



CIRCULAR ED 210-9

October 2000

GUIDELINES FOR ALCOHOL DETERMINATION

PROTOCOL FOR EXCISE OFFICERS TO ENSURE THAT THE DETERMINATION OF ALCOHOLIC STRENGTHS USING A PYCNOMETER IS ACCEPTABLE FOR EXCISE PURPOSES

INTRODUCTION

A pycnometer is a glass container used for measuring density of liquids in air. When a pycnometer is used to determine the density in air of liqueurs, beers, etc., any sugars or other obscuring matter must be removed before the density in air measurement is made. Obscuration (i.e., obscuring matter) in the liquid will affect the density determination and consequently the percent alcohol.

The usual laboratory procedure of overcoming obscuring matter is to separate the alcoholic portion of the spirit or beer from the non-volatile matter by distillation. The density in air of this distillate is determined by pycnometry to determine the actual alcoholic strength using the *Canadian Alcoholometric Laboratory Table, 1996* in accordance with the *Departmental Alcohol Determination Regulations, 1997*.

The alcoholic strengths of unobscured spirits may be found by correlating the direct measurement of their density in air to the alcoholic strength found in the *Canadian Alcoholometric Laboratory Table, 1996*.

This protocol is not concerned with sample preparation, it is concerned only with ensuring that the pycnometer is used in a manner acceptable for excise purposes. For further information on sample preparation, please contact the Chief, Alcohol and Tobacco Section, Laboratory and Scientific Services Directorate at (613) 954-9944.

INSTRUMENT

The pycnometer must be an "approved" pycnometer as required under the *Departmental Alcohol Determination Regulations, 1997* before being used for the determination of alcohol strength for excise purposes.

A pycnometer is a very simple instrument to use. It is, however, very important to use an accurate balance which determines mass with an accuracy of ± 0.0001 g. The pycnometer operator must follow the "Protocol for the Determination of Alcoholic Strengths for Excise Purposes by Density in Air using a Pycnometer".

In order to demonstrate that a pycnometer is used in a manner acceptable for excise purposes, the operator is required to record the following information each day when using the pycnometer for excise purposes:

- 1.1 the date;
- 1.2 the name of the operator;
- 1.3 the water values of the pycnometer and the calculated density in air of freshly boiled double distilled water, to 4 decimal places; and

1.4 the masses in air and the calculated mean density in air of the samples measured, to 4 decimal places.

ACTION

To ensure that the pycnometer is used correctly and acceptable alcoholic strength results, excise officers must check the licensee's records of the density in air of freshly boiled double distilled water. It should be $0.9971 \text{ g/cm}^3 \pm 0.0001 \text{ g/cm}^3$ (i.e. within the range of 0.9970 g/cm^3 to 0.9972 g/cm^3).

When the licensee's pycnometer operator records values outside these limits, the operator's protocol prescribes corrective action. The operator must provide the excise officer with records indicating that such corrective action has been taken to ensure proper use of the pycnometer as well as a new set of values which do comply with these criteria before the licensee can measure alcoholic strengths for declarations.

If excise declarations have been made and the above density in air is not satisfied, the excise officer should consider:

- 1) requiring the licensee to redetermine the alcoholic strengths;
- 2) obtaining a sample for official testing by the Laboratory and Scientific Services Directorate; or
- 3) having the pycnometer re-examined and approved in accordance with the *Departmental Alcohol Determination Regulations, 1997*.

Information or enquiries concerning pycnometer protocols should be communicated to the Chief, Alcohol and Tobacco Section, Laboratory and Scientific Services Directorate at (613) 954-9944.

APPENDICES

Appendix no.1

(Regional Address/Adresse régionale)

Fax

Date:

To/A: Chief, Alcohol and Tobacco Section, LSSD
Chef, Section de l'alcool et du tabac, DTSL
TEL: (613) 954-9944
FAX: (613) 952-7825

From/De: (Excise Duty Officer, Region)
(Préposé de l'accise, Région)
TEL:
FAX:

RE: Certification of Instruments
Certifications d'instruments

Number of pages (including this sheet): 2
Nombre de pages (incluant celle-ci):

Message:

ATTACHED ARE THE RESULTS USING THE QUALITY CONTROL SAMPLES SENT BY LSSD.

VEUILLEZ TROUVER CI-JOINTS LES RÉSULTATS OBTENUS DES ÉCHANTILLONS POUR LE
CONTRÔLE DE LA QUALITÉ EN PROVENANCE DE LA DTSL.

Appendix no.2

BELOW ARE THE TEST RESULTS USING THE QUALITY CONTROL SAMPLES SENT BY THE LABORATORY AND SCIENTIFIC SERVICES DIRECTORATE.

VOICI LES RÉSULTATS DES ÉCHANTILLONS POUR LE CONTRÔLE DE LA QUALITÉ EN PROVENANCE DE LA DIRECTION DES TRAVAUX SCIENTIFIQUES ET DE LABORATOIRE.

COMPANY/COMPAGNIE: _____

ADDRESS/ADRESSE: _____

TEL: _____ FAX: _____

EXCISE DUTY LICENSEE NUMBER/N° DE LICENCE DES DROITS D'ACCISE: _____

Pycnometer Pycnomètre Model No./N° de modèle: _____ Serial No./N° de série: _____

Manufacturer/ Fabricant: _____

Sample / Échantillon	Mass of empty pycnometer / Masse du pycnomètre vide	Mass of pycnometer filled with freshly boiled doubled distilled water / Masse du pycnomètre rempli d'eau bidistillée fraîchement bouillie	Mass of pycnometer filled with Quality Control Spirit / Masse du pycnomètre rempli de l'échantillon d'eau-de-vie pour le contrôle de la qualité	Density / Masse volumique	Percent alcohol / Pourcentage d'alcool
A					
B					
C					

Date of testing / Date d'examen: _____

Name of Excise Officer (print) / Nom du préposé de l'accise (lettres moulées):

Signature of Excise Officer / Signature du préposé de l'accise: _____

Name of licensee representative (print) / Nom du représentant du détenteur de licence (lettres moulées):

Signature of licensee representative / Signature du représentant du détenteur de licence:
