



WORK INSTRUCTION

CALIBRATING and/or VERIFYING MEASURING and TEST EQUIPMENT IN-HOUSE

REVISION: 04

PROCEDURE NO.: WI-8.2.4.19

DATE EFFECTIVE: 06/15/20

1. How to Verify and/or Calibrate a Caliper/Micrometer

1.1. Micrometer Tolerance +/- .001. The micrometer will be reset if it is off the zero mark by more than +/- .001 and will repeat within one unit of graduation. Wear on the lead screw will be adjusted if any shake is detected and wear on the anvil faces shall not exceed +/- .001.

1.2. Equipment needed for calibration/verification

1.2.1. Calibrated/Verified and certified Gauge Blocks

1.2.2. Clean Cloth

1.2.3. Miscellaneous Tools

1.3. Calibration Frequency

1.3.1. Quality Assurance will perform the calibrations every 12 months.

1.4. Calibration/Verification Method

1.4.1. Avoid sudden temperature changes and have the equipment remain in ambient room temperature.

1.4.2. Use a clean lint free cloth and clean all foreign material from the micrometer, anvil surfaces and gauge blocks such as dirt, tape or grease.

1.4.3. Zero adjust the micrometer in a posture in which the measurements are actually performed. Check the operation, the thimble should turn easily at all operations. Take the first of three dimension readings at three equal size intervals distributed over the total range in the as received condition.

1.4.4. Wear on the lead screw will be checked by pushing the thimble to and from in the direction of the lead screw axis, if there is shake the lead screw adjustment should be tightened. Care should be exercised not to tighten the adjusting screw so that the lead screw binds.

1.4.5. Wear on the anvil faces will be periodically checked between the various points on the anvil especially from the center of the anvil to the near edges.

1.4.6. Clean, adjust or repair the micrometer if required. If unable to repair or adjust to the specified tolerance, follow the process defined SP 7.6 Control of Monitoring and Measuring Equipment

1.5 Check the tolerance of each caliper to determine if the caliper's accuracy is within ± 0.001 " up to 6" and ± 0.002 " on up to 12" and the repeatability is within ± 0.001 " up to 6" and ± 0.002 " on up to 12".



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- 1.5.1 Clean the caliper and make sure that when shut, no gaps appear and the caliper goes to a zero reading. If gaps appear or the caliper does not repeat to the zero reading, the caliper must be repaired or replaced.
- 1.5.2 The caliper should be clean with no sticking, skipping or binding occurring during operation over the full travel range.
- 1.5.3 The caliper is measured against a set of six or more known block values (sizes).
- 1.5.4 Measured values obtained from the caliper are recorded to the nearest 0.001" for three separate measurements from each block to check accuracy and repeatability.
- 1.5.5 The average measured value is calculated and recorded to the nearest 0.001".
- 1.5.6 The measured values repeatability is checked. All values must be within 0.001" up to 6" and within 0.002" up to 12".
- 1.5.7 The average measured value is checked against the block value to verify the accuracy. The average value must be within 0.001" up to 6" and within 0.002" on up to 12".
- 1.5.8 Clean, adjust or repair the caliper if required. If unable to repair or adjust the specified tolerance, follow the process defined SP 7.6 Control of Monitoring and Measuring Equipment

2. How to Verify and/or Calibrate Go No/Go Gages

2.1. Go/No Go Gages Tolerance +/- .001. Go/No Go Gages will fail the verification process if it is found to exceed +/- .001.

2.2. Equipment needed for calibration/verification

- 2.2.1. Calibrated/Verified and certified Micrometer and/or Caliper and/or pin gages
- 2.2.2. Clean Cloth
- 2.2.3. Miscellaneous Tools

2.3. Calibration Frequency

- 2.3.1. Quality Assurance will perform the calibrations every twelve months.



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2.4. Calibration/Verification Method

- 2.4.1. Avoid sudden temperature changes and have the equipment remain in ambient room temperature.
- 2.4.2. Use a clean lint free cloth and clean all foreign material from the Go/No Go Gages and Micrometer and/or Caliper such as dirt, tape or grease.
- 2.4.3. Take the first of three dimension readings at three equal size intervals distributed over the total range in the as received condition.
- 2.4.4. Wear on the Go/No Go Gages will be periodically checked between the various points on the gage especially from the center to the near edges.
- 2.4.5. If the gage fails the specified tolerance, follow the process defined SP 7.6 Control of Monitoring and Measuring Equipment.

3. How to Verify a Tape Measure and OD Tape and Steel Ruler

3.1. Tape Measure Tolerance + or - One increment

3.2. Equipment needed for calibration/verification

- 3.2.1. Calibrated/Verified Steel Ruler
- 3.2.2. Clean Cloth

3.3. Calibration Frequency

- 3.3.1. Quality Assurance Supervisors will perform the calibrations every twelve months.

3.4. Calibration/Verification Method

- 3.4.1. Use a clean lint free cloth and glass cleaner; clean all foreign material from the Tape Measure such as dirt, tape or grease.
- 3.4.2. Verify that the tape measure moves smoothly, is completely legible and the end is not damaged or worn.
- 3.4.3. Use a certified steel rule to verify that the tape measure increments are correctly indicated throughout the length of the steel rule.
- 3.4.4. If the tape measure is unacceptable document the results in accordance with the process defined SP 7.6 Control of Monitoring and Measuring Equipment.

4. RECORDS

- 4.1. Monitoring and Measuring Equipment Record



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5. REVISION HISTORY

REVISION LEVEL	DATE OF REVISION	SECTIONS	DESCRIPTION OF CHANGE
00	05/25/09	All	Initial release
01	01/06/15	3.3.1	Changed "quarterly" to "every six months"
02	5/23/17	1.3.1 & 1.5	1.3.1- changed 6 to 12 months. Added 1.5 for caliper
03	3/22/19	3.3.1	Changed calibration from 6 to 12 months
04	6/15/20	2.3.1 File Name	Changed six months to twelve Change file name to represent document title

AUTHORIZATION

POSITION	HELD BY	AUTHORIZATION SIGNATURE OR INITIALS
Prepared By: Quality Control Manager	Tony Acosta	
Senior Management Representative/ Management Representative:	Samir Patel	