INDIANA DEPARTMENT OF TRANSPORTATION
DIVISION OF MATERIALS AND TESTS

VERIFICATION OF CALIPERS
ITM No. 916-20

1.0 SCOPE.

1.1 This test method covers the procedures for verifying the accuracy of calipers used for measuring the critical dimension of various testing equipment.

1.2 This ITM may involve hazardous materials, operations, equipment and may not address all of the safety problems associated with the use of the test method. The user of the ITM is responsible for establishing appropriate safety and health practices and to determine the applicability of regulatory limitations prior to use.

2.0 TERMINOLOGY.

2.1 Accuracy. The degree of conformity of a measurement with the true value of the quantity measured.

2.2 National Institute of Standards and Technology (NIST). A federal technology agency that develops and applies technology, measurements, and standards.

3.0 APPARATUS.

3.1 Set of gauge blocks including the 1.000", 3.000", 6.000" and 12.000" (if applicable) having NIST traceability documentation which includes parallelism verification and certified within the last 24 months.

3.2 Calipers readable to the nearest 0.001 in.

3.3 Rubber band

3.4 Thermometer having a range of at least 68°F - 77°F.

3.5 Record all measurements on Appendix A

4.0 SIGNIFICANCE AND USE.

This ITM is used by laboratory personnel to determine the accuracy of calipers. Verification should be performed in an environment that the ambient temperature will be between 68°F - 77°F.

5.0 PROCEDURES.

5.1 Allow the gauge blocks and calipers to stabilize to the ambient working temperature (68°F - 77°F) overnight. Place a thermometer next to the blocks/calipers, measure and record the temperature.

5.2 Visually inspect the caliper blades for nicks, burrs, scratches, wear, or other signs of mishandling that may affect accuracy of instrument.

5.2.1 For the blades used to measure outside dimensions, close the calipers and hold up to a light source to check for illuminated gaps between the blades. Light will not be seen if jaws are parallel.

5.2.2 For the blades used to measure inside dimensions, close the calipers and hold up to a light source. Adjust the calipers until light is apparent between the outside dimensional measurement blades. Using the illuminating light as a reference, visually determine that the blades are parallel with no apparent wear (Figure 1).

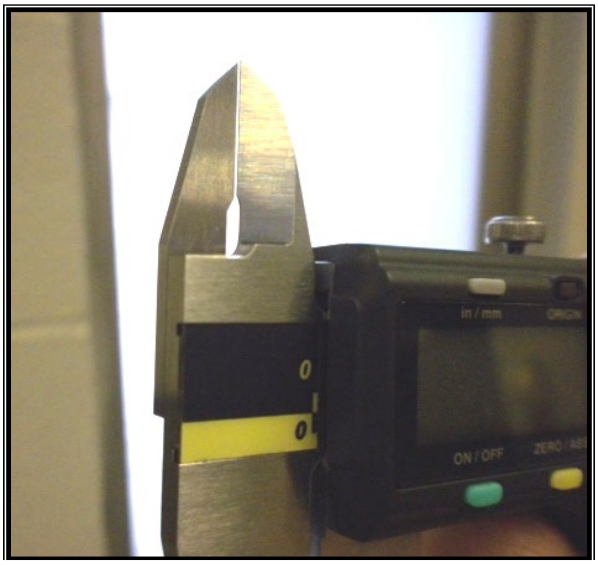

Figure 1

5.3 Using the calipers record the outside measurement width at 1 in. and 3 in. of the smallest gauge block (Figure 2).

5.4 Using the calipers record the outside measurement of the 6 in. gauge block (Figure 3).

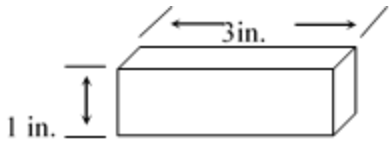

Figure 2

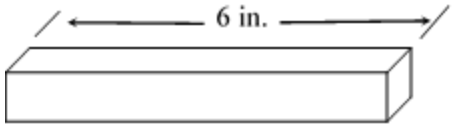

Figure 3

Using the calipers record the outside measurement of the 12 in gauge block (Figure 4)

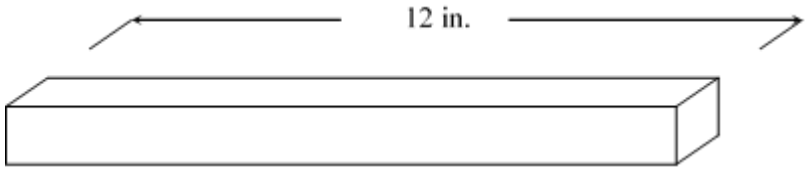

Figure 4

5.5 Arrange the blocks in accordance with (Figure 5) to verify the jaws for internal measurements at 1 in., 3 in.,6 in and 12 in. Wrap a rubber band around the blocks to prevent the end blocks from moving. Measure and record the internal measurement at 1 in., 3 in., 6 in and 12 in. (Figure 6).

Note 1: 6 in. and 12 in. must be one continuous block.
Note 2: Care should be taken to ensure parallelism with the center block(s).
Note 3: Measurements are required to be taken on the sharpened blade of the calipers during verification and in regular use.

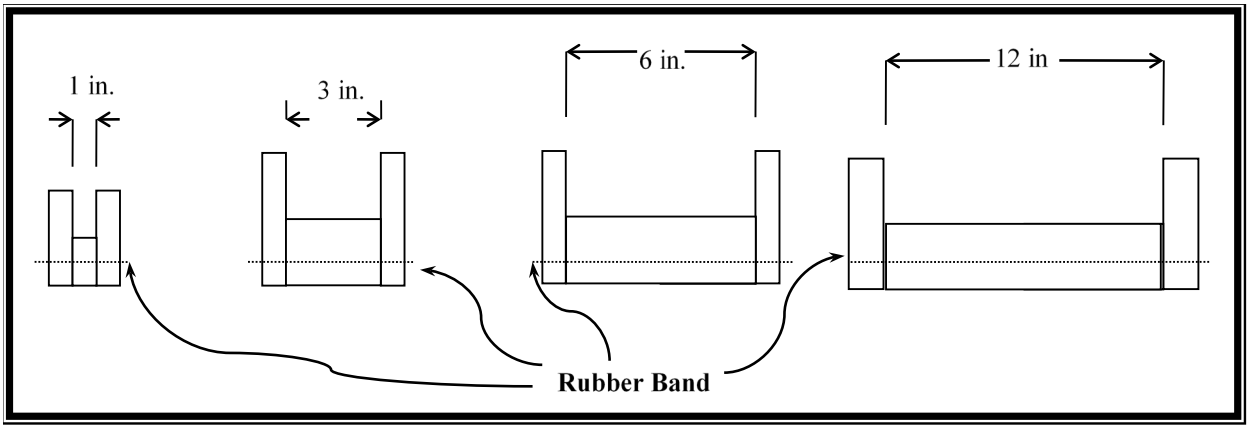

Figure 5

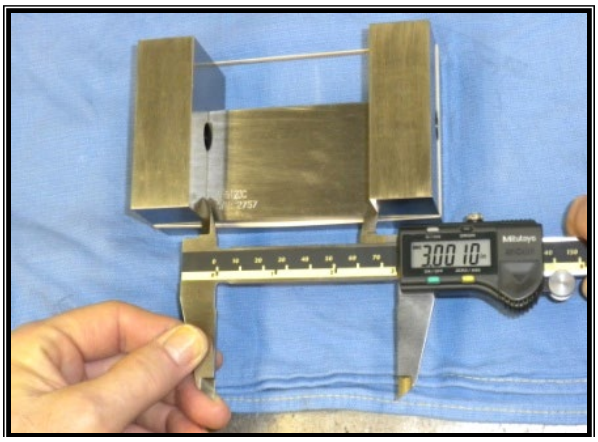

Figure 6

5.6 Place the gauge blocks on end, using the depth part of the calipers, measure and record the depth measurement at 1 in., 3 in., 6 in., and 12 in., if applicable. (Figure 7)

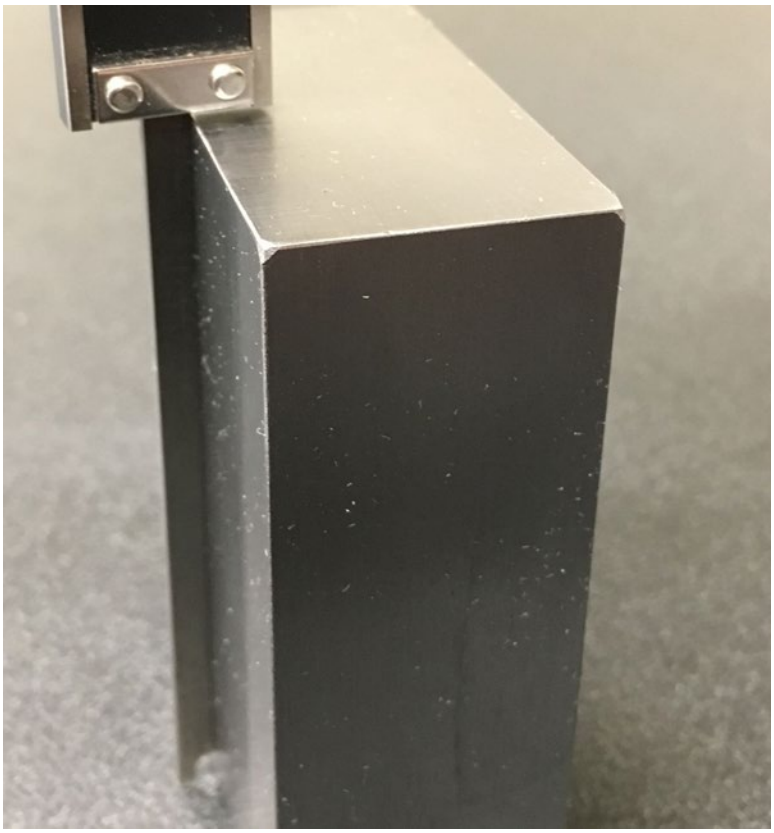

Figure 7 (3 inch block)

6.0 REPORT. The measurements shall be reported on the form in Appendix A

CALIPER VERIFICATION FORM
ITM 916

Description:	Tolerance: ± 0.002”		Comm #:
Location:	Calibration Interval:	Calibration Procedure:	Serial #:
Lab:	12 months	ITM 916	
Ambient Temperature (°F):			

Calibration Date:	Calibrated By:	Visual Inspection	Outside Jaw		Inside Jaw		Depth		In Specs.
			Standard Value	Measured Value	Standard Value	Measured Value	Standard Value	Measured Value	
			1.000 in.		1.000 in.		1.000 in.		Yes □ No □
			3.000 in.		3.000 in.		3.000 in.		Yes □ No □
			6.000 in.		6.000 in.		6.000 in.		Yes □ No □
		Pass □	*12.000 in.		*12.000 in.		*12.000 in.		Yes □ No □
		Fail □							Yes □ No □
									Yes □ No □
									Yes □ No □

Comments:	Previous Calibration Date:	Next Calibration Date:

*If applicable