Australian Government

Department of Industry, Science and Resources

National Measurement Institute

36 Bradfield Road, West Lindfield NSW 2070

Certificate of Approval

NMI 15/1/5

Issued by the Chief Metrologist under Regulation 60
of the
National Measurement Regulations 1999

This is to certify that an approval for use for trade has been granted in respect of the instruments herein described.

Perten Instruments Model Inframatic IM 9500 Grain Protein Measuring Instrument

submitted by   Perten Instruments of Australia Pty Ltd
                             Unit 13, 2 Eden Park Drive
                             Macquarie Park   NSW   2113.

NOTE: This Certificate relates to the suitability of the pattern of the instrument for use for trade only in respect of its metrological characteristics. This Certificate does not constitute or imply any guarantee of compliance by the manufacturer or any other person with any requirements regarding safety.

This approval has been granted with reference to document NMI M 8, *Pattern Approval Specifications for Protein Measuring Instruments for Grain*, dated July 2004.

This approval is subject to review at the decision of the Chief Metrologist in accordance with the conditions specified in the document NMI P 106.

DOCUMENT HISTORY

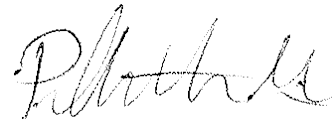| Rev	Reason/Details	Date
0	Pattern & variant 1 approved – certificate issued	31/08/12
1	Pattern & variant 1 amended (software) – certificate issued	9/11/12
2	Variant 2 provisionally approved – interim certificate issued	18/10/16
3	Variant 2 approved – certificate issued	5/01/17
4	Variant 2 amended (software) – certificate issued	21/05/18
5	Variant 3 approved – certificate issued	01/05/20
6	Variants 4 & 5 approved & test procedure amended – certificate issued	13/01/21
7	Variant 6 approved & test procedure amended – certificate issued	17/04/25

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI 15/1/5' and only by persons authorised by the submittor.

It is the submittor's responsibility to ensure that all instruments marked with this approval number are constructed as described in the documentation lodged with the National Measurement Institute (NMI) and with the relevant Certificate of Approval and Technical Schedule. Failure to comply with this Condition may attract penalties under Section 19B of the National Measurement Act and may result in cancellation or withdrawal of the approval, in accordance with document NMI P 106.

Auxiliary devices used with this instrument shall comply with the requirements of General Supplementary Certificates No S1/0/A or No S1/0B.

Signed by a person authorised by the Chief Metrologist to exercise their powers under Regulation 60 of the *National Measurement Regulations 1999.*

Phillip Mitchell
A/g Manager
Policy and Regulatory Services

TECHNICAL SCHEDULE No 15/1/5

1. Description of Pattern   approved on 31/08/12

A Perten Instruments model Inframatic IM 9500 grain protein measuring instrument (Figure 1) used to determine the protein content of a whole grain sample of barley or wheat.

The model Inframatic IM9500 is fitted with a colour LCD touch screen display/ keyboard.

Instruments are approved for use over a temperature range of 5 °C to 40 °C and must be so marked.

1.1 Design

The model Inframatic IM 9500 instrument automatically determines the protein content of a sample of grain, and displays the value in increments of 0.1%, by passing a monochromatic light beam through the sample and to a detector; the detected signal is amplified and processed by the internal computer. Results are displayed on the LCD touch screen and may also be printed via an USB output to an external printer.

1.2 Interfaces

Instruments may be fitted with interfaces as follows:

(a)   An Ethernet interface for data communication.

(b)   Four USB interfaces for the connection of peripheral devices.

1.3 System Software

Instruments are fitted with Windows XP embedded Standard Service pack 3 software and Perten Infragrain measurement software 5.1.0.xxxx. The measurement software version is displayed at the login window.

1.4 Descriptive Markings

Instruments carry the following markings:

Manufacturer's mark, or name written in full	Perten Instruments AB Sweden
Name or mark of manufacturer's agent	Perten Instruments of Australia Pty Ltd
Pattern approval mark for the instrument	NMI 15/1/5
Model designation	....
Serial number of the instrument	....
Approved operating range	...... to .....% protein
Scale interval	..............%
Grain type	....
Special temperature limits	5 °C to 40 °C
Power supply	230 VAC, 50 Hz

1.5 Verification Provision

Provision is made for the application of a verification mark.

1.6   Sealing Provision

Provision is made for sealing the calibration adjustments by a password, and evidence of alteration of the calibration model and configuration is provided by an audit trail.

The value of event counter may be recorded on a destructible adhesive label attached to the instrument (e.g. as #XXXX).

Any subsequent alteration to the calibration or configuration will be evident as the recorded value and the current counter value will differ.

(i)   Password

Normal operation of the instrument is in 'Operator Level'. Alteration of calibration model/configuration may only be carried out in 'Supervisor Level', and a password is required to enter this level.

(ii)   Evidence of calibration model/configuration alteration (audit trail)

The audit trail records each change to the calibration model/configuration and its parameters, including all information from the creation to the latest modifications. Access to the audit trail may be obtained by the following procedure:

a)   In the operation window, select '**Options/Adv. Options/Settings**' buttons.

b)   Select '**Audit Trail**' tab to view the audit trail information (Figure 2).

2.   Description of Variant 1   approved on 31/08/12

The model Inframatic IM 9500 HLW/TW (Figure 3) which is similar to the pattern but having a weighing module for determination of hectolitre weight in kg/hL. The weight result is for information purposes only and is not for trade use.

3.   Description of Variant 2   provisionally approved on 18/10/16
                                                                           approved on 5/01/17
                                                                           amended on 21/05/18

A Perten Instruments model Inframatic IM 9500 Plus grain protein measuring instrument which is similar to the pattern but has a different PC module and has a different touch screen display (Figure 4).

Instruments are approved for use over:

* an operating range of 6.6 to 16% protein for wheat and with a scale interval of 0.1%
* an operating range of 7.2 to 15.6% protein for barley and with a scale interval of 0.1%
* an operating temperature range of 5 °C to 40 °C

which must be so marked.

3.1   System Software

Instruments are fitted with Windows 7 Professional Service Pack 1 software and Perten Results Plus measurement software.

The identification of Perten Results Plus measurement software may be 3.5.yyyyy or 3.7yyyyy.

The measurement software version is displayed by pressing the 'About' button in the Home window.

3.2 Sealing Provision

Provision is made for sealing the calibration adjustments by a password, and evidence of alteration of the calibration model and configuration is provided by an audit trail.

The audit trail records each change to the calibration model/configuration and its parameters, including all information from the creation to the latest modifications. Access to the audit trail may be obtained by the following procedure:

a) In the Home window, select the '**Reporting**' icon.

b) Press the '**Audit Trail**' button to enter the audit trail search window.

c) Set the filter dates to search the audit trail information.

4 Description of Variant 3   approved on 01/05/20

Instruments which are similar to variant 2 but fitted with Win 10 IoT Enterprise operating system, Microsoft SQL Server 2014 Express SP3 and Perten Results Plus measurement software version 3.13.yyyyy.

The measurement software version is displayed by pressing the 'About' button in the Home window.

Instruments may also be known as PerkinElmer model Inframatic IM 9500 Plus.

4.1 Additional Features

Instruments may be fitted with a number of functions for analysis of additional products. The additional functions (other than the indications of measured protein content of whole grain of barley or wheat either on the indicator or on an auxiliary or peripheral device) are not approved for trade use.

5 Description of Variant 4   approved on 13/01/21

The model Inframatic IM 9500 HLW/TW Plus (Figure 5) which is similar to variant 2 but having an integral Test Weight Module to automatically determine the bulk density of a sample of barley or wheat grain by weighing a sample packed in the test cell. Results are displayed on the LCD touch screen display.

The Test Weight Module has a cylindrical test cell of a fixed volume of 0.47 litres directly supported by a single Tedea Huntleigh model 1022 C3 load cell of 5 kg maximum capacity.

Instruments are approved for use over:

•   an operating range of up to 50 to 93 kg/hL with a scale interval of 0.1 kg/hL;

•   an operating temperature range of 5 °C to 40 °C.

5.1 Verification Provision

The instrument can be verified for trade use to measure both protein and density or alternatively to only measure protein or only density. Instruments which are verified to only measure one aspect shall be marked with a notice near the display, stating which measurement is NOT approved for trade use, e.g. 'The protein measurement is not approved for trade use' or similar.

The instrument shall only be marked with one verification mark.

5.2   Descriptive Markings and Notices

Instruments carry the following markings:

Manufacturer's mark, or name written in full	Perten Instruments AB Sweden
Name or mark of manufacturer's agent	Perten Instruments of Australia Pty Ltd
Pattern approval mark for the instrument	NMI 15/1/5
Model designation	....
Serial number of the instrument	....
Approved operating range	...... to .....% protein
Scale interval	..............%
Density operating range	.... kg/hL
Density scale interval	.... kg/hL
Grain type	....
Special temperature limits	5 °C to 40 °C
Power supply	100 - 240 VAC, 50/60 Hz

5.3   System Software

Instruments are fitted with Win 10 IoT Enterprise operating system, Microsoft SQL Server 2014 Express SP3 and Perten Results Plus measurement software version 3.15.yyyyy, where 'yyyyy' refers to the identification of non-legally relevant software.

The measurement software version is displayed by pressing the 'About' button in the Home window.

6   Description of Variant 5   approved on 13/01/21

Instruments which are similar to variant 3 but fitted with Perten Results Plus measurement software version 3.15.yyyyy, where 'yyyyy' refers to the identification of non-legally relevant software.

The measurement software version is displayed by pressing the 'About' button in the Home window.

7   Description of Variant 6   approved on 17/04/25

The models Inframatic IM 9500 Plus and Inframatic IM 9500 HLW/TW Plus measuring instruments now with an alternative touchscreen display and updated circuit boards (Figure 6).

Instruments are fitted with Windows 10 IoT Enterprise LTSC 21H2 operating system, Microsoft SQL Server 2022 Express and Perten Results Plus measurement software version 3.28.yyyyy, where 'yyyyy' refers to the identification of non-legally relevant software.

The measurement software version is displayed by pressing the 'About' button in the Home window.

TEST PROCEDURE No 15/1/5

Protein Measurement

Instruments shall be tested in accordance with National Instrument Test Procedures NITP 15.1: measuring instruments for grain quality protein measuring instruments.

Maximum Permissible Errors

The maximum permissible errors are specified in Schedule 1 of the *National Trade Measurement Regulations 2009*.

Ensure that instruments are only being used within the special temperature limits stated elsewhere in this Technical Schedule.

The serial number of the measuring instrument shall be recorded at the time of any verification.

Density Measurement

Measures shall be tested when standing on a level surface.

Any trade approved weighing instrument with a verification scale interval of 0.1 g or better may be used to weigh grain captured in a reference chondrometer and to provide mass information for bulk density determination calculations. The weighing instrument shall be verified.

Bulk density of grain is normally expressed in kg/hL; care needs to be exercised during volume to bulk density calculations to take account of the volume (0.5 or 1.0 L) of the measure.

Volume to Density Conversion Factors

$$Bulk\ density\ (kg/hL) = \frac{Mass\ of\ grain\ captured\ (in\ kg)}{Volume\ of\ measuring\ container\ (in\ L)} \times 100$$

$$Bulk\ density\ (kg/hL) = \frac{Mass\ of\ grain\ captured\ (in\ g)}{Volume\ of\ measuring\ container\ (in\ L)} \times 0.1$$

Bulk density (kg/hL) = Mass of grain captured (g) × 0.2   (for 0.5 L container)

Bulk density (kg/hL) = Mass of grain captured (g) × 0.1   (for 1 L container)

Maximum Permissible Error

Verification of the instrument shall be carried out by comparison with a reference chondrometer (instruments designated as either Franklin, Kern or Schopper are acceptable).

The procedure shall be carried out using samples of barley and wheat grain that are free from impurities and under the same ambient conditions of temperature and humidity where measurements are normally made.

Take one test sample large enough to fill the filling hopper of the reference chondrometer and the test cell of the Test Weight Module.

Carry out five measurements on the reference chondrometer; carry out five measurements on the instrument using the same test sample of grain (#). For each measurement, determine the density of the sample of grain. The mean value of the density should then be determined for both the instrument and the reference chondrometer.

The discrepancy of the two mean values shall be within ±0.5 kg/hL.

(#) The difference between the highest and lowest value of the density shall not exceed 0.5 kg/hL
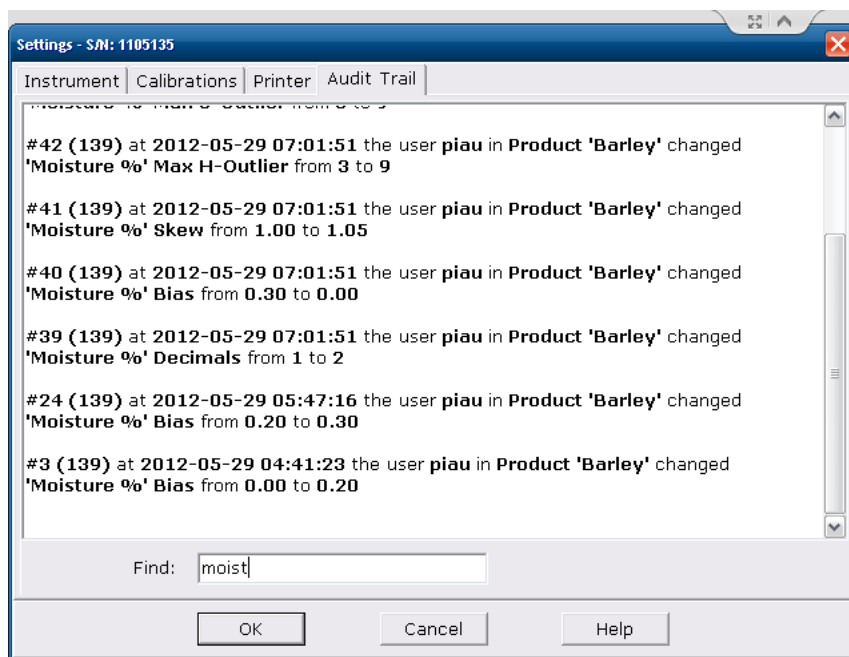
Ensure that instruments are only being used within the special environment limits stated elsewhere in this Technical Schedule.

FIGURE 15/1/5 – 1

Perten Instruments Model Inframatic IM 9500 Grain Protein Measuring Instrument

FIGURE 15/1/5 – 2

Audit Trail Information

FIGURE 15/1/5 – 3

Perten Instruments Model Inframatic IM 9500 HLW/TW

FIGURE 15/1/5 – 4

Perten Instruments Model Inframatic IM 9500 Plus

FIGURE 15/1/5 – 5

Perten Instruments Model Inframatic IM 9500 HLW/TW Plus

FIGURE 15/1/5 – 6

Perten Instruments Models Inframatic IM 9500 HLW/TW Plus and
Inframatic IM 9500 Plus with New Touchscreen

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