG-CS & SPG-TS probe and gage.

Table 1-1

Models	Measurement Range
SPG, SPG-S & SPG-OS	0 - 500 microns (0 - 20 mils)
SPG-CS	0 - 1500 microns (0 - 60 mils)
SPG-TS	0 – 6 mm (0 – 250 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

Model	Range	Performance Specifications	Test Method
SPG, SPG-S & SPG-OS	0 - 500 microns (0 - 20 mils)	± (5 microns + 5% of reading) ± (0.2 mils + 5% of reading)	Compared to Reference Standards
SPG-CS	0 – 1500 microns (0 – 60 mils)		
SPG-TS	0 – 6 mm (0 – 250 mils)	± (0.076 mm + 1% of reading) ± (3 mil + 1% of reading)	

Table 2-2 Minimum Use Specification

	Range	Accuracy
SPG, SPG-S & SPG-OS	0 - 500 microns (0 - 20 mils)	± 1.25 microns (± 0.05 mils)
SPG-CS	0 - 1500 microns (0 - 60 mils)	± 1.25 microns (± 0.05 mils)
SPG-TS	0 – 6 mm (0 – 250 mils)	± 19.05 microns (± 0.75 mils)

Table 2-3 Actual Equipment Specification

Equipment Generic Name	Range	Accuracy	Manufacturer/Model #'s Applicable
Reference Standards	0 – 6 mm (0 – 250 mils)	± 1.25 microns (± 0.05 mils)	DeFelsko Corp.

***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 Visual Inspection

3.1.1 Visually inspect the UUC for, but not limited to:

- Loose probe tip
- probe tip wear or damage
- Dirty or damage probe base plate

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

3.2 Verify the Reference Standards and SPG base plate and tip are all clean.

3.3 Gage Reset

3.3.1 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 off any surface during the RESET process.

3.4 Probe Zero

3.4.1 Select "ZERO" from the gage menu and measure the zero plate. One measurement is sufficient.
Note: Careful alignment is required when using the SPG-OS on the zero plate on the reference standards.

3.4.2 Perform a zero check by measuring the same plate. For SPG, SPG-S, SPG-OS and SPG-CS; If the gage does not read within ± 3 microns (± 0.1 mils), repeat the ZERO function. For SPG-TS; if the gage does not read within ± 0.07 mm (± 3mils), 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.

4.2 Using the appropriate certificate template for the UUC, record the thickness of the Reference Standards from their calibration certificate. For the SPG, SPG-S and SPG-OS it is approximately 51, 178 & 508 microns. For the SPG-CS it is approximately 178, 508 and 1,524 microns. For the SPG-TS it is approximately 1.524, 2.540, 3.810 & 5.080 mm.

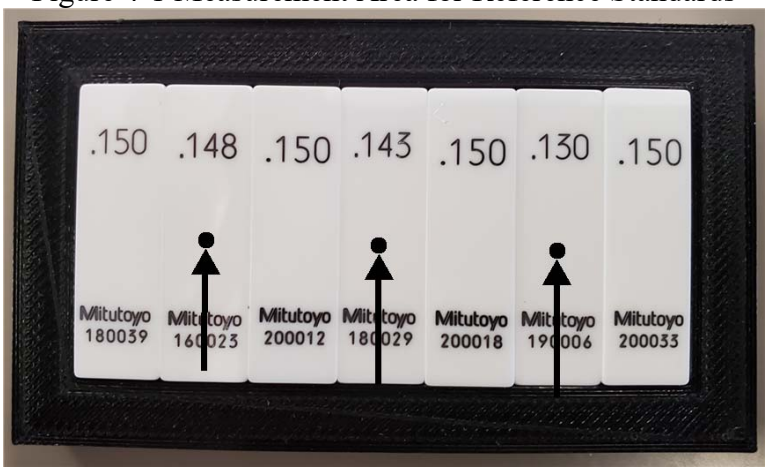
4.3 Determine the allowed range of readings for the UUC using the calculation methods shown in Table 5-1.

4.4 Use the UUC to take readings of all the reference standards. Verify that the readings are within the allowable limits determined in 4.3. Record the readings on the certificate.

Note: Record all digits displayed on the gage.

4.5 When taking readings the probe tip shall be located in the center of the Reference Standard as shown below.

Figure 4-1 Measurement Area for Reference Standards



4.6 Turn off the gage, perform a reset per section 3.3, then turn off the gage.

5 Performance Requirements

Note: The technician shall 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 SPG

Standard Thickness (microns)	Min. Reading Allowed❶ (microns)	Max. Reading Allowed❷ (microns)	Gage Measurement (microns)
A			B

SPG, SPG-S, SPG-OS and SPG-CS
❶Calculation: (A times 0.95) - 5. Round up to the nearest 1 micron.
❷Calculation: (A times 1.05) + 5. Round down to the nearest 1 micron.
* For imperial/metric readings convert using 1 mil = 25.4 microns

SPG-TS
❶Calculation: (A times 0.99) – 0.025. Round up to the nearest 0.02 mm.
❷Calculation: (A times 1.01) + 0.025. Round down to the nearest 0.02 mm.

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Management Procedure Change Notice

Procedure Number: MP 2541
Revision Level: I
Date of Change: July 21, 2023
Title: Calibration Procedure, PosiTector SPG, SPG-S, SPG-OS, SPG-CS & SPG-TS Surface Profile Gage

Reason for Change:

- Clarify reference standard values

Description of Change:

- In Section 4.2 specified values are approximate and to use reference standard values from calibration certificate

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

Printed Name	Signature	Date

Management Form 0010.02-05/1998

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