



<b>ATF-LS- FT14-W-W</b> <b>Maintenance and Calibration of Microscopes and other</b> <b>Measuring Devices</b>	Published Online: <b>March 2018</b>
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The certified standards used to conduct in-house performance checks of measuring devices (gauge block sets, weights) will have their performance verified by an external calibration laboratory at regular intervals not to exceed five (5) years. Proper handling of these standards should be followed when conducting performance checks.

### **Microscopes**

- Comparison and Stereo Microscope Calibration
  - Currently all maintenance and calibration verifications are provided by an approved vendor and shall be recorded in the logbook.
- Comparison Microscope Magnification Performance Check
  - A pair of Bright-Line Counting Chamber Hymacytometer slides by Reichert (#11581080) will be used. To check for magnification, place one slide on each stage of the microscope. Initially focus each side of the microscope using 20X magnification. 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 magnifications with the same one line tolerance. Document results and date in the logbook.

### **Measuring Devices (with moving parts)**

- Caliper and Micrometer Performance Check
  - Use the Mitutoyo Gauge Block Set and choose at least three different blocks. (Pick blocks that are at least 0.010" apart)
  - Insert the center of the block into the caliper/micrometer and measure.
  - Observe the measurement noted on the caliper/micrometer to the actual measurement listed on the block. The tolerance can be  $\pm 0.003''$ .
  - If the caliper/micrometer is within the tolerance on all measurements, the performance has been checked/verified. If the caliper does not measure within the tolerance, the caliper/micrometer should be re-set and the process repeated.
  - Record the results and date in the logbook.
- Leica Application Suite (LAS) Software Measuring Tool

- Calibration of the LAS Measuring Tool shall be performed by a Leica certified technician, field service engineer, or other qualified representative using traceable standards at regular intervals not to exceed five (5) years. Should a computer using the LAS Software be replaced, the LAS Measuring Tool must not be put into service until calibrated by a Leica representative.
  - Performance checks of the LAS Software Measuring Tool will be conducted using standards such as the Mitutoyo Gauge Block Set. At each magnification, the standard should be measured using the LAS Measuring Tool. The observed measurement should be within a tolerance of  $\pm .003$ ". If the LAS Measuring Tool does not measure within tolerance at all magnifications, the LAS Measuring tool shall be taken out of service as a measuring device until calibration can be performed by a Leica representative.
  - Record the results and date in the logbook of any calibration and/or performance check.
- Trigger Pull Spring Gauge Performance Check
    - Use the trigger pull weights located in the FSL-W Firearms Section. Trigger pull weights have been originally verified by an external vendor.
    - Measure the trigger pull weight using the trigger pull spring gauge. Use two different weights.
    - Compare the weight measured on the trigger pull spring gauge to the actual weight of the trigger pull weight.
    - The trigger pull spring gauges are considered to be within tolerance when the measured weight is  $\pm 0.25$  pounds of the actual weight.
    - Record the results and date in the logbook.

### **Measuring Devices (no moving parts)**

- Trigger Pull Weights Validation
  - Trigger pull weights will be verified prior to being put into service for casework and do not require annual performance verification unless damage is observed. The weights will have their performance verified to an appropriate standard at regular intervals not to exceed five (5) years.
  - Currently all maintenance and performance verifications of trigger pull weights are performed by an external vendor and verified to a tolerance of  $\pm 1$  ounce.
  - All performance verifications will be recorded in the logbook.

### **Balances and Scales**

- Weight Scales Performance Check
  - Use the Troemner Calibration Weight Set.
  - Press the "calibration" button on the scale and follow the directions on the display.
  - The weight scales are considered to be within tolerance when the calibration is  $\pm 0.1$  gram.
  - Record the results and date in the logbook.