Australian Government
National Measurement Institute
Bradfield Road, West Lindfield NSW 2070

Certificate of Approval

No 15/1/4

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

Bruker Optics Model Matrix-I FT-NIR Spectrometer

submitted by Bruker Optik GmbH
Rudolf-Plank-Str. 27
76275 Ettlingen
GERMANY

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 M8, *Pattern Approval Specifications for Protein Measuring Instruments for Grain*, dated July 2004.

CONDITIONS OF APPROVAL

This approval becomes subject to review on 1 March 2015, and then every 5 years thereafter.

Instruments purporting to comply with this approval shall be marked with approval number ‘NMI 15/1/4’ 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.

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The National Measurement Institute reserves the right to examine any instrument or component of an instrument purporting to comply with this approval.

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

DESCRIPTIVE ADVICE

Pattern: approved 15 February 2010

- A Bruker Optics model Matrix-I FT-NIR Spectrometer used to determine the protein content of a whole grain sample of barley or wheat grain.

Technical Schedule No 15/1/4 describes the pattern.

FILING ADVICE

The documentation for this approval comprises:

Certificate of Approval No 15/1/4 dated 3 August 2010
Technical Schedule No 15/1/4 dated 3 August 2010 (incl. Test Procedure)
Figures 1 and 2 dated 3 August 2010

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

TECHNICAL SCHEDULE No 15/1/4

Pattern: Bruker Optics Model Matrix-I FT-NIR Spectrometer

Submittor: Bruker Optik GmbH
Rudolf-Plank-Str. 27
76275 Ettlingen GERMANY

1. Description of Pattern

The pattern is a Bruker Optics model Matrix-I FT FT-NIR Spectrometer (Figure 1) used to determine the protein content of a whole grain sample of barley or wheat.

The Bruker Optics model Matrix-I FT FT-NIR Spectrometer consists of a spectrometer and a personal computer (PC). The instrument automatically determines the protein content of a sample of grain in increments of 0.1%.

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 Matrix-I FT Spectrometer uses a lead sulphide (PbS) detector to collect the radiation scattered by the grain sample in the integrating sphere; the detected signal is converted to digital format and provided to the PC running OPUS software. The PC processes the data and determines the protein content of a whole grain sample. The result is displayed on the PC screen.

1.2 Interfaces

Instruments may be fitted with interfaces as follows:

(a) A COM port and a LPT port for the connection of peripheral devices.

(b) An MPE port for the connection of external optical modules and detectors. (Note that any measurements produced by these modules are for information purposes only and are not for trade use).

(c) A CAN-bus and an Ethernet interface for data communication.

1.3 System Interface/Operation Personal Computer

The instrument uses a personal computer running OPUS version 6.5.SP2 software (#) for the operation of the system.

1.4 Indication – OPUS LAB Software

The instrument uses OPUS LAB (#) software to perform routine analysis of the received protein and moisture information. The OPUS LAB software provides the operator interface of the instrument and performs the following functions during the analysis operation:

- Analysis of NIR spectra provided by the Matrix-I Spectrometer;
- Prediction of the protein and moisture contents of the grain sample;
- Form and display a set of evaluation results which may be used for trade;
- Log the results to the specified folder on the PC.

The measurement results may in addition be provided to another computer system via a computer network.

(#) Later versions of the OPUS and OPUS LAB software may be used provided that any updates do not affect any aspect related to the approval of the pattern.

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1.3 Descriptive Markings

Instruments carry the following markings:

Manufacturer's mark, or name written in full	Bruker Optik GmbH
Name or mark of manufacturer's agent	Bruker Biosciences Pty Ltd
Pattern approval mark for the instrument	15/1/4
Model designation	Matrix-I
Serial number of the instrument	.....
Approved operating range	..... to .....% protein
Scale interval	.....%
Grain type	.....
Special temperature limits	5°C to 40°C
Power supply	240 V AC, 50 Hz

1.4 Sealing Provision

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

(i) Password

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

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

The method audit trail records each change to the calibration model 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 main OPUS window, on the '**Validation'** menu, select '**Methods**'. The '**Methods - Add signature/Show History**' menu which then appears provides for printing and viewing of the audit trail.

b) In the method list, select '**Quant 2 Method (*q2)**', and then click '**Load method**' button.

c) Select '**History**' tab to view/print the audit trail information (Figure 2).

1.5 Verification Provision

Provision is made for the application of a verification mark.

TEST PROCEDURE

Instruments tested for initial verification shall comply with the certificate of approval and technical schedule, and the maximum permissible errors for initial and subsequent verifications/certifications at the operating conditions in effect at the time of verification.

Instruments shall comply with the requirements of, and shall be tested in conjunction with any relevant tests in, the document NMI M8, *Pattern Approval Specifications for Protein Measuring Instruments for Grain*, dated July 2004.

Maximum Permissible Errors at Verification/Certification

The maximum permissible errors applied during a verification/certification test are:

±0.5% of the quantity of barley measured; and

±0.4% of the quantity of wheat measured.

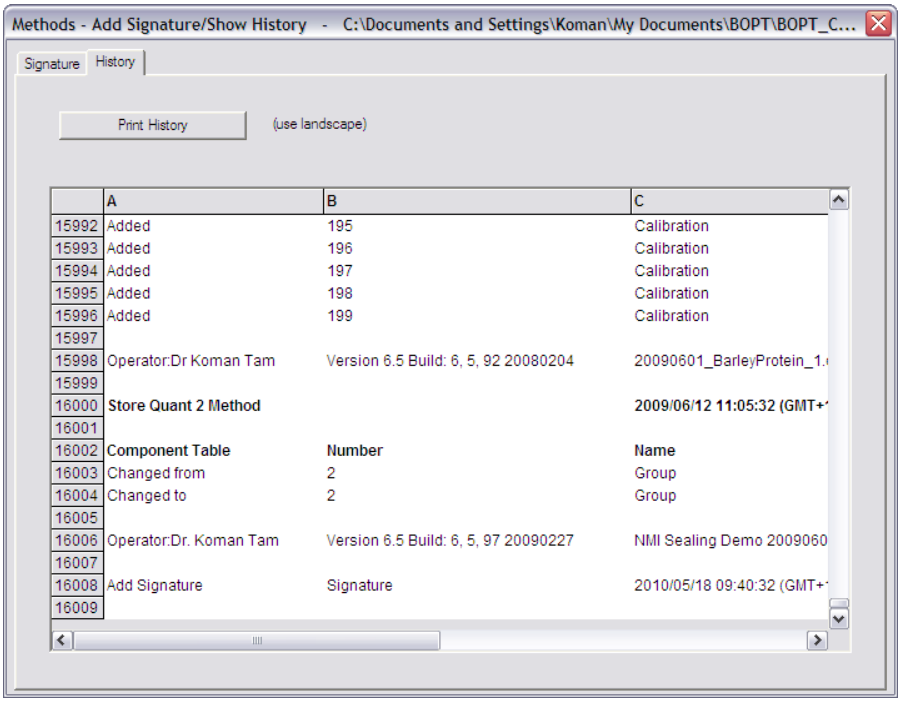
Ensure that instruments are only being used within the special temperature limits stated elsewhere in this Technical Schedule.

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

FIGURE 15/1/4 – 1

Bruker Optics Model Matrix-I FT-NIR Spectrometer

FIGURE 15/1/4 – 2



	A	B	C
15992	Added	195	Calibration
15993	Added	196	Calibration
15994	Added	197	Calibration
15995	Added	198	Calibration
15996	Added	199	Calibration
15997			
15998	Operator:Dr Koman Tam	Version 6.5 Build: 6, 5, 92 20080204	20090601_BarleyProtein_1.
15999			
16000	**Store Quant 2 Method**		**2009/06/12 11:05:32 (GMT+**
16001			
16002	**Component Table**	**Number**	**Name**
16003	Changed from	2	Group
16004	Changed to	2	Group
16005			
16006	Operator:Dr. Koman Tam	Version 6.5 Build: 6, 5, 97 20090227	NMI Sealing Demo 2009060
16007			
16008	Add Signature	Signature	2010/05/18 09:40:32 (GMT+
16009			

Audit Trail Information