



Australian Government
Department of Industry,
Innovation and Science

**National
Measurement
Institute**

Use of Near Infrared (NIR) instruments in the sugar industry for trade purposes

Consultation paper

Legal Metrology Branch

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www.measurement.gov.au

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Introduction

The National Measurement Institute (NMI) is seeking submissions from stakeholders on a proposal to implement trade measurement framework for the Near Infrared (NIR) instruments used by sugar industry for quality measurements.

Currently, NMI does not specify any trade measurement requirements for the NIR instruments used by sugar industry for quality measurements.

Background

What is trade measurement?

NMI, a division of the Australian Government Department of Industry, Innovation and Science, administers the *National Measurement Act 1960* (the Act).

The Act establishes a national system of units and standards of measurement and provides for their uniform use throughout Australia to ensure traceability of measurement.

The Act also regulates transactions involving measurement, including sales of measured quantities and packaged goods, and sets out specific requirements for measuring instruments used for trade.

Consistency and certainty in measurement supports fair and open competition. It provides a level playing field for business by ensuring that all market participants, irrespective of their size or financial strength, follow the same rules and have equal opportunity to compete.

A measuring instrument is being used for trade if it is used in determining the consideration in respect of a transaction or in determining the amount of a tax. In Australia, the Act requires that all measuring instruments used for trade must be pattern-approved and verified.

Pattern approval and Verification

Pattern approval confirms that a measuring instrument's design meets relevant documentary standards¹ and performs as intended over a range of environmental and operating conditions.

Manufacturers, importers and suppliers that wish to supply and sell trade measuring instruments in Australia are required to ensure those instruments have a pattern approval certificate from NMI. NMI examines the designs of instruments, including associated test results, against relevant standards and issues certificates for pattern approval that are internationally recognised. NMI may also appoint Approving Authorities to examine measuring instruments and produce test reports for pattern approval.

Verification tests the performance and accuracy of each instrument that has been pattern approved. NMI appoints servicing licensees to carry out verification of measuring instruments used for trade purposes in accordance with the test procedures specified by NMI.

Use of NIR instruments in the sugar industry

NMI has worked with the Australian sugar industry over many years to ensure measuring instruments that are used for trade measurements (e.g. weighing instruments, polarimeters and brix hydrometers) comply with the regulatory framework established under the Act.

¹ A documentary standard provides requirements, specifications, guidelines or characteristics that can be used consistently to ensure that materials, products, processes and services are fit for their purpose. (www.iso.org).

Use of NIR instruments in the sugar industry for trade purposes

In the recent years, the sugar industry has been trialling the use of NIR instruments to analyse sugarcane as an alternative method to the measurement of Pol, Brix and Fibre to determine sugar quality. The price per tonne of sugar cane supplied by the grower to the sugar mill is generally determined using long standing industry methods which rely on trade measurements for Pol % juice; Brix % Juice and Fibre. For this purpose the NIR instruments would be considered as measuring instruments in use for trade under the Act.

In 2018 NMI undertook an analysis of the use of NIR instruments for the measurements of Pol, Brix and Fibre, by the sugar milling industry. Shredded cane passes through the NIR instrument's sample window at the first mill, where it is subjected to NIR light spectrum. Depending on the composition of the sample differing values of NIR light is absorbed by the sample or reflected back to the NIR instrument which in turn is measured for the different wavelengths. The wavelength profile of the sampled cane is compared against a library of profiles to find the best fit. The profiles for corresponding values of Pol, Brix and Fibre in the library have been determined using trade approved measuring instruments (weighing instruments, polarimeters and brix hydrometers).

For NIR instruments to provide consistent and accurate measurements for Pol, Brix and Fibre there are two important considerations:

- The NIR measuring instrument's capability to accurately and consistently measure reflectance (absorbance) at different wavelengths using traceable reference standards (e.g. photometric standards); and
- The accuracy of NIR profiles to predict the quantities being measured (i.e. Pol, Brix or Fibre).

Proposed regulatory engagement

NMI proposes the following approach regarding the use of NIR instruments by sugar milling industry for trade purposes:

1. The development of a regulatory framework to support only the spectrometric analysis of cane sugar by NIR instruments, with the option for NIR instruments to be pattern approved and verified for measuring reflectance (absorbance) across NIR spectrum.
2. NMI assists industry in maintaining an auditable library of profiles to predict Pol, Brix and Fibre for sugar cane samples. (Note: These profiles would not be approved by NMI, but could be audited by NMI to ensure consistency of Pol, Brix and Fibre values against other approved instruments such as weighing instruments, polarimeters or brix hydrometer.)

Use of NIR instruments in the sugar industry for trade purposes

Providing Your Feedback

NMI invites stakeholders to take part in consultation on the proposed regulatory framework for NIR instruments used in the sugar industry for trade measurement of quality parameters.

Stakeholders are specifically invited to provide feedback and comment on the following questions:

1. **Do you agree with the proposed NMI's regulatory engagement?**
2. **What would be the benefits and risks to your business under the proposed regulatory framework for NIR instruments?**
3. **Do you think the proposed regulatory framework would result in any associated delay costs for your business? If yes, please provide details.**
4. **Are there any other impacts, both positive and negative to your business that would occur as a result of implementing this proposed regulatory framework? If yes, please provide details.**

The public consultation process will commence on **21 March 2019**, with the closing date for submissions and comments being **24 May 2019**.

Your submission must reach NMI by 11:59 PM AEST on **24 May 2019**.

The Department prefers responses to the consultation paper are submitted online through the Department's consultation hub at <https://consult.industry.gov.au/national-measurement-institute/nir-instruments-sugar-industry-regulatory-approach>

You can provide answers to the questions through an online survey or by uploading a written submission. Attachments providing supporting evidence may also be included.

Alternatively, submissions can be made via our Offline consultation form and submitted by:

- email to NMILegalMetrologyPolicy@measurement.gov.au, with the subject heading 'NIR Consultation' and your company or individual name; or
- post to Legal Metrology Branch, National Measurement Institute, GPO Box 2013, Canberra ACT 2601, marked Attention: 'NIR Consultation'

All information (including name and address) contained in formal submissions may be made available to the public on the Department's consultation hub following the close of submissions, unless you request for your submission to be treated confidentially.

For this purpose, automatically generated confidentiality statements in emails will not be viewed as a request to consider your submission as confidential.

Providing a confidential submission

If you wish to make a confidential submission, please specify this requirement when providing feedback.

A request made under the Freedom of Information Act 1982 (Cth) for a submission marked 'confidential' to be made available will be determined in accordance with this Act.

You can read a full Privacy Collection Statement in the Online submission area or Offline submission form available on the consultation hub: <https://consult.industry.gov.au/national-measurement-institute/nir-instruments-sugar-industry-regulatory-approach>