


Preparing Authority: Sam Hays	 P108 - Technical Consensus Decisions from the Materials Testing Advisory Committee	Publication Date: 01/09/24
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This document provides a summary of consensus decisions voted on and approved by the A2LA Materials Testing Advisory Committee (MTAC) for use by laboratories and assessors.

- I. Traceability Decisions – The consensus decisions noted here are to assist the laboratory in meeting the requirements of [P102 - A2LA Policy on Metrological Traceability](#) for specific equipment, reference materials and reference standards.

- 1.1 Density Beads – PT results may be accepted in lieu of traceability for density beads as long as the laboratory participates in available commercial PT annually. This exception is applicable to the following testing:

Density of Plastics - Gradient Column Method

ASTM D1505

ISO 1183-2

- 1.2 Severn Engineering Instrumentation –There are no accredited calibration providers for the calibration of Severn Engineering Instrumentation, including the Ferrite Indicator, Type I or II, and Low-Mu Permeability Indicator. As such, the only option for a traceable calibration to an NMI (e.g., NIST) is through Severn Engineering Instrumentation. Note that A2LA has on file the complete reverse traceability documentation so an exception to A2LA [P102 – A2LA Policy on Metrological Traceability](#) is not required. Assessors are, however, instructed to ensure the CAB has current copies of Severn Engineering Instrumentation calibration certificates and to review these certificates for technical content.

Please note that this clarification is applicable to the following testing:

Determination of Low Magnetic Permeability

ASTM A342

MIL-I-17214B

Determination of Ferrite Content of Welds

ASTM A799 / A799M-04

ANSI / AWS4.2M / A4.2-2006

- 1.3 Variable Thread Gauging Systems – The gauge system consists of three separate parts:

Part 1) Dial or digital indicators

Part 2) Calibration setting plug

Part 3) Contacting rolls and segments

Part 1) and Part 3) constitute the gauge as it is commonly used for inspection. The gauge system is the part of System 22 that covers pitch diameter and functional size measurement.

Part 2) confirms the presence of the correct setting of the inspected gauge system, the actual calibrated size of the setting plug.

When Parts 1) and 3) are assembled together, the gauge is verified using the calibrated setting plug, Part 2), which is calibrated by an accredited calibration lab.

The accredited calibration of the setting plug is sufficient to verify the system as a whole, and therefore a full system calibration is not required.

- 1.4 Gage Punches – Gage punches used for determining the percent elongation for a tensile test do not require a traceable calibration, but rather, a verification. Gage lengths may be established by various means other than a gage punch. Additionally, the gage marks could be measured (with a calibrated measuring device) before testing and that measurement used for the final calculation.
- 1.5 Aluminum Conductivity Standards – If a CAB is accredited to the Boeing specification for conductivity (BAC 5651), their aluminum conductivity standard must be calibrated yearly.
- 1.6 Strain Gages – In many cases strain gages are certified by the manufacturer for a particular gage factor and then permanently attached to an item. The gage is then attached to a read-out device via soldering or bonding. The attachment of the strain gage to the read-out device is a critical step and should be closely evaluated by the CAB to ensure proper connection.

When strain gages are used in the above manner, the readout device must be calibrated by an accredited provider and the system (strain gage and readout) must be verified using a calibrated instrument (e.g. a multi-meter, resistor). As long as the CAB has a certificate from the manufacturer for the strain gage and has verified the system using an accredited instrument, accredited calibration of the strain gage is not required.

When a strain gage is not used in the above manner, accredited calibration is required. This explanation includes but is not limited to the following testing:

Compressive Properties of Composite Materials

ASTM D3410/D3410M

ASTM D6642/D6641M

Shear Properties of Composite Materials

ASTM D53799/D53799M

ASTM D7778/D7778M

ASTM D3518/D3518M

- 1.7 Devices with Dimensional Measurement Capabilities – If a device (e.g. microhardness tester) is being used to measure the distance across the face of the test item, then some form of traceability must be established.
- 1.8 Micrometers per ASTM D5947 – For plastics and rubber test methods that reference ASTM D5947, the micrometers used shall be calibrated per the requirements of D5947 and the

parallelism of the anvil and foot of micrometer shall be checked and referenced on the calibration certificate.

- 1.9 Water Testing per SAE J2412 and SAE J2527 – The CAB shall have objective evidence of DI water conductivity being within the accepted range, as well as being acceptable as analyzed for silica content by an appropriate technique (e.g. silica test kit) prior to use. Likewise, for any DI water obtained from an outside source, the CAB shall also have objective evidence of acceptable conductivity and silica content analysis. If a CAB is using their own water purification (distillation, reverse osmosis, etc.) equipment for these tests, an accredited calibration is not required. However, the typical in-line binary "go-no go" indicator lights used in this equipment is insufficient for meeting this requirement, even if there is a written record of when it was observed as "green-go" vs "red- no go."
- 1.10 Environmental Chambers – Three approaches are deemed as acceptably meeting A2LA [P102 – A2LA Policy on Metrological Traceability](#) for environmental chambers:
 - 1.10.1 A calibration performed in accordance with the manufacturer instructions/recommendations, as long as the CAB, when using the environmental chamber, includes an accredited sensor with the load to measure the environment during the test; or
 - 1.10.2 The CAB obtains an accredited calibration of the entire system; or
 - 1.10.3 The CAB obtains an accredited calibration of the individual components of the entire system.
- 1.11 Thermo-Analytical Methods – Once all equipment has been calibrated per the requirements of [P102](#) for approved thermo-analytical methods (e.g. TGA, TMA, and DSC), and the CAB is using traceable reference materials to perform frequent standardizations, then these standardizations will not be assessed as “in-house calibrations” as defined in the T4 requirements of [P102](#).
- 1.12 Thermogravimetric Analyzers (TGAs) – A separate calibration is required for the internal balance of TGAs.
- 1.13 Hardness Tester Indenters – A separate calibration is required for the indenters used on hardness testing machines.
- 1.14 Class A Glassware – no additional calibration required.
- 1.15 When a testing lab conducts tests in accordance with a standard that references the calibration of their testing machine to ASTM E4 or ISO 7500-1, their machines shall be calibrated to the respective calibration standard. Where a laboratory uses both standards, their machine shall be calibrated to ASTM E4 as well as ISO 7500-1, as these two standards have differences and cannot be used to supplement each other.

Example: A laboratory conducts tests to ASTM E8/E8M, which reference ASTM E4 as the calibration standard for the testing machine. The same laboratory also conducts

tests in accordance with ISO 6892-1, which references ISO 7500-1 as the calibration standard for their testing machine. The laboratory will have to get their machine calibrated to both ASTM E4 and ISO 7500-1 to comply with the relevant testing standards.

II. Guidance for including specific standards on your scope

2.1 Application of SAE J81

- 2.1.1 The following verbiage found in SAE J81 – Thread Rolling Screws:
“by other suitable means in any ductility test for thread cutting screws”
is to be interpreted as meaning ‘any means by which the laboratory can make the required bend is acceptable.’ (Motion 9, MTAC meeting minutes dated 4/2/2011)

2.2 Application of ASTM E308: Standard Practice for Computing the Colors of Objects

- 2.2.1 The following guidelines must be met by a CAB in order to list ASTM E308 on their Scope:

2.2.1.1 The laboratory must own a copy of the standard.

2.2.1.2 The laboratory must own, lease or rent a color spectrometer capable of producing a printout of reflectance or transmittance spectra to the resolution needed for the testing they are performing.

2.2.1.3 The laboratory must be able to provide objective evidence demonstrating that their color calculations used the formulae required by ASTM E308.

- 2.2.2 CABs who use ASTM E308 as a reference when performing associated testing, but are unable to perform those tests outlined in the standard, may list ASTM E308 on the bottom of their accredited Scope with a footnote indicating that ASTM E308 is referenced when performing testing, but that the CAB is not accredited to perform ASTM E308 testing.

2.3 Application of ASTM E23: Standard Test Methods for Notched Bar Impact Testing of Metallic Materials

- 2.3.1 Section 10.2.3 of ASTM E23 states that the test temperature is to be reported. Likewise, Note #9 following Section 10.2.3 states that even if a laboratory tests at room temperature, then the actual temperature is reported. Although notes in standards are considered “non-mandatory language,” ASTM E23 lists the range of acceptable test temperatures. Therefore, the actual room temperature is to be listed on test reports, unless otherwise specified by a specification or customer request.

2.4 Application of ASTM E208: Standard Test Method for Conducting Drop-Weight Test to Determine Nil-Ductility Transition Temperature of Ferritic Steels

2.4.1 Section 6.2 of ASTM E208 states that the weight used for testing shall be between 50 and 300 lbs. If a CAB uses a weight outside of this required range, it is acceptable if it is agreed upon by the CAB's customer. However, the CAB shall meet the required range for the weight limit in order for ASTM E208 to remain on their Scope of Accreditation.

2.5 Standard Methods Containing Options for Equipment Set-Up or Arrangement

2.5.1 Standards exist that offer options for equipment arrangement that may or may not be employed by the CAB in performance of the test. To clarify the full range of capability included as accredited work on a Scope of Accreditation, Scopes must identify their equipment arrangement capability if they are not capable of performing the identified testing in accordance with all arrangement options. This clarification is applicable to the following test:

2.5.1.1 ASTM E290: Standard Test Methods for Bend Testing of Material for Ductility (Arrangements A, B, and/or C).

III. Guidance on the inclusion of specific non-testing activities on Scopes of Accreditation

3.1 Failure Analysis

3.1.1 ASM Handbook 11 contained or referred to several test methods that may or may not be employed by a CAB to perform failure analysis. To clarify the full range of capability included as accredited work on a Scope of Accreditation, Scopes must list ASM Handbook 11 in one of two ways:

<u>Test</u>	<u>Test Method(s)</u>
Failure Analysis	Using the methods listed above (and if applicable, on Scope(s) of Accreditation xxxx.xx (and xxxx.xx)) in accordance with the ASM Handbook Volume 11
Failure Analysis (Visual Examination, Coating Thickness, Photomicrography)	ASM Handbook Volume 11 (Pages xxx-xxx)

3.2 Weld Procedure/Welder Qualification

3.2.1 Many CABs list weld procedure and/or welder qualification on their Scopes of Accreditation along with numerous test methods. A majority of these test methods include a number of tests ranging from a simple bend test to a combination of tests (x-ray, metallography, chemistry, visual inspection by a certified welder, etc.) To clarify the full range of capability included in accredited work on a Scope of Accreditation, Scopes must list Weld Procedure/Welder Qualification in the following way:

<u>Test</u>	<u>Test Method(s)</u>
Weld Procedure/Welder Qualification	Using the methods listed above (and if applicable, on Scopes(s) of Accreditation xxxx.xx (and xxxx.xx)) in accordance with AWS D1.1, 1.2, 1.3, 1.4, 1.5, and 1.6, etc.

IV. Miscellaneous

- 4.1 Fastener tests using an optical comparator, thread gauging, angle and radius and other small parts, do not require environmental controls, as stated in ANSI B1.2.
- 4.2 If a method is used that does not generate a final result (e.g. sample preparation and conditioning), then it does not require a quality check per ISO/IEC 17025:2017, Section 7.7

DOCUMENT REVISION HISTORY

Date	Description
12/20/22	➤ Added Class A Glassware to Section I
01/09/24	➤ Changed the numbering system ➤ Added Section 1.15 when referencing the calibration of testing machines to ASTM E4 or ISO 7500-1