



Standards Council of Canada  
Conseil canadien des normes



# Accreditation of Fastener Testing Laboratories

**CAN-P-1581B**  
May 2009

Program Speciality Area (PSA-Fasteners)



# ACCREDITATION OF FASTENER TESTING LABORATORIES

## Program Specialty Area (PSA-FASTENERS)

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Requests for clarification and recommendations for amendment of this document, or requests for additional copies should be addressed to the publisher directly.

## **PREFACE**

This Program Specialty Area (PSA) is operated and managed by the SCC through its Program for Accreditation of Laboratories – Canada (PALCAN). Accreditation under this PSA program is the formal recognition by the Standards Council of Canada of the competence of a laboratory to perform a specific list of tests in these specialty areas. It is not a guarantee that test results will conform to standards or agreements between a testing laboratory and its clients; business transactions between an accredited testing laboratory and its clients are legal matters between the two parties.

The Task Group Laboratories (TG Labs) is constituted by and reports to the Advisory Committee on Conformity Assessment (ACCA). TG Labs provides program advice, assists in carrying out assessments and re-assessments and making recommendations to the Director Conformity Assessment Branch, ACCA and the Council, as required.

This document was designed to meet International Organization for Standardization (ISO)/International Electrotechnical Commission (IEC) Standard 17025 requirements. Rather than serving as a "stand alone" document, it was designed to harmonize with and complement the SCC document CAN-P-4E, *"General Requirements for the Competence of Calibration and Testing Laboratories"*, which is ISO/IEC: 17025 verbatim.

Accreditation by SCC requires an on-site assessment of the laboratory to demonstrate conformance with the requirements as well as prior and continued participation and satisfactory performance in appropriate proficiency testing programs for each major area of testing.

The scope of these guidelines will be evaluated periodically to respond to client, laboratory and accreditation requirements as well as improvements in the available science and technology or regulatory changes.

This Preface is not an integral part of this document.

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## 1. SCOPE

This program specialty area applies to the accreditation of laboratories that are conducting tests and measurements on threaded fasteners, providing services supporting fastener production, such as plating, producers of material destined for fastener manufacture and commercial laboratories offering testing services.

## 2. INTRODUCTION

The United States of America Fastener Quality Act (FQA), Public Law 101-592, was signed by President George H. W. Bush on November 16, 1990. The Act protects public safety by: (1) requiring that certain fasteners sold in commerce conform to specifications to which they are represented to be manufactured; (2) providing for accreditation of laboratories engaged in fastener testing; and (3) requiring inspection, testing and certification in accordance with standardized methods.

On March 7, 1996, President William J. Clinton signed the National Technology Transfer and Advancement Act of 1995, Public Law (PL) 104-113, which amended the FQA to further clarify and define the requirements of the original Act. Further amendments were promulgated by PL 105-234 (August 14), 1998, an act exempting certain fasteners approved by the Federal Aviation Administration from FQA coverage, and PL106-34 (June 8, 1999), the Fastener Quality Act Amendments Act of 1999.

Additional information on the Fastener Quality Act;

<[http://www.nist.gov/public\\_affairs/siteindex](http://www.nist.gov/public_affairs/siteindex)>

Subject Index "F" | Fasteners  
&

<<http://ts.nist.gov/WeightsAndMeasures/fqaregs2.cfm>>

The SCC offers accreditation for laboratories that conduct tests and measurements of threaded fasteners, provide services supporting fastener production, such as plating, production of material destined for fastener manufacture and commercial laboratories offering testing or measurement services, including those fasteners covered by the latest FQA. Assessments, leading to accreditation, are also conducted by its Partner organization, Bureau de normalisation du Québec.

Laboratories are required to participate in specific Proficiency Tests, conducted by an SCC-designated Proficiency Testing provider, be able to provide "Records of Conformity" for a 5-year period and prepare their scopes in a particular way.

The SCC has affirmed to the United States National Institute of Standards and Technology that it meets, and will continue to meet, the required criteria.



The general requirements for the competence of testing and calibration laboratories are described in CAN-P-4E (ISO/IEC 17025:2005). These requirements are designed to apply to all types of calibration and objective testing and therefore may need to be interpreted with respect to specific types of testing and the techniques involved.

The requirements outlined in this document are elaborations or interpretations of the general criteria and may include additional requirements applicable to a certain field of testing, testing technology, type of test or discipline.

### **3.0 PRESENTATION OF THE LABORATORY SCOPE OF ACCREDITATION**

The SCC website ([www.scc.ca](http://www.scc.ca)) contains a search directory for laboratory scopes. See Annex 1 for direction regarding presentation of scopes specific to this PSA.

Appendix B of CAN-P-1570 is the basis to establish and present scopes of accreditation.

### **4.0 REQUIREMENTS AND ADDITIONAL ACCREDITATION CRITERIA**

#### **4.1 GENERAL REQUIREMENTS**

For information on the accreditation process, accreditation conditions, and details on preparing an application see: CAN-P-1570 *PALCAN Handbook – Program Requirements for Applicant and Accredited Laboratories and its respective appendices*.

Laboratories must meet all the pertinent provisions of the most recent versions of the PALCAN documents, including but not limited to:

- CAN-P-4E *General Requirements for the Competence of Testing and Calibration Laboratories, (ISO/IEC 17025:2005)*; the checklist that is used to assess these requirements is the latest version of CAN-P-1510E, *Assessment Rating Guide*.
- CAN-P-1623 *PALCAN Interpretation and Guidance on the Estimation of Uncertainty of Measurement in Testing*
- CAN-P-1624 *PALCAN Policy on Use of Proficiency Testing as a Tool for Accreditation of Testing*
- CAN-P-1625 *PALCAN Policy on Guidelines and Procedures for Laboratories with Serious and Critical Non-conformities*
- CAN-P-1626 *PALCAN Policy on Traceability Requirements for Calibration Sources Used by Accredited Testing Laboratories*
- CAN-P-1627 *PALCAN Policy on the Selection of Physical Measurement Calibration Sources for Testing Laboratories*
- CAN-P-1628 – *PALCAN Policy on the Use of Information Technology in Accredited Laboratories*
- CAN-P-1630 – *PALCAN Interpretations for Conducting Assessments of Testing and Calibration Laboratories*
- CAN-P-1631 *PALCAN Guidelines for the Use of Accreditation Body Logos and for Claims of Accreditation Status*

4.1.1 The laboratories shall also satisfy the additional requirements of this PSA.

## 4.2 Additional Criteria

In addition to the requirements, laboratories performing analyses must also apply the best scientific practices accepted nationally or internationally for each relevant testing field or discipline, such as:

- ISO/TS 14253-2 - *Procedure for Uncertainty Management (PUMA)*
- ASTM E8 & ASTM E18 – *Rockwell Hardness & Tensile Strength Testing.*
- Chemistry: the *CITAC / EURACHEM Guide to Quality in Analytical Chemistry* Edition 2002, prepared jointly by CITAC (The Cooperation on International Traceability in Analytical Chemistry) and EURACHEM (A Focus for Analytical Chemistry in Europe) <http://www.citac.cc/>

## 5.0 INTERPRETATION AND APPLICATION OF CAN-P-4E REQUIREMENTS

All the requirements of the most recent version of CAN-P-4E apply to all accredited laboratories. This section of these requirements is to be used in conjunction with the CAN-P-4E document. It provides guidance in the form of interpretation and/or application of some clauses of CAN-P-4E. Laboratories are also reminded that the references specified this document and annexes also supplement CAN-P-4E by providing specific guidance in their respective fields of testing.

### **Management Elements:**

CAN-P-4E (ISO/IEC 17025:2005) Section No:	Interpretation / Application
4.1.2 (Organization):	The laboratories shall also satisfy the additional requirements of this PSA.
4.13.1	If the laboratory is part of a fastener manufacturing business, "Records of Conformance," as defined in the FQA, Section 3, <i>Definitions</i> , Part(13), designated for each lot of fasteners sold or offered for sale, are retained by the laboratory for a minimum of five years.
4.13.2	All other records are retained for a minimum of three years.
4.3.1 Document control	Establish and maintain procedures to control documents from external sources from which standard methods are obtained.

4.4.1c Review of requests, tenders and contracts	See also 5.4.2 Establish and maintain procedures for the review of requests, tenders and contracts to ensure that the appropriate test method is selected and is capable of meeting the customers' requirements.
4.5.3 Subcontracting	Whenever the laboratory subcontracts the performance of any test or portion of a test to another laboratory, the subcontracting laboratory shall: a) place the work with another laboratory accredited under the provisions of the Fastener Quality Act; b) inform the customer, before the fact, that subcontracting will be necessary; and c) clearly identify in its records and in the report to the customer specifically which test method(s) were performed by the accredited laboratory, and which were performed by the contractor.

**Technical Elements:**

CAN-P-4E (ISO/IEC 17025:2005) Section No:	Interpretation / Application
<b>5.2 Personnel</b>	
5.2.1	The laboratory has a detailed, documented description of its training program for new and current staff members.
5.2.2	Documented performance criteria are established to determine when a new staff member has achieved the required level of performance.
5.2.3	Test results obtained by new staff members are checked by a staff member whose performance has been demonstrated to be acceptable until the new staff member demonstrates the required level of performance.
5.4.2 Methods	The laboratory shall confirm that it can properly operate standard methods before introducing the tests or calibrations. If the standard method changes, the confirmation shall be repeated. This exercise is referred to

	<p>as verification, and is not to be confused with validation. Objective evidence to demonstrate that the laboratory meets the performance criteria of the standard method as published is generated and summarized. The data required for verification of a standard method may be dictated by the customer. See also CAN-P-1630</p>
5.4.6 Estimation of measurement uncertainty	<p>Irrespective of the type of testing, the laboratory must identify all the significant components of measurement uncertainty. Numerical estimates are expected for those tests which produce numerical results.</p> <p>See also CAN-P-1623 &amp; examples listed in “Additional Criteria</p>
5.6 Measurement traceability	<p>See CAN-P-1626 Note 4.2 the definition for critical equipment</p>
5.6.3 Reference standards and reference materials	<p>Where possible, certified reference materials (CRMs) should be used.</p>
5.9 Assuring the quality of test and calibration result	<p>The laboratory shall maintain records of performance and monitor results from proficiency testing activities. Unsatisfactory results must be followed up with an investigation and if necessary corrective or preventive actions. See also CAN-P-1630</p>

**Note:** See also Annex 3: RECORD OF CONFORMANCE as required by Section 3 (13) of the “Fastener Quality Act” This reference is given since laboratories may use their reports as the means to incorporate the elements listed in the annex.

## 6.0 PROFICIENCY TESTING REQUIREMENTS

### 6.1 PROFICIENCY TESTING

Participation in proficiency testing is required for laboratories applying for accreditation or maintaining accreditation as detailed in annex 2.

Testing conducted in the Fasteners PSA is divided into five major areas:

- Mechanical and physical testing and inspection;
- Nondestructive inspection;
- Dimensional inspection;
- Chemical analysis;
- Metallography.

Participation in proficiency testing, applicable to their needs expressed in their scopes of testing, is required for laboratories applying for test methods under Rockwell hardness of fasteners (externally threaded), axial tensile strength of full-size threaded fasteners, wedge tensile strength of full-size threaded fasteners, tensile strength tests of machined aluminum and steel and chemical analysis. Proficiency testing is conducted biannually for each of these areas of testing.

Proficiency Testing programs, which have become available in recent times include: “Fastener Double Shear, Microhardness, Case Depth, Round Dimensional”.

**Note:** “Round Dimensional”, in Canadian terminology, is “Micrometer, Outside”, “Caliper, Outside” or “Diametral Measuring Device”

The normal SCC requirements for proficiency testing apply to other tests. In those instances where PT service is not available, the requirement may be satisfied, but not limited to Inter Laboratory Comparisons (ILCs).

The SCC may expand/change its requirements to include other methods in the major areas of testing, at which time this section will be updated.

The SCC-selected Proficiency Testing Provider reports performance results of the individual proficiency tests to participating laboratories, together with investigative / corrective action(s) that are to be taken to resolve problems and avoid similar errors in future.

In those instances when corrective action(s) is required, the laboratory will advise the responsible SCC Senior Program Officer (and the responsible BNQ official, when the latter organization conducts the assessment).

Regular proficiency test results and investigative / corrective action(s) are to be included in the Annual Surveillance Questionnaire Form 1.d: F2220E ASQ submitted by laboratories during non-on site assessment years.

## **6.2 MONITORING PT**

Laboratory performance reports are reviewed by the SCC designated PT Provider, which identifies action(s) the laboratory is required to undertake. The SCC has access to PT results and will retain such information, together with actions taken. The “PALCAN Review of Proficiency Testing and Record of Conformance (Reporting) Practice for Fastener Laboratory” form will be used to capture information during “On-Site” assessments.

The laboratory will be subject to suspension and withdrawal procedures as documented in CAN-P-15CA, *SCC Conformity Assessment Accreditation Program Requirements and Procedures for the Suspension and Withdrawal of Accreditations and the Resolution of Complaints, Disputes and Appeals*, when the laboratory’s PT testing performance does not meet specified performance criteria, as defined by the specified PT Provider.

## 7.0 REFERENCES/BIBLIOGRAPHY

ISO Guide 43-1:1997 Proficiency Testing by Interlaboratory Comparison - Part 1 Development and Operation of Laboratory Proficiency Testing Schemes.

ISO Guide 43-2:1997 Proficiency Testing by Interlaboratory Comparison - Part 2 Selection and Use of Proficiency Testing Schemes by Laboratory Accreditation Bodies.

Harmonized Guidelines for Internal Quality Control in Analytical Chemistry Laboratories. Pure Appl. Chem 67, 649-666,1995. <http://www.iupac.org/publications/pac/1995/pdf/6704x0649.pdf>

The International Harmonized Protocol for the proficiency testing of analytical chemistry laboratories (IUPAC Technical Report) Pure Appl.Chem.78(1),145-196,2006 <http://www.iupac.org/publications/pac/2006/pdf/7801x0145.pdf>

ILAC-G22:2004: Use of Proficiency Testing as a Tool for Accreditation in Testing. [http://www.ilac.org/documents/ILAC-G22\\_2004-use\\_of\\_proficiency\\_testing\\_as\\_a\\_tool\\_for\\_accreditation\\_in\\_testing.pdf](http://www.ilac.org/documents/ILAC-G22_2004-use_of_proficiency_testing_as_a_tool_for_accreditation_in_testing.pdf)

ILAC-G13:2007 Guidelines for the Requirements for the Competence of Providers of Proficiency Testing Schemes. [http://www.ilac.org/documents/ILAC\\_G13\\_08\\_2007.pdf](http://www.ilac.org/documents/ILAC_G13_08_2007.pdf)

## 8.0 DEFINITIONS

The relevant definitions found in the latest edition of CAN-P-4E, CITAC/EURACHEM Guide and the EA/Eurachem Guide are applicable.

## ANNEX 1: PRESENTATION OF SCOPES

The laboratory is expected to present and manage its scope of accreditation in a manner which best illustrates to users/potential users the competencies assessed by the SCC or its Partner organization BNQ, in this PSA.

The scopes for laboratories conforming to the PSA-FASTENERS will have the following notation to differentiate them from other accredited testing laboratories.

On the title page, under “Accredited laboratory No ---“

(Conforms with the requirements of CAN-P-4E (ISO/IEC 17025-2005) and

CAN-P-1581:2008 – *US Fastener Quality Act, Public Law 101-592 (as amended by PL 104-113)*)

A suitable heading, such as the following, should appear at the bottom of the title page:

### METALLIC ORES AND PRODUCTS

#### Tools, Fasteners and Hardware

Beginning with the second page, specifications or standards will be listed in the left hand column with their titles on the right, e.g.

ASTM F606     Standard Test Methods for Determining the Mechanical Properties of Externally Threaded Fasteners, Washers, and Rivets

ASTM E18     Standard Test Methods for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials

SAE J122     Surface Discontinuities on Nuts

Laboratories offering other testing services that do not have to meet *US Fastener Quality Act* requirements should identify these with an asterisk and with a notation.

The following notation should appear somewhere in the scope document:

Details of the *US Fastener Quality Act* are available from the accredited laboratory contact noted above and the Standards Council of Canada.

## **ANNEX 2: PROFICIENCY TESTING PROVIDER**

The SCC-designated Proficiency Provider is:

Collaborative Testing Services Inc. (CTS)  
P.O. Box 650820  
21331 Gentry Drive  
Sterling, VA 20165-0820  
USA

Tel: (571) 434-1925

Fax: (571) 434-1937

[<metals@cts-interlab.com>](mailto:metals@cts-interlab.com) | [<www.collaborativetesting.com>](http://www.collaborativetesting.com)



### **ANNEX 3: RECORD OF CONFORMANCE**

4.13.1, states a special requirement of the US *Fastener Quality Act in respect to Records of Conformance, namely:*

If the laboratory is part of a fastener manufacturing business, "Records of Conformance", as defined in the FQA, Section 3, *Definitions*, Part(13), designated for each lot of fasteners sold or offered for sale, are retained by the laboratory for a minimum of five years.

"In addition to regular reporting requirements of CAN-P-4E, the following should be included:"

- a) the name and address of the manufacturer;
- b) a description of the type of fastener;
- c) the lot number;
- d) the nominal dimensions of the fastener (including diameter and length of bolts or screws), thread form and class of fit;
- e) the consensus standard or specifications to which the lot of fasteners has been manufactured, including the date, number, revision, and other information sufficient to identify the particular consensus standard or specifications being referenced;
- f) the chemistry and grade of material;
- g) the coating material and characteristics and the applicable consensus standard or specifications for such coating; and
- h) the results or a summary of results of any tests performed for the purpose of verifying that a lot of fasteners conforms to its grade identification marking or to the grade identification marking the lot of fasteners is represented to meet;"