1.0 Purpose

1.1 This procedure establishes the measurement requirements to determine the accuracy, range of use and required number of points to be used in the calibration of Non-Destructive Testing equipment by an outside vendor.

2.0 Reference Documents

2.1 MT-20, Meyer Tool Quality Control Manual
2.2 ISO 10012-1, Calibration System Requirements
2.3 ANSI/NCSL Z540-1 American Standard for Calibration/Calibration laboratories and Measuring and Test Equipment – General Requirements
2.4 PI-157
2.5 QP-105 Meyer Tool Radiographic procedure
2.6 QP-106 Meyer Tool Computed Radiographic procedure
2.7 QP-107 Meyer Tool Liquid Penetrant procedure

3.0 General

3.1 The following calibration requirements are for use by our approved external suppliers for calibration use only. Internal calibration will be completed in accordance with the appropriate procedures.

3.2 This procedure will be used in conjunction with QP-105, QP-106 and QP-107.

4.0 Equipment

4.1 Light Meters

4.1.1 Spectronics Radiometer

Model: DSE-100X – Read out unit
Calibrated at 3 set points: 2mV, 100mV & 180 mV
Accuracy: ± 5%
Calibration Interval: 6 months
Standards: Traceable to NIST, ANSI/NCSL Z540-1, ISO 10012-1, 2003

DIX – 555A – Visible Light Sensor
Calibrated at 3 set points: 2fc, 100fc & 180fc
Range of use: 0fc to 199fc

DIX – 365 - UV A Sensor

Calibrated at 3 set points: 200µW/cm², 2000µW/cm² & 7000µW/cm²
Range of use: 200µW/cm² to 3000µW/cm²

4.1.2 Spectronics Radiometer/Photometer

Model: XR – 1000 – Read out unit
Calibrated at 3 set points: 500 fl, 50000 fl & 20000 fl
Accuracy: ± 5%
Calibration Interval: 6 months
Standards: Traceable to NIST, ANSI/NCSL Z540-1, ISO 10012-1, 2003

XS – 555/L – Luminance Sensor Detector
Calibrated at 3 set points: 500 fl, 50000 fl & 200000 fl
Range of use: 500 fl to 200000 fl

4.1.3 Gould Bass Radiometer with Luminance Sensor

Model: DLM-1500
Calibrated at 4 set points: 000fl, 25000fl, 50000fl & 150000fl
Accuracy: ± 5%
Calibration Interval: 6 months
Standards: Traceable to NIST, ANSI/NCSL Z540-1, ISO 10012-1, 2003
Range of use: 0 fl to 1500000 fl

4.2 Water Temperature Gages

4.2.1 Model: Dial Thermometer
Calibrated at 4 set points: 40 f, 80 f, 120 f & 160 f
Accuracy: ± 2%
Calibration Interval: 6 months
Standards: Traceable to NIST, ANSI/NCSL Z540-1, ISO 10012-1, 2003, ISO/IEC 17025
Range of use: 50 f to 100 f

4.3 Pressure Gages

4.3.1 Model: 0-15 PSI Pressure gage
Calibrated at 4 set points: 3, 6, 9 & 12 PSI
Accuracy: ± .3 PSI
Calibration Interval: 6 Months.
Standards: Traceable to NIST, ISO 10012-1, 2003, ISO/IEC 17025, ISO 9001: 2000, Mil-Std-45662A
Range of Use: 0 to 5 PSI

4.3.2 Model: 0-30 PSI Pressure gage
Calibrated at 4 set points: 6, 12, 18 & 24 PSI
Accuracy: ± .6 PSI
Calibration Interval: 6 Months.
Standards: Traceable to NIST, ISO 10012-1, 2003, ISO/IEC 17025, ISO 9001: 2000, Mil-Std-45662A
Range of Use: 0-25 PSI

4.3.3 Model: 0-100 PSI Pressure gage

Calibrated at 4 set points: 20, 40, 60 & 80 PSI
Accuracy: ± 2 PSI
Calibration Interval: 6 Months.
Standards: Traceable to NIST, ISO 10012-1, 2003, ISO/IEC 17025, ISO 9001: 2000, Mil-Std-45662A
Range of Use: 0-40 PSI

4.4 Refractometer

4.4.1 Model: ATAGO N1-e Refractometer
Calibrated at 5 set Points: 1%, 5j%, 10%, 20% & 30% Brix.
Accuracy: ±.2%
Range of Use: 0 to 10 Brix.
Calibration Intervals: 6 months
Standards: ISO 10012-1, ANSI/NCSL Z540-1

4.5 Personal Monitoring Devices

4.5.1 Dosimeter

4.5.1.1 Model: 138
Range of Use: 0-200mR
Calibrated at 3 set points: 0, 100 & 200mR
Accuracy: ± 5%
Calibration Intervals: Annually
Standards: Traceable to NIST, ISO 10012-1, ISO/IEC 17025, Mil-Std-45662A

4.5.2 Rate Alarms:

4.5.1.2 Model: RA-500
Range of Use: 0-1000mR
Calibrated at 3 set points: 0, 500 & 1000mR
Accuracy: ± 5%
Calibration Intervals: Annually
Standards: Traceable to NIST, ISO 10012-1, ISO/IEC 17025, Mil-Std-45662A

4.5.3 Survey Meters:

4.5.1.3 Models: ND-2000 series or Victoreen
Range of Use: 0-1000mR/hr
Calibrated at 3 set points: 0-10mR/hr, 0-100mR/hr & 1000mR/hr
Accuracy: ± 5%
Calibration Intervals: 6 months
Standards: Traceable to NIST, ISO 10012-1, ISO/IEC 17025, Mil-Std-45662A

4.6 Tam Panels

4.6.1 Tam Panels are calibrated in accordance with PI-224
4.6.2 Calibration intervals: Annually

4.7 Densitometers
- 4.7.1 Densitometers are calibrated in accordance with CP-132
- 4.7.2 Calibration Intervals: Quarterly

4.8 Dryer Ovens
- 4.8.1 Dryer ovens are calibrated in accordance with CP-115
- 4.8.2 Calibration Intervals: Quarterly

4.9 Timers
- 4.9.1 Timers are calibrated in accordance with CP-120
- 4.9.2 Calibration Intervals: Quarterly

5.0 Out of Tolerance Condition

5.1 Any Calibration that exceeds the ±value specified in section 4.0 of this procedure shall be considered “OUT OF TOLERANCE” and removed from service or ban from entering service.

5.2 If a calibration fails to conform to a specified requirement the calibration department will refer to Quality Manual MT-20 for further action to be taken.

Revision History

Rev. Ltr.	Parg.	Description of Revision	Date Rev.	Rev. By
Orig.	All	New procedure	5-Oct-09	D. Olson
A	4.3.1, 4.3.2, 4.3.3	Added Calibration Interval: 6 months	19-Jul-10	D. Olson
A	4.6.1	Changed QP-107 to PI-224 and added Calibration Intervals: annually.	19-Jul-10	D. Olson
A	4.7.1	Added: Calibration Intrvals: Quarterly.	19-Jul-10	D. Olson
A	4.8.1	Added: Calibration Intrvals: Quarterly.	19-Jul-10	D. Olson