



ATF-LS-FT14-W-S Maintenance and Calibration of Microscopes and other Measuring Devices	Published Online: March 2018
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Trigger weights and gauge block sets used in the work instructions to follow will be sent to an external calibration laboratory for the purpose of verifying traceability to an appropriate standard at regular intervals not to exceed every ten (10) years.

- Comparison Microscope Magnification Performance Check
 - A pair of Bright-Line Hemacytometer slides by Reichert-Jung (sold as “calibration Standard K-2739” by Cambridge Instruments) will be used. To check for magnification, place the K2739 onto both stages. Focus each side of the microscope using the 4X objective. Position the dividing prism such that it is in the center of the field. Align each side such that the lines on the scales are horizontal and the line at the top of the field of view is perfectly aligned on each side. The lines on the scale shall be aligned to one another such that the line on the bottom of the field is not misaligned by more than one line with either an upward or downward direction. Repeat the same procedure for all objectives with the same one line tolerance. Document results as needed in logbook.
- Comparison Microscope Caliper Performance Checks
 - A stage micrometer slide (such as calibration standard KR-806 or KR 814) will be used for performance checks. Placing the micrometer on the left stage, adjust the microscope to any magnification. Focus the microscope on the 1” scale located on the slide. Turn on the Mitutoyo caliper and zero it. Move the left stage until the eyepiece reticle is now on the next scale division. Observe the measurement noted on the caliper to the actual measurement listed on the scale. The tolerance can be $\pm .003$ ”. Document results as needed in logbook.
 - *NOTE: Since the scale on the micrometer slide will not change unless damaged or broken, external re-calibration of the micrometer is not needed under normal usage. Replace the stage micrometer if damage should occur that affects the division markings.*
- Micrometer/Caliper Performance Check
 - Use MSC Industrial Supply “Accupro Gold” Gauge Block Set, Serial Number 990946
 - Wipe the measuring surfaces of the instrument with clean paper tissue.
 - Close the instrument to read zero. Adjust zero reading if necessary.
 - Select block(s) that bracket typical examination measurements.
 - Wipe the measured surfaces on the block(s) with clean paper tissue.
 - Carefully measure the block gauge. The tolerance can be $\pm .003$ ”.
 - Enter the measurement of each block gauge into the logbook, date and initial.
 - Wipe the block with silicone impregnated cloth to protect block surfaces.

- Balances
 - Balance specifications or tolerances used for casework will be verified once annually as part of a general laboratory service contract by an outside vendor. A “balance test confirmation” sheet for all balances will be placed in a logbook in the Firearms and Toolmark Section and a sticker will be placed on each balance. The balances are considered to be within tolerance when the calibration is within ± 1 gram.

- Chantillon Spring Trigger Pull Gauge Check
 - Use trigger weights (dead weights) to check gauge. Trigger weights have been checked with a calibrated balance.
 - Place the desired amount of weight on the trigger weight base. Do not exceed the capacity of the gauge.
 - Slowly lift the weights up off the table using the trigger hook of the spring gauge.
 - Record with a check mark in the logbook if the measurement is within one division on the scale (1/16 pound for IN-6; 1/8 pound for IN-12; and ¼ pound for IN-15).
 - Repeat steps 2 through 4 for other weight values.
 - See manufacturer instructions if the gauge needs adjustment.

- Armorer’s/Shop Trigger Weights (Dead Weights) Validation
 - Use a calibrated balance and measure each weight.
 - Enter the measurement of each weight into the logbook, then date and initial.
 - The weights are considered validated if, for 3 pounds or less they are within ± 1 gram, and for greater than 3 pounds they are within ± 3 grams.
 - Each weight will be marked with the date they are verified.
 - NOTE: The 2-pound base includes the trigger rod.