

	TRACE-PM 7.5 Bruker M4 Tornado Micro-X-ray Fluorescence Spectrometry	
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	Document Manager: Cheryl Lozen	Approved By: Ryan Larrison

7.5 Bruker M4 Tornado Micro-X-ray Fluorescence Spectrometry

7.5.1 Quality assurance checks

Each day the XRF is used for casework analysis, it must pass quality control checks, including calibration and a source performance check.

7.5.1.1 Calibration

Within the calibration function of the instrument's software, set the parameters to 50 kV, 200 μ A, 130000 cps, 40 keV, Zr, and K-a. Test the current calibration of each detector using the zirconium standard supplied by the manufacturer. This zirconium standard does not need periodic checking or replacing.

If the displayed deviation from the current calibration is \pm 5eV, it is suitably calibrated.

If the deviation for either detector is $>$ \pm 5eV, calibrate each detector. After calibration, test the calibration of each detector. If deviations are \pm 5eV, it is suitably calibrated. Note the calibration results (pass/no-pass) in the case record.

7.5.1.2 Source/detector performance check and detecting trends

Using voltage and power settings of 50 kV and 300 μ A, check the performance of the X-ray source and detectors using the copper standard supplied by the manufacturer. This copper standard does not need periodic checking or replacing.

Record the counts per second (cps) values observed for each detector in a logbook or on a file on the instrument computer. This will allow for detection of trends of the source and detectors. Counts should not show appreciable drift (10% tolerance from prior reading). If the reading of either detector is $<$ 75% of prior readings, do not use that detector for casework and contact a Forensic Science Division equipment technician or the manufacturer for maintenance and/or repair. Note the source performance check results (pass/no-pass) in the case record.