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Editorial

Oenology and metrology

As illustrated by Noah's story, planting vines and producing wine is one of the most ancient human activities which has now reached a state of near perfection, combining ancestral know-how and modern technology to produce the best possible wine according not only to soil and climatic conditions but also - of course - to the taste of potential consumers.

Measurements have contributed to this evolution; for example, appropriate temperature regulation is required for good fermentation and at the time of tasting, a significant element is the persistence of the taste (length of the final flavor) which is expressed in "caudalie" (a special name for the second!).

Owing to the economic importance of wine for producers, sellers and buyers as well as for public authorities which in many countries levy taxes on the alcohol content of wine, legal metrology has developed its controls on a number of measuring instruments used in the wine trade and the OIML has harmonized these practices internationally.

One of the most significant steps was the international harmonization of alcohol-strength measurements. Several national alcoholometry systems existed up to the mid-seventies based on different principles (Gay-Lussac degree, proof system, etc.), which rendered the international trade of alcoholic products complex.

The publication by the OIML in 1973 of the "International Alcoholometric Tables" (OIML R 22) was a decisive step which rapidly resulted in a complete international harmonization of national and regional alcoholometry systems: the symbol "% vol" (or any other equivalent symbol) may now be seen on practically all alcoholic beverage bottles that are produced all over the world. (*Note:* the OIML Tables refer to the $IPTS_{68}$ temperature scale. Since 1990, a new IPT_{90} scale has been adopted by the Meter Convention; however, the differences between the two scales are relatively small and the figures in the 1975 OIML Tables - as well as those in any derived or practical table - are still valid).

Based on these Tables the OIML has published a Recommendation on alcoholometers (R 44) and a compatible ISO International Standard also exists, referring to OIML Tables.

Other alcohol-related measurements are covered, for example, by R 29 on capacity serving measures, R 45 on casks and barrels, R 86 on drum meters for alcohol, R 96 on measuring container bottles, or R 117 on measuring systems for liquids.

However, it is not sufficient to measure the qualities (and quantities) of wine when produced. It is also necessary to predict what these qualities will be, in order to define the most appropriate wine-making procedure. One of the relevant characteristics is the sugar content of grape must, which may be measured using the refractometry technique. An OIML Recommendation on refractometers was published recently (R 124). This Recommendation is now being implemented step by step by wine-producing countries such as Portugal, France, etc.

A paper about the verification of refractometers, developed by Portuguese and Dutch metrology and wine experts, is published in this issue of the OIML Bulletin; it is intended to organize an intercomparison of reference samples in order to check whether the verification of the instruments is sufficiently coherent amongst countries. ■

BIML

AN APPLICATION OF R 76

New standard measurement transmission device for standard track scales

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Abstract

This paper first gives a brief introduction to the manufacture of a standard track scale that complies with the Class II accuracy requirements of OIML R 76 (1992) Nonautomatic weighing instruments. *It then outlines the main specifications and structural characteristics of the 11 m standard track scale.*

1 Introduction

OIML R 76 stipulates in subclause 3.5.1 that the mpe of a Class III scale for trade use should be as in Table 1, where e is the verification scale interval, which in China is equal to 20 kg or 50 kg for Class III nonautomatic track scales and 2 kg for Class II instruments.

Static track scales for business usage (which fall under the category of nonautomatic weighing instruments and which are widely used in China for railway transportation trade measurements) should also meet the above requirements. However, the measurement mpe of railway track scale test weight wagons should be less than 1/3 of the Class III mpe in Table 1. The standard track scale (which is the standard equipment used for measurement inspection of the test weight wagon) should be less than 1/3 of the mpe of the test weight wagon. Therefore, the mpe of the standard track scale should be less than 1/9 of the mpe of Class III in Table 1. Since the mpe of Class II scales stipulated in R 76 is 1/10 that of Class III scales, the standard track scale should meet Class II requirements.

In order to conform to the above, the standard track scale general design and construction, components and materials, installation and adjustment, etc. were all given full consideration.

2 Methods of installation and adjustment of the standard track scale

The standard instrument used to inspect the standard track scale is designed to maximum limits of analogue detection of the test weight wagon.

Table 1 Maximum permissible errors for increasing or decreasing loads

Maximum permissible errors on initial verification	For loads m expressed in verification scale intervals e			
	Class (I)	Class (II)	Class (III)	Class (IIII)
± 0.5 e	0 ≤ m ≤ 50 000	0 ≤ m ≤ 5 000	0 ≤ m ≤ 500	0 ≤ m ≤ 50
± 1 e	50 000 < m ≤ 200 000	5 000 < m ≤ 20 000	500 < m ≤ 2 000	50 < m ≤ 200
± 1.5 e	200 000 < m	20 000 < m ≤ 100 000	2 000 < m ≤ 10 000	200 < m ≤ 1 000

BIML note: Table reproduced as in OIML R 76

Table 2 Wheel axle setting data

Type	Central distance of a bogie (small wagon)	Full length of a bogie axle (small wagon)	Full length of an axle	All up
T6	2.86 m	1.60 m	4.46 m	40 t
Small counterweight for wagons of group 2	3.46 m	1.00 m	4.46 m	40.04 t
T6F / T6D C62	8.70 m	1.75 m	10.45 m	20 t to 84 t
Small counterweight for wagons of group 1	8.70 m	1.00 m	9.70 m	82.13 t

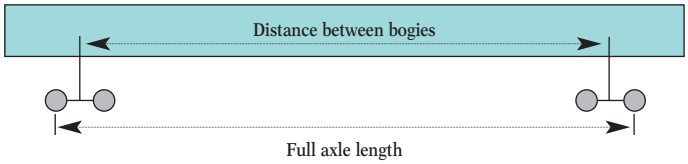

Fig. 1 Wheel axle settings

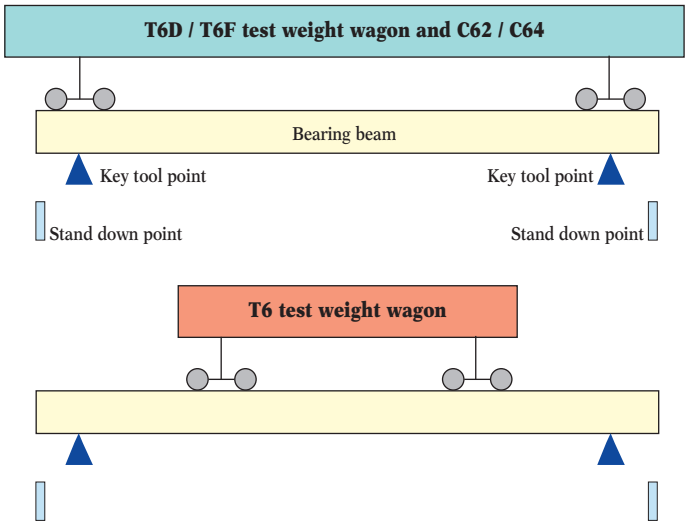

Fig. 2 Sketch of a standard track scale inspecting a test weight wagon

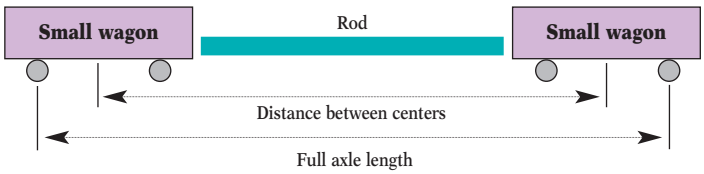

Fig. 3 Imitation of the test weight wagons

The function of the standard track scale instrument is to inspect test weight wagons, of which there are two kinds: type T6 and type T6F / T6D. The mass of the T6 is 40 t, and that of the latter types is between 20 t and 84 t. The T6 is a short axle type and the T6F / T6D are both long axle wagons: these are quite similar to the type C62 and C64 bulk cargo vehicles which account for 80 % of China's railway transportation vehicles. The wheel axle setting is depicted in Fig. 1 and relevant data presented in Table 2.

The long test weight wagon in Fig. 2 can only move 350 mm along the standard track scale while being inspected. The short test weight wagon, however, can move further on the standard track scale while being inspected, but should remain in the middle of the scale.

Figure 3 shows details of the exclusive counterweight for imitating small counterweight wagons of types T6D / T6F and T6; relevant data is presented in Table 2. The two small wagons are connected by a long central rod of mass 130 kg ± 0.1 kg (when imitating the long test weight wagon) and a short rod of mass 40 kg ± 0.1 kg (when imitating the short test weight wagon).

The distance between the centers of the two small wagons, when used to imitate the long test weight wagon, is exactly the same as the underframe of the long test weight wagon.

The axle length of the two small wagons is shorter by 0.75 m than that of the long test weight wagon, so the full axle length of the two small wagons should be increased by 0.75 m when used to imitate the long wagon. Consequently, the movable distance of the two small wagons reaches 1.1 m, which is 0.75 m longer than the long test wagon.

The mass of each small wagon is 2 500 kg ± 0.1 kg, including its attached F_2 counterbalance weight of 77 t.

Each counterbalance weighing 3 t or 2 t is weighed by a 3 t weighing scale whose sensitivity is less than 0.001 %. The counterbalance weighing 1 t or 0.5 t is weighed by a 0.5 t or 1 t weighing scale whose sensitivity is less than 0.001 %. All these counterbalances can be used to inspect standard track scales within 30 days after they have been weighed.

The above-mentioned counterbalance, small wagon and rod are made of different masses of 20.13 t, 40.13 t, 60.13 t and 82.13 t, to imitate the long test weight wagon and the short test weight wagon of 40.4 t.

Generally speaking, there are no wagons whose mass exceeds these values. This is because in China, the total mass of each bulk wagon is less than 84 t, so 100 t data are rare.

The imitated test weight wagon consisting of standard masses of the small wagon group moves to and from its rest position (to the left, to the right and in the middle of the standard track scale) 5 times to inspect the scale (i.e. just within the length of the standard track scale).

3 Main current specifications and structural characteristics of the 11 m standard track scale

Accuracy class:	OIML R 76 Class II
Maximum capacity (Max.):	100 t
Minimum capacity (Min.):	18 t
Verification scale interval (e):	2 kg
No. of verification scale intervals (n):	50 000
Length of weighing surface:	11 m
Gauge:	1 435 mm
Actual scale interval (d):	0.1 kg
Number of actual scale intervals:	1 000 000
Actual measurement value: (the same loaded wagon to and fro 5 times, weighing 10 times)	

at 20 t: random error, σ = 0.053 kg; max. error = 0.4 kg
at 40 t: random error, σ = 0.042 kg; max. error = 1.5 kg
at 60 t: random error, σ = 0.157 kg; max. error = 1.2 kg
at 82 t: random error, σ = 0.166 kg; max. error = 1.0 kg

The 11 m standard track scale satisfies the mpe requirements for Class II and its random error is only σ = 0.166 kg, which means that it has a latent capacity to improve its accuracy. ■

CHEN-SENLIN

REFRACTOMETRY - R 124

Uncertainty budgets and mpes in refractometry: A project study

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Introduction

Refractometers are instruments which measure the refractive index of grape must before fermentation, using the phenomenon of light refraction or of total internal reflection of light. These instruments may also be used to measure the refractive index of sugar solutions and, possibly, of concentrated must. A means of predicting the alcoholic strength of the wine made from the must is thus available.

Refractometers may ensure an appropriate level of credibility of measurement results on the condition that they are subject to legal metrological control. This can be achieved by complying with the requirements of OIML R 124 *Refractometers for the measurement of the sugar content of grape must* [1].

However, to improve the accuracy of measurement results, the relationship between uncertainty budgets and maximum permissible errors (mpe's) should be evaluated.

This paper contributes to improving the understanding of uncertainty components when metrological control of refractometers is applied, and presents the methods used to prepare and certify the reference solutions employed as working standards. Evidence is also given of the traceability chain and of the links to national measurement standards.

Based on a preparation and measurement process, an evaluation of uncertainty sources was carried out in accordance with the Eurochem Guide [2], which builds on the *Guide to the Expression of Uncertainty in Measurement* (GUM) [3]. The influence of repeatability and reproducibility were estimated and seem not to deviate from confidence intervals. The homogeneity and stability testing between (and within) bottles was evaluated by statistical analysis using an adequate, fully nested design. The relationship between the mass fraction and the refractive index of sugar has been addressed by several authors, in particular by Jaulmes (see OIML R 124, clause 13, page 7). According to his work the correlation between the sugar content and the refractive index can be defined as follows:

$c = 6844\ (n - 1.3358)$ for $n \leq 1.3706$ and

$c = 6712\ (n - 1.3351)$ for $n > 1.3706$

where:

c is the concentration of sugar; and
n the refractive index of the sample.

When used for determining the sugar content of grape must, refractometers are provided with an additional scale where the mass fraction is related to the expected alcoholic content by:

$T = C/K$

where:

C is the mass fraction of the sucrose solution;
T is the expected alcoholic content that a must can produce after fermentation; and
K is the chemical equivalence factor.

The basic principle governing the scale of refractometers for the wine industry is the stoichiometric transformation of the sugar in the grape into ethanol. Available information indicates that the chemical equivalence factor K is between 16.5 % and 17.7 %. Community legislation was put into force by a tabulation of the values of the refractive index of sucrose-water solutions and the alcoholic strength at 20 °C. These values were adopted from ICUMSA [4].

In the wine industry the sugar content of grape is determined by measuring the refractive index of the solution and referring the result to a standard curve. It is based on the principle of Abee refractometers where the adjustment was in agreement with ICUMSA and the relation between the concentration of sucrose in sucrose-water solutions and the refractive index n was established at a wavelength of 589 nm at a temperature of 20 °C.

As a consequence, the refractometry method of measurement has resulted in the widespread use of the units of mass fraction, i.e. sugar (sucrose) content and % vol., i.e. ethanol content. Invariably, these units are used in routine industrial measurements.

Metrological control

Refractometry has been designated as the reference method to measure the sugar content of grape must in Portugal. A survey of refractometer use for grape must

was introduced in 1992. Since then all measuring systems used in the trade of grape for the wine industry must fulfil the performance requirements laid down by law; as a consequence, reliability of measurements is ensured. Therefore such instruments are traceable to national primary measurement standards. The refractometers used for this purpose must obtain pattern approval at IPQ and must pass initial and subsequent verifications (carried out by verification bodies). Refractometers located at wine cellars are checked once a year before the grapes are picked, the objective being to maintain the errors of the instruments as close as possible to the initial range. Within the framework of the Portuguese Metrological System, IPQ is also responsible for maintaining, disseminating and guaranteeing international traceability to SI units.

For this purpose IPQ prepares national standards, from which secondary standards are derived and certified, which are disseminated for calibration in industry and government laboratories. The performance of this framework is assessed annually. Commercial laboratories which are accredited under the National Measurement System and which use nationally traceable reference solutions for instruments are subject to regular accuracy checks using nationally traceable reference standards.

Traceability is assured by means of standard solutions which are produced gravimetrically from pure reagents and then disseminated. Sucrose is the indicated sugar, although hydrolyse of polysaccharides to hexose sugars (fructose and glucose) is very fast. Their disadvantage is that it is impossible to store these solutions, even for a few hours. As a consequence the sucrose-water solutions can be used neither as transfer standards, nor as reference solutions for checking the performance of the measuring system.

Recently, legal metrology has addressed these needs through OIML Recommendation R 124. The OIML suggests the use of glucose solutions as transfer standards; these solutions are stabilized by adding allyl isothiocyanate and tartaric acid. The mass fraction of the glucose solution is determined using a standard refractometer calibrated at 20 °C with solutions of chemically pure saccharose prepared gravimetrically. In the case of glucose solutions, the values of temperature corrections are read from tables of saccharose, multiplied by 1.3. The standard uncertainty should not exceed 0.06 %.

Preparation and certification of reference materials

Due to the absence of international measurement standards, the solutions are prepared gravimetrically using sucrose from ultra pure water of 18 MΩ resistance. The weighing is performed on a calibrated balance; these calibrations are carried out regularly in accordance with the protocol validated by the mass department, ensuring traceability to the national mass standards. The temperature is monitored by thermometers calibrated by the Portuguese Primary Temperature Laboratory. The volumetric equipment used is calibrated by the National Metrology Laboratory and is used to express the uncertainty in the reference materials, either in mass fraction or in volumetric concentration units.

The preparation of the solution is performed in steady ambient conditions under normal atmospheric pressure and at a temperature close to 20 °C. In order to avoid temperature corrections, all the reagents and glassware are placed inside the room some time beforehand so that they attain ambient laboratory conditions. The humidity conditions are set at 50 % ± 10 % in order to prevent systematic errors during the weighing. For humidity values higher than 60 %, some sugar hydration can occur. The concentration of glucose can be expressed as:

$$C_{C_6H_{12}O_6} = \frac{1\,000 \times m_{C_6H_{12}O_6} \times P_{C_6H_{12}O_6}}{V_f \times M_{C_6H_{12}O_6}}$$

The uncertainty evaluation of a typical solution is shown in Tables 1 through 4 (see page 10).

Calibration of the measuring system

The glucose solutions are used as transfer standards. The same facilities are used to prepare glucose and sucrose-water solutions. The refractive index of the glucose-water solution is determined in a measuring system calibrated by means of a sucrose-water solution.

As calibration is defined as a set of operations that establish, under specified conditions, the relationship between values of quantities indicated by a measuring instrument and values represented by a material measure or a reference material, this is the key step in obtaining metrological control in order to assure traceable links [5]. The calibration model chosen can then be inverted to be used to convert response data from the solutions(s) to be certified into the same units as the standards used for calibration [6]. For the application as described, rigorous statistical control is vital, and therefore indirect determination is not recommended.

A typical calibration curve is shown in Fig. 1. Based on these data, which are inverted prior to fitting, a quadratic equation was chosen as a calibration function whose coefficients are $b_2 = 7.41 \times 10^{-6}$, $b_1 = 1.369 \times 10^{-3}$ and

Table 1 Calculation of combined standard uncertainty of m

Variable X_i	Estimate x_i	Uncertainty	Distribution	Standard uncertainty $u(x_i)$	Sensitivity coefficient c_i	Contribution $u_i(y)$
Repeatability	460.001	3.00×10^{-4}	Normal	3.00×10^{-4}	1	3.00×10^{-4}
Resolution	0	1.00×10^{-4}	Rectangular	5.77×10^{-5}	1	5.77×10^{-5}
m	460.001					3.11×10^{-4}

Table 2 Calculation of combined standard uncertainty of M

Variable X_i	Estimate x_i	Uncertainty	Distribution	Standard uncertainty $u(x_i)$	Sensitivity coefficient c_i	Contribution $u_i(y)$
C	72.0642	0.0008	Rectangular	4.62×10^{-4}	6	2.77×10^{-3}
H	12.096	0.00007	Rectangular	4.04×10^{-5}	12	4.85×10^{-4}
O	95.9964	0.0003	Rectangular	1.73×10^{-4}	6	1.04×10^{-3}
$C_6H_{12}O_6$	180.1566					3.00×10^{-3}

Table 3 Calculation of combined standard uncertainty of V_f

Variable X_i	Estimate x_i	Uncertainty	Distribution	Standard uncertainty $u(x_i)$	Sensitivity coefficient c_i	Contribution $u_i(y)$
Specification	2 000 ml	0.6	Triangular	0.24	1	0.24
Repeatability	0	0.0062	Normal	0.0062	1	0.0062
Temperature	0	0.00525	Rectangular	0.0030	1	0.0030
Volume	2 000 ml					0.24

Table 4 Calculation of combined standard uncertainty of C_{stock}

Variable X_i	Estimate x_i	Uncertainty	Distribution	Standard uncertainty $u(x_i)$	Sensitivity coefficient c_i	Contribution $u_i(y)$
P	0.999	0.001	Rectangular	5.77×10^{-4}	1.28	7.37×10^{-4}
m	460.001	3.11×10^{-4}	Normal	3.11×10^{-4}	$2.77\ 10^{-3}$	8.62×10^{-4}
V	2 000	0.24	Normal	0.24	$-6.38\ 10^{-4}$	1.56×10^{-4}
M	180.1566	3.00×10^{-3}	Normal	3.00×10^{-4}	$-7.08\ 10^{-3}$	2.12×10^{-2}
C	1.275×10^{-3}					0.021×10^{-3}

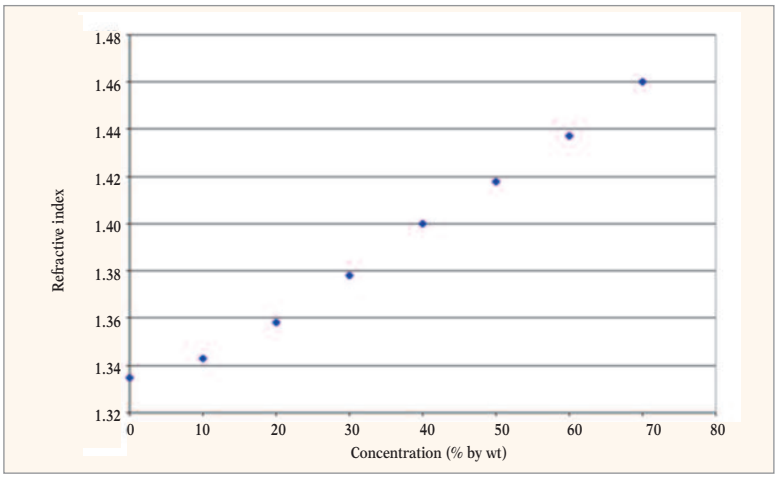

Fig. 1 Typical calibration curve

b_0 = 1.333356. The uncertainty from calibration for the solution(s) to be certified is computed from [7]:

$$(x_c) = G(y_c)$$

$$u(x_c)^2 = (\partial G / \partial y_c)^2 u(y_c)^2 + \sum_{k=0}^{M} (\partial G / \partial b_k)^2 \mathrm{var}(b_k) +$$

$$+ 2 \times \sum_{k=0}^{M-1} \sum_{l=k+1}^{M} (\partial G / \partial b_k)(\partial G / \partial b_l)\mathrm{cov}(b_k, b_l)$$

Stability studies

The stability and homogeneity studies for glucose solutions were carried out in a reference refractometer calibrated daily using fresh sucrose solutions. For stability testing, two kinds of experiments were carried out.

First, a short-term stability study was undertaken in order to establish their validity for OIML pattern approval drift tests. Second, a long-term stability study was conducted to assess the shelf life and the effect of transport under normal conditions during metrological verifications in a wine cellar.

The protocol that specifies the storage and transport conditions was elaborated. The sampling was carried out using a nested design. For long-term stability studies the flasks were stored at room temperature for periods of 1, 3 and 5 months. The storage temperature limit condition was evaluated by thermal degradation. In this case the flasks were stored for ten days at 30 °C, 45 °C and 60 °C.

The performance of the glucose-water solution was tested using two different grades (high purity and normal glucose) and the stability protocol outlined above was applied. All the solutions prepared from the batch using normal glucose showed statistically significant degradation, in contrast to the high-grade solutions. Most high-grade solutions stored under the test conditions remained stable for over one year; only solutions stored at 60 °C were degraded, showing a lower refractive index value. Figure 2 shows the stability data for high-grade glucose solutions. The lower and upper limits of uncertainty (U = 0.02 %) have been estimated using the formula described by Pauwels [8]:

$$u_{exp}^2 = u_{meas}^2 = u_{betw}^2$$

where:

$$u_{meas} = \frac{s_{method}}{\sqrt{n}}$$

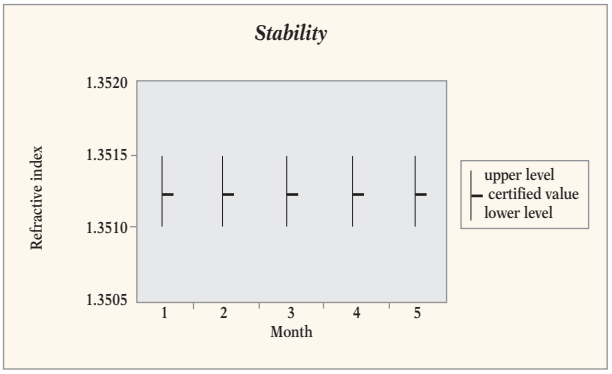

Fig. 2 Stability data for high-grade glucose solutions

The effect of instability for these solutions is so small that it can be concluded that this uncertainty component can be ignored, taking into consideration the repeatability of measurements.

Homogeneity tests

The homogeneity tests were carried out using a fully nested design. The assessment of the homogeneity was performed after filling, to permit all random process variations to be estimated. Five flasks were taken; from each of them, samples of 1 ml were withdrawn and their refractive index was determined. One flask was kept under normal conditions and divided into five layers. An aliquot was withdrawn from each and the refractive index determined. The overall protocol was applied to three different batches.

The refractometer was calibrated before use and checked at a refractive index of 1.3333. Three measurements were made against the refractive index of water. A statistical evaluation of the data was carried out by means of an F-Test. The variance of 5 results obtained on measurements in the 5 flasks was compared to the variance of 5 results obtained on the pooled aliquots from the flasks; no significant inhomogeneity was found.

The results of the homogeneity tests are presented in Figs. 3 and 4. No trends due to the filling sequences were detected. This good concordance between the sampling modes further confirms the reliability and feasibility of the method proposed by the OIML.

On-site measurements

The glucose solutions have been distributed to reference laboratories as working standards and are used on initial

verification, verification after repair, periodic verification and supervision. The main tests are repeatability, drift and zero setting, using three different concentrations at the reference temperature of 20 °C. All the tests are repeated at least 5 times and the mean considered as being the reference value.

A database was constructed in which the test result conditions are stored, including the uncertainty from solutions and tests. This led to the conclusion that the uncertainty arising from solutions is lower compared to that arising from other sources such as instrument drift, temperature control, or zeroing.

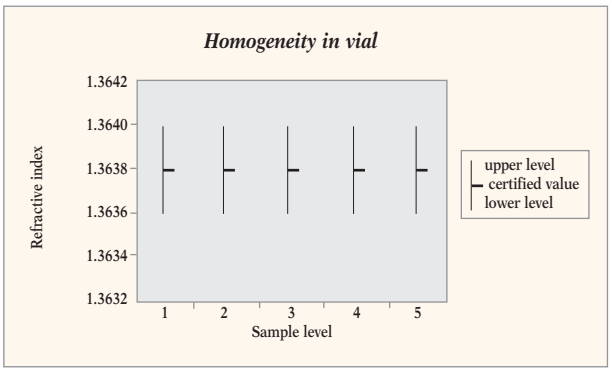

Fig. 3 Within-vial homogeneity test

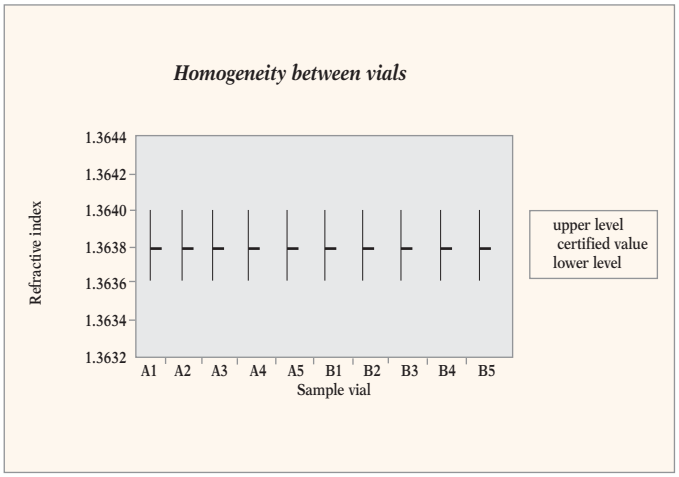

Fig. 4 Between-vial homogeneity test

Conclusions

The nature of wine and its commercial significance indicates the importance of regulations for its control. An EC Directive specifies that correspondence values for ethanol strength through the grape must be correct. In addition, Council Regulations lay down EC procedures for determining these values. OIML R 124 prohibits the placing on the market of refractometers with errors larger than one scale division.

In Portugal, regulations implemented for refractometers have led to better guarantees in trade. All the factors involved can be well tested using a glucose solution as the reference. Glucose solutions prepared according to the method indicated by OIML R 124 ensure the availability of accurate, repeatable and reproducible analytical procedures. The solutions allow the correct implementation of national regulations. International comparability of the results and their traceability according to the GUM concept provide a tool for harmonization of test results, support to laboratory accreditation, and last but not least, allow compliance limits to be set up with uncertainty contribution. ■

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MID

European Directive for Measuring Instruments - A new challenge to industry and to the state

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Summary

After nearly ten years of preparatory work, the Commission of the European Union intends to submit the draft of a general directive for measuring instruments to the European Council and the European Parliament for further handling. To start with, the draft was forwarded to the national metrology institutes responsible for issuing type approvals.

In this paper the concept of the draft directive is presented and legal aspects are dealt with. The Commission's proposals for the further harmonization of the measuring instruments market are elucidated and potential conclusions are drawn, which might be of significance particularly for the weighing instrument industry since a totally harmonized directive according to the new approach is already available for this area.

1 Preliminary remarks

In early January 1999, interested national metrology institutes responsible for issuing type approvals received the third draft of a directive for measuring instruments [1] from the Commission of the European Union. This directive is called the Measuring Instruments Directive (MID). The text is now available in the various national languages of the member countries and will, according to statements by the Commission, be submitted to the political voting bodies of the European Council and of the European Parliament in the course of this year.

The text has led to a considerable need for discussions among experts, and some technical annexes still present gaps. Nevertheless it may be assumed that no more substantial modifications will be made.

The first drafts of a European measuring instruments directive date back to 1991 and were referred to as METRO. Although the content has been substantially amended since then, the most recent version - at least in its technical annexes - leaves something to be desired; examples are given under points 5 and 6 below. From the point of view of the Commission, the MID is largely completed so it can now be presented not only to European Union member states but also to a larger circle of interested parties.

2 Objectives in terms of economic policy

In Article 100A of the Treaty of Rome founding the European Community (which evolved into the European Union) it was prescribed that a common internal market should be created. This presupposed that barriers to trade (which are the result of differences in legal regulations, product requirements, standards etc.) are removed. This should be achieved, among other things, by reaching Europe-wide harmonization of legal regulations, including legal metrology. The latter had in part been established in the respective nations/states according to their specific features as early as 100 years ago with the goal of protecting the consumer, and in commercial transactions today legal metrology is a fixed reference for fair competition which ensures that law and order is maintained.

3 Concept of the MID

As a means for harmonizing national laws, in the early seventies the Commission proposed adopting individual directives, each relating to a specific kind of measuring instrument. Within the scope of the Outline Directive 71/316/EEC [2], 23 individual directives were thus adopted.

Due to the lengthy political and administrative coordination process required to bring them into force, these product directives (with their detailed technical specifications) were not able to keep pace with rapid changes in technology, and even less so as metrology increasingly began to use microprocessor technology. So this was another reason for the Commission to feel compelled to look for a new concept which has become better known by the designation "new approach".

The MID also follows this new concept. It primarily aims at completing the single market (free access to the market) and for this uses the following measures:

- For measuring instruments only *basic technical requirements* are fixed, the objective being to ensure as high a level of consumer protection as possible. These requirements are equivalent to performance require-

ments which are to codetermine (but not to interfere with) further technical development. So as regards technical requirements for instruments, general reference to standards is an integral component of the new concept.

- The member states mutually recognize the certificates issued for measuring instruments. The authorities supervising the market are not allowed to additionally define national - and perhaps conflicting - requirements for the kinds of measuring instruments subjected to the MID.

Those kinds of measuring instruments that are not covered by Community law continue to be governed by national law.

As the Commission itself admits, the legal regulations for metrology contained in the MID are limited to the free circulation of measuring instruments. Whether a measuring instrument is subjected to metrological control such as, for example, verification, continues to be at the discretion of the individual member state according to how it defines the need of its citizens for protection within the scope of its traditional legal culture. Measuring instruments will thus continue to be subjected to legal metrology controls in some member states and not in others. If, however, a member state exclusively prescribes using only officially controlled measuring instruments, the regulations of the MID are applicable without any restriction. The Directive thus regulates only the access of the measuring instruments to the market, not their type of use nor the tests they have to undergo during their useful life, i.e. subsequent verification and inspection.

3.1 Essential requirements

According to the MID, manufacturers of measuring instruments have to ensure that their products meet essential technical requirements in order that minimum metrological standards are complied with. The compliance of a measuring instrument with the relevant essential requirements is evaluated by a conformity assessment procedure which is stated for the individual instruments in the separate annexes.

However, manufacturers may prefer to apply more detailed specifications giving presumption of conformity to the essential requirements of the MID. Two sources of presumption of conformity are provided for:

a) The member states presume that a measuring instrument meets the essential requirements if it complies with the harmonized European Standards in force; these standards are to be published in Series C of the Official Journal of the European Union. The presumption of conformity can apply (only) to those elements of the standards the instrument complies with.

b) It is an important modification of the former versions of the MID that not only European Standards but also OIML Recommendations can act in the sense of the Directive. So the Commission can request the OIML to prepare a "normative document with normative elements" for the kinds of measuring instruments subjected to the Directive; if the technical requirements of these are met, the corresponding requirements of the MID will also be met (presumption effect). The respective OIML Normative Documents are also to be published in the Official Journal of the EU, Series C. The status of the OIML Recommendations has thus considerably been enhanced as regards their legal effect and will in future have decisive importance in the conformity assessment procedure.

If a member state or the Commission holds the opinion that parts of a harmonized standard do not completely comply with the essential requirements, the matter will be discussed in accordance with Directive 98/34/EC [3] of the Council on the *Standing Committee on Standards and Technical Regulations*. The reasons for deviations ascertained are to be stated; the Committee forthwith gives its opinion and the Commission informs the member states of the decision. It is one of the Committee's tasks to establish whether national standards are in possible conflict with the essential requirements of the MID.

3.2 Notified bodies

According to the MID, the member states are obliged to subject measuring instruments to a conformity assessment procedure which is based on the modular approach and which has been presented in Directive 93/465/EEC [4].

The MID takes up this modular approach and (in its Annexes) describes the modules which can be taken as a basis for conformity assessment (cf. Table 1). Of the total of 14 modules among which a selection can be made, three are not, however, applied for the time being.

For a given product the manufacturer can choose the module preferred for the conformity procedure according to the instrument-specific Annexes of the MID (cf. Table 2). The manufacturer can either carry out the conformity testing in-house or can have it performed by a third party by involving a *notified body*. In any case, the responsibility is borne by the manufacturer [6].

The member states inform the Commission and the other member states which bodies they have notified for the tasks in connection with the conformity assessment

procedure. The Commission assigns an identification number to these notified bodies which must be publicized in Series C of the Official Journal of the EU in a "List of Notified Bodies". From this list it can also be ascertained for what kinds of measuring instruments the individual bodies have been notified and whether there are limitations as regards categories of instruments, range of measurement, measuring technique or other instrument features.

The MID does not require that the notified bodies should have been accredited but in Annex III it describes the criteria they must meet to carry out their tasks in connection with the conformity assessment modules. For the notified body to be fully operative the criteria, which are listed in eight short paragraphs, constitute essential requirements which need to be interpreted. As notified bodies may have either a private or a public legal status and thus follow different business principles, considerable and cost-intensive efforts will still have to be made for their work to be harmonized on a permanent basis and Europe-wide.

3.3 CE identification

If a measuring instrument fulfils the essential requirements, the manufacturer will be entitled (and obliged) to affix the CE mark. According to the MID, this obligation will be dropped if the measuring instrument is not subjected to legal control at the national level. But even for these instruments the manufacturer may be compelled by one or several *other, parallel, directives* (such as, for example, electromagnetic compatibility) to affix the CE conformity mark. To clearly show whether the measuring instrument meets the requirements of the MID, in addition to the CE identification, a "metrological identification" is to be applied, which is in the form of an "M" and gives the year in which the mark was applied.

The right to apply the "M" is also granted to the manufacturer whose role is "strengthened" by the Commission "to as high a degree as acceptable". This is achieved by the fact that "as little intervention as possible is required from the certification body". The manufacturer will have greatest freedom of action as regards the selection of the conformity modules if a certification center confirms that the relevant measuring instruments are manufactured under a quality system in accordance with ISO 9001.

3.4 Measuring Instruments Standing Committee

To reconcile diverging opinions on the interpretation of the MID or to deal with technical developments, a *"Measuring Instruments Standing Committee"* has been created into which representatives of the member states are delegated; the Committee is presided over by a representative of the Commission. The representative submits a draft of the measures to be taken to the Committee, which is authorized to prepare - by voting, if necessary - comments on the changes it proposes for the instrument-specific Annexes, for the testing programs fixed or for normative documents. The Commission takes account of the Committee's comments to the greatest extent possible but ultimately reserves the right to take the final decision. Thus the member states irreversibly transfer their (metrological) competence to a supranational decision-making body.

3.5 Placing on the market and putting into use of measuring instruments, and supervision of the market

The member states are responsible for prescribing that:

- measuring instruments should be placed on the market only if they fulfil the respective performance requirements;
- for particular measuring tasks only legally controlled measuring instruments (mandatory verification) should be used; and
- that these instruments must be subjected to tests (periodic verifications and metrological evaluations) at regular intervals within the proposed period of use.

According to common understanding, the terms "placing on the market" and "putting into use" are equivalent in metrological terms. In Article 3 the Commission makes, however, a distinction by considering "placing on the market" to be the moment of the transition of a product from the manufacturing phase to that of distribution and/or utilization on the Community market. In contrast to this, "placing on the market" is regarded as equivalent to the "first use of a product for the purposes for which it was intended". The difference seems to be rather of a semantic nature; from the point of view of the Commission, it is, however, of considerable importance for market supervision: only in the phase of placing on the market do the member states have the right to check measuring instruments for conformity with the essential requirements. This is meant to ensure that after having been placed on the market in other member countries instruments are not again subjected to conformity testing without a particular reason.

The member states have to take any measure necessary to ensure that the measuring instruments placed on the market and put into use under the MID comply with

Table 1 Modules for the declaration of conformity according to the MID

Module description	Declaration of conformity based on
A	Internal production control by the manufacturer
A1	Internal production control by the manufacturer plus product testing by a Notified Body
B	Type examination by an NB*
C (+ B)	Internal production control by the manufacturer
C1 (+ B)	Internal production control plus product testing by an NB
D (+ B)	Approved quality system (ISO 9002) for the production process by an NB
D1	Approved quality system (ISO 9002) for the production process by an NB and technical documentation
E (+ B)	Approved quality system for final product inspection and testing (ISO 9003) by an NB
E1	Approved quality system for final product inspection and testing (ISO 9003) by an NB and technical documentation
F (+ B)	Type approval by an NB with subsequent product verification (individually or statistically)
F1	Product verification at the choice of the manufacturer by an NB either of every instrument or statistically, and technical documentation
G	Unit verification by an NB and technical documentation
H	Approved full quality system (ISO 9001) subject to surveillance by an NB
H1	Approved full quality system (ISO 9001) plus design examination subject to surveillance by an NB including inspection visits to the manufacturers' premises

* NB: Notified Body

Modules A / C / C1 described in the MID are not applied to the conformity assessment procedures.

the basic and measuring instrument-specific requirements and were subjected to conformity assessment. If, however, they find out that the requirements have not been met in a systematic manner (and not only occasionally), the Commission must immediately be informed of the measures taken; grounds must be given for the decision. The decision may be that the instruments are withdrawn from the market, and that the further placing on the market or putting into use is prohibited or limited.

The Commission hears those concerned and then establishes whether the measures taken were justified, but it also ensures that the member states are informed about the course and the results of the project.

If a member state establishes that the CE mark and the additional metrological mark have unlawfully been affixed to a measuring instrument, it will bind the manufacturer or his agent having residence in the Community to remedy this situation. This has to take place under specified conditions which have been fixed by the member state in question. If no corrections are made, the member state will take all measures it considers fit.

How these targets can practically be achieved has to be clarified in further discussions.

4 Structure of the MID

It was originally the Commission's intention to present a directive for measuring instruments which (as for other regulated products) primarily harmonizes the procedure for market access, leaving the technical specifications largely to the standardization bodies or to the OIML.

Only at a relatively late date could hearings before the Commission show that for the use of measuring instruments not only the objective of free access to the market but also some other goals are to be taken into account. These - particularly consumer protection - had been largely neglected by previous draft directives. This protection goal manifests itself, among other things, in far-reaching safety of the measuring instruments from manipulation and as long a period of use as possible.[1] The MID takes account of consumer protection insofar as the Annexes relevant to metrology contain regulations which are to ensure that the measuring instruments are capable of complying with the maximum permissible errors over as long a period of use as possible. The

[1] Correctness of operation within the legally defined maximum permissible errors in service.

subdivision of the Annexes will, however, trigger off further discussions.

So Annex I: "*Essential Requirements*" specifies climatic and mechanical ambient conditions and combinations of these which (just as the electromagnetic ambient conditions) correspond to a theoretical schematization rather than to the practical conditions of use for the various kinds of measuring instruments.

Annex II deals with the general test programs corresponding to different test levels to which the kinds of measuring instruments are subjected for conformity assessment in accordance with the manufacturers' specifications. This is just one of the weak points of the MID; the test program selection which has been proposed on a general basis is not appropriate in all cases for the concrete applications of the kinds of measuring instruments.

Annex IV describes the *Technical Documentation* to be submitted by the manufacturer; these are to enable the notified body or the national authorities to assess whether the measuring instrument complies with the applicable MID requirements and particularly comprise documents on the design, manufacture and functioning of the product.

The *Conformity Assessment Annexes* describe the eight modules of the relevant Directive 93/465/EEC [4] (referred to as A to H) with their respective amendments (cf. Table 1). As a supplementary characterization, six modules bear a "1" and are variants of the basic module. For the manufacturer they in part imply an increase in the severity of testing (for example, modules A1, C1 and H1); in the other cases (D1, E1 and F1) these variants reduce the severity. This means that the modules of the MID and those of the so-called Module Directive [4] of 1993 are not in all cases congruent. So for variants D1, E1 and F1 a section has been added to the technical documents that manufacturers must hold at the disposal of the national authorities for ten years.

The rather general formulations not only call for interpretation but in view of the potential heterogeneity of the notified bodies in Europe, might rather have the opposite effect.

The last part of the MID contains the *Instrument-Specific Annexes*. These not only list the respective kinds of measuring instruments but also assign to them those modules which the manufacturer can select for conformity assessment (cf. Table 2). In the case of material measures of length or automatic weighing instruments, for example, the selection can comprise up to eight modules. For capacity serving measures the MID allows the manufacturer to choose among seven modules. In practice however, this great number will be reduced to the procedure which from the administrative point of view is most simple and least expensive for the manufacturer.

5 MID proposals for "automatic weighing instruments"

With the Directive 90/384/EEC for non-automatic weighing instruments [7], the Commission accounted for the first kind of measuring instruments harmonized in accordance with the new approach. For manufacturers of weighing instruments it implied that under certain boundary conditions they can themselves carry out "initial verification". It is, however, bindingly prescribed that a notified body must first perform a type evaluation.

In the MID for *automatic weighing instruments*, this requirement need no longer be followed in the selection of module H or H1. The manufacturer rather can choose from among several procedures or combinations of modules. The choice depends on whether mechanical or electromechanical construction is concerned or whether the instrument is of the electronic type and/or software-controlled (cf. Table 2, MI-006). Chapter I defines the requirements valid for automatic weighing instruments, particularly the ambient conditions and the conditions of use under which the weighing instruments have to work. These are to be specified by the manufacturer who must also fix under which class the weighing instrument falls. In the following chapters the requirements for the different kinds of weighing instruments are specified. The maximum permissible errors of measurement are stated for the possible device classes depending on the weight of the load. These chapters also give the conformity assessment procedures; it may be noted that the same "mechanical" and "electronic" subdivisions are used as in other instrument-specific Annexes:

Chapter II Automatic catchweighers
Chapter III Automatic gravimetric filling instruments
Chapter IV Discontinuous totalizers
Chapter V Continuous totalizers
Chapter VI Automatic rail weighbridges.

Module H1 (H)

For all kinds of measuring instruments the Commission grants the manufacturer the option to decide - besides other modules - in favor of module H1. This is also valid for automatic weighing instruments. For the mechanical or electromechanical design of automatic catchweighers, module H and for other kinds of weighing instruments, modules H1 can be selected.

This illustrates the Commission's "program" for economic policy, i.e. to comply as far as possible with the manufacturer's wishes as regards the liberalization of the "approval market".

Table 2 Choice of modules for specific kinds of measuring instruments

Annex numbering	Chapter	Kind of measuring instrument	Declaration of conformity according to module
MI-001		Water meters	B + F / B + D / H1
MI-002		Gas meters	B + F / B + D / H1
MI-003		Active electrical energy meters and measurement transformers	B + F / B + D / H1
MI-004		Heat meters (meters and sub-assemblies)	B + F / B + D / H1
MI-005		Measuring systems for the continuous and dynamic measurement of quantities of liquids other than water	
		- for mechanical or electromechanical systems	B + F / B + E / B + D / G / H1
		- for electronic systems or systems containing software	B + F / B + D / G / H1
MI-006	I	Automatic weighing instruments (specific requirements for all)	
	II	Automatic catchweighers	
		- for mechanical or electromechanical instruments	F1 / E1 / D1 / B + F / B + E / B + D / G / H
		- for electronic instruments containing software	B + F / B + D / G / H1
	III	Automatic gravimetric filling instruments	
		- for mechanical or electromechanical instruments	B + F / B + E / B + D / G / H1
		- for electronic instruments containing software	B + F / B + D / G/ H 1
	IV	Discontinuous totalizers	
		- for mechanical or electromechanical instruments	B + F / B + E / B + D / G / H1
		- for electronic instruments or instruments containing software	B + F / B + D / G / H1
	V	Continuous totalizers	
		- for mechanical or electromechanical instruments	B + F / B + E / B + D / G / H1
		- for electronic instruments or instruments containing software	B + F / B + D / G / H1
	VI	Automatic rail weighbridges	
		- for mechanical or electromechanical instruments	B + F / B + E / B + D / G / H1
		- for electronic instruments or instruments containing software	B + F / B + D / G / H1
MI-007		Taximeters	B + F / B + D / H1
MI-008		Material measures	
	I	Material measures of length	A1 / D1 / E1 / F1 / B + E / B + D / G / H
	II	Capacity serving measures	A1 / D1 / E1 / F1 / B + E / B + D / H
MI-009		Dimensional measuring instruments	
	I	Requirements common to all dimensional measuring instruments	F1 / E1 / D1 / B + E / B + D / G / H
		- for mechanical or electromechanical instruments	B + F / B + D / G / H1
		- for electronic instruments or instruments containing software	
	II	Length measuring instruments	Modules as Chapter I
	III	Area measuring instruments	Modules as Chapter I
	IV	Multidimensional measuring instruments	Modules as Chapter I
MI-010		Evidential breath analyzers	B + F / G / H1
MI-011		Exhaust gas analyzers	B + F / B + D / H1

6 An instrument-specific example from the MID

Those who are familiar with the political scene suppose that the deliberations on the MID in the subsequent bodies will take between 2–3 years. In addition, the Commission has provided a transition period of two and a half years until the Directive comes into force.

But the "measuring instruments market" for weighing instruments will not be completely harmonized even after this date.

So the Commission does not intend in the foreseeable future to include non-automatic weighing instruments in the MID regulations. As a consequence, the EC law for measuring instruments as a whole increasingly becomes more complex and difficult to handle.

The harmonization takes place horizontally for individual kinds of measuring instruments and thus implies that depending on the intended use and the definition, there may be three different conformity assessment procedures for a measuring instrument of more or less the same design, which are based on different requirements and in part are governed by differing legal regulations:

- Directive for Non-automatic Weighing Instruments 90/384/EEC [7];
- MID for Automatic Weighing Instruments; and
- national regulations.

Up to now, except for a committee draft OIML Recommendation, internationally harmonized standards for *in-motion road vehicle weighing instruments* are not available. Neither does the MID deal with them, so these measuring systems will continue to be governed by national regulations. This could also apply to the kinds of measuring instruments which are not directly covered by the EC Directives. Among these would be, for example, combined measuring instruments for the determination of the postage of packages for which multidimensional measuring instruments are combined with weighing instruments.

At the same time, the EEC type approvals which have been granted on the basis of the 23 individual directives in accordance with the Outline Directive 71/316/EEC [2] remain valid for a maximum of ten years. Of these 23 individual directives only eleven will be abolished, the rest will remain in force.

As a consequence of this, besides the many new conformity assessment procedures, the previous EEC approval procedures according to the "old approach" will be maintained for a number of kinds of measuring instruments.

It remains to be seen in what direction the future consultations on the MID in the European Parliament and in the Council will lead. The experts place great hopes in the consultations within the *European Cooperation in Legal Metrology* (WELMEC) which with its Working Group 8 has a suitable forum for discussions.

7 New challenges for the economy and for the state

For some years, owing to the implementation of the Directive for Non-automatic Weighing Instruments [7], the weighing instruments industry, as the first group of manufacturers of measuring instruments, has had broad experience with directives following the new approach. To conclude from this that the implementation of the MID would not lead to substantial changes would do no justice to the changes in the general conditions for the state and for the economy. The changes are essentially characterized by a shift from a metrology system shaped by preventive measures to a rather repressive system. This means that industry will have greater leeway under certain conditions but that it will also have more responsibilities and risks. Whether the advantages and disadvantages of these structural changes will balance each other out will depend on the degree to which it will be possible to come to an EU-wide uniform interpretation and application of the requirements for measuring instruments. This primarily concerns the severity of testing and the procedures of the notified bodies but also the public authorities responsible for the surveillance of the market.

If it is not possible to ensure fair competitive conditions for all those involved in the market, there will be a risk that the objective of legal metrology is increasingly jeopardized. ■

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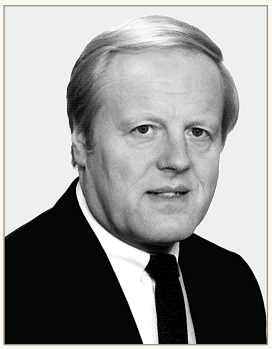

About the author

Hartmut Apel (born 1942), economist, pursued his studies of political economics at the Göttingen and Köln Universities. After long years spent in South America for an international organization of the United Nations and at the Federal Ministry for Economic Cooperation and Development in Bonn, he has been employed since 1975 with the Verification Department of the Physikalisch-Technische Bundesanstalt (PTB). Since 1995, he has been Head of the Legal Metrology Section.

OIML TC 3/SC 5 MEETING

Conformity assessment

Paris
27–29 June 2000

SAM CHAPPELL

Secretariat: ..... United States of America + BIML

Chairman: ..... Sam Chappell

Participation: ... Thirty-six delegates representing fifteen OIML Member States, one Corresponding Member, the OIML Development Council, one liaison organization and the BIML (see below)

P-members: ..... Austria, Belgium, Brazil, P.R. of China, Finland, France, Germany, Japan, Netherlands, Poland, Russia, Sweden, Switzerland, United Kingdom, USA

O-members:..... Yugoslavia

OIML Corresponding Member: ... Albania

Liaison institution:..... CECIP

OIML Development Council:..... Tunisia

Discussion topics reported on:

1 Means for establishing mutual confidence

2 Sixth Draft OIML document *Mutual Acceptance Agreement on OIML Pattern Evaluation (MAA)*

3 Reports on ongoing projects

4 Resolutions of the meeting

Objective: To discuss the sixth draft OIML document *Mutual Acceptance Agreement on OIML Pattern Evaluation* and to review the state of progress of the work of OIML TC 3/SC 5 *Conformity Assessment*

1 Discussion of the means for establishing mutual confidence

Two application documents were reviewed that address the subject *How to acquire confidence in organisms responsible for type approval and laboratories in charge of testing measuring instruments*:

Part 1 *Adaptation of ISO/IEC Guide 65 "General requirements for bodies operating product certification systems" to type approval activities*; and

Part 2 *Adaptation of ISO/IEC 17025 "General requirements for the competence of testing and calibration laboratories" to testing laboratory activities*.

A third application document addresses peer review: *OIML procedure for reviewing laboratories to enable the mutual acceptance of test results and OIML certificates*.

Drafts of these documents were distributed for comment by the Secretariat in April and are based on ISO/IEC Guides 65 and 68, ISO/IEC 17025 and on EA–2/02 in which the issuing authorities and testing laboratories could be assessed using equivalent principles for accreditation or peer review.

Although not discussed in detail, it was agreed that Messrs. Lagauterie (France) and Engler (Netherlands) would continue to develop the work on the application (interpretation) documents for assessing the competence of participants.

The discussions began by addressing the means by which a declaration of mutual confidence might be achieved under the OIML document *Mutual Acceptance Agreement on OIML Pattern Evaluation* (MAA). The 6th draft of this document proposed that such means could be either accreditation or peer review.

Participants were polled to determine the extent to which accreditation is used in their countries to assess the competence of legal metrology activities and the value of accreditation. Six of the member states present indicated that accredited laboratories were employed. Nevertheless, it became evident that the value of any accreditation depends on the basis of its assessment. For example, assessment of testing laboratories might be carried out, in some cases, by a third party and in other cases by a governmental body. The assessment team for some accreditations might include legal metrology experts whereas others might not. Often the assessment does not include an expert for testing the specific category of measuring instrument being addressed. Some existing accreditations, therefore, might require additional assessments.

It appeared from the comments received in writing and from the discussions at this (and previous) meetings that most collaborators in the work preferred

accreditation to peer review as a means of establishing mutual confidence. Two member states disagreed and both suggested that "self declaration" followed by peer review, if necessary, should be sufficient.

It was also pointed out that self declaration was a means adopted in the MRA for the Meter Convention. In particular, it was observed that this MRA would not be practical as a model for the MAA because different infrastructures support that MRA than those proposed for MAA. For example, participants in the MRA under the Meter Convention must participate in key comparisons of basic and derived standards for realization of SI units of measurement. Regional Metrology Organizations (RMO's) along with the Joint Committee of Regional Bodies (JCRB) implement rules to judge equivalence and establish a mechanism for carrying out peer review when warranted.

Intercomparisons of type testing have been considered as a means for establishing mutual confidence; however, because of the associated time, effort and costs, they were not considered to be practical, necessary, or without ambiguity.

The Chair, on behalf of the US Delegation, then introduced a proposed procedure aimed at simplifying such means and, hence, minimizing the cost and effort of establishing mutual confidence. Instead of a complete accreditation or peer review, the proposal was for a procedure involving self assessment for determining the competence of participants. This self assessment would include completing "check lists" for the specific category of instruments to be covered by a *Declaration of Mutual Confidence*. The check lists would be developed to be consistent with the requirements for determining the competence of issuing authorities according to ISO/IEC Guide 65 and with those requirements for testing laboratories according to ISO/IEC 17025. These check lists and the required *Questionnaire on National Capabilities* would be completed and submitted by applicants for participation in a declaration of mutual confidence. These application documents would be peer reviewed by expert representatives of potential participants. An agreed upon follow-up assessment by experts may be carried out, if necessary and justifiable, to determine competence of an applicant in specific areas to supplement the documentation received. When compared with the other means considered, this procedure for establishing mutual confidence has the advantage and potential of concentrating resources on verifying competence or identifying and making the changes and adjustments necessary to achieve the required competence within reasonable time and cost limits. This procedure also incorporates the appropriate international principles of accreditation and peer review. Participants agreed that the Secretariat should revise the 6th draft MAA to reflect this approach.

2 Review of the 6th draft OIML document on the MAA

The sixth draft OIML document *Mutual Acceptance Agreement on OIML Pattern Evaluation* (MAA) was reviewed clause by clause. Several editorial recommendations were made that were noted to be included in the 7th draft by the Secretariat including the terms defined under the terminology clause. In particular, the term "arrangement" was recommended to replace "agreement" to be consistent with the terms used by the Meter Convention's Mutual Recognition Arrangement (MRA) for establishing equivalence of national physical measurement standards. Also the reference to test reports "being accompanied by certificates" will be changed to avoid implying that certificates of conformance would be accepted by participants in a *Declaration of Mutual Confidence*.

Additional points of clarification were agreed upon including clarifying that the supporting role of the BIML should be administrative and not technical and that the participants themselves or the CIML must resolve disputes. As with the OIML Certificate System, under the agreement English or French (or both) would be the language utilized in correspondence and test reports. Generally, the costs associated with establishing mutual confidence shall be borne by the participant receiving a benefit. The Secretariat will incorporate these and other changes in a 7th draft OIML document "MAA" that will be distributed to participating members for review and vote.

3 Reports on ongoing projects

Finally, brief reports were provided about other projects being developed within OIML TC 3/SC 5:

- S. Chappell reported on the status of the task group, having representatives of France, Germany and the USA, on the *Expression of measurement uncertainty as applied to legal metrology activities*. A draft OIML document on this subject is planned for distribution to collaborating members for review and comment by September 2000. A meeting of the task group was to be held at the BIML on June 30.
- A. Szilvássy (BIML) provided a report on the status of the comments received from collaborators on the draft revision of the publication on the *OIML Certificate System for Measuring Instruments* which had been distributed with a deadline for response of June 30.

- A. Szilvássy also gave a preliminary report on the responses to a questionnaire distributed to over 170 manufacturers that have applied for and received OIML certificates for the instruments currently covered by the OIML Certificate System. The responses were, on the whole, positive and encouraging with regard to the System achieving its anticipated goals in operation and effectiveness.

4 Resolutions of the meeting

1 The Secretariat will prepare minutes of the meeting and distribute them to collaborators within a month. Any additional comments on the 6th draft OIML document *Mutual Acceptance Arrangement on OIML Type Evaluation* (MAA) should be submitted in writing by August 31, 2000.

2 The Secretariat will request suggestions and input from collaborators of OIML TC 3/SC 5 to be used as a basis for presenting information about the MAA at the Round Table discussion on *Mutual Recognition* at the 11th International Conference on Legal Metrology to be held in London in October 2000.

3 The Secretariat will prepare a 7th draft OIML document on the MAA according to the comments presented at the meeting and those received in writing by August 31, 2000 and then distribute the draft MAA by mid October 2000 to collaborating members of OIML TC 3/SC 5 for comment and vote.

4 The Secretariat will draft "check lists" for self assessing the competence of issuing authorities and testing laboratories of potential participants in a *Declaration of Mutual Confidence* of an MAA according to and compatible with ISO/IEC Guide 65 and ISO/IEC 17025, respectively by November 30, 2000.

5 Comments will be accepted by the Secretariat up to August 31, 2000 on the application (interpretation) documents on accreditation and peer review for assessing the competence of potential participants in a *Declaration of Mutual Confidence*. In consideration of the comments received and the discussions at the meeting, the primary authors will prepare first committee drafts on the subjects for distribution by the Secretariat to collaborators for comment in November 2000.

6 The Secretariat will consider calling a meeting within the year to discuss the requirements and procedures for establishing and implementing a Declaration of Mutual Confidence based on a category of instruments already covered by the OIML Certificate System. ■

OIML TC 9/SC 2 WG MEETING

Automatic catchweighing instruments: Revision R 51

Teddington, 7–9 June 2000

KEN HANSELL, NWML (TC 9/SC 2 SECRETARIAT)

Attendance: 15 delegates representing Belgium, People's Republic of China, Denmark, France, Germany, Netherlands, Sweden, United Kingdom, BIML and CECIP

Chairman: Martin Birdseye, NWML (International Director)

Main discussion points:

- the practicality and need for a zero-setting test;
- the need to consider two higher accuracy classes;
- the difficulties associated with static weighing (zero and EMC tests);
- the difficulties associated with multiple weighings (rounding errors); and
- the possibility of introducing a new class.

The decision to hold this meeting was made following an extensive consultation, commencing in December 1999. This indicated a range of technical issues which, when resolved, would enhance the effectiveness of OIML R 51.

Opening the meeting, Ian Dunmill (BIML) gave an update on the progress made by the BIML on OIML Normative Documents for the purposes of the EC Measuring Instruments Directive.

Using an LCD projector, the WG actively modified the existing Recommendation on screen, a technique that allowed the group to focus on agreeing the actual wording to be used rather than merely agreeing basic principles. This resulted in consensus that:

- zero setting tests are ineffective on these instruments and should be replaced by a functionality test;
- two higher classes for class X instruments should be introduced and better alignment be made to the classes used in R 76; and
- confirmation that class Y machines used for multiple weighings should be subjected to the requirements of R 51 but with the possibility of dual approval with R 107.

There was also an understanding on the issues of static weighing and associated testing, and rounding error. The debate on the latter focused on the practical question of how to allow for rounding error on instruments without the facility to display to a high resolution in test mode. This issue was clearly understood, although there was no clear agreement. The secretariat was assigned the task of investigating various proposals, producing a 1 CD revision and reporting back to the working group. ■

WELMEC

European cooperation in legal metrology

WELMEC celebrates ten years at its 16th Committee Meeting

Moss (Norway) 8–9 June 2000

LIZ PITT, WELMEC Secretariat

The 16th WELMEC Committee meeting was held on 8–9 June 2000 in Moss near Oslo, Norway. In welcoming delegates to the meeting, the Chairman, Dr. Seton Bennett (NWML, UK) announced that this was the 10th anniversary of the signing of the WELMEC Memorandum of Understanding. Over the ten years WELMEC has produced 15 Guides, established EMeTAS*, created a web site (www.welmec.org) and realized mutual cooperation through the WELMEC Type Approval Agreement.

Committee Members were pleased to see the meeting attended by Bernard Athané (BIML) and Daniel Hanekuyk (CEC). A new feature of the Committee meetings was to include presentations from two countries on their legal metrology infrastructure: Knut Lindløv (Justervesenet, Norway) and Jean-François Magana (Sous-direction de la Métrologie, France) gave interesting and informative presentations.

Dr. Bennett informed the Committee that Corinne Lagauterie (France) would represent WELMEC on the EA Working Group which is preparing a guidance document on the calibration of non-automatic weighing instruments.

Participants were informed that WELMEC's workload was increasing, therefore costs were rising accordingly. Having considered several options to avoid increasing Members' and Associate Members' contributions to a much higher rate, it was decided to contain costs by having only one Committee meeting per annum, but with the flexibility to hold ad hoc meetings as the need arose.

On the subject of the Measuring Instruments Directive, Daniel Hanekuyk told the Committee that the adopted text of the MID may appear in the Official Journal of the European Communities in August. Mr. Athané spoke about the draft Normative Document that he had previously circulated to WELMEC Members: he said that the draft MID included provision for compliance with OIML Normative Documents (based on OIML Recommendations), which was one way in which manufacturers could satisfy the essential requirements of the MID. In this way the OIML could offer the European metrological community useful internationally agreed Normative Documents. Following discussions with the Commission, Mr. Athané had produced a format for them; the choice of which numbering system to adopt required a final decision, but Mr. Athané envisaged three options:

- to use successive numbering;
- to link numbering to OIML Recommendations; or
- to use the MID Annex numbers.

Mr. Athané sought comments from the Commission and from WELMEC on the format of the documents.

Reports from WELMEC Working Groups were given. A revised WELMEC 2 Guide (Common Application of Directive 90/384/EEC) now only requires minor amendments by WG 2 before being made available on the WELMEC web site. WG 4 hoped to meet later in the year to look at EN standards for the assessment of Notified Bodies. There was some discussion over the terms of reference for the recently re-organized WG 5 so that in reference to metrological supervision it is understood that the WG will look at

WELMEC Working Groups

WG 2	Weighing instruments *(Secretariat: United Kingdom)*
WG 4	Application of EN45000 standards in legal metrology *(Secretariat: Norway)*
WG 5	Metrological supervision *(Joint secretariat: Sweden and United Kingdom)*
WG 6	Prepackages *(Secretariat: Netherlands)*
WG 7	Software *(Secretariat: Germany)*
WG 8	The Measuring Instruments Directive *(Secretariat: France)*
WG 10	Measuring systems for liquids other than water *(Secretariat: Netherlands)*

* European Metrological Type Approvals Service

enforcement and market surveillance especially. The new WELMEC 8.3 Guide on the implementation of Directive 76/211/EEC produced by WG 6, was approved by the Committee and has been published on the WELMEC web site. Further work for WG 7 would include software guidelines on electricity meters and gas meters. Once the proposal for the MID has been published, WG 8 would suggest meeting to discuss the technical annexes. This would include involvement of the federations of European manufacturers. The new WG 10 had met to discuss various topics including data transfer of measured quantities, type approval of families of meters, provisions for fuel dispensers, testing procedures for air separators, and performance tests on digital working and electronic sealing.

Mr. Athané praised the cooperation between WELMEC and the OIML, which had continued to expand, and which was now operating very satisfactorily. This relationship was a good example of successful cooperation between a regional legal metrology organization and the OIML.

Seton Bennett and Wilfried Schulz (PTB, Germany) were re-elected as Chairman and Vice-Chairman respectively for a further three years.

The 17th WELMEC Committee meeting will be held in the Republic of Ireland in April or May 2001. ■

The WELMEC Committee, meeting in Moss on 8–9 June 2000:

1	INSTRUCTS	the Secretariat to circulate a questionnaire on legal metrology experts;
2	INSTRUCTS	the Secretariat to circulate a budget on WELMEC costs for 2001;
3	AGREES	to meet on an annual basis;
4	APPROVES	a 3 % increase in subscriptions for 2001;
5	INSTRUCTS	the WG 2 Secretariat to make changes to the revised WELMEC 2 Guide;
6	APPROVES	the Terms of Reference for WG 4;
7	ACCEPTS	the Terms of Reference for WG 5 in general but INSTRUCTS the WG 5 Secretariat to remove the reference to pre-packages;
8	INSTRUCTS	WG 6 to extend its Terms of Reference to cover market surveillance of pre-packaged goods;
9	APPROVES	the publication of WELMEC Guide 8.3 on the implementation of Directive 76/211/EEC;
10	REQUESTS	Members and Associate Members to provide BIML with comments on the format of the OIML Normative Documents by 31 July 2000;
11	REQUESTS	Members and Associate Members to provide BIML with comments on the draft CEN/OIML agreement by 31 July 2000;
12	INSTRUCTS	the Secretariat to take over complete maintenance of the WELMEC web site;
13	APPROVES	the re-election of Seton Bennett as Chairman and Wilfried Schulz as vice-Chairman;
14	THANKS	Justervesenet for organising the 16th WELMEC Committee meeting;
15	ACCEPTS	the invitation from Ireland to hold the 17th WELMEC Committee meeting in May 2001.

COOMET

10th Committee Meeting

Almaty (Kazakhstan) 25–26 May 2000

BIML

The 10th COOMET Committee meeting was held on 25–26 May in Almaty (Republic of Kazakhstan) under the chairmanship of COOMET President Dr. V. Belotserkovsky.

Representatives of Belarus, Cuba, Germany, Kazakhstan, Kyrghyz Republic, Moldova, Poland, Russia, Slovakia and Ukraine attended the meeting and representatives of Uzbekistan and Yugoslavia participated as observers.

Main topics

- COOMET's activity in the period between Committee meetings and its tasks on further increasing the effectiveness of cooperation - report by the COOMET President.
- Reports by COOMET rapporteurs on work accomplished (including the report for the legal metrology field (Germany) - for details see the July 2000 OIML Bulletin).
- Use of the COOMET analytical information system on the Internet.
- International activity of COOMET and COOMET member-organizations.
- Participation of COOMET members' national organizations in the *Mutual Recognition Arrangement of national measurement standards* and proposals on the implementation of coordinated activities in its realization.
- The 2000–2001 COOMET Working Program.
- Changes and additions to the COOMET organizational-legal documents.

Report by the COOMET President

Dr. V. Belotserkovsky gave a summary report on *COOMET activities in the period between Committee meetings and problems of cooperation*. Among other important aspects he mentioned that:

- proposals put forward at the 9th Committee meeting on the arrangements aimed at increasing the effectiveness of COOMET activities were supported and followed to a considerable extent in the realization of the COOMET Working Program;
- the significance of COOMET as a regional metrology organization is essentially increasing with the opportunity to participate actively in the realization of the *Mutual Recognition Arrangement of national measurement standards and of calibration and measurement certificates issued by national metrology institutes* (MRA). BIPM methodical principles and the experience gained in this direction by EUROMET, APMP and other organizations should be taken into account in appropriate measures;
- the role of COOMET will increase in connection with the strengthening of constructive cooperation with EUROMET and WELMEC and by the establishment of close connections with APMP and APLMF;
- cooperation involving a number of COOMET members in various regional and international organizations merits approval and encouragement (for example Ukraine and Lithuania recently joined EUROMET as corresponding members);
- in the field of legal metrology there are grounds for hope that more extensive cooperation will be developed. At the April 2000 Legal Metrology Working Group meeting, arrangements were reached providing actualization and extension of cooperation subjects.
- in order to make it easier for interested organizations from European as well as from Asian countries to join COOMET, it seems expedient to extend COOMET's geographical boundaries to some degree, but this would require modifications to the Memorandum of Understanding;
- another proposed addition to the Memorandum concerns the establishment of the President's Council - analogous to the Executive or Advisory Committees that exist in practically all RMO's. Since COOMET members are connected with different economic communities (for example, EC and CIS) it is necessary to have a body for general and technical policy issues;
- key persons involved in organizing cooperation in given subject fields are the COOMET Rapporteurs. Now their role of harmonizing the activities of contact persons and coordinators in COOMET projects is increasing in line with the problems encountered in realizing the MRA on national measurement standards. Unfortunately there are two subject fields ("Acoustics and vibration" and "Flow measurement") which do not have Rapporteurs. In order to promote cooperation in these fields, it is necessary to nominate the organizers;

- an important condition to render COOMET activities effective is the use of modern information technology and communication facilities such as the Internet. It is necessary not only to introduce the COOMET analytical information system on the Internet but also to create and use databases on measurement standards, measuring capabilities, pattern approval of measuring instruments, and various other documents;
- in the majority of regional organizations much attention is paid to the problem of training metrology experts, including the preparation of young metrologists and the organization of training periods for leading scientists and experts, etc. In the framework of COOMET this is one of the major problems to be solved. Although some international metrology personnel training centers have already been already designated (e.g. the PTB, the German Metrology Academy (DAM) and the Slovak Metrology Institute (SMU) in Bratislava) the functions of such centers could also be carried out by other organizations, for example the Academy for Standardization, Metrology and Certification and VNIIMS of the Gosstandart of Russia; and
- last but not least the problem of financing the COOMET Secretariat should be solved, based on the experience of other RMO's.

Main resolutions

- In order to increase the effectiveness of the application of measurement standards, COOMET member organizations should take measures:
  - to improve national measurement standards, raising their metrological characteristics up to the level of those of leading countries;
  - to enhance participation in the realization of the *Mutual Recognition Arrangement of national measurement standards and of calibration and measurement certificates issued by national metrology institutes* and to participate in international comparisons at various levels including "key comparisons" carried out under the aegis of BIPM Consultative Committees;
  - to improve the quality systems applied to national measurement standards; and
  - to participate in international projects on the creation of measurement standards.
- In order to render cooperation in the field of legal metrology more active, the recommendations of the Working group on Legal Metrology should be accepted (for more information see the July 2000 OIML Bulletin).
- To introduce the COOMET analytical information system on the Internet.
- The COOMET President is to ensure that the COOMET web site comes into operation by October 2000.
- To admit the State Inspection for Standardization and Metrology of the Kyrgyz Republic (Kyrgyzstandard) as a new COOMET Member and to take note of the decision of the Central Office of Measures of Poland (GUM) about the termination of its COOMET membership from June 2000, and also that the GUM will continue its participation in a number of COOMET projects.
- To adopt changes in and additions to the *COOMET Memorandum* and the *Rules of procedure*.
- To establish the President's Council, to approve the nomination of the Vice-Presidents: N. Zhagora (Belarus), P. Kneppo (Slovakia), G. Sidorenko (Ukraine), H-D. Velfe (Germany) and to hold the First President's Council meeting in Moscow in October 2000.

The participants had the opportunity to visit laboratories of the Almaty branch of the Center for Standardization and Metrology of Kazakhstan.

It was decided to hold the 11th COOMET Committee meeting in May 2001 in Kishinev. ■

Delegates attending the 10th COOMET meeting

WTO TBT WORKSHOP

Technical assistance and special and differential treatment in the context of the TBT Agreement

Geneva (Switzerland) 19–20 July 2000

JOHN ADANK, CHAIRMAN (NEW ZEALAND)

Background

At the First Triennial Review of the Agreement on Technical Barriers to Trade in 1997, the TBT Committee held discussions on technical assistance and special and differential treatment. It was noted that some members, particularly developing countries, encountered difficulties in the implementation and operation of the Agreement, and it was decided that technical assistance should be provided, for example in the preparation of technical regulations, the establishment of national standardising bodies, regulatory bodies, or conformity assessment bodies. The Committee therefore decided to hold this Workshop in order to promote information exchange and to facilitate discussion on technical assistance in the lead up to the Second Triennial Review, to be conducted before the end of 2000.

The Workshop

The two day Workshop provided a valuable opportunity for exchange of information and ideas on the problems faced by developing countries in respect to the implementation and operation of the TBT Agreement. The discussion was practical and solution-oriented. The discussions on each of the four themes:

- Implementation;
- International Standards;
- Conformity assessment; and
- Capacity building

highlighted the real world challenges that developing countries face in both pursuing their rights and meeting their obligations under the Agreement. One clear theme arising from the discussion was "identifying specific strategies and solutions to address common challenges".

All countries have specific technical assistance needs and requirements. It was noted that there was no one single model bureaucratic or administrative structure that all countries should follow. A number of speakers highlighted the importance of ensuring that solutions were targeted at the specific priorities and needs identified by individual, or groups of developing countries that would allow them to effectively implement as well as benefit from the Agreement. This calls for an assessment at the national level - an assessment which some speakers pointed out might need to be assisted by guidance from outside - including through bilateral cooperation or cooperation at the regional or international level. However, it was emphasised that any solutions must be carefully tailored to take into account the specific situation of each country. The discussions also highlighted a range of common challenges faced by developing and least developed countries in the four subject areas discussed.

Implementation of the TBT Agreement

In regard to implementation, effective coordination at the national level (among all relevant agencies and departments) and achieving increased awareness of TBT requirements were emphasised.

The importance of securing political commitment to support the contribution that could be made at the technical level was underlined in this regard. The value of training opportunities, including internships, "in house" experts ("twinning" arrangements), as well as arrangements involving personnel from other developing countries who had faced similar challenges in the past (South-South Cooperation) was highlighted. In addition, it was suggested that involvement of all interested parties, including the private sector, was important to further understand the benefits of the TBT Agreement and to support implementation by national authorities. It was noted that minimising the use of mandatory technical regulations and utilising international standards, rather than preparing separate national standards, could reduce the regulatory burden and open up market access opportunities.

International standardisation

International standardisation was recognised as an area in which developing country participation is still

limited and constrained as a result of technical capacity, the location of Secretariats and meetings as well as other constraints in the areas of financial and human resources which impeded participation in meetings. This was an area for ongoing attention within international and regional bodies. Regional cooperation was recognised as a useful way to influence the international standardisation process. The useful role that Internet and video-conferencing could play in facilitating the negotiations and discussions within international standardising bodies was underlined by a number of speakers, as well as the importance of working to secure greater participation among developing country participants to act as Chairs or secretariats in various technical committees. Prioritising key areas of interest in participating in international standardising bodies was seen as essential. Securing effective translation arrangements for international standards was also seen as an area in which progress needs to be made.

Conformity assessment

The discussions on conformity assessment highlighted the importance of effective capacity building and technical assistance through enhanced regional and international cooperation, as well as the use of relevant international Guides and Recommendations. A co-ordinated strategy at the national level to identify relevant infrastructural requirements and needs was important, given the limited human and financial resources, as well as training opportunities in developing countries. It was recognised that technical assistance in this area was an evolving process, given the need to nurture skills and institutional development over a long time-frame.

Capacity building

In regard to capacity building more generally, the need for more effective human resource development as well as for information and knowledge dissemination was highlighted. The importance of supporting the capacity building process through effective coordination at the national level was also emphasised - lack of effective national coordination could seriously impede the capacity building process. A number of speakers emphasised the need to sensitise industry about the importance of standards, quality and metrology. Needs assessment and identification were seen as an essential first step in devising effective strategies and solutions. Regional seminars, involving participation from countries with similar needs, as well as relevant international and regional agencies were considered useful ways of exchanging experience and identifying solutions.

Conclusions

The important role that information technology and the Internet could play in assisting national bodies, both in the domestic sphere as well as in the context of regional and international cooperation, was emphasised throughout the two days of discussions. A number of developing county participants drew attention to their need for basic computer resources in this regard. Finally, the need to look for ways to achieve more effective coordination of technical assistance activities was very much highlighted, with a specific proposal made to establish a centralised mechanism relating to co-ordination of TBT-related technical assistance activities. It was considered useful to keep this idea under review, taking account of the initiatives under way to collect data on technical assistance in various bodies, as well as the relationship that such a proposal might have in regard to the Integrated Framework.

The European Community, Japan, the Netherlands, Norway and the United Kingdom were thanked for their generous contribution in funding the participation of speakers from developing countries and participants from least developed countries.

It was suggested that there should be further reflection at the national level and in the context of the ongoing discussions of the TBT Committee on the report of the Workshop. In the light of the Workshop, regional and international bodies should also reflect further on the contribution that they could make in the area of TBT-related technical assistance. ■

50ème Assemblée Générale

Lindau (Allemagne) 1–2 juin 2000

MICHEL TURPAIN, Secrétaire Permanent

Le CECIP, *Comité Européen des Constructeurs d'Instruments de Pesage*, a tenu sa 50ème Assemblée Générale à Lindau sur les bords du Lac de Constance, à l'invitation de la Fédération Allemande, AWA, *Arbeitsgemeinschaft Waagen*.

Pour ce grand événement qui réunit les industriels du pesage, nous avions invité une délégation d'une dizaine de constructeurs de pesage chinois membres de la *China Weighing Instrument Association*, donnant un caractère mondial à notre assemblée en s'ajoutant aux quatorze Fédérations Européennes (avec l'adhésion de l'Ukraine) représentant les pays suivants:

Allemagne, Belgique, Espagne, Finlande, France, Hongrie, Italie, Pays-Bas, Pologne, République Slovaque, République Tchèque, Royaume-Uni, Suisse, Ukraine

Que de chemin parcouru depuis le 29 mai 1959, date de création du CECIP avec cinq Fédérations: Allemagne, Belgique, France, Italie, Pays-Bas, qui suivaient le chemin ouvert par le Traité de Rome en 1957 et montraient la vision européenne de notre industrie!

L'Assemblée Générale est aussi l'occasion d'inviter des experts ou des personnalités d'organismes internationaux ou européens pour nous faire part de leur politique ou de leur point de vue sur des sujets touchant le pesage. Cette année nous avions l'honneur de recevoir:

- Mr. Gerard Faber, Président de l'OIML, qui a délivré un discours sur *Les tendances de l'activité de l'OIML dans le domaine des instruments de pesage*;
- Professeur Dr. Manfred Kochsiek, Vice-Président de l'OIML et Vice-Président du Physikalisch-Technische Bundesanstalt, qui nous a présenté *Vers un système de mesure global*;
- Dr. Michael Gläser, Responsable du Laboratoire Masses du PTB, qui nous a parlé de *La masse de l'atome d'or - un chemin vers la nouvelle définition du kilogramme*; et
- Mr. Cao Liping, Secrétaire Général de la *China Weighing Instrument Association*, qui nous a présenté la Fédération Chinoise.

Cette année les interventions, de grande qualité et très appréciées, étaient tournées vers la mondialisation des marchés et l'évolution des systèmes de mesure avec la recherche d'une nouvelle façon de définir le kilogramme.

Chaque Fédération a ensuite présenté la situation de l'industrie du pesage dans son pays, avec un tableau récapitulatif détaillant la production d'instruments de pesage en Europe et montrant une croissance légère mais générale en valeur.

La partie statutaire comprenait entre autres:

- les rapports d'activité de chaque groupe de travail:
  - le groupe métrologie légale qui poursuit sa tâche de propositions et d'examens:
    - des documents de l'OIML, en particulier la révision des Recommandations touchant les instruments de pesage à fonctionnement automatique;
    - des documents de la Commission Européenne, en particulier le Projet de *Directive sur les Instruments de Mesure* (MID);
    - des documents du WELMEC, *European Cooperation in Legal Metrology*, en particulier les guides d'harmonisation;
  - le Groupe Affaires et Commerce qui veille à une concurrence saine sur les marchés et aux intérêts des constructeurs et des consommateurs, en particulier dans le projet de la MID;
  - le Bureau qui assure la gestion quotidienne du Comité et son développement en prenant contact avec les Fédérations de constructeurs d'instruments de pesage à travers le monde, amenant de nouveaux membres au CECIP, comme l'Ukraine, en apportant notre expérience aux jeunes Fédérations des pays qui frappent à la porte de l'Union Européenne, en créant des liens avec les Fédérations de Chine, des États-Unis d'Amérique ou du Japon;
- l'admission d'une nouvelle Fédération, celle de l'Ukraine, UkrVaga, *Association of Ukraine Manufacturers of Weighing Machines*;
- l'élection d'un nouveau Bureau:

Dr. Klaus Wurster	Président (Allemagne)
Mme Caroline Obrecht	Vice-Présidente (Suisse)
Mr. Tim Cooper	Vice-Président (Royaume-Uni)
Mr. Fabio Martignoni	Vice-Président (Italie)
Mr. Michel Turpain	Secrétaire Permanent (France)

- l'invitation de la République Slovaque pour recevoir la 51ème Assemblée Générale à Bratislava, le 25 mai 2001.

Nos amis allemands avaient parfaitement organisé cette superbe Assemblée Générale dans le cadre merveilleux de Lindau, qui se termina pour les 140 participants, par une croisière sur le Lac de Constance à bord d'un superbe bateau à aubes, le *Hohentwiel*. Nous voguions à la découverte de Friedrichshafen et de son musée Zeppelin, de Meersburg et de son château, des fleurs de l'Ile de Mainau avec en permanence un cadre de montagnes et de collines couvertes de vignobles sous un soleil radieux. Un dîner de gala à bord du bateau acheva cette fabuleuse croisière qui marquera l'histoire du CECIP. ■

50th General Assembly

Lindau (Germany) 1–2 June 2000

MICHEL TURPAIN, **Permanent Secretary**

CECIP, the *European Committee of Weighing Instrument Manufacturers*, held its 50th General Assembly in Lindau on the banks of Lake Constance, at the invitation of the German Federation AWA, *Arbeitsgemeinschaft Waagen*.

A delegation of some ten Chinese manufacturers, all members of the *China Weighing Instrument Association*, was invited to this important event which brings together representatives of the weighing industry, thus giving a truly world-wide nature to the Assembly which was attended, in addition to the Chinese representatives, by fourteen European Federations (including Ukraine) from the following countries:

Belgium, Czech Republic, Finland, France, Germany, Hungary, Italy, Spain, Netherlands, Poland, Slovak Republic, Switzerland, Ukraine, United Kingdom.

And what progress has been made since 29 May 1959, the date on which CECIP was formed with five member Federations: Belgium, France, Germany, Italy, Netherlands, following the 1957 Treaty of Rome and anticipating the European vision of the weighing industry!

The General Assembly is also an opportunity to invite experts or key individuals from international or European bodies to report on their policies and to share their views on weighing related subjects. This year the Assembly was honored to welcome:

- Mr. Gerard Faber, OIML President, who gave a speech on *Trends in OIML activities in the field of weighing instruments;*
- Professor Dr. Manfred Kochsiek, OIML Vice-President and Vice-President of the Physikalisch-Technische Bundesanstalt, who presented *Towards a global measurement system*;
- Dr. Michael Gläser, in charge of the PTB Mass Laboratory, who gave a talk on *The mass of the gold atom - a way to the new definition of the kilogram*; and
- Mr. Cao Liping, Secretary General of the *China Weighing Instrument Association*, who presented the Chinese Federation.

This year all the presentations, which were of a high standard and much appreciated, dealt with market globalization and the development of measurement systems with research into a new way of defining the kilogram.

Each Federation then presented the situation of the weighing industry in its country, including a table summarizing weighing instrument production in Europe which indicates slow but general growth.

The statutory part included, amongst other items:

- activity reports for each working group:
  - the legal metrology group which is continuing with its task of coming up with proposals and examinations:
    - of OIML documents, especially the revision of Recommendations dealing with automatic weighing instruments;
    - of European Commission documents, especially the Draft *Measuring Instruments Directive* (MID);
    - of WELMEC (*European Cooperation in Legal Metrology*) documents, especially harmonization guides;
  - the Business and Commerce Group, which ensures healthy market competition and which monitors the interests of manufacturers and consumers, especially concerning the draft MID;
  - the Bureau which takes care of the day-to-day management of the Committee and of its development by making contact with the Federations of weighing instrument manufacturers throughout the world, bringing on board new CECIP members, such as Ukraine, by passing on experience acquired to the younger Federations of those countries that come knocking at the European Union's door, and by creating ties with the Chinese, American or Japanese Federations;
- the admission of a new Federation, that of Ukraine, UkrVaga, *Association of Ukraine Manufacturers of Weighing Machines*;

- the election of a new Bureau:

Dr. Klaus Wurster	President (Germany)
Mrs. Caroline Obrecht	Vice-President (Switzerland)
Mr. Tim Cooper	Vice-President (UK)
Mr. Fabio Martignoni	Vice-President (Italy)
Mr. Michel Turpain	Permanent Secretary (France)

- the invitation of the Slovak Republic to host the 51st General Assembly in Bratislava, on 25 May 2001.

CECIP's German friends made a perfect job of organizing this General Assembly in the marvelous surroundings of Lindau, which culminated in the 140 participants taking a river cruise on Lake Constance on board a superb paddle boat, the *Hohentwiel*. Delegates on board were rewarded with fine views of Friedrichshafen and its Zeppelin Museum, Meersburg and its castle and the flowers on Mainau Island; for the whole trip the surrounding mountains and hillside vineyards were bathed in sunshine and this fabulous cruise, which will go down in CECIP's history, concluded with a gala dinner on board. ■

Statistiques, Industrie du Pesage (1999) — Weighing Industry Statistics (1999)

Pays *Country*	Production HT Monnaie locale *Ex VAT local currency*	Production HT Euro *Ex VAT Euro*	Variation /1998	Export	Import
				Variation/1998	Variation/1998
Allemagne *Germany*	1 350 M. DEM	690	+ 0.4 %	729 M. DEM	367 M. DEM
				+ 8.6 %	+ 1.7 %
Belgique *Belgium*					
Espagne *Spain*	21 919 M. ESP	132	+ 9.1 %	4 730 M. ESP	6 039 M. ESP
				+ 14.7 %	+ 10.2 %
Finlande *Finland*	145 M. FIM	24	+ 3.5 %	23.4 M. FIM	59.8 M. FIM
				– 23.5 %	– 25.4 %
France *France*	1 215 M. FRF	185	+ 2.5 %	469 M. FRF	760 M. FRF
				+ 2.8 %	+ 5.1 %
Hongrie *Hungary*					
Italie *Italy*	164 583 M. ITL	85	+ 2.6 %	37 624 M. ITL	37 423 M. ITL
				+ 3.7 %	+ 0.4 %
Pays Bas *Netherlands*					
Pologne *Poland*					
Rép. Slovaque *Slovak Republic*					
Rép. Tchèque *Czech Republic*	343 M. CZK	9.5	– 0.8 %	29 M. CZK	152 M. CZK
				+ 11.5 %	+ 53.2 %
Royaume-Uni *United Kingdom*	128 M. GBP	206	+ 6.6 %	94.33 M. GBP	77.72 M. GBP
				+ 5.3 %	– 6.9 %
Suisse *Switzerland*				218.8 M. CHF	65.5 M. CHF
				+ 11.2 %	+ 7.2 %

A JOINT ISO/OIML PUBLICATION

Instruments for the measurement of vehicle exhaust emissions

BERNARD ATHANÉ, BIML Director

The first joint ISO International Standard/OIML International Recommendation will soon be published as ISO 3930/OIML R99, to replace the former and separate publications of both Organizations.

This is not the first time that ISO and the OIML have produced common publications: in fact the VIM (*International Vocabulary of Basic and General Terms in Metrology*) and the GUM (*Guide to the Expression of Uncertainty in Measurement*) were published some years ago by ISO on behalf of seven International Organizations cooperating within the former ISO/TAG 4. But these two joint publications did not reach the status of International Standard/Recommendation.

The cooperative procedures which link ISO (and the IEC) with the OIML provide for several levels of cooperation, according to the relative involvement of each Organization in a given work project: mutual information and participation in the work, reference by one Organization to the work of the other, or joint publications.

This last level is applicable mainly when the two Organizations have the same degree of interest in a given topic and when the contents of the respective ISO Standard and OIML Recommendation are likely to be quite similar.

This was the case for instruments for measuring vehicle exhaust emissions, where an ISO Standard and an OIML Recommendation already existed but had to be revised for adaptation to technical progress and harmonized in order to avoid contradictions which would complicate matters somewhat for manufacturers of such instruments.

The OIML Recommendation R 99 was initially published in 1991. Its revision started a few years later with the participation of ISO experts. When the new version was completed, ISO/TC 22/SC 5 was just starting the revision of ISO 3930. It was realized that in fact the content of the OIML Recommendation would be quite appropriate for the new ISO Standard, subject to some technical amendments and to the addition of certain clauses specific to ISO Standards.

Discussions then started within the relevant technical bodies: ISO/TC 22/SC 5 and OIML TC 16/SC 1, and at the headquarters of each Organization: ISO Central Secretariat and BIML. It was readily agreed that the OIML would proceed with a provisional issue of R 99 while ISO/TC 22/SC 5 would start the examination of this Recommendation with a view to adopting it as draft revision of ISO 3930.

ISO/TC 22/SC 5 work developed in close cooperation with experts representing OIML TC 16/SC 1. With the exception of certain comments from an ISO Member (also an OIML Member) which were impossible to accept by both Organizations, all the comments offered by ISO experts were found to be acceptable by OIML experts because they served to improve and clarify the OIML Recommendation. The introduction of clauses specific to ISO Standards as well as the adaptation of the text to ISO's typical layout was also easy, since in fact the *OIML Directives for Technical Work* and the general presentation of OIML Recommendations are directly inspired by the corresponding ISO Directives.

After approval at ISO/TC 22/SC 5 level, it appeared necessary to proceed with a postal consultation of all ISO Members. In parallel, OIML Members were informed of the changes introduced at the request of ISO. The joint ISO 3930/OIML R99 is expected to be available shortly in English and in French. It has been agreed that it would be printed by ISO, and that the OIML would purchase the required number of copies. In parallel, the text will be posted on ISO's and the OIML's web sites for downloading by authorized bodies. Matters of copyright and harmonization of the sale price have been agreed by the ISO Central Secretariat and the BIML.

The joint publication will contain metrological performance requirements applicable to instruments for measuring vehicle exhaust emissions as well as test procedures. Since it may be of interest for manufacturers of such instruments to apply for OIML certificates of conformity, a standardized test report format is being developed within OIML TC 16/SC 1. ISO/TC 22/SC 5 will be invited to participate in this work and will have to decide whether this test report format may be endorsed by ISO, in which case it will be issued as a joint ISO/OIML Annex to ISO 3930/OIML R99.

In the future, and owing to the successful completion of this action, it will probably be appropriate to identify all those work projects that are common to ISO (or the IEC) and the OIML which might give rise to joint publications. However, other forms of cooperation (in particular reference by one Organization to the work of the other) will need to be applied whenever appropriate.

To conclude, I would like to express my gratitude to the ISO and OIML experts who have been instrumental in the development of ISO 3930/OIML R99, in particular Philippe Legrand, Secretary of ISO/TC 22/SC 5, Gep Engler, Secretary of OIML TC 16/SC 1, and Gérard Lagauterie, who exercised a permanent liaison between both sub-committees. ■

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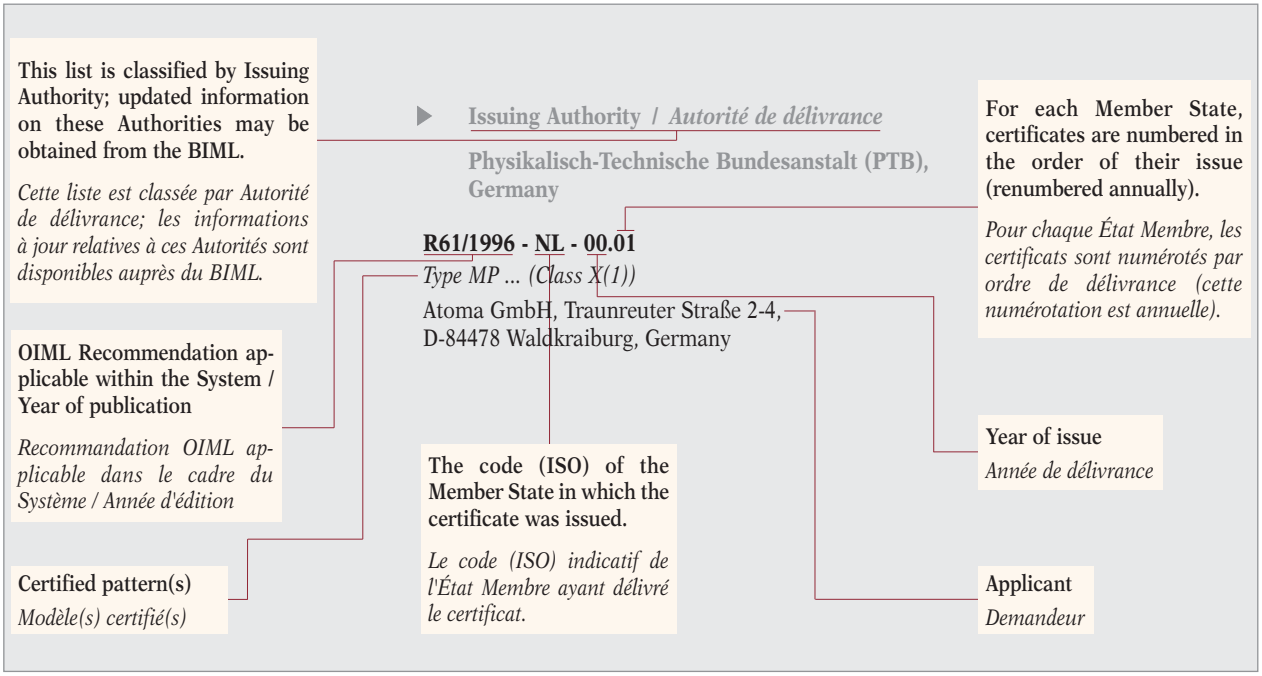
OIML Certificate System:
Certificates registered 2000.05–2000.07
For up to date information: www.oiml.org

The OIML *Certificate System for Measuring Instruments* was introduced in 1991 to facilitate administrative procedures and lower costs associated with the international trade of measuring instruments subject to legal requirements.

The System provides the possibility for a manufacturer to obtain an OIML certificate and a test report indicating that a given instrument pattern complies with the requirements of relevant OIML International Recommendations.

Certificates are delivered by OIML Member States that have established one or several Issuing Authorities responsible for processing applications by manufacturers wishing to have their instrument patterns certified.

OIML certificates are accepted by national metrology services on a voluntary basis, and as the climate for mutual confidence and recognition of test results develops between OIML Members, the OIML Certificate System serves to simplify the pattern approval process for manufacturers and metrology authorities by eliminating costly duplication of application and test procedures. ■



Système de Certificats OIML:
Certificats enregistrés 2000.05–2000.07
Pour des informations à jour: www.oiml.org

Le *Système de Certificats OIML pour les Instruments de Mesure* a été introduit en 1991 afin de faciliter les procédures administratives et d'abaisser les coûts liés au commerce international des instruments de mesure soumis aux exigences légales.

Le Système permet à un constructeur d'obtenir un certificat OIML et un rapport d'essai indiquant qu'un modèle d'instrument satisfait aux exigences des Recommandations OIML applicables.

Les certificats sont délivrés par les États Membres de l'OIML, qui ont établi une ou plusieurs autorités de délivrance responsables du traitement des demandes présentées par des constructeurs souhaitant voir certifier leurs modèles d'instruments.

Les services nationaux de métrologie légale peuvent accepter les certificats sur une base volontaire; avec le développement entre Membres OIML d'un climat de confiance mutuelle et de reconnaissance des résultats d'essais, le Système simplifie les processus d'approbation de modèle pour les constructeurs et les autorités métrologiques par l'élimination des répétitions coûteuses dans les procédures de demande et d'essai. ■

INSTRUMENT CATEGORY
CATÉGORIE D'INSTRUMENT

Automatic catchweighing instruments
Instruments de pesage trieurs-étiqueteurs à fonctionnement automatique

R 51 (1996)

▶ Issuing Authority / *Autorité de délivrance*
Sous-direction de la Métrologie, France

R51/1996-FR1-00.01
Modèle BINWEIGH BL 01 (Class Y(a))
Société PME FRANCE, Z.A. du Champ du Caillou, 10, rue de Gally, 78450 Chavenay, France

▶ Issuing Authority / *Autorité de délivrance*
National Weights and Measures Laboratory (NWML), United Kingdom

R51/1996-GB1-00.01
APEX ACW... (Class X(1))
Ward Bekker Systems Ltd, Combi House, Spring Lane Industrial Estate, Malvern, Worcestershire WR14 1AJ, United Kingdom

▶ Issuing Authority / *Autorité de délivrance*
Netherlands Measurement Institute (NMi) Certin B.V., The Netherlands

R51/1996-NL1-00.02
Ecoline SD100 (Class X(1))
Garvens Automation GmbH, Hasede, Kampstraße 7, D-31180 Giesen, Germany

R51/1996-NL1-00.03
Types CSG..L and CMG..L with controller CE2000, CSG..LW and CMG..LW with controller CE2000 (Class X(1))
Yamato Scale GmbH, Hanns-Martin-Schleyer Straße 13, D-47877 Willich, Germany

R51/1996-NL1-00.04 Rev. 1
System 2000 (2100, 2200, 2300), System 3000 (3100, 3200, 3300) (Class Y(a))
DIBAL S.A., c/ Astintze Kalea, 24, Poligono Industrial Neinver, 48016 Derio (Bilbao-Vizcaya), Spain

INSTRUMENT CATEGORY
CATÉGORIE D'INSTRUMENT

Load cells
Cellules de pesée

R 60 (1991), Annex A (1993)

▶ Issuing Authority / *Autorité de délivrance*
Service de la Métrologie, Ministère des Affaires Économiques NGIII, Belgium

R60/1991-BE-99.02
Cellule de pesée à jauges de contrainte Sensy type 5510 (Classe C)
Sensy S.A., ZI Jumet - Allée centrale, B-6040 Jumet, Belgium

▶ Issuing Authority / *Autorité de délivrance*
Physikalisch-Technische Bundesanstalt (PTB), Germany

R60/1991-DE-00.02
Strain gauge compression load cell type RTN .. (Classes C3 to C5)
Hottinger Baldwin Messtechnic Wägetechnik GmbH, Im Tiefen See 45, D-64293 Darmstadt, Germany

▶ Issuing Authority / *Autorité de délivrance*
National Weights and Measures Laboratory (NWML), United Kingdom

R60/1991-GB1-00.03
Telemecanique model SM2PZ.... (Class C3)
Schneider Electrics S.A., 33 bis, avenue de Chatou, F-92002 Nanterre Cedex, France

R60/1991-GB1-00.04
Model TB5 (Class C3)
Raute Precision Oy, Mestarinkatu 10, 15800 Lahti, Finland

R60/1991-GB1-00.05
Model TB5 (Class C3)
Raute Precision Oy, Mestarinkatu 10, 15800 Lahti, Finland

R60/1991-GB1-00.06
Telemecanique model SM2PZ.... (Class C3)
Schneider Electrics S.A., 33 bis, avenue de Chatou, F-92002 Nanterre Cedex, France

▶ Issuing Authority / *Autorité de délivrance*

Netherlands Measurement Institute (NMi) Certin B.V., The Netherlands

R60/1991-NL1-98.21 Rev. 1
Type SCL ... (Class C)
Precia-Molen, Teteringsedijk 53, 4817 MA Breda, The Netherlands

INSTRUMENT CATEGORY
CATÉGORIE D'INSTRUMENT

Metrological regulation for load cells (applicable to analog and/or digital load cells)
Réglementation métrologique des cellules de pesée (applicable aux cellules de pesée à affichage analogique et/ou numérique)

R 60 (2000)

▶ Issuing Authority / *Autorité de délivrance*

Netherlands Measurement Institute (NMi) Certin B.V., The Netherlands

R60/2000-NL1-00.07
Type 3540 (Class C)
Tedea Huntleigh Europe Ltd., 37 Portmanmoor Road, Cardiff CF24 5HE, United Kingdom

R60/2000-NL1-00.08
Type CMI (Class C)
Société Precia Molen, BP 106, F-07001 Privas cedex, France

R60/2000-NL1-00.09
PW6K. ../.. K (Class C)
Hottinger Baldwin Messtechnic Wägetechnik GmbH, Im Tiefen See 45, D-64293 Darmstadt, Germany

INSTRUMENT CATEGORY
CATÉGORIE D'INSTRUMENT

Automatic gravimetric filling instruments
Doseuses pondérales à fonctionnement automatique

R 61 (1996)

▶ Issuing Authority / *Autorité de délivrance*

Physikalisch-Technische Bundesanstalt (PTB), Germany

R61/1996-DE-00.01
Type MEAF-BAG (Accuracy class Ref (0.2))
Bühler AG, 9240 Uzwil, Switzerland

▶ Issuing Authority / *Autorité de délivrance*

Netherlands Measurement Institute (NMi) Certin B.V., The Netherlands

R61/1996-NL1-00.03
*Type BOS-**-** (Class X(1))*
Precia-Molen, Teteringsedijk 53, 4817 MA Breda, The Netherlands

R61/1996-NL1-00.04
*Type ADW-*XX****/***/*** (Class Ref(1))*
Yamato Scale GmbH, Hanns-Martin-Schleyer Straße 13, D-47877 Willich, Germany

▶ Issuing Authority / *Autorité de délivrance*

Swedish National Testing and Research Institute AB, Sweden

R61/1996-SE-99.01
Type BF-PA-PP 100-1500 W (Class Ref(0,5))
Korsnäs Strömsnäs AB, SE-287 81 Strömsnäsbruk, Sweden

R61/1996-SE-99.02
Type BF-PA-PP 100-1500 S (Class Ref(0,5))
Korsnäs Strömsnäs AB, SE-287 81 Strömsnäsbruk, Sweden

INSTRUMENT CATEGORY
CATÉGORIE D'INSTRUMENT

Nonautomatic weighing instruments
Instruments de pesage à fonctionnement non automatique

R 76-1 (1992), R 76-2 (1993)

▶ Issuing Authority / *Autorité de délivrance*

Physikalisch-Technische Bundesanstalt (PTB), Germany

R76/1992-DE-98.04 Rev. 2
Nonautomatic electromechanical weighing instrument, types: BD BH 110 (Class I), DT BH 210 (Class II) and DS BH 310, DT BH 310 (Class III)
Sartorius A.G., Postfach 32 43, D-37070 Göttingen, Germany

R76/1992-DE-00.01
Types 320 XB and 320 XT (Classes I and II)
Precisa Instruments A.G., Moosmattstraße 32, CH 8953 Dietikon, Switzerland

▶ Issuing Authority / *Autorité de délivrance*

Centro Español de Metrologia, Spain

R76/1992-ES-00.01
Type "SMALLY" (Class III)
OMEGA BILANCE S.p.A., Cs. Sempione 111 Gallarate (Va), Italy

R76/1992-ES-00.02
Type "C-i02" (Class III)
DIBAL S.A., c/ Astintze Kalea, 24, Poligono Industrial Neinver, 48016 Derio (Bilbao-Vizcaya), Spain

▶ Issuing Authority / *Autorité de délivrance*

National Weights and Measures Laboratory (NWML), United Kingdom

R76/1992-GB1-00.03
MEQ-xx and MFQ-xx (Class III)
Fabricantes De Basculas Torrey S.A. De C.V., Los Andes 605, Col. Coyoacan, Monterrey, N.L., C.P. 64510, Mexico

▶ Issuing Authority / *Autorité de délivrance*

Netherlands Measurement Institute (NMi) Certin B.V., The Netherlands

R76/1992-NL1-00.07
DPS-90 (Class III)
Teraoka Seiko Co., Ltd., 13-12 Kugahara, 5-Chome, Ohta-ku, Tokyo 146-8580, Japan

R76/1992-NL1-00.11
n <= 3000 divisions; 1.5 kg <= Max <= 30 kg; e >= 0.5 kg; T = 50 % of Max (Class III)
Teraoka Seiko Co., Ltd., 13-12 Kugahara, 5-Chome, Ohta-ku, Tokyo 146-8580, Japan

R76/1992-NL1-00.12
DS-682 (Class III)
Teraoka Seiko Co., Ltd., 13-12 Kugahara, 5-Chome, Ohta-ku, Tokyo 146-8580, Japan

R76/1992-NL1-00.13
DS-777.. (Class III)
Teraoka Seiko Co., Ltd., 13-12 Kugahara, 5-Chome, Ohta-ku, Tokyo 146-8580, Japan

R76/1992-NL1-00.14
MSI-3360 .... (Class III)
Measurement Systems International, Inc., 14240 Interurban Avenue South, Seattle, Washington 98168-4660, U.S.A.

R76/1992-NL1-00.15
ASTRA (Class III)
Descom Co., Ltd., 4-12 Wonmi Dong, Wonmi-Ku, Buchon-City, Kyungki-Do 420-110, Rep. of Korea

INSTRUMENT CATEGORY
CATÉGORIE D'INSTRUMENT

Discontinuous totalizing automatic weighing instruments (Totalizing hopper weighers)
Instruments de pesage totalisateurs discontinus à fonctionnement automatique (Peseuses totalisatrices à trémie)

R 107 (1997)

▶ Issuing Authority / *Autorité de délivrance*

Netherlands Measurement Institute (NMi) Certin B.V., The Netherlands

R107/1997-NL1-00.01
Type ABS-..-.. (SCS, if applicable) (Class 0.2)
Precia-Molen, Teteringsedijk 53, 4817 MA Breda, The Netherlands

Métrologie 2001

October 2001
Saint-Louis (Alsace), France

Presentation

The *International Metrology Congress* is organized every two years by the *Collège Métrologie* of the *Mouvement Français pour la Qualité*. The aims of the Congress are:

- to highlight new techniques of measurement and calibration that have been or are being developed; and
- to present the evolution of metrology and the implications for industry, the environment, the economy and quality, at national and international levels.

The Congress is a meeting place for the exchange of information, ideas and experience through oral presentations, poster sessions, an exhibition of metrological equipment and technical visits to industry.

It will attract over 600 people from 30 different countries, and from every circle concerned with metrology and measurement:

- metrologists from industry;
- metrologists from calibration laboratories;
- manufacturers and users of measuring instruments;
- quality managers; and
- teachers and researchers.

Métrologie 2001 is organized under the aegis of the *Bureau National de Métrologie* (BNM) and with the scientific support of the *National Physical Laboratory* (NPL).

Topics

The control of measurement and testing is an essential condition to ensure the quality of products. *Métrologie 2001* will address the following themes to meet these needs:

- measurement uncertainties;
- comparisons;
- capability of measurement facilities;
- measuring instruments;
- traceability, calibration and verification;
- measurement and testing procedures;
- control of measurement and analysis process;
- organization of the metrology function;
- standardization in the field of metrology;
- legal metrology;
- training and qualification of people; and
- economic aspects of metrology.

Authors have the possibility of developing those topics either in a general way or by applying them to a specific field:

- length;
- mass, force, pressure, acceleration;
- electricity, magnetism (including electromagnetic compatibility);
- time, frequency;
- temperature, humidity;
- flow;
- optical measurements;
- radiometry, photometry;
- ionizing radiations;
- chemistry, chemical analysis;
- environment, pollution;
- agricultural industry, œnology; and
- biotechnologies and medical applications.

Presentation of papers

The selection of papers will be made by a Scientific and Technical Committee. The Committee will choose the mode of presentation according to the subject: oral presentations, posters or round tables.

Authors will be able to present their papers either in French or English and simultaneous translation will be provided.

Exhibition

An exhibition of metrological equipment will be located at the same venue as the Congress from Monday, October 22 (16:00) through Thursday, October 25 (12:00). Registration forms and conditions will be sent out on request (see Organizing Committee contact details below).

ORGANIZING COMMITTEE

President
Patrick LEBLOIS - MECASEM Métrologie - Besançon

Vice-Presidents
Pierre Barbier - Collège Métrologie
Patrick REPOSEUR - COFRAC - Paris

Secretariat *Métrologie 2001*
Sandrine GAZAL
Maison de l'Entreprise, 429, rue de l'Industrie,
34966 Montpellier Cedex 2, France

Tel: 33 (0)4 67 06 20 36
Fax: 33 (0)4 67 06 20 35
E-mail: ***sandrine.gazal@wanadoo.fr***
Web: ***www.metrologie2001.com***

Présentation

Le *Congrès International de Métrologie* est organisé, tous les deux ans, par le *Collège Métrologie* du *Mouvement Français pour la Qualité*. Ses objectifs sont:

- de faire le point sur les techniques d'étalonnage et de mesure originales, développées ou en cours de développement; et
- de présenter les évolutions de la métrologie et ses implications dans l'industrie, l'environnement, l'économie et la qualité, au niveaux national et international.

Le Congrès est un carrefour d'échange d'informations, d'idées et d'expériences autour de conférences, orales et affichées, d'une exposition de matériel métrologique et de visites techniques d'entreprises.

Il rassemble désormais plus de 600 participants, de 30 pays différents et de tous les milieux concernés par la métrologie et la mesure:

- des métrologues de l'industrie;
- des métrologues des laboratoires d'étalonnage;
- des constructeurs et utilisateurs d'appareils de mesure;
- des responsables qualité; et
- des enseignants et chercheurs.

Métrologie 2001 est organisé avec le concours du *Bureau National de Métrologie* (BNM), et la participation scientifique du *National Physical Laboratory* (NPL).

Thèmes

La maîtrise des mesures et des essais est une condition indispensable pour garantir la qualité des produits. Afin de répondre à ces préoccupations *Métrologie 2001* abordera les thèmes suivants:

- incertitudes de mesure;
- comparaisons;
- capabilité des moyens de mesure;
- instruments de mesure;
- traçabilité, étalonnage et vérification;
- procédés de mesure et d'essais;
- maîtrise des processus de mesure et d'analyse;
- organisation de la fonction métrologique;
- normalisation en métrologie;
- métrologie légale;
- formation, qualification des personnels; et
- aspects économiques de la métrologie.

Les conférenciers ont la possibilité de développer ces thèmes soit d'une manière générale, soit en les appliquant à des domaines spécifiques:

- dimensionnel;
- masse, force, pression, accélération;
- électricité, magnétisme (y compris compatibilité électromagnétique);
- temps, fréquence;
- température, hygrométrie;
- débits;
- mesures optiques;
- radiométrie, photométrie;
- rayonnements ionisants;
- chimie, analyses chimiques;
- environnement, pollution;
- agro-alimentaire, œnologie; et
- biotechnologies et applications médicales.

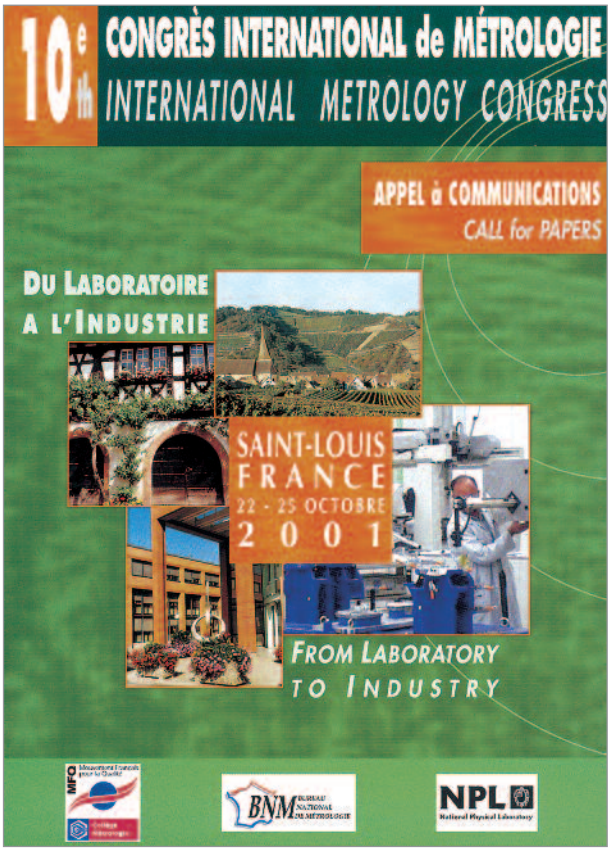
Présentation des conférences

La sélection des conférences sera réalisée par un Comité Scientifique et Technique. Ce comité choisira le mode de présentation en fonction des sujets: conférences orales, conférences affichées ou tables rondes.

Les conférenciers pourront présenter leur sujet soit en français, soit en anglais. Une traduction simultanée sera assurée.

Exposition

Une exposition de matériels métrologiques se déroulera sur le lieu du congrès du lundi 22 octobre à 16h au jeudi 25 octobre à 12h. Les modalités de participation seront adressées sur demande (voir coordonnées du Comité d'Organisation ci-contre).



The OIML is pleased to welcome the following new

CIML Members

Belgium ..... **Mr. Eggermont**

Egypt ..... **Mr. Eisa**

Romania ..... **Mr. Iacobescu**

Sweden ..... **Mr. Björkqvist**

USA ..... **Mr. Ehrlich**

OIML Meetings

November 2000

9–10	**TC 8/SC 5**	Water meters	PARIS

December 2000/January 2001

TBA	**TC 11**	Instruments for measuring temperature and associated quantities	BERLIN

January/February 2001

TBA	**TC 8/SC 7**	Gas metering	BRUSSELS

Committee Drafts

received by the BIML, 2000.05.01 – 2000.07.31

Revision of D 18: "The use of certified reference materials in the fields covered by the State Metrological Control. Basic Principles".	English	2 CD	TC 3/SC 3	Russia
Absorption spectrometers for medical laboratories	English	1 CD	TC 18/SC 5	Germany
Liquid-in-glass thermometers	English	2 CD	TC 11/SC 2	USA

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- a titled, typed manuscript;
- the originals of any relevant visual materials (photos, illustrations, diagrams, etc.);
- a disk copy in either WordPerfect or Word (PC or Mac);
- a photograph suitable for publication;
- full contact details: name, position, institution, address, telephone, fax and e-mail.

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