

## Aqueous Ethanol Proficiency Testing Scheme Description

### NMISA-PT-141 Round 1, Round 2, and Round 3 - Determination of ethanol in aqueous medium for forensic blood alcohol testing

#### FOREWORD

This is the call for participation in, and description of the NMISA proficiency testing (PT) scheme for the determination of ethanol in aqueous medium. Participants will be required to report on the ethanol content which form part of their routine laboratory services for forensic blood alcohol testing. A confidential report will be issued to all participants after completion of the PT scheme. Information on the concentration ranges, dates for distribution and reporting are listed in Table 1.

This forms part of a range of ISO 17043 accredited PT services offered by NMISA. Please consult our website [www.nmisa.org](http://www.nmisa.org) for information on PT schemes on offer. NMISA can also assist with the preparation of traceable gravimetrically prepared spike solutions for benchmarking *ad-hoc* analyses for which commercial PT schemes are not available.

#### SCHEME AIMS

This scheme will assist laboratories that routinely conduct forensic blood alcohol testing, to monitor and improve the quality of their measurements, and monitor their continued laboratory performance. The PTS allows laboratories to evaluate their accuracy and comparability of measurement results produced; the continued competency of analytical staff; and the maintenance and effectiveness of the current quality assurance systems within the laboratory. In addition, this information may also be used to provide accreditation bodies or clients with objective evidence of laboratory performance.

#### PARTICIPATION FEES AND ADDITIONAL CHARGES

The scheme will consist of three rounds. Three different concentration levels (between 0.01 g/ 100 g and 0.5 g/ 100 g) of aqueous ethanol in 25 ml bottles will be distributed. The cost of participation in the PT scheme is R 8 150 per round (per laboratory). For delivery within the Republic of South Africa (RSA) the fee includes delivery. For participants outside the RSA the delivery cost, including customs and import duties, will be carried by the participants. This fee includes the material and a confidential report upon completion. Upon registration for participation an official quotation will be provided. Participation is confirmed following receipt of a purchase order and/or proof of payment.

Since many of the South African participants are located within close proximity to NMISA, the option of collecting the PT scheme samples from NMISA premises is permitted.

*International laboratories will have test samples sent by courier and appropriately packaged to maintain sample integrity. International participants must provide NMISA with any import or quarantine permits that might be required to complete sample delivery well in advance of the shipment date and are liable for any customs or import duties charged.*

## PT SCHEME DESCRIPTION

The timeline for the PTS is presented in Table 1. Laboratories are requested to report results for as many of the parameters/replicates specified as possible, to allow for maximum benefit from the participation. The levels of the analytes should be easily achievable using analytical methods typically applied. Instructions for proper handling and storage of the samples prior to sample preparation will accompany the PT scheme samples. Participants should adhere to these instructions to ensure sample integrity and comparability of the results

**Table 1: PTS details for NMISA-PT141 aqueous ethanol.**

| NMISA-PT141 aqueous ethanol |   | Sample format                            | Distribution/ Dispatch  | Result reporting                                  |
|-----------------------------|---|--|---|---|
| <b>Parameters</b>           | <b>Aqueous ethanol *</b><br>Round 1 (0.01 – 0.5 g/ 100g)<br>Round 2 (0.01 – 0.5 g/ 100g)<br>Round 3 (0.01 – 0.5 g/ 100g)  | 25 ml x 3 concentration levels per round | Round 1: June 2026<br>Round 2: Sept 2026<br>Round 3: Nov 2026 | Approximately 5 weeks after PTS distribution date |
| <b>Result Reporting</b>     | <p>Participants will be required to perform the analysis using their normal laboratory procedures and are required to report <b>two results for each concentration level measured</b> in the sample provided.</p> <p>Participants are encouraged to include an uncertainty estimate for each result obtained. The result reporting form will be distributed to participants and will request additional information on the measurement technique and parameters, any recovery correction application, calibration standards used etc. Up to four sets of results can be submitted by each participating laboratory.</p>   |  |   |   |
| <b>PT conduct</b>           | <p><b>Collusion and falsification of results</b><br/>           The falsification of results and/ or collusion, either between participants or between participants and the scheme provider, is deemed to be unethical and contrary to professional conduct. Therefore, any form of collusion or result falsification is discouraged.</p> <p><b>Assigned value</b><br/>           The certified reference value and associated expanded uncertainty of measurement of the certified reference material will be used as the assigned value of PT test samples. The aqueous ethanol CRMs produced at the NMISA Organic Analysis Laboratory, are ISO/IEC 17025 and ISO 17034 accredited solutions.</p> <p><b>Laboratory performance</b><br/>           Laboratory performance will be evaluated using the standard deviation limits calculated using equation (1)</p> <p><b>Standard deviation of proficiency assessment</b><br/>           In equation (1) <math>\mu</math> is the expected standard deviation for the proficiency testing scheme.<br/> <math display="block">f(x) = \mu = \sqrt{a^2 + (bx)^2} \quad (1)</math><br/>           From the accumulation of historical data the <math>\pm 1s</math>, <math>\pm 2s</math> and <math>\pm 3s</math> limits could be calculated using <math>a = 0.00148</math> and <math>b = 0.0272</math>. <math>x</math> represents the certified ethanol concentration of the CRM.</p> <p><b>PT report</b></p> <ul style="list-style-type: none"> <li>The PTS report will be distributed within 2 weeks following the result submission deadline. Reports will be provided in electronic format only (Adobe Acrobat- pdf) files.</li> <li>The scheme is fully confidential. Each participant will be issued with a unique identification number. For multiple participants within the same laboratory the participating laboratory is required to identify its analysts by a code known only to the laboratory.</li> </ul> |  |   |   |