INTERNATIONAL RECOMMENDATION

OIML R 146-3

Edition 2016 (E)

Protein measuring instruments for cereal grain and oilseeds

Part 3: Test report format

Instruments de mesure de protéine pour grains de céréales et graines oléagineuses

Partie 3: Format du rapport d'essais

ORGANISATION INTERNATIONALE DE MÉTROLOGIE LÉGALE

INTERNATIONAL ORGANIZATION OF LEGAL METROLOGY

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Foreword

The International Organization of Legal Metrology (OIML) is a worldwide, intergovernmental organization whose primary aim is to harmonize the regulations and metrological controls applied by the national metrological services, or related organizations, of its Member States.

The main categories of OIML publications are:

- **International Recommendations (OIML R),** which are model regulations that establish the metrological characteristics required of certain measuring instruments and which specify methods and equipment for checking their conformity. OIML Member States shall implement these Recommendations to the greatest possible extent;
- **International Documents (OIML D),** which are informative in nature and which are intended to harmonize and improve work in the field of legal metrology;
- **International Guides (OIML G),** which are also informative in nature and which are intended to give guidelines for the application of certain requirements to legal metrology; and
- **International Basic Publications (OIML B),** which define the operating rules of the various OIML structures and systems.

OIML Draft Recommendations, Documents and Guides are developed by Project Groups linked to Technical Committees or Subcommittees which comprise representatives from the Member States. Certain international and regional institutions also participate on a consultation basis. Cooperative agreements have been established between the OIML and certain institutions, such as ISO and the IEC, with the objective of avoiding contradictory requirements. Consequently, manufacturers and users of measuring instruments, test laboratories, etc. may simultaneously apply OIML publications and those of other institutions.

International Recommendations, Documents, Guides and Basic Publications are published in English (E) and translated into French (F) and are subject to periodic revision.

Additionally, the OIML publishes or participates in the publication of **Vocabularies (OIML V)** and periodically commissions legal metrology experts to write **Expert Reports (OIML E)**. Expert Reports are intended to provide information and advice, and are written solely from the viewpoint of their author, without the involvement of a Technical Committee or Subcommittee, nor that of the CIML. Thus, they do not necessarily represent the views of the OIML.

This publication – reference OIML R 146-3, Edition 2016 (E) – was developed by Project Group 1 in Technical Subcommittee TC 17/SC 8 Instruments for quality analysis of agricultural products. It was approved for final publication by the International Committee of Legal Metrology in 2016 and was submitted to the International Conference on Legal Metrology in 2016 for formal sanction.

OIML Publications may be downloaded from the OIML web site in the form of PDF files. Additional information on OIML Publications may be obtained from the Organization's headquarters:

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PART 3: TEST REPORT FORMAT FOR TYPE EVALUATION

1 INTRODUCTION

This Report Format applies for any kind of protein measuring instrument for grain (independent of its technology). It presents a standardized format for the results of the various tests and examinations, outlined in OIML R 146-2, clause 7, to which a type of protein measuring instrument for grain shall be submitted with a view to its approval based on this OIML Recommendation.

It is recommended that all metrology services or laboratories evaluating and/or testing types of protein measuring instrument for grain according to OIML R 146:2016, or to national or regional regulations based on that Recommendation, use this Report Format, directly or after translation into a language other than English or French. In case of a translation, it is highly recommended to leave the structure and the numbers of the clauses unchanged: in this case most of the contents are also understandable for those who cannot read the language of the translation.

It is also recommended that this Report Format in English or in French (or in both languages) be transmitted by the country performing the tests to the relevant authorities of another country, when requested for issuing a national or regional type approval.

In the practical application of the Report Format, a cover page shall be included by the Issuing Authority, and clauses 1-5 shall be included as a minimum.

2 APPLICABILITY OF THIS TEST REPORT FORMAT

In the framework of the OIML Certificate System for Measuring Instruments applicable to protein measuring instruments for grain in conformity with OIML R 146:2016, use of this report format is mandatory, in French and/or in English with translation into the national languages of the countries issuing such certificates, if appropriate.

Implementation of this Report Format is informative with regard to the implementation of OIML Recommendation OIML R 146:2016 in national regulations.

3 GUIDANCE FOR THE APPLICATION OF THIS TEST REPORT

Refer to OIML R 146-1, clause 2 for definitions of terms, acronyms and symbols used.

Some abbreviations and symbols specific to a few pages within R 146-3 *Test Report* include:

H	heat (e.g. 'Dry H 'is 'Dry heat' and 'Damp H' is 'Damp heat')
GT	grain type (e.g. wheat, barley)
ID	unique identifier
Ref	reference (typically 'reference conditions' but occasionally 'reference P_{MB} value')
U_{nom}	nominal test voltage
V	voltage (e.g. 'Low V' is 'Low voltage' and 'High V' is High voltage)

The measurement unit is not always stated in the header row or column in the table.
The examiner is not expected to include the measurement unit with each recorded measurement result.
Percent by weight (abbreviated as '% w/w' or '%') is the measurement unit applicable for any values of the following:
- Protein content (P_{MB})
- MPE, error shift limits, maximum fault, etc.
- Basis moisture content (M_B), and
- Actual "as is" moisture content (M)

The **colored fields** should always be filled in as appropriate.
Where the heading or label of a colored field indicates "pass/ fail" or "pass/ fail/ NA", select the applicable option in the drop-down list that appears when the mouse is placed over the right side of the field.
Note: If it is impossible to enter the results in a computer, this Report Form may be printed and completed manually. In this case write "pass", "fail" or "NA" in the coloured fields as appropriate.

In the Examination Checklist, the optional comments fields have a different color to the mandatory fields (i.e. fields labelled "yes/ no", "pass/ fail" response or details of validation).

The mandatory fields relating to conditions to be specified by the national responsible body (within the limits suggested in OIML R 146) have a different color to the fields with the result from the assessment of the submitted type and documentation (i.e. fields labelled "pass/ fail/ NA"). Select "NA" only when the requirement (or a variant of a requirement) is not adopted by the national responsible body.

In case a prescribed test or requirement is not relevant for the type of instrument to be tested or has not been adopted by the national responsible body, the reason why the test is omitted shall be clearly stated in the “Comments” field.

In the test reports, the white fields with blue outline contain calculations and/or conditional formatting to highlight a suspect result.

4 THE EVALUATION REPORT

The format for the report is given on the following pages.

COVER PAGE BY THE ISSUING AUTHORITY
(NATIONAL RESPONSIBLE BODY)

1 AUTHORITY RESPONSIBLE FOR THIS REPORT

Organization name:	
Address:	
Report number:	
Application number:	
Testing period:	to
Issue date of this Report:	
Approver name:	
Approver signature:	
Stamp(s) if applicable:	

2 SYNOPSIS OF THE RESULTS OF THE EXAMINATION AND TESTS

The tested samples of the type fulfils ALL the applicable requirements in OIML R 146:

Pass/fail

Comments:

3 SUMMARY OF THE RESULTS OF THE EXAMINATION AND TESTS

3.1 Examinations

(^) Contains specifications set by the national responsible body in the 'SpecConfirm' sheet.

R 146-1 Metrological and technical requirements		Result	Location / ref
3	^Units of measurement		
4	Metrological requirements		
4.1	^Applicable grains and P_{MB} measuring ranges – specification		
4.2	^Instrument environmental operating temperature – specification		
4.3	^Grain sample operating temperature – specification		
4.4	^Influence quantities – specification		
4.5	^Maximum permissible error and other accuracy requirements		
4.7	Requirements for calibrations		3.2 Performance Tests Summary and test reports
4.8	Error due to variations in influence quantities		
4.9	Error due to changes in the instrument over time		
5	Technical requirements		
5.1	Checking facilities		
5.2	^Manufacturer’s manual		
5.3	Markings		
5.4	^Sample input and calibration selection		
5.5	Instrument construction		
5.6	Level indicating means		
5.7	Presentation of the measured value		
6	Requirements for software-controlled devices and security		
6.1	^Specification of software requirements		
6.2	^Data storage		
6.3	^Data transmission		
6.4	^Provision for software and calibration security		
6.3	Software documentation		
R 146-2 Metrological controls and performance tests			
1.1.2	Documentation file		
3.4	^Maintenance and reconfiguration of the approved software		
3.5	In-field updates to grain calibrations		

3.2 Performance tests

R 146-2 Annex A: Type evaluation tests		Result	Location
A.4	Tests for time related effects		
A.4.1	Instrument warm-up time		
A.4.2	Instrument drift and instability		
A.5	Tests for influence variations within the rated operating conditions		
A.5.1	Instrument levelling		
A.5.2	Cold		
A.5.3	Dry heat		
A.5.4	Damp heat		
A.5.5	AC mains voltage variation		
A.5.6	Variation in voltage supplied by external road vehicle batteries		
A.6	Tests for disturbances		
A.6.1	AC mains voltage dips, short interruptions and voltage variations		
A.6.2	Bursts (transients) on AC mains		
A.6.3	Radiated radiofrequency, electromagnetic susceptibility		
A.6.4	Conducted radio-frequency fields		
A.6.5	Electrostatic discharges		
A.6.6	Storage temperature (extreme shipping conditions)		
A.6.7	Random vibration		
A.7	Assessment of calibrations in the submitted type		
GT1	*		
GT2	*		
GT3	*		
GT4	*		
GT*			
A.7.1	Accuracy and precision at reference conditions		
GT1	*		
GT2	*		
GT3	*		
GT4	*		
GT*			
A.7.1	Accuracy and precision at reference conditions		
GT1	*		
GT2	*		
GT3	*		
GT4	*		
GT*			

* Insert calibration name and version number

4 GENERAL INFORMATION ABOUT THE APPLICATION

4.1 Manufacturer

Name:

Address:

4.2 Applicant

Organization:

Contact name:

Address:

Email address:

Phone: Fax:

Application date: Ref number:

Applicant is authorized by the manufacturer (documented evidence) Yes/ no

Comments:

4.3 Testing laboratories involved in the tests

Complete this form for each test laboratory

Organization name:

Address:

Application number:

Tests by this laboratory:

Testing period: to

Name(s) of test engineer(s):

Laboratory accredited by:

Accreditation number: Expiry:

Accreditation includes R 146: Yes/ no Edition:

Details of relevant peer assessement or assessment by other means:

Details, if any tests have been performed at another location than the laboratory premises:

Responsible person - name:

Date signed:

Signature:

Stamp(s) if applicable:

Comments:

4.4 General information concerning type

4.4.1 Description of the instrument (key technical characteristics and intended applications)

e.g. benchtop near infrared (NIR) protein measuring instrument with calibrations for wholegrain wheat and barley

4.4.2 Information indicated on the instrument

Manufacturer trademark:

Year of manufacture:

Type designation:

Model number(s) (if applic):

Electrical power markings:

Software ID (if applic):

Other descriptor/marking:

Comments:

4.4.3 Information on sample units

Serial number	Model number	Manufacture mode (prototype / production)	Year

Add additional rows if more than three sample units are submitted.

Comments:

4.4.4 Relevant external/internal photographs taken during the examination and tests

4.5 Accessories supplied by the applicant

Batteries (if applicable):	Type		V_{nom}		Number required
Data printer (if applic):					
External data storage (if applic):					
Cables:					
Other accessories:					

4.6 Information on sample instruments

In case the tests and evaluation are valid for more versions, give full details of the types, versions, measuring ranges, etc.:

Justification for the selection of the sample unit(s):

4.7 Adjustments and modifications

Adjustments, modifications and repairs made to the sample unit(s) during the testing:

4.8 Results of previous tests that were taken into account

Details:

4.9 Additional information concerning type

4.9.1 Instrument limitations of use as declared by the supplier

						Calibration dependent
Sample P_{MB} content (%)		Min:		Max:		
Sample moisture content (%)		Min:		Max:		
Operating temperature (°C)		Min:		Max:		
Grain sample temperature (°C)		Min:		Max:		
Maximum Δt (°C)		or $\Delta t_{C,max}$		& $\Delta t_{H,max}$		

If limits are dependent on the grain calibration (i.e. answer is 'Yes') specify values/range in 4.9.2 instead.

Comments:

4.9.2 Information on the submitted calibrations

Calibration principle:

Calibration number	GT1	GT2	etc.*
Calibration name:			
Version number:			
Displayed name:			
Date submitted:			
Calibration limitations of use as declared by the supplier			
Applicable type(s) of grain:			
P_{MB} measuring range:			
Min/max moisture content:			
$t_{C,sample}$ and $t_{H,sample}$:			
Δt_{max} or Δt_{Cmax} and Δt_{Hmax}:			
Regression information			
Approx number of data points:			
Data sources, date range:			
Reference method(s):			
Other validation result: (e.g. SD, SEP)			
Default bias (if applic):			
Default slope (if applic):			
Other characteristics:			

*Copy table into additional pages if more than two calibrations are submitted for examination.

Comments:

4.9.3 Additional information (e.g. connection equipment, interfaces, etc.)

4.10 Documentation supplied by applicant

Date received	Document title and/or reference number	Description (include version number if applicable)

Insert additional rows as required.

4.11 Test equipment and grain used in type evaluation

4.11.1 Test equipment

Instrument/ equipment	Make/ model	Serial #	Parameter applied/ measured	Calibrated range(s)	Test(s) used

Insert additional rows as required.

Details e.g. ~ equipment setup for ESD and EMS tests
~ details of simulations
~ confidence intervals for uncertainty estimations

4.11.2 Grain test samples

Information about the grain reference materials (RMs) used in tests:

Reference method used to generate whole-grain certified reference materials (CRMs):

5 EXAMINATION DETAILS

5.1 Checklist - Specifications to be confirmed by the national authority

Metrological and technical specifications of the national responsible body				
3.3^	The national responsible body has specified the basis moisture content (M_B) for expressing the protein content of each grain type. The examiner has entered or attached the national specification.	☐ Yes		☐ No
		Grain type name		M_B
	Comments: e.g. ref ID and location in attached publication	use next page if required		
4.1	**Applicable grains and P_{MB} measuring ranges – specification**			
4.1.1^	The national responsible body has specified commercially important PMB ranges for the grains in R 146-1 Table 3 on which PMB measurements are subject to national approval. The examiner has entered or attached the national specification for the PMB measurement ranges.	☐ Yes		☐ No
		GT name	Min P_{MB}	Max P_{MB}
	Comments: e.g. ref ID and location in attached publication	use next page if required		
4.2	**Instrument environmental operating temperature – specification**			
4.2.2^	The national responsible body has specified the range of ambient temperatures (t_C to t_H) in which the instrument can be used to take P_{MB} measurements for commercial purposes. The range t_C to t_H includes 10 ºC to 30 ºC. The examiner has entered the values for t_C and t_H or attached the national specification.	☐ Yes		☐ No
		t_C		national spec
		t_H		
		Comments: *e.g. ref ID and location in attached publication*		
4.2.3(b)^	The supplier has requested for a wider environmental temperature operating range to be adopted as t_C to t_H **AND** the national responsible body has accepted for this particular type evaluation. The examiner has indicated the revised values for t_C to t_H.	☐ Yes		☐ No
		revised t_C		only for this case
		revised t_H		
		Comments:		
4.3	**Grain sample operating temperature – specification**			
4.3.1	Specification of the sample temperature range			
4.3.1.2^	The national responsible body has specified the range of sample temperatures ($t_{C,sample}$ to $t_{H,sample}$) in which the instrument can be used to take P_{MB} measurements for commercial purposes. The range $t_{C,sample}$ to $t_{H,sample}$ includes 10 ºC to 30 ºC. The examiner has entered or attached the values of $t_{C,sample}$ and $t_{H,sample}$ for each grain type.	☐ Yes		☐ No
		GT name	$t_{C,sample}$	$t_{H,sample}$
	Comments: e.g. ref ID and location in attached publication	use next page if required		
4.3.1.3(b)^	The supplier has requested for a wider sample temperature range to be adopted as $t_{C,sample}$ to $t_{H,sample}$ **AND** the national responsible body has accepted for this particular type evaluation. The examiner has entered or attached the revised values of $t_{C,sample}$ and $t_{H,sample}$ for each grain type.	☐ Yes		☐ No
		GT name	rev $t_{C,sample}$	rev $t_{H,sample}$
	Comments: e.g. ref ID and location in attached publication	use next page if required		
4.3.2	Specification of the sample and instrument maximum temperature differential (Δt_{max})			
4.3.2.2^	The national responsible body has specified a Δt_{max} in which the instrument can be used to take commercial P_{MB} measurements. Δt_{max} (or $\Delta t_{C,max}$ and $\Delta t_{H,max}$, if unequal about t_{ref}) ≥10 ºC. The examiner has entered or attached the values of Δt_{max} (or $\Delta t_{C,max}$ and $\Delta t_{H,max}$) for each grain type.	☐ Yes		☐ No
		GT name	Δt_{max} or $\Delta t_{C,max}$	& $\Delta t_{H,max}$
	Comments: e.g. ref ID and location in attached publication	use next page if required		

Additional space for comments, adopted requirements, etc. Reference applicable OIML R 146 clauses.

Continued - Metrological and technical specifications of the national responsible body					
4.3.2.3(b)^	The supplier has requested for a larger maximum differential to be adopted as Δt_{max} (or $\Delta t_{C,max}$ and $\Delta t_{H,max}$) **AND** the national responsible body has accepted for this type evaluation. The examiner has entered or attached the revised values of Δt_{max} (or $\Delta t_{C,max}$ and $\Delta t_{H,max}$) for each grain type.	☐ Yes		☐ No	
		GT name	rev Δt_{max} / rev $\Delta t_{C,max}$	& rev $\Delta t_{H,max}$	
	Comments:				
		use next page if required			
4.4	**Influence quantities – specification**				
4.4.1^	The rated operating ranges for influence factors specified by the national responsible body conform to the default values in the international standard. The examiner has entered or attached any ranges (that differ from OIML R 146-1, 4.4.1) and provided reasons for deviations.	☐ Yes		☐ No	
		Influence factor	Revised min	Revised max	
	Comments: *e.g. Reason for deviation*				
		use next page if required			
4.4.2^	The disturbances specified by the national responsible body conform to the default values in the international standard. The examiner has entered or attached any settings (that differ from OIML R 146-1, 4.4.2) and provided reasons for deviations.	☐ Yes		☐ No	
		Disturbance setting	Revised min	Revised max	
	Comments: *e.g. Reason for deviation*				
		use next page if required			
4.5	**Maximum permissible error (MPE) and other accuracy requirements**				
4.5.2^	The accuracy requirements specified by the national responsible body for each grain type conform to the international standard. The examiner has indicated any MPEs or limits (that differ from OIML R 146-1 Table 4) and provided reasons for deviations.	☐ Yes		☐ No	
		GT name	Test parameter	Revised MPE/limit	
	Comments: *e.g. Reason for deviation*				
		use next page if required			
4.5.3^	The MPE for each grain type has been scaled in accordance with the nationally-specified M_B and the recommended rounding method has been performed.	☐ Yes		☐ No	
		Comments:			
4.5.4^	Reference method specified for the national responsible body for P_{MB} measurements is based on an international standard. The examiner has inserted or attached the test procedure and provided reasons for any deviations.	☐ Yes		☐ No	
		Comments: *e.g. ref ID of attached publication*			
Annex A^	The national responsible body has specified the relationship between the measured nitrogen content (N) and the protein content (P_M or P_{MB}) for each grain type. The examiner has entered or attached the national specification.	☐ Yes		☐ No	
		GT name	Correlation		
	Comments: *e.g. ref ID and location in attached publication*				
		use next page if required			
5.2	**Manufacturer's manual**				
5.2.3(a)^	Language(s) other than the official language are accepted by the national responsible body. The examiner has noted all language(s) accepted for the publication.	☐ Yes		☐ No	
		Comments: *Specify language(s).*			
5.4	**Sample input and calibration selection**				
5.4.2.2(a)^	A sample smaller than the International Recommendation is permitted by the national responsible body. The examiner has indicated the smallest size permitted by the national responsible body and the reason for deviation from the international standard.	☐ Yes		☐ No	
		Comments: *e.g. Minimum allowable sample size.*			
5.4.2.3^	Minimum guidelines for the sampling of cereals for testing - based on international standards - have been specified by the national responsible body. The examiner has referenced or attached the test procedure and provided reasons for deviations from international standard.	☐ Yes		☐ No	
		Comments: *e.g. ref ID of attached publication or reason for deviation.*			

Additional space for comments, adopted requirements, etc. Reference applicable OIML R 146 clauses.

Software specifications of the national responsible body		
6(a)^	'N/A' except if instruments or modules are operated by software. The national responsible body has attempted to adopt the software requirements in OIML R 146 clause 6. The examiner has attached an alternative assessment criteria and report template (where applicable) and provided reasons for deviations from the International Recommendation.	☐ N/A ☐ Yes ☐ No Comments:
If the answer to 6(a)^ is 'No' or 'N/A', the following considerations may not apply.		
6(b)^	The possible consequences arising from any fraud or misuse facilitated by the software have been considered by the national responsible body. Severity I is maintained as the appropriate risk level and procedure A methods suffice for validation in most cases. The examiner has provided reasons for deviations from procedure A.	☐ Yes ☐ No Comments:
6.1	**Specification of the software requirements**	
6.1.8(a)^	The national responsible body requires instruments to be equipped with an internal recording element and/or a communication interface that permits interfacing with an external recording element.	☐ Yes ☐ No Comments:
	Data transmission in insecure environment	
6.1.9(a)^	In regards to the trading practices of the country where the type approval is sought. Legally relevant measurement data can be stored outside the measuring instrument or transmitted in an insecure environment before the P_{MB} values are used for commercial purposes.	☐ Yes ☐ No Comments:
6.1.9(b)^	'N/A' except if the answer to 6.1.9(a)^ is 'Yes'. The national responsible body requires instruments to meet the requirements in OIML R 146-1, 6.3 if it is possible to store or transmit the measurement data in an insecure enviroment.	☐ N/A ☐ Yes ☐ No Comments:
6.1.9(c)^	'N/A' except if the answer to 6.1.9(b)^ is 'Yes'. The national responsible body deems the risk associated with instruments that can be used in an insecure environment as severity II and requires data protection via cryptographic means.	☐ N/A ☐ Yes ☐ No Comments:
6.1.9(d)^	'N/A' except if the answer to 6.1.9(c)^ is 'Yes'. The national responsible body requires the effectiveness of data encryption facilities to be validated via Procedure B methods (extended examination).	☐ N/A ☐ Yes ☐ No Comments:
6.2	**Data storage**	
6.2.1(a)^	Storage of the legally relevant P_{MB} measurements and data is required by the national responsible body.	☐ Yes ☐ No Comments:
6.4	**Provision for software and calibration security**	
6.4.1(a)^	The national responsible body has adopted all the guidance in R 146-1, Annex E on sealing methods, as the means of ensuring the requirements in 6.4.1 are met.	☐ Yes ☐ No Comments:
6.4.2.4(a)^	The national responsible body has restricted access to any of the device-specific (i.e. calibration or configuration) parameters. The examiner has entered or attached the details of any access restrictions.	☐ Yes ☐ No Comments: *e.g. Details of any access restrictions to device-specific parameters*
9.4	**Maintenance and reconfiguration of the approved software**	
9.4(a)^	Software changes on a verified instrument by a 'traced update' (instead or in addition to 'verified updates') are permitted by the national responsible body.	☐ Yes ☐ No Comments:
9.5	**In-field updates to grain calibrations**	
9.5.1(a)^	The national responsible body allows for updates to P_{MB} calibrations to accommodate for seasonal variations.	☐ Yes ☐ No
9.5.1(b)^	The national responsible body requires retention of data collected during the current and/or recent years that are used for calibration adjustments.	☐ Yes ☐ No Comments:
9.5.3^	A calibration update process which is not a verified update is permitted by the national responsible body, provided that the instrument fulfils the requirements for traced updates at type evaluation.	☐ Yes ☐ No Comments:

5 EXAMINATION DETAILS

5.2 Examination checklist - metrological and technical requirements

(^) Clause is associated with specifications set by the national responsible body in the 'SpecConfirm' sheet.

Checks on the requirements within R 146-1		Findings
3	**Units of measurement**	
3.1	The measurement of the protein content in a grain sample is expressed in percentage by mass (% w/w). The percentage symbol alone (%) is also permitted.	☐ Pass ☐ Fail Comments:
3.2	For each type of grain, the measured protein content is expressed at one basis moisture content (M_B). The scaling of the protein content at the actual "as is" moisture content (P_M) to the protein content at the basis moisture content (P_{MB}) is in accordance with Equation 1.	☐ Pass ☐ Fail Comments:
4	**Metrological requirements**	
4.1	**Applicable grains and P_{MB} measuring ranges – specification**	
4.1.2	The grain types and the corresponding P_{MB} measuring range that can be analyzed by the submitted type of instrument have been declared by the supplier and inserted in section 4.9.1 or 4.9.2 of the '*ApplicationGenInfo*' sheet. The P_{MB} measuring ranges include the range specified by the national responsible body for the grain type.	☐ Pass ☐ Fail Comments:
4.2	**Instrument environmental operating temperature – specification**	
4.2.1	'N/A' except if answers to 4.2.2^ and 4.2.3(b)^ are 'No' (i.e. limits for the environmental temperature have NOT been specified by the national responsible body). Performance test(s) demonstrate that the submitted type provides accurate P_{MB} measurements in all the environmental temperatures possible in the country/region.	☐ N/A ☐ Pass ☐ Fail Comments:
4.2.3(a)	A rated operating range for the environmental temperature has been declared by the supplier as shown in section 4.9.1 or 4.9.2 of the '*ApplicationGenInfo*' sheet. Unless a wider range is specified in 4.2.3(b)^, the supplier range is equivalent to the national specification in 4.2.2^.	☐ Yes ☐ No Comments:
4.3	**Grain sample operating temperature – specification**	
4.3.1	Specification of the sample temperature range	
4.3.1.1	'N/A' except if answers to 4.3.1.2^ and 4.3.1.3(b)^ are 'No', i.e. a limited range for the sample temperature ($t_{C,sample}$ to $t_{H,sample}$) has NOT been specified by the national responsible body. Performance test(s) demonstrate that the submitted type provides accurate P_{MB} measurements on samples that are between 2 ºC to 45 ºC in temperature.	☐ N/A ☐ Pass ☐ Fail Comments:
4.3.1.3(a)	A limited range for the sample temperature has been declared by the supplier as shown in section 4.9.1 or 4.9.2 of the '*ApplicationGenInfo*' sheet. Unless a wider range is specified in 4.3.1.3(b)^, the supplier range(s) are equivalent to the national specification in 4.3.1.2^.	☐ Yes ☐ No Comments:
4.3.2	Specification of the sample and instrument maximum temperature differential (Δt_{max})	
4.3.2.1	'NA' except if answers to 4.3.2.2^ and 4.3.2.3(b)^ are 'No', i.e. Δt_{max} (maximum limit for the sample and instrument temperature differential when the latter is at t_{ref}) has NOT been specified by the national responsible body. Performance test(s) demonstrate that the instrument at reference temperature (t_{ref}), provides accurate P_{MB} measurements on samples within the range $t_{C,sample}$ to $t_{H,sample}$ regardless of the magnitude of Δt.	☐ N/A ☐ Pass ☐ Fail Comments:

(^) Clause is associated with specifications set by the national responsible body in the 'SpecConfirm' sheet.

Continued - Checks on the requirements within R 146-A.9.9.1		Findings
4.3.2.3(a)	A maximum limit for Δt has been declared by the supplier as shown in section 4.9.1 or 4.9.2 of the '*ApplicationGenInfo*'. Unless a larger Δt_{max} is specified in 4.3.2.3(b)^, supplier limit(s) for Δt are equivalent to the national specification in 4.3.2.2^.	☐ Yes ☐ No Comments:
4.3.3	Provisions in absence of a manufacturer-specified sample temperature range	
4.3.3(a)	'N/A' except if answer to 4.3.1.3(a) is 'No'. Performance test(s) demonstrate that the submitted type provides accurate P_{MB} measurements. Where relevant, the examiner has attached national provisions (e.g. operating procedures for ground grain protein analyzers) aimed to mitigate risks associated with the lack of sample temperature detection/ compensation facilities.	☐ N/A ☐ Pass ☐ Fail Comments: *e.g. ref ID of attached publication*
4.3.3(b)	'N/A' except if answer to 4.3.2.3(a) is 'No'. Performance test(s) demonstrate that the submitted type provides accurate P_{MB} measurements. Where relevant, the examiner has attached national provisions (e.g. operating procedures for ground grain protein analysers) aimed to mitigate risks associated with the lack of Δt detection/ compensation facilities.	☐ N/A ☐ Pass ☐ Fail Comments: *e.g. ref ID of attached publication*
5	**Technical requirements**	
5.1	**Checking facilities**	
5.1.1	Suppression of P_{MB} measured values following a significant fault. There is provision for the instrument to automatically and clearly indicate when a significant fault has occurred by an appropriate error message, unambiguous warning or blanking the display.	☐ Pass ☐ Fail Comments:
5.1.2	Suppression of P_{MB} measured values outside of operating ranges	
5.1.2.1(a)	There is provision for the instrument to automatically and clearly indicate if the following type-approved operating range is exceeded, by an appropriate error message, unambiguous warning or blanking the display: Range t_C to t_H specified in 4.2.2^ or 4.2.3(b)^.	☐ Pass ☐ Fail Comments:
5.1.2.1(b)	There is provision for the instrument to automatically and clearly indicate if the following type-approved operating range(s) is exceeded, by an appropriate error message, unambiguous warning or blanking the display: Range(s) $t_{C,sample}$ to $t_{H,sample}$ specified in 4.3.1.2^ or 4.3.1.3(b)^.	☐ Pass ☐ Fail Comments:
5.1.2.1{c)	There is provision for the instrument to automatically and clearly indicate if the following type-approved operating limit(s) are exceeded, by an appropriate error message, unambiguous warning or blanking the display: Δt_{max} for each grain type as specified in 4.3.2.2^ or 4.3.2.3(b)^.	☐ Pass ☐ Fail Comments:
5.1.2.2	The instrument shall automatically prevent further measurements as long as the respective influence factor or sample characteristic remains outside the type-approved ranges.	☐ Pass ☐ Fail Comments:
5.1.2.3	The operator is not required to judge the precise ambient temperature and the temperature of the sample in order to make an accurate measurement.	☐ Pass ☐ Fail Comments:
5.1.3	Suppression of P_{MB} values or warnings outside of the approved measuring range. There is provision for the instrument to automatically suppress P_{MB} measured values that are outside of the type-approved measurement range for the calibration, unless it is accompanied by an appropriate error message or unambiguous warning.	☐ N/A ☐ Pass ☐ Fail Comments:
5.1.4	'N/A' for instruments which do not require any warm-up time. After the instrument is switched on, there is provision for any measured values to be suppressed until the operating temperature necessary for accurate measurement has been attained.	☐ Pass ☐ Fail Comments:

(^) Clause is associated with specifications set by the national responsible body in the 'SpecConfirm' sheet.

Continued - Checks on the requirements within R 146-1		Findings
5.2	**Manufacturer's manual**	
5.2.1	There is a manual to be provided with each protein measuring instrument, that describes the installation, operation, and routine maintenance of the instrument and its accessories.	☐ Pass ☐ Fail Comments:
5.2.2(a)	The manual includes the name and address of the manufacturer.	☐ Pass ☐ Fail Comments:
5.2.2(b)	The manual includes the type of the instrument with which it is intended to be used.	☐ Pass ☐ Fail Comments:
5.2.2{c)	The manual includes the date of issue.	☐ Pass ☐ Fail Comments:
5.2.2(d)	The manual includes the types of grain for which the instrument is designed to be used.	☐ Pass ☐ Fail Comments:
5.2.2{e)	The manual includes the limitations of use of the instrument.	☐ Pass ☐ Fail Comments:
5.2.3(b)	'N/A' except if answer to 5.2.3(a)^ is 'Yes'. The user/owner manual is supplied in all the accepted or official language(s). The translations appear to be accurate.	☐ N/A ☐ Pass ☐ Fail Comments:
5.3	**Markings**	
5.3.1(a)	The instrument is clearly and permanently marked with the manufacturer’s name or mark.	☐ Pass ☐ Fail Comments:
5.3.1(b)	Instrument is clearly and permanently marked with the model designation.	☐ Pass ☐ Fail Comments:
5.3.1{c)	Instrument is clearly and permanently marked with the serial number given by the manufacturer.	☐ Pass ☐ Fail Comments:
5.3.1(d)	Provision is made for application of a type approval mark.	☐ Pass ☐ Fail Comments:
5.3.2	Markings have been grouped together in a clearly visible location, either on a permanently attached nameplate or on part of the instrument. The required information is readily observable without disassembly.	☐ Pass ☐ Fail Comments:
5.3.3	All operational controls, indications, indicating switches, features, light displays and push buttons shall be clearly identifiable. Keys visible only to the operator need only be marked to the extent that a trained operator can understand the function of each key.	☐ Pass ☐ Fail Comments:
5.4	**Sample input and calibration selection**	
5.4.1	Selection of calibration on the instrument	
5.4.1.1	On instruments that have a different calibration for each grain type, the user is able to select the calibration applicable for the sample to be analyzed.	☐ Pass ☐ Fail Comments:
5.4.1.2	The selection of the calibration on the user interface is unambiguous and visible to all parties present, i.e. during the measurement it can be verified that the selected (displayed) calibration corresponds with the sample analyzed.	☐ Pass ☐ Fail Comments:
5.4.2	Sampling and minimum sample size	
5.4.2.1	The operator is not required to judge the precise volume or weight required by the instrument to make an accurate P_{MB} measurement.	☐ Pass ☐ Fail Comments:
5.4.2.2(b)	'NA' except if the answer to 5.4.2.2(a)^ is 'No'. The size of the sample analyzed by the instrument is at least 100 g or 400 kernels or seeds (which ever is smaller).	☐ N/A ☐ Pass ☐ Fail Comments:
5.5	**Instrument construction**	
5.5.1	Nothing observed in the design and construction of the instrument and accessory equipment should make it prone to inaccuracy, malfunction and fraud under normal service conditions.	☐ Pass ☐ Fail Comments:
5.5.2	Day to day forces on the parts of the instruments shall not compromise the accuracy of measurements.	☐ Pass ☐ Fail Comments:
5.5.3	The instrument housing protects the main components from dust and moisture.	☐ Yes ☐ No Comments:

(^) Clause is associated with specifications set by the national responsible body in the 'SpecConfirm' sheet.

Continued - Checks on the requirements within R 146-1		Findings
5.5.4	'NA' except if the instrument analyses ground/milled samples. The manufacturer of the protein measuring instrument has designated the type(s) of mill to be used and included a unit with the submission so its suitability for the measurement process be assessed during type evaluation. The examiner has indicated the appropriate mill type(s).	☐ N/A ☐ Pass ☐ Fail Comments: *e.g. Specification of mill type.*
5.6	**Level indicating means**	
5.6.1(a)	Based on manufacturer specifications and preliminary tests, tilting the instrument in any upright direction by up to 5 % (approximately 3º) may reduce the accuracy of the instrument.	☐ Yes ☐ No Comments:
5.6.1(b)	'N/A' except if the previous answer is 'Yes'. The instrument is equipped with a level indicator and level adjustment means to reduce the likelihoood of being tilted.	☐ N/A ☐ Pass ☐ Fail Comments:
5.6.2	'N/A' except if the answer to 5.6.1(a) is 'Yes'. The level indicating means is readable without any instrument disassembly.	☐ N/A ☐ Pass ☐ Fail Comments:
5.7	**Presentation of the measured value**	
5.7.1	The instrument is equipped with a digital indicating element which does not display any protein content values before the end of the measurement cycle.	☐ Pass ☐ Fail Comments:
5.7.2	Measurement results are displayed as percent protein by mass (%) the M_B. Subdivisions of this unit are in terms of decimal subdivisions (not fractions).	☐ Pass ☐ Fail Comments:
5.7.3(a)	The display on the type allows the protein content value to be determined with a resolution of at least 0.1 % P_{MB}.	☐ Pass ☐ Fail Comments:
5.7.3(b)	Sample instruments submitted for type evaluation permit 0.01 % P_{MB} resolution.	Comments:
5.7.4(a)	The type is a multi-constituent measuring instrument (e.g. it measures grain moisture content in addition to protein content)	Comments:
5.7.4(b)	'NA' except if the previous answer is 'Yes'. Appropriate labels are displayed or recorded to make it clear which constituent is associated with the displayed or recorded measured values.	☐ N/A ☐ Pass ☐ Fail Comments:
5.7.5	The height for the digits used to display protein content is at least 10 mm. Numbers and symbols of units are presented in accordance with OIML D2.	☐ Pass ☐ Fail Comments:

5.3 Examination checklist - requirements for software-controlled devices and security

NOTE: All the following are not applicable 'N/A' except if the answer to 6(a)^ is 'Yes'

(^) Clause is associated with specifications set by the national responsible body in the 'SpecConfirm' sheet.

Checks on the software requirements within R 146-1		Findings
6.1	Specification of the software requirements	
6.1.1	For instruments and modules operated by software, the manufacturer has described or declared how the software is implemented within the instrument or module. Examiner to indicate whether the software is embedded or on a universal computer system.	
	Details of level I validation method: AD	☐ Pass ☐ Fail
	Insert details or the reference to relevant sections of an attached software validation report.	
6.1.2	The legally relevant software is clearly identifiable via a unique software version or a checksum. Examiner to indicate whether the software version or the checksum is displayed or printed out on command during operational mode, or displayed during the start-up procedure.	
	Details of level I validation method(s): AD + VFTSw	☐ Pass ☐ Fail
	Insert details or the reference to relevant sections of an attached software validation report.	
6.1.3	The legally relevant measuring algorithms and functions are appropriate and functionally correct. Examiner to conduct further examinations and metrological tests if necessary.	
	Details of level I validation method(s): AD + VFTM	☐ Pass ☐ Fail
	Insert details or the reference to relevant sections of an attached software validation report.	
6.1.4(a)	Optional assessment during type evaluation Conformity of the legally relevant software (in the submitted units) to that in the approved type has been verified at level (b) described in OIML D 31, 5.2.5. Examiner to confirm the identity of parts of the legally relevant source code, and for the rest of the software, the identity of the legally relevant functions described in the documentation.	
	Details of level I validation method(s): AD + VFTSw	☐ Pass ☐ Fail
	Insert details or the reference to relevant sections of an attached software validation report.	
6.1.4(b)	Selected functions or parts of the source code can be modified.	☐ Yes ☐ No
		Comments:
6.1.4(c)	'N/A' except if the previous answer is 'Yes'. It is possible to detect software variations, e.g. via checksum values.	
	Details of level I validation method(s): AD + VFTSw	☐ N/A ☐ Pass ☐ Fail
	Insert details or the reference to relevant sections of an attached software validation report.	
6.1.5	There is provision to make further measurements impossible when a significant fault is detected.	
	Details of level I validation method(s): AD + VFTSw	☐ N/A ☐ Pass ☐ Fail
	Insert details or the reference to relevant sections of an attached software validation report.	
6.1.6(a)	The software of the instrument is separated into a legally-relevant part and non-relevant parts.	☐ Yes ☐ No
		Comments:
6.1.6(b)	'N/A' except if the previous answer is 'Yes'. The requirements of D 31, 5.2.1.2 for *Separation of software parts* have been fulfilled.	
	Details of level I validation method: AD	☐ N/A ☐ Pass ☐ Fail
	Insert details or the reference to relevant sections of an attached software validation report.	
6.1.7(a)	The instrument uses an internal or external universal computer.	☐ Yes ☐ No
		Comments:
6.1.7(b)	Cryptographic data protection is implemented in the software of the instrument.	☐ Pass ☐ Fail
		Comments:
6.1.7(c)	'N/A' except if the answer to 6.1.7(a) and/or 6.1.7(b) is 'Yes'. The legally relevant software can be operated only in the environment specified for its correct functioning. If necessary to secure the correct functioning of the legally relevant software, the operating system has been fixed to a defined invariant configuration.	
	Details of level I validation method(s): AD + VFTSw	☐ N/A ☐ Pass ☐ Fail
	Insert details or the reference to relevant sections of an attached software validation report.	

(^) Clause is associated with specifications set by the national responsible body in the 'SpecConfirm' sheet.

Checks on the software requirements within R 146-1		Findings
6.1.8(b)	N/A' except if the answer to 6.1.8(a)^ is 'Yes'. The instrument is equipped with the required recording element(s).	☐ N/A ☐ Pass ☐ Fail Comments:
6.1.8{c)	'NA' except if answers to 6.1.8(a)^ and 6.1.8(b) are 'Yes'. Correspondence between the displayed information and remote recording element has been verified during performance test(s).	☐ N/A ☐ Pass ☐ Fail Comments:
6.2	**Data storage** All 'N/A' except if the answer to 6.2.1(a)^ is 'Yes'	
	Details of level I validation method for 6.2: AD + VFTSw	☐ N/A ☐ Pass ☐ Fail
	Insert details or the reference to relevant sections of an attached software validation report.	
6.2.1(b)	The measurement data is stored automatically when the measurement is finished.	☐ Pass ☐ Fail Comments:
	No protein content values are recorded before the end of the measurement cycle.	☐ Pass ☐ Fail Comments:
	The storage device has sufficient permanency to ensure that data are not corrupted.	☐ Pass ☐ Fail Comments:
	There is sufficient memory for storage of the required measurement data to be used at a later time.	☐ Pass ☐ Fail Comments:
6.2.2	The measurement value stored is accompanied by all relevant information necessary for future legally relevant use.	☐ Pass ☐ Fail Comments:
	The measurement records include: test sample identifier, measurement date and time, unique identification of the instrument, grain type, P_{MB} results and units as displayed, calibration version ID, error messages and constituent labels (on multi-constituent meters).	☐ Pass ☐ Fail Comments:
6.3	**Data transmission** All 'N/A' except if the answer to 6.1.9(b)^ is 'Yes'	
	Details of level I validation method: AD + VFTSw	☐ N/A ☐ Pass ☐ Fail
	Insert details or the reference to relevant sections of an attached software validation report.	
6.3.1	The data is protected by software means to guarantee the authenticity and integrity.	☐ Pass ☐ Fail Comments:
	There is provision for the data to be discarded or marked unusable if an irregularity is detected.	☐ Pass ☐ Fail Comments:
6.3.3	There is provision so that the measurement is not inadmissibly influenced by a transmission delay.	☐ Pass ☐ Fail Comments:
6.3.4	There is provision to ensure measurement data is not lost if a transmission interruption occurs because the network services become unavailable (e.g. the measurement process should stop).	☐ Pass ☐ Fail Comments:
6.3.2	'NA' except if the answers to both 6.1.9(c)^ and 6.1.9(d)^ are 'Yes'. Data is protected by cryptographic means. A seal is broken if a confidential key is input or read.	
	Details of level II validation method: AD + VFTSw + SMT	☐ N/A ☐ Pass ☐ Fail
	Insert details or the reference to relevant sections of an attached software validation report.	
6.4	**Provision for software and calibration security**	
6.4.1	Sealing	
6.4.1(b)	'N/A' except if unrestricted or remote access to sealable parameters is possible **AND** the answer to 6.4.1(a)^ is 'Yes'. Annex E Checklist.	☐ N/A ☐ Pass ☐ Fail
	An event logger has been provided which includes the following: an event counter, the parameter ID, the date and time of change, and the new value of the parameter changed. For changes to multiple calibration constants (e.g. 10 or more), the calibration version number may be presented rather than the calibration constants.	☐ Pass ☐ Fail Comments:
	The event logger automatically retains the ID of the parameter changed, the date and time of change, and the new value of the parameter.	☐ Pass ☐ Fail Comments:
	If the instrument does not include a printer, there is provision for attachment of a printer, which can print the contents of the audit trail upon demand.	☐ Pass ☐ Fail Comments:

(^) Clause is associated with specifications set by the national responsible body in the 'SpecConfirm' sheet.

Checks on the software requirements within R 146-1		Findings
6.4.1(b) cont.	The event logger has the capacity to retain records equal to 25 times the number of sealable parameters in the instrument. Not more than 1000 records are required.	☐ Pass ☐ Fail Comments:
	Non-sealable parameters that are routinely changed in normal operation, cannot be accessed in the mode which allows sealable parameters to be adjusted.	☐ Pass ☐ Fail Comments:
	The event counter cannot be reset by the operator and has the capacity of at least 1000 values (e.g. 000 to 999).	☐ Pass ☐ Fail Comments:
	The event counter increments appropriately. In the case of an event logger, if an adjustment mode is entered but no changes are made, this does not constituite an event and the counter must not increment.	☐ Pass ☐ Fail Comments:
	The event logger drops the oldest event when the memory capacity is full and a new entry is saved.	☐ Pass ☐ Fail Comments:
	The audit trail information is capable of being retained in memory for at least 30 days while the instrument is without power.	☐ Pass ☐ Fail Comments:
	Accessing the audit train information for review is separate from the mode used to enter or modify sealable parameters.	☐ Pass ☐ Fail Comments:
	Audit trail information can be accessed without requiring the removal of any parts other than the normal requirements to inspect the integrity of a physical seal or to use a key (for a panel lock).	☐ Pass ☐ Fail Comments:
	The printed audit trail is readily interpretable by an enforcement official.	☐ Pass ☐ Fail Comments:
	Event logger information is printed in order from the most recent event to the oldest event.	Comments:
	If the event logger information is printed on more than one line per event, information is printed in blocks which are readily understandable.	☐ Pass ☐ Fail Comments:
6.4.1(c)	'N/A' except if unrestricted or remote access to sealable parameters is possible **AND** the answer to 6.4.1(a)^ is 'No'. Provision has been made for appropriate sealing by mechanical, electronic and/or cryptographic means, making any change that affects the metrological integrity of the instrument impossible or evident. Calibrations, zero-setting and test point adjustments are sealed.	
	Details of level I validation method: AD + VFTSw	☐ N/A ☐ Pass ☐ Fail
	Insert details or the reference to relevant sections of an attached software validation report.	
6.4.2	Safeguards against fraudulent use	
	Details of level I validation method: AD + VFTSw	☐ Pass ☐ Fail
	Insert details or the reference to relevant sections of an attached software validation report.	
6.4.2.1	The legally relevant software has been secured against unauthorized modification, loading or changes by swapping of the memory device. If the instrument has an operating system or an option to load software, additional means to mechanical sealing have been considered.	☐ Pass ☐ Fail Comments:
6.4.2.2	Only clearly documented functions are allowed to be activated by the user interface, which have been realized in such a way that it does not facilitate fraudulent use.	☐ Pass ☐ Fail Comments:
6.4.2.3	Parameters that fix the legally relevant characteristics of the measuring instrument shall be secured against unauthorized modification. The current parameter settings can be printed or displayed on demand.	☐ Pass ☐ Fail Comments:
6.4.2.4(b)	'NA' except if the answer to 6.4.2.4(a)^ is 'Yes'. The instrument complies with any access restrictions to adjustable parameters.	☐ N/A ☐ Pass ☐ Fail Comments:

Checks on software requirements within R 146-2		Findings
3.4	**Maintenance and reconfiguration of the approved software**	
3.4(b)	'N/A' except if the answer to 9.4(a)^ is 'Yes'. Implementation of the software fulfils the requirements for traced updates in D 31, 5.2.6.2.	
	Details of level I validation method: AD + VFTSw	☐ N/A ☐ Pass ☐ Fail
	Insert details or the reference to relevant sections of an attached software validation report.	
3.5	**In-field updates to grain calibrations**	
3.5.2	Calibration version	
	The calibration constants that are adjustable and unique calibration names, or calibration version numbers can be displayed and printed on demand.	☐ Pass ☐ Fail Comments:
3.5.3	Security of calibrations and reverification	
	Details of level I validation method: AD + VFTSw	☐ Pass ☐ Fail
	Insert details or the reference to relevant sections of an attached software validation report.	
	There is provision for only authorized persons to change grain calibrations.	☐ Pass ☐ Fail Comments:
	Changes to the grain calibrations of the instrument are impossible unless recorded in an audit trail.	Comments:
	There is provision for an error message to be automatically displayed if calibration constants are electronically corrupted and to make further measurements impossible.	☐ Pass ☐ Fail Comments:
Checks on the software requirements within R 146-1		**Findings**
6.5	**Software documentation**	
	The submitted software documentation is complete. Examiner has indicated the inclusion or exclusion of the following information with the submission.	☐ Pass ☐ Fail Comments:
	Description of the legally relevant software, incorporating how the requirements are met	☐ Yes ☐ No Comments:
	Description of the operating system security	☐ Yes ☐ No Comments:
	Description of the software sealing method(s)	☐ Yes ☐ No Comments:
	Overview of the system hardware, highlighting any hardware components that are deemed legally relevant or performing legally relevant functions	☐ Yes ☐ No Comments:
	Description of the accuracy of the algorithms	☐ Yes ☐ No Comments:
	Declaration of the hardware and software environment, including minimum resources and configuration necessary for correct functioning of the instrument	☐ Yes ☐ No Comments:
	Description of the user interface, menus and dialogues	☐ Yes ☐ No Comments:
	Description of the software identification which has to be clearly assigned to the legally relevant functions	☐ Yes ☐ No Comments:
	Clear instructions on how to check the actual software identification against the reference number as listed in the type approval certificate	☐ Yes ☐ No Comments:
	List of commands of each hardware interface of the measuring instrument/ electronic device/ sub-assembly	☐ Yes ☐ No Comments:
	List of durability errors that are detected by the software	☐ Yes ☐ No Comments:
	Description of data sets stored or transmitted	☐ Yes ☐ No Comments:
	List of significant faults that are detected and a description of the detecting algorithm	☐ Yes ☐ No Comments:
	Operating manual which clearly identifies all operational controls, indications, and features	☐ Yes ☐ No Comments:

5.4 Examination checklist - documentation requirements

Checks on the requirements within R 146-2		Findings
1.1.2	**Documentation file**	
	The submitted documentation file is complete. Examiner has indicated the inclusion or exclusion of the following information with the submission	☐ Pass ☐ Fail Comments:
	General description of the instrument	☐ Yes ☐ No Comments:
	General characteristics of the instrument	☐ Yes ☐ No Comments:
	Drawings of general arrangement and details of metrological interest	☐ Yes ☐ No Comments:
	Description of calibrations submitted for approval	☐ Yes ☐ No Comments:
	Descriptions and characteristic data for all devices and sub-assemblies of the instrument	☐ Yes ☐ No Comments:
	Technical description, drawings and plans of devices, sub-assemblies	☐ Yes ☐ No Comments:
	Declarations of the manufacturer	☐ Yes ☐ No Comments:
	Samples of all intended print-outs	☐ Yes ☐ No Comments:
	Information concerning special cases	☐ Yes ☐ No Comments:
	Results of tests performed by the manufacturer using protocols from Parts 2 and 3	☐ Yes ☐ No Comments:
	Certificates of other type approvals or separate tests	☐ Yes ☐ No Comments:
	Drawing or photo of the instrument	☐ Yes ☐ No Comments:
	Manufacturer's manual according to OIML R 146-1, 5.2. NOTE: Ensure consistency with the responses in 5.2.1, 5.2.2 and 5.2.3(b).	☐ Yes ☐ No Comments:
	Software documentation according to OIML R 146-1, 6.3	☐ Yes ☐ No Comments:
	Other evidence to support the assumption that the design and characteristics of the type comply with the requirements of R 146-1	☐ Yes ☐ No Comments:

6 TYPE EVALUATION TESTS

6.1 Tests for time-related effects

6.1.1 Instrument warm-up time [ref. OIML R 146-2, Annex A, A.4.1]

Observer:
Type/ application #:
Instrument 1 ID:
Instrument 2 ID:

General comments on test:

	Not warm	Warm	
Ambient temp (*t*):			°C
Ambient RH:			%
Date commenced:			ddmmyyyy
Time commenced:			hh:mm

Displayed name	Error shift limits		Sample info	Nominal values (%)	
GT	Min	Max	ID	P_{MB}	*M*

Instrument	Mean P_{MB}		Error shift	RESULTS SUMMARY (pass / fail)		
	Not warm	Warm	Warm	Comments	Instrument	Type
1						
2						

Raw data entry

	P_{MB} (Not warmed up)			P_{MB} (Warm-up time elapsed)		
	Instr. 1	Instr. 2	Comments	Instr. 1	Instr. 2	Comments
1						
2						
3						
4						
5						

6.1.2 Instrument drift and instability [OIML R 146-2, Annex A, A.4.2]

Observer:
Type/ application #:
Instrument 1 ID:
7.1.2 Instrument 2 ID:

General comments on test:

	Before testing	After 4-6 wks	
Ambient temp (t):			°C
Ambient RH:			%
Date commenced:			ddmmyyyy
Time commenced:			hh:mm

Displayed name	Error shift limits		Sample info		Nominal values (%)	
GT	Min	Max	number	ID	P_{MB}	M
			1			
			2			
			3			

Sample number	Instrument	Mean P_{MB}		Error shift	RESULTS SUMMARY (pass / fail)		
		Start	4 - 6 wks	After 4 - 6 weeks	Comments	Instrument	Type
1	1						
2							
3							
1	2						
2							
3							

Raw data entry

Sample number	P_{MB} (Before testing, except warm-up test)			P_{MB} (After 4 - 6 weeks)		
	Instr. 1	Instr. 2	Comments	Instr. 1	Instr. 2	Comments
1						
2						
3						

6.2 Test for influence factor variables within the rated operating range

6.2.1 Instrument levelling [ref. OIML R 146-2, Annex A, A.5.1]

Observer:
Type/ application #:
Instrument 1 ID:
Instrument 2 ID:

Displayed name	Error shift limits		Sample info	Nominal values (%)	
GT	Min	Max	ID	P_{MB}	M

	Start - ref	Influence			Recovery	
	Level	1st tilt	2nd tilt	*	Level	
Tilt angle:						° (angluar degrees)
Ambient temp (t):						°C
Ambient RH:						%
Date commenced:						ddmmyyyy
Time commenced:						hh:mm

* Add other tilt orientations if required

General comments on test (e.g. tilt orientation):

Instrument	Mean P_{MB}					Error shift (at tilt orientation)				RESULTS SUMMARY (pass / fail)		
	Start - ref	1st	2nd	*	Recovery	1st	2nd	*	Recovery	Comments	Instrument	Type
1												
2												

Raw data entry

P_{MB} (Start-ref)			P_{MB} (1st orientation)			P_{MB} (2nd orientation)			P_{MB} (*)			P_{MB} (Recovery)		
Instr. 1	Instr. 2	Comments	Instr. 1	Instr. 2	Comments	Instr. 1	Instr. 2	Comments	Instr. 1	Instr. 2	Comments	Instr. 1	Instr. 2	Comments

* Add other tilt orientations if required

6.2.2 Cold [OIML R 146-2, Annex A, A.5.2]

Observer:
Type/ application #:
Instrument 1 ID:
Instrument 2 ID:
Spare instrument ID:

General comments on test:

	Starf ref	Cold (t_C)	Recovery	
EUT ambient temp:				°C
EUT ambient RH:				%
Sample temp:				°C
Spare ambient temp:				°C
Spare ambient RH:				%
Date commenced:				ddmmyyyy
Time commenced:				hh:mm

Displayed name	Error shift limits		Sample info		Nominal values (%)		Sample stability	Correct for recov
GT	Min	Max	number	ID	P_{MB}	M	ΔP_{MB}	Yes/ No
			1					
			2					
			3					

Sample number	Instrument	Error shift			RESULTS SUMMARY (pass/fail)		
		Cold (t_C)	Recovery	Corrected	Comments	Instrument	Type
1	1						
2							
3							
1	2						
2							
3							

Sample number	Mean P_{MB} (Start - ref)			Mean P_{MB} (Cold)		Mean P_{MB} (Recovery)		
	Instr. 1	Instr. 2	Spare-ref	Instr. 1	Instr. 2	Instr. 1	Instr. 2	Spare-ref
1								
2								
3								

Sample number	P_{MB} (Start - ref)			P_{MB} (Cold)		P_{MB} (Recovery)			Comments
	Instr. 1	Instr. 2	Spare-ref	Instr. 1	Instr. 2	Instr. 1	Instr. 2	Spare-ref	
1									
2									
3									
Comments									

6.2.3 Dry Heat [OIML R 146-2, Annex A, A.5.3]

Observer:
Type/ application #:
Instrument 1 ID:
Instrument 2 ID:
Spare instrument ID:

General comments on test:

	Starf ref	Dry H (t_H)	Recovery	
EUT ambient temp:				°C
EUT ambient RH:				%
Sample temp:				°C
Spare ambient temp:				°C
Spare ambient RH:				%
Date commenced:				ddmmyyyy
Time commenced:				hh:mm

Displayed name	Error shift limits		Sample info		Nominal values (%)		Sample stability	Correct for recov
GT	Min	Max	number	ID	P_{MB}	M	ΔP_{MB}	Yes/ No
			1					
			2					
			3					

Sample number	Instrument	Error shift			RESULTS SUMMARY (pass/fail)		
		Dry H (t_H)	Recovery	Corrected	Comments	Instrument	Type
1	1						
2							
3							
1	2						
2							
3							

Sample number	Mean P_{MB} (Start - ref)			Mean P_{MB} (Dry Heat)		Mean P_{MB} (Recovery)		
	Instr. 1	Instr. 2	Spare-ref	Instr. 1	Instr. 2	Instr. 1	Instr. 2	Spare-ref
1								
2								
3								

Sample number	P_{MB} (Start - ref)			P_{MB} (Dry Heat)		P_{MB} (Recovery)			Comments
	Instr. 1	Instr. 2	Spare-ref	Instr. 1	Instr. 2	Instr. 1	Instr. 2	Spare-ref	
1									
2									
3									
Comments									

6.2.4 Damp heat [OIML R 146-2, Annex A, A.5.4]

Observer:
Type/ application #:
Instrument 1 ID:
7.2.4 Instrument 2 ID:
Spare instrument ID:

General comments on test:

	Starf ref	Damp H (t_H)	Recovery	
EUT ambient temp:				°C
EUT ambient RH:				%
Sample temp:				°C
Spare ambient temp:				°C
Spare ambient RH:				%
Date commenced:				ddmmyyyy
Time commenced:				hh:mm

Displayed name	Error shift limits		Sample info		Nominal values (%)		Sample stability	Correct for recov
GT	Min	Max	number	ID	P_{MB}	M	ΔP_{MB}	Yes/ No
			1					
			2					
			3					

Sample number	Instrument	Error shift			RESULTS SUMMARY (pass/fail)		
		Damp H (t_H)	Recovery	Corrected	Comments	Instrument	Type
1	1						
2							
3							
1	2						
2							
3							

Raw data entry - Damp heat [ref. OIML R 146-2, Annex A, A.5.4]

Sample number	Mean P_{MB} (Start - ref)			Mean P_{MB} (Damp H)		Mean P_{MB} (Recovery)		
	Instr. 1	Instr. 2	Spare-ref	Instr. 1	Instr. 2	Instr. 1	Instr. 2	Spare-ref
1								
2								
3								

Sample number	P_{MB} (Start - ref)			P_{MB} (Damp heat)		P_{MB} (Recovery)			Comments
	Instr. 1	Instr. 2	Spare-ref	Instr. 1	Instr. 2	Instr. 1	Instr. 2	Spare-ref	
1									
2									
3									
Comments									

6.2.5 AC mains voltage variations [OIML R 146-2, Annex A, A.5.5]

Observer:
Type/ application #:
Instrument 1 ID:
Instrument 2 ID:

Displayed name	Error shift limits		Standard deviation	Sample info	Nominal values (%)	
GT	Min	Max	Max	ID	P_{MB}	M
			0.1			

	Start - ref	Influence		Recovery	
	U_{nom}	U_{nom} +10 %	U_{nom} -15 %	U_{nom}	
Test voltage:					V
Test frequency:					Hz
Ambient temp (t):					°C
Ambient RH:					%
Date commenced:					ddmmyy
Time commenced:					hh:mm

General comments on test:

Instrument	Standard deviation replicate P_{MB}				Mean P_{MB}				Error shift			RESULTS SUMMARY (pass / fail)		
	Start - ref	U_{nom} +10 %	U_{nom} -15 %	Recovery	Start - ref	U_{nom} + 10%	U_{nom} - 15%	Recovery	U_{nom} + 10%	U_{nom} - 15%	Recovery	Comments	Instrument	Type
1														
2														

Raw data entry

#	P_{MB} (Start -ref)			P_{MB} (U_{nom} +10%)			P_{MB} (U_{nom} -15%)			P_{MB} (Recovery)		
	Instr. 1	Instr. 2	Comments	Instr. 1	Instr. 2	Comments	Instr. 1	Instr. 2	Comments	Instr. 1	Instr. 2	Comments
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												

6.2.6 Variation in voltage supplied by external 12 V and 24 V road vehicle batteries [OIML R 146-2, Annex A, A.5.6]

Observer:
Type/ application #:
Instrument 1 ID:
Instrument 2 ID:

Displayed name	Error shift limits		Sample info	Nominal values (%)	
GT	Min	Max	ID	P_{MB}	M

	Start - ref	Influence		Recovery	
	U_{nom}	Low V	High V	U_{nom}	
Test voltage:					V
Test frequency:					Hz
Ambient temp (t):					°C
Ambient RH:					%
Date commenced:					ddmmyy
Time commenced:					hh:mm

General comments on test:

Instrument	Mean P_{MB}				Error shift			RESULTS SUMMARY (pass / fail)		
	Start - ref	Low V	High V	Recovery	Low V	High V	Recovery	Comments	Instrument	Type
1										
2										

Raw data entry

#	P_{MB} (Start -ref)			P_{MB} (Low V)			P_{MB} (High V)			P_{MB} (Recovery)		
	Instr. 1	Instr. 2	Comments	Instr. 1	Instr. 2	Comments	Instr. 1	Instr. 2	Comments	Instr. 1	Instr. 2	Comments
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												

6.3 Test for disturbances

6.3.1 AC mains voltage dips and short interruptions [OIML R 146-2, Annex A, A.6.1]

Observer:
Type/ application #:
Instrument ID:

General comments on test:

Displayed name	Fault limits		Sample info	Nominal values (%)	
GT	Min	Max	ID	P_{MB}	M

	Start testing	Test (min voltage indicated) A	B	C	D	End testing	
		$0 \times U_{nom}$	$0 \times U_{nom}$	$0.7 \times U_{nom}$	$0 \times U_{nom}$		
Test voltage:		0	0		0		V
Min voltage duration:		0.5	1	25/30^	250/300^		cycles
Test frequency:							Hz
Ambient temp (t):							°C
Ambient RH:							%
Date:							ddmmyy
Time:							hh:mm

^These values are for 50 Hz and 60 Hz respectively

All faults within limits (yes / no)	All insignificant# (yes / no)	RESULT (pass / fail) Type	Comments

#A fault exceeding the limit is insignificant if 'acted on' or exempted from the definition of a significant fault.

Raw data entry

	Ref P_{MB}	A		B		C		D	
		P_{MB}	Comments	P_{MB}	Comments	P_{MB}	Comments	P_{MB}	Comments
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
*									
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
*									
All faults within limits									
All faults insignificant									
Comments (e.g. action details)									

6.3.2 Bursts (transients) on AC mains [OIML R 146-2, Annex A, A.6.2]

Observer:
Type/ application #:
Instrument ID:

General comments on test:

	Start test	End test	
Test voltage:			V
Test frequency:			Hz
Ambient temp (t):			°C
Ambient RH:			%
Date:			ddmmyy
Time:			hh:mm
Mean ref P_{MB}:			
1			
2			
3			
4			
5			

Displayed name	Fault limits		Sample info	Nominal values (%)	
GT	Min	Max	ID	P_{MB}	M

All faults within limits (yes / no)	All insignificant[#] (yes / no)	RESULT (pass / fail)	
		Type	Comments

#A fault exceeding the limit is insignificant if 'acted on' or exempted from the definition of a significant fault.

Disturbance severity

Amplitude:	1	kV
Repetition rate:	5	kHz

Raw data entry - Bursts (transients) on AC mains [OIML R 146-2, Annex A, A.6.2]

Connection	L → G				N → G				PE → G			
Polarity	(+)		(-)		(+)		(-)		(+)		(-)	
	P_{MB}	Comments	P_{MB}	Comments	P_{MB}	Comments	P_{MB}	Comments	P_{MB}	Comments	P_{MB}	Comments
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
*												
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
*												
All faults within limits												
All faults insignificant												
Comments (e.g. action details)												

6.3.3 Radiated, radio-frequency, electromagnetic field [OIML R 146-2, Annex A, A.6.3]

Observer:
Type/ application #:
Instrument ID:

Displayed name	Fault limits	
GT	Min	Max

General comments on test:

All faults within limits (yes / no)	All insignificant# (yes / no)	RESULT (pass / fail)	
		Type	Comments

#A fault exceeding the limit is insignificant if 'acted on' or exempted from the definition of a significant fault.

Disturbance settings (indicate values if alternative settings are applied)

Frequency range:		MHz	Frequency range:	26* - 2000 MHz
Modulation:			Modulation:	80 % AM, 1 kHz sine wave
Field strength:		V/ m	Field strength:	10 V/ m
Step size:			Step size:	1 %
Rate of sweep:			Rate of sweep:	1.5E-03 decade/ s

*Testing from 80 MHz is permitted.

Antenna:
Circular polarization (yes / no):
Note: Two orthogonal polarizations shall be tested if the answer is 'No'.

Example radiated EMS testing scheme:

Antenna polarization:	1 - Vertical				2 - Horizontal			
Facing EUT side:	Front	Left	Right	Back	Front	Left	Right	Back

Raw data entry - Radiated, radio-frequency, electromagnetic fields [OIML R 146-2, Annex A, A.6.3]

Before disturbances	
Antenna polarization:	
Facing EUT side:	
Test voltage:	
Test frequency:	
Ambient temp (*t*):	
Ambient RH:	
Date:	
Time:	
Grain sample ID:	
Nominal P_{MB}:	
Nominal moisture:	
Mean ref P_{MB}:	
1	
2	
3	
4	
5	

Use another sample/ batch for other orientations or instrument if 1st sample unfit due to overuse/ exposure.

Comments:

During disturbances					
Frequency (MHz)	P_{MB}	Fault	Within limit (yes / no)	Insignificant (yes / no)	Comments
*					

Add additional rows if required.

Continued - Raw data entry - Radiated, radio-frequency, electromagnetic fields [OIML R 146-2, Annex A, A.6.3]

Before disturbances	
Antenna polarization:	
Facing EUT side:	
Test voltage:	
Test frequency:	
Ambient temp (*t*):	
Ambient RH:	
Date:	
Time:	
Grain sample ID:	
Nominal P_{MB}:	
Nominal moisture:	
Mean ref P_{MB}:	
1	
2	
3	
4	
5	

Use another sample/ batch for other orientations or instrument if 1st sample unfit due to overuse/ exposure.

Comments:

During disturbances					
Frequency (MHz)	P_{MB}	Fault	Within limit (yes / no)	Insignificant (yes / no)	Comments
*					

Add additional rows if required.

Continued - Raw data entry - Radiated, radio-frequency, electromagnetic fields [OIML R 146-2, Annex A, A.6.3]

Before disturbances	
Antenna polarization:	
Facing EUT side:	
Test voltage:	
Test frequency:	
Ambient temp (t):	
Ambient RH:	
Date:	
Time:	
Grain sample ID:	
Nominal P_{MB}:	
Nominal moisture:	
Mean ref P_{MB}:	
1	
2	
3	
4	
5	

Use another sample/ batch for other orientations or instrument if 1st sample unfit due to overuse/ exposure.

Comments:

During disturbances					
Frequency (MHz)	P_{MB}	Fault	Within limit (yes / no)	Insignificant (yes / no)	Comments
*					

Add additional rows if required.

Continued - Raw data entry - Radiated, radio-frequency, electromagnetic fields [OIML R 146-2, Annex A, A.6.3]

Before disturbances	
Antenna polarization:	
Facing EUT side:	
Test voltage:	
Test frequency:	
Ambient temp (t):	
Ambient RH:	
Date:	
Time:	
Grain sample ID:	
Nominal P_{MB}:	
Nominal moisture:	
Mean ref P_{MB}:	
1	
2	
3	
4	
5	

Use another sample/ batch for other orientations or instrument if 1st sample unfit due to overuse/ exposure.

Comments:

During disturbances					
Frequency (MHz)	P_{MB}	Fault	Within limit (yes / no)	Insignificant (yes / no)	Comments
*					

Add additional rows if required.

Raw data entry - Radiated, radio-frequency, electromagnetic fields [OIML R 146-2, Annex A, A.6.3]

Before disturbances	
Antenna polarization:	
Facing EUT side:	
Test voltage:	
Test frequency:	
Ambient temp (*t*):	
Ambient RH:	
Date:	
Time:	
Grain sample ID:	
Nominal P_{MB}:	
Nominal moisture:	
Mean ref P_{MB}:	
1	
2	
3	
4	
5	

Use another sample/ batch for other orientations or instrument if 1st sample unfit due to overuse/ exposure.

Comments:

During disturbances					
Frequency (MHz)	P_{MB}	Fault	Within limit (yes / no)	Insignificant (yes / no)	Comments
*					

Add additional rows if required.

Continued - Raw data entry - Radiated, radio-frequency, electromagnetic fields [OIML R 146-2, Annex A, A.6.3]

Before disturbances	
Antenna polarization:	
Facing EUT side:	
Test voltage:	
Test frequency:	
Ambient temp (*t*):	
Ambient RH:	
Date:	
Time:	
Grain sample ID:	
Nominal P_{MB}:	
Nominal moisture:	
Mean ref P_{MB}:	
1	
2	
3	
4	
5	

Use another sample/ batch for other orientations or instrument if 1st sample unfit due to overuse/ exposure.

Comments:

During disturbances					
Frequency (MHz)	P_{MB}	Fault	Within limit (yes / no)	Insignificant (yes / no)	Comments
*					

Add additional rows if required.

Continued - Raw data entry - Radiated, radio-frequency, electromagnetic fields [OIML R 146-2, Annex A, A.6.3]

Before disturbances	
Antenna polarization:	
Facing EUT side:	
Test voltage:	
Test frequency:	
Ambient temp (*t*):	
Ambient RH:	
Date:	
Time:	
Grain sample ID:	
Nominal P_{MB}:	
Nominal moisture:	
Mean ref P_{MB}:	
1	
2	
3	
4	
5	

Use another sample/ batch for other orientations or instrument if 1st sample unfit due to overuse/ exposure.

Comments:

During disturbances					
Frequency (MHz)	P_{MB}	Fault	Within limit (yes / no)	Insignificant (yes / no)	Comments
*					

Add additional rows if required.

Continued - Raw data entry - Radiated, radio-frequency, electromagnetic fields [OIML R 146-2, Annex A, A.6.3]

Before disturbances	
Antenna polarization:	
Facing EUT side:	
Test voltage:	
Test frequency:	
Ambient temp (t):	
Ambient RH:	
Date:	
Time:	
Grain sample ID:	
Nominal P_{MB}:	
Nominal moisture:	
Mean ref P_{MB}:	
1	
2	
3	
4	
5	

Use another sample/ batch for other orientations or instrument if 1st sample unfit due to overuse/ exposure.

Comments:

During disturbances					
Frequency (MHz)	P_{MB}	Fault	Within limit (yes / no)	Insignificant (yes / no)	Comments
*					

Add additional rows if required.

6.3.4 Conducted, radio-frequency, electromagnetic field [OIML R 146-2, Annex A, A.6.4]

Observer:
Type/ application #:
Instrument ID:

	Start test	End test	
Test voltage:			V
Test frequency:			Hz
Ambient temp (t):			°C
Ambient RH:			%
Date:			ddmmyy
Time:			hh:mm
Mean ref P_{MB}:			
1			
2			
3			
4			
5			

Displayed name	Fault limits		Sample info	Nominal values (%)	
GT	Min	Max	ID	P_{MB}	M

General comments on test:

All faults within limit (yes / no)	All insignificant# (yes / no)	RESULT (pass / fail)	
		Type	Comments

#A fault exceeding the limit is insignificant if 'acted on' or exempted from the definition of a significant fault.

Disturbance settings (indicate values if alternative settings are applied)

Frequency range:		MHz
Modulation:		
RF amplitude (50 Ω):		V (e.m.f.)

Frequency range:	0.15 - 80	MHz
Modulation:	80 % AM, 1 kHz sine wave	
RF amplitude (50 Ω):	10	V (e.m.f.)

Raw data entry - Radiated, radio-frequency, electromagnetic fields [OIML R 146-2, Annex A, A.6.5]

Cable or interface:

Frequency (MHz)	P_{MB}	Fault	Within limit (yes / no)	Insignificant (yes / no)	Comments
*					

Add additional rows if required.

Cable or interface:

Frequency (MHz)	P_{MB}	Fault	Within limit (yes / no)	Insignificant (yes / no)	Comments
*					

Add additional rows if required.

Cable or interface:

Frequency (MHz)	P_{MB}	Fault	Within limit (yes / no)	Insignificant (yes / no)	Comments
*					

Cable or interface:

Frequency (MHz)	P_{MB}	Fault	Within limit (yes / no)	Insignificant (yes / no)	Comments
*					

6.3.5 Electrostatic discharges [OIML R 146-2, Annex A, A.6.5]

Observer:
Type/ application #:
Instrument ID:

	Start test	End test	
Test voltage:			V
Test frequency:			Hz
Ambient temp (t):			°C
Ambient RH:			%
Date:			ddmmyy
Time:			hh:mm
Mean ref P_{MB}:			
1			
2			
3			
4			
5			

Displayed name	Fault limits		Sample info	Nominal values (%)	
GT	Min	Max	ID	P_{MB}	M

General comments on test:

All faults within limits (yes / no)	All insignificant# (yes / no)	RESULT (pass / fail)	
		Type	Comments

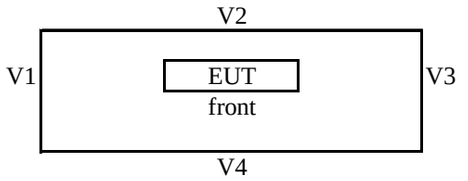
#A fault exceeding the limit is insignificant if 'acted on' or exempted from the definition of a significant fault.

Disturbance settings

Direct discharge mode (contact, paint penetration or air)

2 kV
4 kV
6 kV
8 kV

Refer to diagram of coupling plane positions for applying discharges indirectly.
Notes: H = horizontal, V = vertical



Polarity of indirect discharges (positive / negative):

It is permitted to only test at one polarity.
IEC 61000-4-2 specifies to select the most sensitive polarity.

Raw data entry - Electrostatic discharges [OIML R 146-2, Annex A, A.6.5]

Direct discharge application

Voltage (kV)	2			4			6			8		
	P_{MB}		Comments	P_{MB}		Comments	P_{MB}		Comments	P_{MB}		Comments
Polarity	(+)	(-)		(+)	(-)		(+)	(-)		(+)	(-)	
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
*												
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
*												
All faults within limits												
All faults insignificant												
Comments (e.g. action details)												

Continued - Raw data entry - Electrostatic discharges [OIML R 146-2, Annex A, A.6.5]

Indirect discharge application

Coupling plane position	V1				V2				V3			
	P_{MB}			Comments	P_{MB}			Comments	P_{MB}			Comments
Voltage (kV)	2	4	6		2	4	6		2	4	6	
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
*												
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
*												
All faults within limits												
All faults insignificant												
Comments (e.g. action details)												

Continued - Raw data entry - Electrostatic discharges [OIML R 146-2, Annex A, A.6.5]

Continued - Indirect discharge application

Coupling plane position	V4				H			
	P_{MB}			Comments	P_{MB}			Comments
Voltage (kV)	2	4	6		2	4	6	
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
*								
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
*								
All faults within limits								
All faults insignificant								
Comments (e.g. action details)								

6.3.6 Storage temperature (extreme shipping conditions [OIML R 146-2, Annex A, A.6.6]

Observer:
Type/ application #:
Instrument 1 ID:
Instrument 2 ID:

General comments on test:

	Start test	End test	
Ambient temp:			°C
Ambient RH:			%
Date:			ddmmyy
Time:			hh:mm

Displayed name	Fault limits		Sample info	Nominal values (%)	
GT	Min	Max	ID	P_{MB}	M

Instrument	All faults within limit (Yes / no)	All insignificant# (Yes / no)	RESULTS SUMMARY (Pass / fail)		
			Comments	Instrument	Type
1					
2					

#A fault exceeding the limit is insignificant if 'acted on' or exempted from the definition of a significant fault.

Disturbance severity

Minimum temp: -20 °C
Maximum temp: 55 °C

Raw data entry

BEFORE disturbance		
#	P_{MB}	
	Instr. 1	Instr. 2
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
Mean P_{MB}		

AFTER disturbance									
	Instrument 1					Instrument 2			
	P_{MB}	Fault	Within limit (yes / no)	Insignificant (yes / no)		P_{MB}	Fault	Within limit (yes / no)	Insignificant (yes / no)
1					1				
2					2				
3					3				
4					4				
5					5				
6					6				
7					7				
8					8				
9					9				
10					10				
Comments					Comments				

6.3.7 Random vibrations [OIML R 146-2, Annex A, A.6.7]

Observer:
Type/ application #:
Instrument ID:

General comments on test:

	Start test	End test	
Ambient temp (t):			°C
Ambient RH:			%
Date:			ddmmyy
Time:			hh:mm

Displayed name	Fault limits		Sample info	Nominal values (%)	
GT	Min	Max	ID	P_{MB}	M

All faults within limits (yes / no)	All insignificant (yes / no)	RESULT (pass / fail)	
		Type	Comments

#A fault exceeding the limit is insignificant if 'acted on' or exempted from the definition of a significant fault.

Disturbance severity

Total frequency range:	10 to 150	Hz
Total RMS level:	7	ms^{-2}
ASD level 10 Hz – 20 Hz:	1	m^2s^{-3}
ASD level 20 Hz – 150 Hz	-3	dB/octave
Number of directions:	3	
Duration per axis:	60	minutes

Raw data entry

	P_{MB} BEFORE
1	
2	
3	
4	
5	
Mean P_{MB}	

	AFTER disturbance				
	P_{MB}	Fault	Within limit (yes / no)	Insignificant (yes / no)	Comments
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

6.4 Test to assess the submitted calibrations

6.4.1 Accuracy and precision [OIML R 146-2, Annex A, A.7.1]

Observer:
Type/ application #:
Instrument 1 ID:
Instrument 2 ID:

General comments on test settings:

	GT1		GT2		GT3		GT4		GT*		
	Start ref	End ref	Start ref	End ref	Start ref	End ref	Start ref	End ref	Start ref	End ref	
Ambient temp (t):											°C
Ambient RH:											%
Date commenced:											ddmmyyyy
Time commenced:											hh:mm

Submitted calibrations					RESULTS SUMMARY (pass / fail)			
Number	Calibration name	Version	Disp. name	M_B (%)	Accuracy	Repeat.	Reprod.	Comments
GT1								
GT2								
GT3								
GT4								
GT*								

	Limits				
Calibration	y(bar)		SEP	Pooled SD	SDD_I
number	Min	Max	Max	Max	Max
GT1					
GT2					
GT3					
GT4					
GT*					

* Add cells for additional calibrations if necessary

Calibration number	Sample info		Reference values		Sample info		Reference values		Sample info		Reference values	
	number	ID	P_{MB}	M	number	ID	P_{MB}	M	number	ID	P_{MB}	M
GT1	1				11				21			
	2				12				22			
	3				13				23			
	4				14				24			
	5				15				25			
	6				16				26			
	7				17				27			
	8				18				28			
	9				19				29			
	10				20				30*			

GT2	1				11				21			
	2				12				22			
	3				13				23			
	4				14				24			
	5				15				25			
	6				16				26			
	7				17				27			
	8				18				28			
	9				19				29			
	10				20				30*			

* Add cells for additional samples if necessary

Calibration number	Sample info		Reference values		Sample info		Reference values		Sample info		Reference values	
	number	ID	P_{MB}	M	number	ID	P_{MB}	M	number	ID	P_{MB}	M
GT3	1				11				21			
	2				12				22			
	3				13				23			
	4				14				24			
	5				15				25			
	6				16				26			
	7				17				27			
	8				18				28			
	9				19				29			
	10				20				30*			
GT4	1				11				21			
	2				12				22			
	3				13				23			
	4				14				24			
	5				15				25			
	6				16				26			
	7				17				27			
	8				18				28			
	9				19				29			
	10				20				30*			
GT*												

* Add cells for additional calibrations and/or samples if necessary

GT1 on Instr. 1 **GT1 on Instr. 2**

The requirement for y(bar) was fulfilled and all functions operated as designed (pass or fail):

Calibration number	Sample number	Mean P_{MB}			Error (y_i)		Averaged y_i, i.e. y(bar)			
		reference	Instr. 1	Instr. 2	Instr. 1	Instr. 2	Instr. 1	Instr. 2	MinLimit	MaxLimit
GT1	1									
	2									
	3									
	4									
	5									
	6									
	7									
	8									
	9									
	10									
	11									
	12									
	13									
	14									
	15									
	16									
	17									
	18									
	19									
	20									
	21									
	22									
	23									
	24									
	25									
	26									
	27									
	28									
	29									
	30*									

Add cells for additional samples if necessary

GT2 on Instr. 1 **GT2 on Instr. 2**

The requirement for y(bar) was fulfilled and all functions operated as designed (pass or fail):

Calibration number	Sample number	Mean P_{MB}			Error (y_i)		Averaged y_i, i.e. y(bar)			
		reference	Instr. 1	Instr. 2	Instr. 1	Instr. 2	Instr. 1	Instr. 2	MinLimit	MaxLimit
GT2	1									
	2									
	3									
	4									
	5									
	6									
	7									
	8									
	9									
	10									
	11									
	12									
	13									
	14									
	15									
	16									
	17									
	18									
	19									
	20									
	21									
	22									
	23									
	24									
	25									
	26									
	27									
	28									
	29									
	30*									
GT*										

* Add cells for additional calibrations and/or samples if necessary

GT1 on Instr. 1 **GT1 on Instr. 2**

The requirement for SEP was fulfilled and all functions operated as designed (pass or fail):

Calibration number	Sample number	Reference P_{MB}	P_{MB} (j=1)		Error (y, j=1)		SEP		
			Instr. 1	Instr. 2	Instr. 1	Instr. 2	Instr. 1	Instr. 2	MaxLimit
GT1	1								
	2								
	3								
	4								
	5								
	6								
	7								
	8								
	9								
	10								
	11								
	12								
	13								
	14								
	15								
	16								
	17								
	18								
	19								
	20								
	21								
	22								
	23								
	24								
	25								
	26								
	27								
	28								
	29								
	30*								

* Add cells for additional samples if necessary

GT2 on Instr. 1 **GT2 on Instr. 2**

The requirement for SEP was fulfilled and all functions operated as designed (pass or fail):

Calibration number	Sample number	Reference P_{MB}	P_{MB} (j=1)		Error (y, j=1)		SEP		
			Instr. 1	Instr. 2	Instr. 1	Instr. 2	Instr. 1	Instr. 2	MaxLimit
GT2	1								
	2								
	3								
	4								
	5								
	6								
	7								
	8								
	9								
	10								
	11								
	12								
	13								
	14								
	15								
	16								
	17								
	18								
	19								
	20								
	21								
	22								
	23								
	24								
	25								
	26								
	27								
	28								
	29								
	30*								
GT*									

* Add cells for additional calibrations and/or samples if necessary

GT1 on Instr. 1 **GT1 on Instr. 2**

The requirement for repeatability was fulfilled and all functions operated as designed (pass or fail):

Calibration number	Sample number	SD		SD^2 (variance)		Pooled SD		
		Instr. 1	Instr. 2	Instr. 1	Instr. 2	Instr. 1	Instr. 2	MaxLimit
GT1	1							
	2							
	3							
	4							
	5							
	6							
	7							
	8							
	9							
	10							
	11							
	12							
	13							
	14							
	15							
	16							
	17							
	18							
	19							
	20							
	21							
	22							
	23							
	24							
	25							
	26							
	27							
	28							
	29							
	30*							

* Add cells for additional samples if necessary

GT2 on Instr.1 **GT2 on Instr. 2**

The requirement for repeatability was fulfilled and all functions operated as designed (pass or fail):

Calibration number	Sample number	SD		SD^2 (variance)		Pooled SD		
		Instr. 1	Instr. 2	Instr. 1	Instr. 2	Instr. 1	Instr. 2	MaxLimit
GT2	1							
	2							
	3							
	4							
	5							
	6							
	7							
	8							
	9							
	10							
	11							
	12							
	13							
	14							
	15							
	16							
	17							
	18							
	19							
	20							
	21							
	22							
	23							
	24							
	25							
	26							
	27							
	28							
	29							
	30*							
GT*								

* Add cells for additional calibrations and/or samples if necessary

GT1 on Instr. 1 **GT1 on Instr. 2**

The requirement for reproducibility was fulfilled and all functions operated as designed (pass or fail):

Calibration number	Sample number	Mean P_{MB}		d	SDD_I	SSD_I
		Instr. 1	Instr. 2			MaxLimit
GT1	1					
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					
	20					
	21					
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					
	30*					

* Add cells for additional samples if necessary

GT2 on Instr. 1 **GT2 on Instr. 2**

The requirement for reproducibility was fulfilled and all functions operated as designed (pass or fail):

Calibration number	Sample number	Mean P_{MB}		d	SDD_I	SSD_I
		Instr. 1	Instr. 2			MaxLimit
GT2	1					
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					
	20					
	21					
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					
	30					
GT*						

* Add cells for additional calibrations and/or samples if necessary

Raw data entry - Accuracy and precision [OIML R 146-2, Annex A, A.7.1]

Calibration number	Sample number	P_{MB} @ ref		Comments	Sample number	P_{MB} @ ref		Comments	Sample number	P_{MB} @ ref		Comments
		Instr. 1	Instr.2			Instr. 1	Instr.2			Instr. 1	Instr.2	
GT1	1				11				21			
	2				12				22			
	3				13				23			
	4				14				24			
	5				15				25			
	6				16				26			
	7				17				27			
	8				18				28			
	9				19				29			
	10				20				30*			

* Add cells for additional samples if necessary

Continued - Raw data entry - Accuracy and precision [OIML R 146-2, Annex A, A.7.1]

Calibration number	Sample number	P_{MB} @ ref		Comments	Sample number	P_{MB} @ ref		Comments	Sample number	P_{MB} @ ref		Comments
		Instr. 1	Instr.2			Instr. 1	Instr.2			Instr. 1	Instr.2	
GT2	1				11				21			
	2				12				22			
	3				13				23			
	4				14				24			
	5				15				25			
	6				16				26			
	7				17				27			
	8				18				28			
	9				19				29			
	10				20				30*			
GT*												

* Add cells for additional calibrations and/or samples if necessary

6.4.2 Sample temperature sensitivity (STS) [OIML R 146-2, Annex A, A.7.2]

Observer:
Type/ application #:
Instrument 1 ID:
Instrument 2 ID:

	Start ref	$t_{ref} - \Delta t_C$	Recov 1	$t_{ref} - \Delta t_H$	Recov 2	
Ambient temp:						°C
Ambient RH:						%
Sample temp:						°C
Date commenced:						ddmmyyyy
Time commenced:						hh:mm

General comments on test settings:

					Limits			
Calibrations submitted and tested					Averaged error shift		RESULTS SUMMARY	
number	Calibration name	Version	Displayed name	M_B (%)	Min	Max	pass / fail	Comments
GT1								
GT2								
GT3								
GT4								

Calibration number	Sample info			Nomimal values (%)	
	moisture	number	ID	P_{MB}	M
GT1	low m	1			
		2			
		3			
	high m	4			
		5			
		6			
GT2	high m	1			
		2			
		3			
	low m	4			
		5			
		6			

Calibration number	Sample info			Nomimal values (%)	
	moisture	number	ID	P_{MB}	M
GT3	low m	1			
		2			
		3			
	high m	4			
		5			
		6			
GT4	high m	1			
		2			
		3			
	low m	4			
		5			
		6			

Instrument 1 only

Calibration	Sample info		Mean P_{MB}					Error shift		Averaged error shift		RESULT	Limits pooled e/shift	
number	moisture	number	Start ref	$t_{ref} - \Delta t_C$	Recov 1	tref + ΔtH	Recov 2	$t_{ref} - \Delta t_C$	$t_{ref} - \Delta t_H$	$t_{ref} - \Delta t_C$	$t_{ref} - \Delta t_H$	pass / fail	Min	Max
GT1	low m	1												
		2												
		3												
	high m	4												
		5												
		6												
GT2	high m	1												
		2												
		3												
	low m	4												
		5												
		6												
GT3	low m	1												
		2												
		3												
	high m	4												
		5												
		6												
GT4	high m	1												
		2												
		3												
	low m	4												
		5												
		6												

All functions operated as intended: pass / fail

Instrument 2 only

Calibration	Sample info		Mean P_{MB}					Error shift		Averaged error shift		RESULT	Limits averaged e/shift	
number	moisture	number	Start ref	$t_{ref} - \Delta t_C$	Recov 1	tref + ΔtH	Recov 2	$t_{ref} - \Delta t_C$	$t_{ref} - \Delta t_H$	$t_{ref} - \Delta t_C$	$t_{ref} - \Delta t_H$	pass / fail	Min	Max
GT1	low m	1												
		2												
		3												
	high m	4												
		5												
		6												
GT2	high m	1												
		2												
		3												
	low m	4												
		5												
		6												
GT3	low m	1												
		2												
		3												
	high m	4												
		5												
		6												
GT4	high m	1												
		2												
		3												
	low m	4												
		5												
		6												

All functions operated as intended: pass / fail

Raw data entry - Sample temperature sensitivity (STS) [OIML R 146-2, Annex A, A.7.2]

Calibration	Sample info		P_{MB} (start ref)		P_{MB} (t_{ref} - Δt_C)		P_{MB} (recov 1)		P_{MB} (t_{ref} + Δt_H)		P_{MB} (recov 2)		Comments
number	moisture	number	Instr. 1	Instr.2	Instr. 1	Instr.2	Instr. 1	Instr.2	Instr. 1	Instr.2	Instr. 1	Instr.2	e.g. functionality
GT1	low m	1											
		2											
		3											
	high m	4											
		5											
		6											
GT2	high m	1											
		2											
		3											
	low m	4											
		5											
		6											
*													

* Add cells for additional calibrations if necessary

Continued - Raw data entry - Sample temperature sensitivity (STS) [OIML R 146-2, Annex A, A.7.2]

Calibration number	Sample info		P_{MB} (start ref)		P_{MB} (t_{ref} - Δt_C)		P_{MB} (recov 1)		P_{MB} (t_{ref} + Δt_H)		P_{MB} (recov 2)		Comments e.g. functionality
	moisture	number	Instr. 1	Instr.2	Instr. 1	Instr.2	Instr. 1	Instr.2	Instr. 1	Instr.2	Instr. 1	Instr.2	
GT3	low m	1											
		2											
		3											
	high m	4											
		5											
		6											
GT4	high m	1											
		2											
		3											
	low m	4											
		5											
		6											