



Australian Government
Department of Industry,
Innovation and Science

**National
Measurement
Institute**

Response Paper

Density Measurement in the Retail
Sale of Liquefied Petroleum Gas
July 2017

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Introduction

This Response Paper provides the outcomes of the recent review of density measurement requirements in the retail sale of Liquefied Petroleum Gas (LPG). The review primarily focused on the density measurement requirements pertaining to LPG dispensers.

The review commenced in late 2016 with the release of a [Discussion Paper](#). The Discussion Paper requested submissions regarding viable alternative methods of measuring or accounting for LPG density that would comply with relevant performance requirements that support the retail sale of LPG. The National Measurement Institute (NMI) received nine submissions to the Discussion Paper, some of which have been made available on the NMI website along with this Response Paper.

The performance requirements relating to LPG dispensers will not change as a result of this review. However, greater flexibility will be provided to industry in demonstrating compliance with these requirements in order to reduce compliance costs and encourage innovation.

The National Measurement Institute

NMI is the Commonwealth Government agency responsible for the administration of the national trade measurement system. Key elements of this system are the pattern approval, verification and correct use of measuring instruments used for trade, including LPG dispensers.

The Outcomes

A principles-based approach

NMI is committed to adopting a [more principles-based approach](#) to the regulation of the national trade measurement system. This approach will allow industry flexibility to develop alternative and innovative methods of demonstrating compliance with outcomes-based performance requirements.

A principles-based approach does not change the performance requirements for measuring instruments used for trade, rather it recognises that there may be multiple ways of demonstrating compliance with those requirements. Guidance is provided below regarding some potential methods of demonstrating compliance in the case of LPG dispensers and the measurement of density.

NMI will accept applications for the pattern approval of LPG dispensers that comply with the relevant performance requirements.

NMI will not mandate the use of a specific technology as a means of demonstrating compliance. It remains the responsibility of the applicant to demonstrate compliance with the performance requirements over the range of operational and environmental conditions to which the LPG dispenser will be exposed. If it can be demonstrated that the design and operation of a LPG dispenser can reliably meet the requirements, it may be considered for approval.

With regards to the use of LPG dispensers for trade, it remains the responsibility of the individual or company using the LPG dispenser to ensure it is verified, used correctly and provides accurate measurement.

Performance requirements

NMI will maintain the performance requirements for LPG dispensers and the sale of LPG based on measurement. These are as follows:

- a) Where LPG is sold by volume, it must be sold by the amount of litres that it would occupy at a temperature of 15°C at equilibrium vapour pressure;
- b) The Accuracy Class applicable to LPG dispensers will be maintained as Class 1.0 in alignment with the international standard [OIML R 117](#);
- c) Correspondingly, the maximum permissible error (MPE) for the volumetric conversion device of the LPG dispenser will be maintained at $\pm 0.4\%$.

In addition, no change will be made to the [National Instrument Test Procedure](#) for LPG dispensers (NITP 10.1).

These requirements are established by and adopted from international standards and provide a level playing field for Australian businesses and consumers.

Guidance Material

The guidance provided below is intended to support industry in complying with the relevant performance requirements for LPG dispensers.

General

Stakeholder submissions to the recent Discussion Paper outlined some examples and circumstances where the performance requirements for LPG dispensers and the sale of LPG could reliably be achieved via methods other than currently considered for approval and implementation by NMI.

As a general rule, where the density of LPG supplied through a dispenser is of a known, constant value and not subject to change over time, it may not be necessary to directly measure the density of the LPG at the dispenser. However, if the density of LPG supplied through a dispenser is unknown or subject to change over time then it should be directly measured or accounted for using appropriate means. Variation in LPG density may result in unacceptable errors in the converted volume.

Direct measurement

NMI will continue to accept pattern approval applications for LPG dispensers that incorporate devices or instruments intended to directly measure the density of LPG passing through the dispenser. Current approvals for LPG dispensers include associated density measuring instruments and mass flow meters as means of directly measuring density.

Products

NMI will accept pattern approval applications for LPG dispensers designed and intended to dispense products with a known, stable density. In these cases a pre-set density value may be incorporated into the conversion device, removing the need for a means of directly measuring density in the dispenser. It is the responsibility of the individual or company using the LPG dispenser for trade to ensure that it is used in a manner that provides correct measure over its operational lifetime.

A number of submissions cited the example of LPG that consists of 'propane only', suggesting that as a defined product with minor variations in density, a direct measurement of density in the dispenser is not necessary. In this case, it may be reasonable that an appropriate pre-set density value (e.g. between 505 to 515 kg/m³) is used as part of the volumetric conversions performed by the dispenser.

Alternative dispenser designs

The review provided a number of conceptual examples of alternative LPG dispenser and system designs that could potentially meet all the relevant performance requirements. NMI welcomes the development of any new and innovative designs and methods. While such designs can be considered for pattern approval, it remains the responsibility of the applicant to demonstrate compliance with relevant requirements over the range of operational and environmental conditions to which the LPG dispenser will be exposed.

Where design changes are required to approved LPG dispensers, any such changes must be appropriately described either as a variant to an existing Certificate of Approval, or as the pattern of a new Certificate of Approval. All LPG dispensers used for trade must be of an approved pattern or approved variant as specified in a Certificate of Approval.

Compliance and Enforcement

NMI will continue to inspect and test LPG dispensers in accordance with current procedures. In support of the principles-based approach outlined in this paper, LPG dispensers will be the subject of ongoing NMI inspection and auditing programs in the coming years.

In order to be legally used for trade, LPG dispensers are required to be of an approved pattern, verified and operate within MPEs. LPG dispensers that do not meet these requirements when tested cannot be verified and cannot be used for trade.

Compliance Costs

Many submissions provided general information regarding the costs and benefits of the current requirements concerning LPG dispenser design and maintenance. NMI welcomes this information and has determined that a modest cost saving may be realised by the industry as a result of the adoption of a flexible, principles-based approach outlined above.

Contamination

Some submissions raised the issue of contamination of LPG supply. While NMI recognises this as an important issue, NMI does not have a direct role in the establishment and enforcement of LPG fuel quality standards. NMI recommends that concerns regarding contamination and quality be raised with the relevant authorities responsible for fuel quality standards.

Questions and Enquires

This review is now considered to be closed. Questions and enquiries regarding the outcome of this review and requirements pertaining to LPG dispensers may be sent to:

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Mail: Policy and Pattern Approval
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