Australian Government
National Measurement Institute

Bradfield Road, West Lindfield NSW 2070

Certificate of Approval

No 6/14B/17

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

Bűhler Model MEAF DUMP MSDL-160 Discontinuous Totalising Automatic Weighing Instrument

submitted by Weston Cereal Industries
1 Braidwood Street
Enfield NSW 2136.

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 R 107, *Discontinuous Totalising Automatic Weighing Instruments (Totalising Hopper Weighers)*, dated July 2004.

CONDITIONS OF APPROVAL

This approval becomes subject to review on 1 April 2012, and then every 5 years thereafter.

Instruments purporting to comply with this approval shall be marked with approval number 'NMI 6/14B/17' and only by persons authorised by the submittor.

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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.

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.

The values of the performance criteria (maximum number of scale intervals etc.) applicable to the instrument shall be within the limits specified herein and in any approval documentation for the components where they are approved separately.

This approval shall NOT be used in conjunction with General Certificate No 6B/0.

DESCRIPTIVE ADVICE

Pattern: approved 19 March 2007

- A Bűhler model MEAF DUMP MSDL-160 Class 0.5 discontinuous totalising automatic weighing instrument of 120 kg maximum capacity.

Technical Schedule No 6/14B/17 describes the pattern.

FILING ADVICE

The documentation for this approval comprises:

Certificate of Approval No 6/14B/17 dated 14 August 2007
Technical Schedule No 6/14B/17 dated 14 August 2007 (incl. Test Procedure)
Figures 1 to 4 dated 14 August 2007

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 6/14B/17

Pattern: Bűhler Model MEAF DUMP MSDL-160 Discontinuous Totalising Automatic Weighing Instrument

Submittor: Weston Cereal Industries
1 Braidwood Street
Enfield NSW 2136

1. Description of Pattern

A Bűhler model MEAF DUMP MSDL-160 Class 0.5 discontinuous totalising automatic weighing instrument of 120 kg maximum capacity.

Note: The following description is intended to introduce terms used in this Certificate and Technical Schedule which may be additional to those in the document This approval has been granted with reference to document NMI R 107, *Discontinuous Totalising Automatic Weighing Instruments (Totalising Hopper Weighers)*, dated July 2004 but which are consistent with the terminology in that document.

The system aims to provide a *bulk load delivery* of close to a requested amount (*target totalised load*) using a particular *delivery sequence*.

This sequence involves the totalisation of the results of a number of *discrete load deliveries* or *weighing cycles*, each of which involves the division of the bulk product into *discrete loads*, according to a *target discrete load* the mass of which is then determined by weighing to give the *discrete load delivered* following which the product is discharged to the bulk output. Note that the *target discrete load* may be achieved by stopping or slowing the bulk product delivery prior to the *target discrete load* value being reached according to *discrete load target shutoff adjustments* (such as inflight adjustments or slow flow pre-sets).

Each *discrete load delivered* is totalised (at any time this may be termed the *cumulative totalisation*).

The *target discrete load* is generally a pre-selected value that is the same for most of the *discrete load deliveries* (this may be termed the *pre-selected target discrete load*). However for the final one or two deliveries in the *bulk load delivery* the *target discrete load* may differ (for example to avoid excessively large or small *discrete loads*). In addition, arrangements for stopping or slowing the bulk product delivery prior to the *target discrete load* value being reached may vary for the final discrete deliveries in the delivery sequence according to *target totalised load shutoff adjustments* (such as inflight adjustments or slow flow pre-sets). These adjustments or pre-sets are generally aimed at achieving a *totalised bulk load delivered* which is as close as possible to the *target totalised load*.

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The *totalised bulk load delivered* is the cumulative totalisation (sum of all discrete loads delivered), in the complete *bulk load delivery*. The transaction is based on the *totalised bulk load delivered* (not the *target totalised load*).

1.1 Details

The instrument is a Class 0.5 discontinuous totalising automatic weighing instrument with a minimum and maximum capacity (for the *target discrete load*) of 120 kg. The instrument is approved for use with a minimum totalised load (Σ_{min}) of not less than 120 kg and a totalisation scale interval of 0.1 kg.

1.2 Weighing System

The pattern (Figures 1 and 2) comprises:

(a) A Bűhler model MSDL hopper-type weigh bin directly supported by three symmetrically-located load cells (Figures 1 and 2);

(b) Three HBM model Z6F C3/200 kg load cells of 200 kg maximum capacity mounted as shown in Figure 2; and

(c) A Bűhler model MEAF digital indicator (Figure 3).

Note: Ducting/containment arrangements for delivery of material and handling of the displaced air can influence instrument performance. (see the Note in Test Procedure)

1.3 Indicator

The Bűhler model MEAF digital indicator controls the measurement functions, totalising, process starting and stopping, upper and lower gate controls, gate limit switches, and alarm functions. In normal operation the measurement data is entered and read on the operator's personal computer located in the control room.

1.4 Operation

The automatic weighing cycle is started with the weigh bin empty. The bin is then filled with product and weighed; after emptying, the bin is weighed again. The difference in the two weighings is the *delivered load.* The instrument operating parameters, such as *target discrete load*, *target totalised delivery*, and *shutoff adjustments*, are programmed via the keyboard on the indicator. The delivery sequence may be initiated locally at the instrument, or remotely via the operator's personal computer.

1.5 Markings and Notices

(a) Instruments carry the following markings, grouped together in a clearly visible place on the instrument, either on a descriptive plate fixed near the indicating device or on the indicating device itself:

Manufacturer's mark, or name written in full	Bűhler Australia Pty Ltd
Indication of accuracy class	0.5
Pattern approval mark for the instrument	6/14B/17
Model number	MEAF DUMP MSDL-160
Serial number	.....
Maximum capacity	*Max* = 120 kg *
Minimum capacity	*Min* = 120 kg *
Minimum totalised load	Σ_{min} = 120 kg *
Totalisation scale interval	d_t = 0.1 kg
Serial number of the instrument	.....
Material to be measured	.....

* These markings shall also be shown near the display of the result if they are not already located there.

(b) Instruments carry a notice visible to the operator stating TARGET LOAD SHALL BE 120 kg ONLY, or similar wording. (This refers to the *target discrete load*.)

1.6 Verification/Certification Provision

Provision is made for the application of a verification/certification mark.

1.7 Sealing Provision

Provision is made for the calibration adjustments in the indicator (protected by internal switch) to be sealed by means of the method shown in Figure 4.

TEST PROCEDURE

Instruments shall be tested in conjunction with any relevant tests specified in the Uniform Test Procedures.

Maximum Permissible Errors

For a class 0.5 instrument, the maximum permissible errors (MPE) applicable are the values below as a percentage of the mass of the totalised load rounded to the nearest totalisation scale interval. Maximum permissible errors apply to loads not less than the minimum totalised load (Σ_{min})

±0.25% for initial verification; and
±0.5% in-service.

Note: Any alteration to the ducting/containment arrangements may necessitate re-verification/certification at the discretion of the relevant trade measurement authority.

Test Procedure

The test procedures to be used are based on NMI R 107, *Discontinuous Totalising Automatic Weighing Instruments (Totalising Hopper Weighers)*, dated July 2004.

The following assumes use of the separate verification method. Care shall be taken to ensure that the control instrument and its method of use are adequate, in accordance with NMI R 107.

Note: Practical circumstances for particular installations may necessitate variations to this test procedure. Such variations shall only be implemented with the agreement of the appropriate trade measurement authority.

1. Tests

Carry out testing with *target discrete loads* and *target totalised loads* determined as follows.

(i) Deliveries with target discrete load of Max

From the intended Σ_{min} and the Max value, calculate $N_{(max)}$, the number of weighing cycles required to deliver the minimum totalised load when operating with discrete loads of Max.

Where $N_{(max)}$ is 5 or more, one delivery shall be carried out with a target discrete load of Max – the quantity of the test load (target totalised load) shall be Σ_{min}.

Where $N_{(max)}$ is less than 5, two deliveries shall be carried out with the target discrete load set to Max, as follows:

- one with a test load (target totalised load) of Σ_{min}; and
- another with a test load (target totalised load) of 5 × Max.

(ii) Deliveries with target discrete load of Min

Similarly, from the intended Σ_{min} and the Min value, calculate $N_{(min)}$, the number of weighing cycles required to deliver the minimum totalised load when operating with discrete loads of Min.

Where $N_{(min)}$ is 5 or more, one delivery shall be carried out with a target discrete load of Min – the quantity of the test load (delivery) shall be Σ_{min}.

If $N_{(min)}$ is less than 5, two deliveries shall be carried out with the target discrete load set to Min, as follows:

- one with a test load (target totalised load) of Σ_{min}; and
- another with a test load (target totalised load) of 5 × Max.

(iii) Additional test if the procedure indicates less than three tests

In some cases the above procedure may indicate only two tests to be performed. If this is the case an additional test is carried out (to achieve a total of three material tests). For this test, the test load (target totalised load) is to be Σ_{min} with the instrument operating with target discrete loads of a value which is typical for the installation (if it is difficult to arrive at a typical value use Min).

Note: For some types of instrument the quantity delivered must be an integer multiple of the discrete load, whereas for other instruments this is not required. In the former case unless the minimum totalised load is an integer multiple of the discrete load, it may be necessary to use the next larger possible test load (which is an integer multiple of the discrete load).

(iv) Tests – to be repeated for each delivery as determined above

(a) Start the weighing system, including surrounding equipment that is normally in use when the weighing instrument is in use.

(b) Set the *target discrete load* and *target totalised load* (as determined above).

(c) Set the instrument to the maximum rate of weighing cycles per hour.

(d) Initiate the delivery, ensuring that all delivered material is collected.

(e) Once the delivery is complete record the totalised load indicated by the instrument.

(f) Transport the delivered material to the control instrument and weigh it.

(g) Calculate the relative error, as follows:

$$Error = \frac{control\ instrument\ indication - instrument\ totalised\ load \times 100}{control\ instrument\ indication}$$

The relative error shall be within the MPE for each delivery.

(v) Additional tests with other products

Where the instrument is used with products of different characteristics, additional tests shall be carried out for the range of products used.

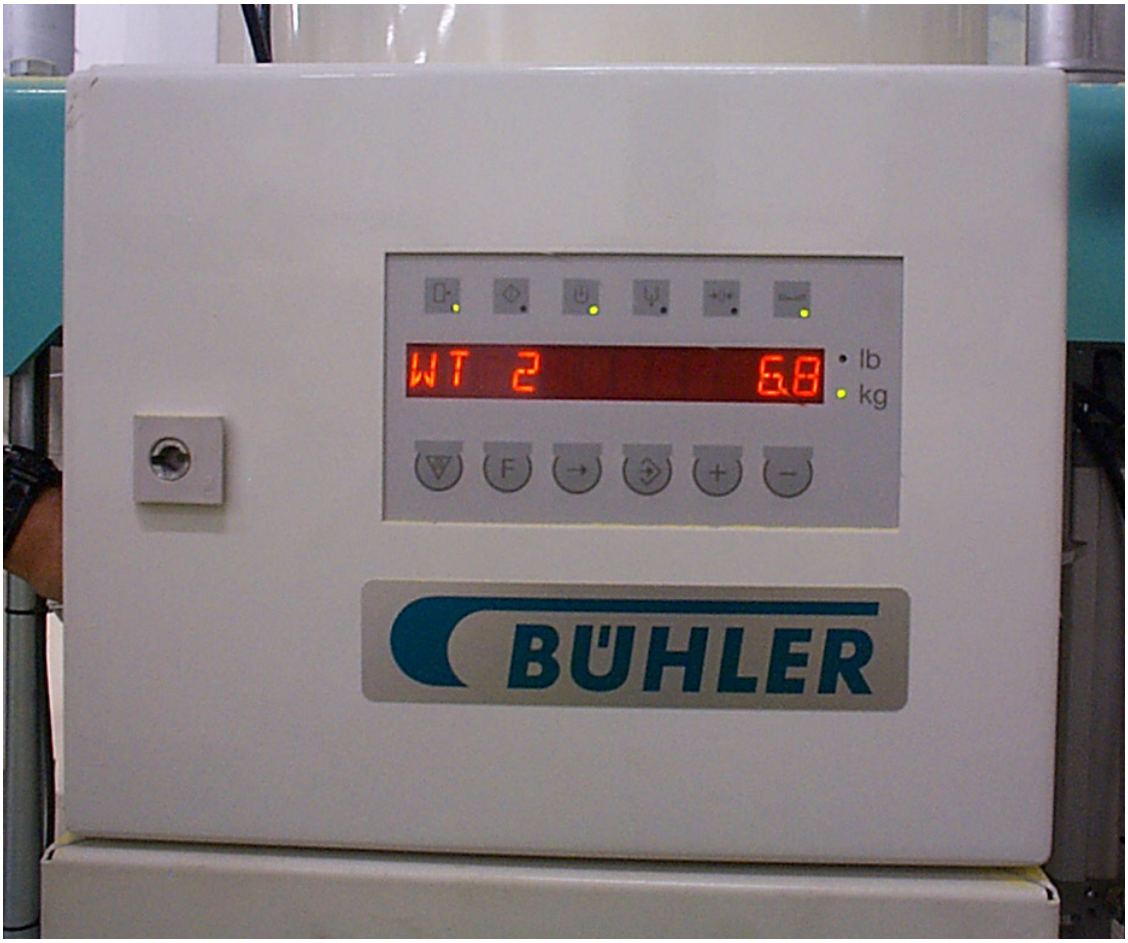
FIGURE 6/14B/17 – 1

Bűhler Model MEAF DUMP MSDL-160 Weighing Instrument

FIGURE 6/14B/17 – 2

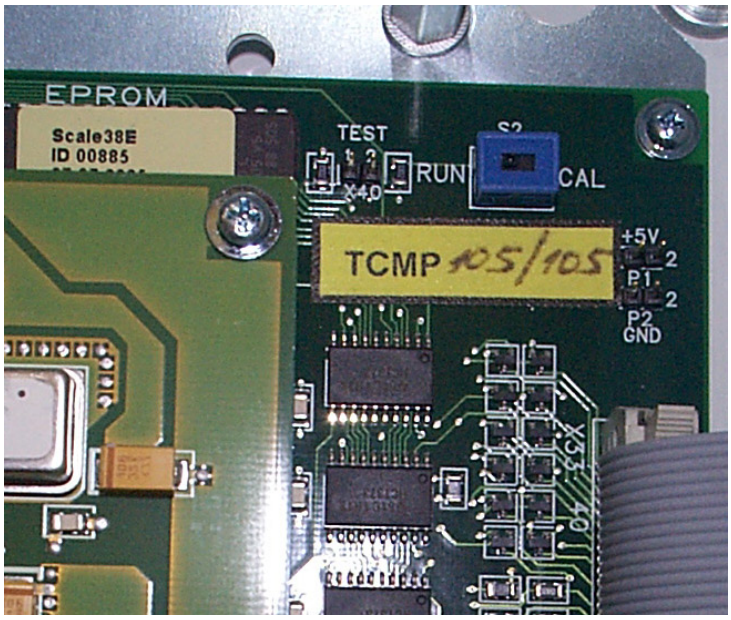
Load Cell Mounting

FIGURE 6/14B/17 – 3

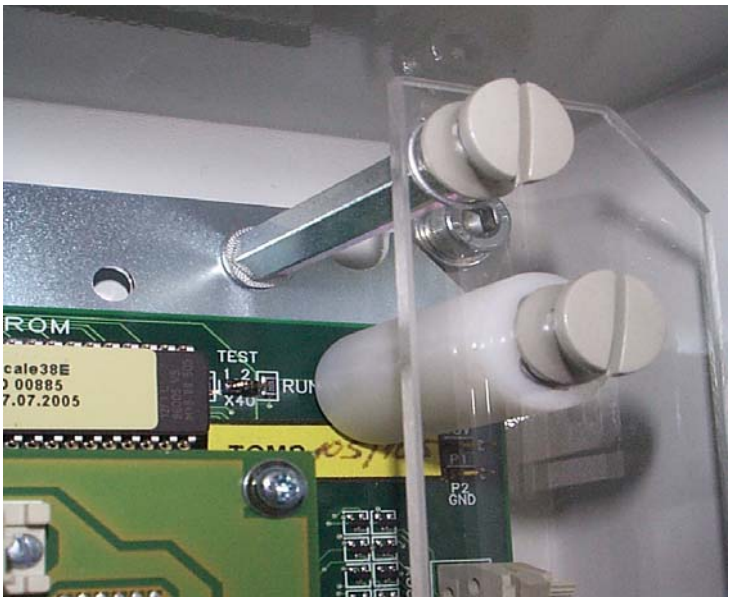


Bűhler Model MEAF Digital Indicator

FIGURE 6/14B/17 – 4



Calibration Switch (Unsealed)



Plastic Cover and Sealable Screws Over Calibration Switch