SOP 1

Recommended Standard Operations Procedures for Preparation of Test/Calibration Reports

1. Introduction

   1.1. Test/calibration reports are the visible outputs of the testing laboratory. They should be prepared with utmost care to ensure that they accurately convey all information pertaining to the testing so that reports may be used with maximum benefit by all concerned. Carefully prepared test reports will contain or refer to all information necessary to justify the test results.

   1.2. The test report may consist of filling in the blanks in a form in the case of a routine measurement. A more detailed report, including narrative information, may be required for special calibrations or tests.

   1.3. Regardless of the final form, the test report must contain the basic information described in the following sections.

2. Content

   2.1. Title (e.g., "Test Report" or "Report of Calibration").

   2.2. Name and address of the laboratory, or location at which tests were performed.

   2.3. Unique identification of the test report or calibration certificate, and on each page an identification in order to ensure that the page is recognized as part of the test report or calibration certificate, and a clear identification of the end of the report or certificate.

   2.4. Name and address of the client.

   2.5. Method used – Describe how test was made by reference to SOP(s). In the absence of SOP's, brief but informative descriptions of the methodology should be included. Information describing deviations from previously agreed upon procedure must also be included.

   2.6. Description of, the condition of, and unambiguous identification of the item calibrated. A laboratory number should be assigned and attached to each test item at the time of its acceptance for testing. The use of the laboratory number will facilitate the internal control of test items during the testing process.

   2.7. Date of receipt of calibration item where this is critical to the validity and application of the results, and the date of performance of calibration.

2.8. Calibration results with the units of measurement in tabular or other convenient form. (When an instrument has been repaired or adjusted the calibration results before and after repair or adjustment, if available, are reported.)

2.9. Identify standards used and their traceability to national standards.

2.10. Conditions (e.g., environmental) under which the calibrations were made that have an influence on the measurement results.

2.11. Where relevant, a statement of compliance/non-compliance with requirements and/or specifications. Compliance refers to all criteria, both specifications and tolerances, of a referenced standard and not just portions (e.g., compliance to tolerance only).

2.12. A statement of the estimated measurement uncertainty, components that were considered and included, a rationale for their inclusion, and the coverage factor and estimated confidence interval.

2.13. Where appropriate and needed, opinions and interpretations.

2.14. Additional information which may be required by specific methods, clients or groups of clients.

2.15. Name, title, and signature of person authoring the report or certificate. Other signatures may be required, at the discretion of the laboratory director. Each signer accepts his/her share of responsibility for the contents of the report.

2.16. Where relevant, a statement to the effect that the results relate only to the items tested or calibrated.

2.17. Hard copies of test reports should also include the page number and total number of pages.

2.18. A statement specifying that the test report or calibration certificate shall not be reproduced except in full, without written approval of the laboratory.

3. Recording

3.1. File all test reports in a systematic manner for ease of retrieval, as necessary.

3.2. Retain copies of all test reports for a minimum period of five years, until superseded by a subsequent report, or as stated in the laboratory quality manual, or until deemed by the laboratory director as having no future value.

APPENDIX A - Sample Format

Recommended Format for Report of Test

Report of Test

Issued by
Name of Testing Laboratory
Laboratory Report No. _____

Test Item(s)/Lab No(s): _____

Submitted by:_____

Date: _____

Purpose of Test: _____

_____

Test Results*:

	As Found	After Adjustment

_____

Reference Information:

Test Method: _____

Traceability: _____

Uncertainty Statement: _____

Conditions of Test: _____

Data
Reference: _____

Test Results Approved by (name, title, date): _____

*Report, as appropriate

APPENDIX B – Sample Format

Recommended Format for Calibration Certificate

A B C COMPANY

123 Utopia Street
Anywhere, USA

Report of Calibration

Report Number:

Name of Device:

Model: Serial No:

Submitted by:

Calibration (date) _____.
The ambient conditions were _____ °C, ____ % relative humidity and ____ mm Hg Barometric pressure.
The item tested was/was not in tolerance at time of calibration. Adjustments are noted and any out of tolerance data are attached.

Data:

Nominal Value	Correction or Error	Expanded Uncertainty

The primary standards to which the above data are traceable are identified in this report. The calibration of these standards is traceable to the National Institute of Standards and Technology. The cycling and certification of all standards of measurement at this facility meet the requirements of ISO/IEC 17025.

Name of Standard	Traceability Reference	Calibration Date	Next Calibration Due

Test Method: _____

Uncertainty Statement: _____

Test Results Approved by (name, title, date): _____

The results stated on this report relate only to the items specifically identified.
This test report or calibration certificate shall not be reproduced except in full, without written approval of the laboratory.

APPENDIX C - Example

BUREAU OF STANDARDS
PO Box 12345
City, State 12345-1234

COMPLIANT CALIBRATION LABORATORY
123 Some Ave.
City, State 12312-1231

REPORT OF CALIBRATION

FOR

1 kg to 10 mg weight kit

(Twenty-one metric weights)

Maker: DENTROM LAKE
Serial No.: 27269

Lab Test No. : TI-01-056
NMI Test No.: 822/1234

SUBMITTED BY

YOUR CUSTOMER, INC.

Customer's Address
City, State

Nominal (g)	Conventional Mass (g)	Conventional Mass Correction (mg)	Expanded Uncertainty (mg)
1 000	1 000.000 82	0.82	0.92
500	500.000 71	0.71	0.53
300	299.999 87	- 0.13	0.27
200	200.000 67	0.67	0.18
100	100.000 411	0.411	0.091
50	50.000 318	0.318	0.051
30	30.000 117	0.117	0.028
20	19.999 987	- 0.013	0.023
10	10.000 011	0.011	0.018
5	5.000 022	0.022	0.015
3	3.000 112	0.112	0.013
2	1.999 965	- 0.035	0.012
1	1.000 117	0.117	0.010
0.500	0.500 013 2	0.013 2	0.005 1
0.300	0.300 022 3	0.022 3	0.004 8
0.200	0.200 001 7	0.001 7	0.004 3
0.100	0.100 001 3	0.001 3	0.004 2
0.050	0.050 001 8	0.001 8	0.004 0
0.030	0.030 001 1	0.001 1	0.003 7
0.020	0.020 000 9	0.000 9	0.003 3
0.010	0.009 999 7	- 0.000 3	0.003 1

The data in the above table of this report only applies to those items specifically listed on this report.

Uncertainty statement:
The combined standard uncertainty includes the standard uncertainty reported for the standard, the standard uncertainty for the measurement process, the standard uncertainty for any uncorrected errors associated with buoyancy corrections, and a component of uncertainty to account for any observed deviations from NIST values that are less than surveillance limits. The combined standard

uncertainty is multiplied by a coverage factor of 2 to give an expanded uncertainty, which defines an interval having a level of confidence of approximately 95 percent. The expanded uncertainty presented in this report is consistent with the 1993 ISO Guide to the Expression of Uncertainty in Measurement. The expanded uncertainty is not to be confused with a tolerance limit for the user during application.

Traceability statement:
The Standards of the Compliant Calibration Laboratory are traceable to the National Metrology Institute, and are part of a comprehensive measurement assurance program for ensuring continued accuracy and measurement traceability within the level of uncertainty reported by this laboratory. The laboratory test number identified above is the unique report number to be used in referencing measurement traceability for artifacts identified in this report only.

Supplemental Information

Description of artifacts submitted for testing:

Twenty one metric weights from 1 kg to 10 mg, marked ASTM Class 4. Weights from 1 kg to 1 g: two-piece weights, with assumed density of 8.0 g/cm^3. Weights from 500 mg to 50 mg: sheet weights, with assumed density of 16.6 g/cm^3. Weights from 30 mg to 10 mg: sheet weights, with assumed density of 2.7 g/cm^3.

Conditions of artifacts submitted for testing:

Artifacts showed evidence of improper handling. Fingerprints and dents were visible on the surface of the weights.

Treatment of artifacts prior to testing:

Artifacts were cleaned with cheesecloth and ethyl alcohol. Thermal equilibrium time/conditions: ten days next to balances in mass lab.

Equipment & Standards:

Balance	Range	Stds Used	Calibration due
AT1005	1 kg to 200 g	Set H	2/31/2002
AT106	100 g to 10 g	Set H	2/31/2002
UMT5/6	5 g to 10 mg	Set H	2/31/2002

Assumed Density of Reference Standards:

1 kg to 1 g: 7.94 g/cm^3 500 mg to 10 mg: 8.41 g/cm^3

Procedure used:

Double Substitution (NIST HB 145, SOP 4)

Environmental conditions at time of test:

Temperature: 20.1 °C to 20.2 °C Barometric Pressure: 752.7 mmHg Relative Humidity: 43.35 % to 43.40 %

Date artifacts were received: February 15, 2001 Date of report preparation: March 3, 2002

Date of test: February 25, 2001
Due date per customer's request: February 25, 2002

Josh Balani II

Test performed by: Josh Balani II
Metrology Expert

Member: ARMAP
NCSLI
NCWM
ASQ