

# Legal metrology under construction: new trends in Europe and Germany



**Dr. Peter Ulbig**

**Department Q.3: Legal Metrology and Technology Transfer  
Physikalisch-Technische Bundesanstalt, Germany**



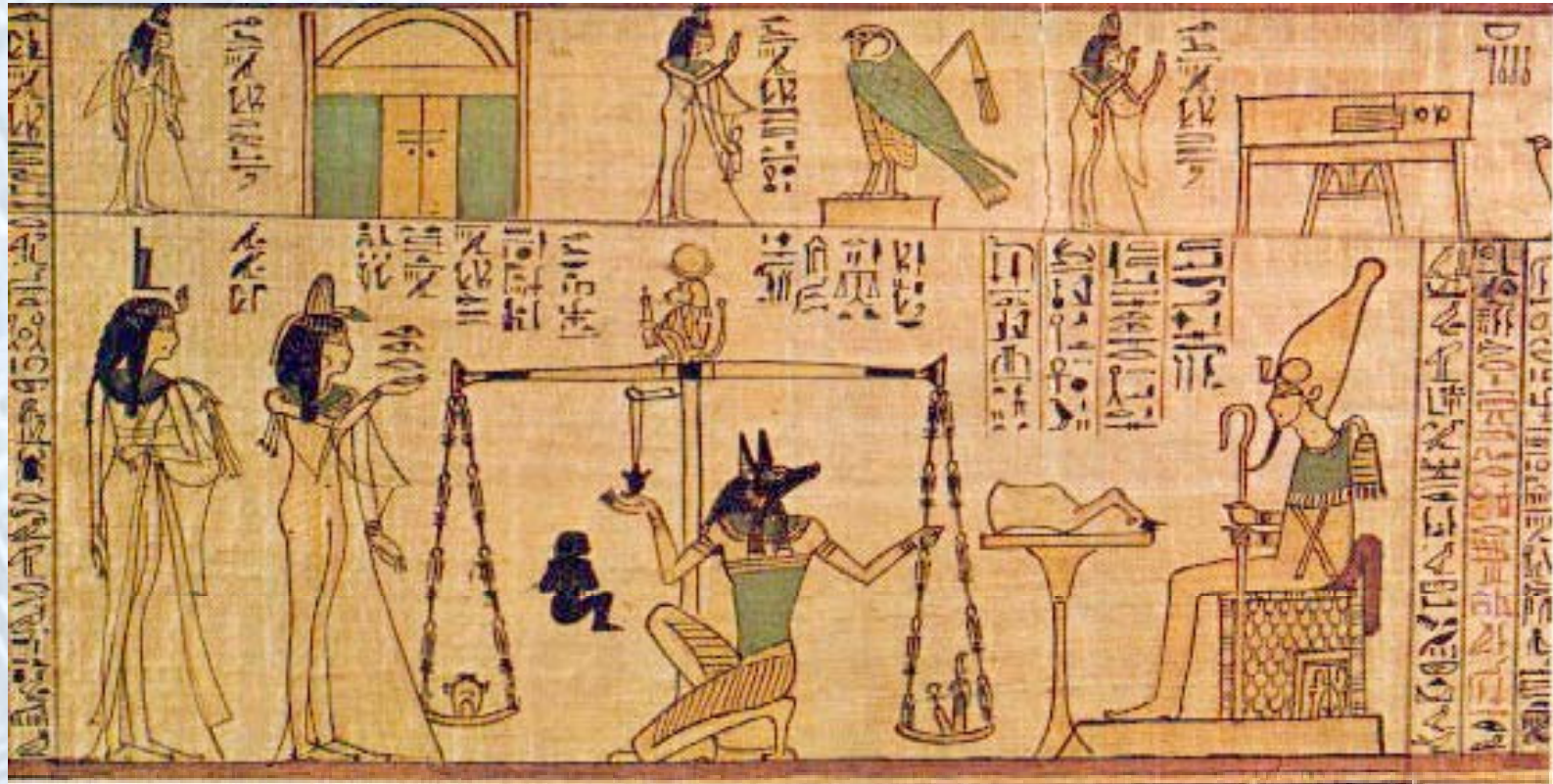
## Topics:

- **Legal metrology in Europe and espec. in Germany**
- **The „New Approach“ of the European Community**
- **The Measuring Instruments Directive of the EC**
- **Towards a new legal metrology system in Germany**

## Topics:

- **Legal metrology in Europe and espec. in Germany**
- The „New Approach“ of the European Community
- The Measuring Instruments Directive of the EC
- Towards a new legal metrology system in Germany

# 1. Legal Metrology in Europe and Germany



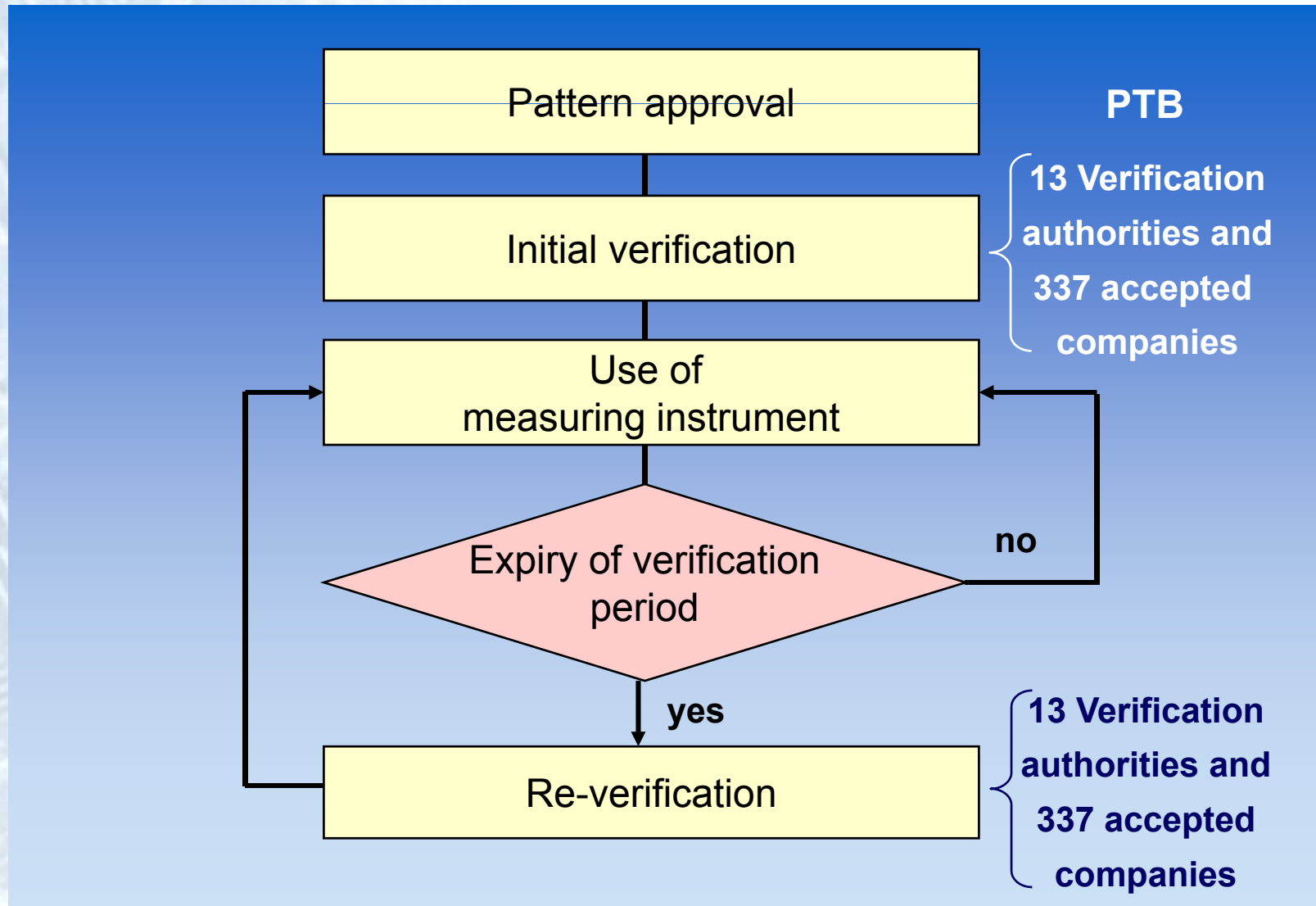
Legal Metrology was invented thousands of years ago ...

# 1. Legal Metrology in Europe and Germany



... but still interesting nowadays!!!

# 1. Legal Metrology in Europe and Germany



## Type approval certificate

### Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin



### Innerstaatliche Bauartzulassung

Type-approval certificate under German law

Zulassungsinhaber:  
*Issued to:*

XXY  
38112 Braunschweig  
Deutschland

Rechtsbezug:  
*In accordance with:*

§ 13 des Gesetzes über das Mess- und Eichwesen (Eichgesetz)  
vom 23. März 1992 (BGBl. I S. 711)

Bauart:  
*In respect of:*

Abgasmessgerät für Kompressionszündungsmotoren in der Ausführung  
als Teilstrom-Trübungsmessgerät mit der Typenbezeichnung

Type approval no.

+

18.10

98.02

Verification mark

+



„verified until

2005“

# 1. Legal Metrology in Europe and Germany



## Disadvantages:

- homologation in most of the European countries necessary
- takes cost and time
- sometimes different requirements
- time to market relatively long



# 1. Legal Metrology in Europe and Germany



## European type approval

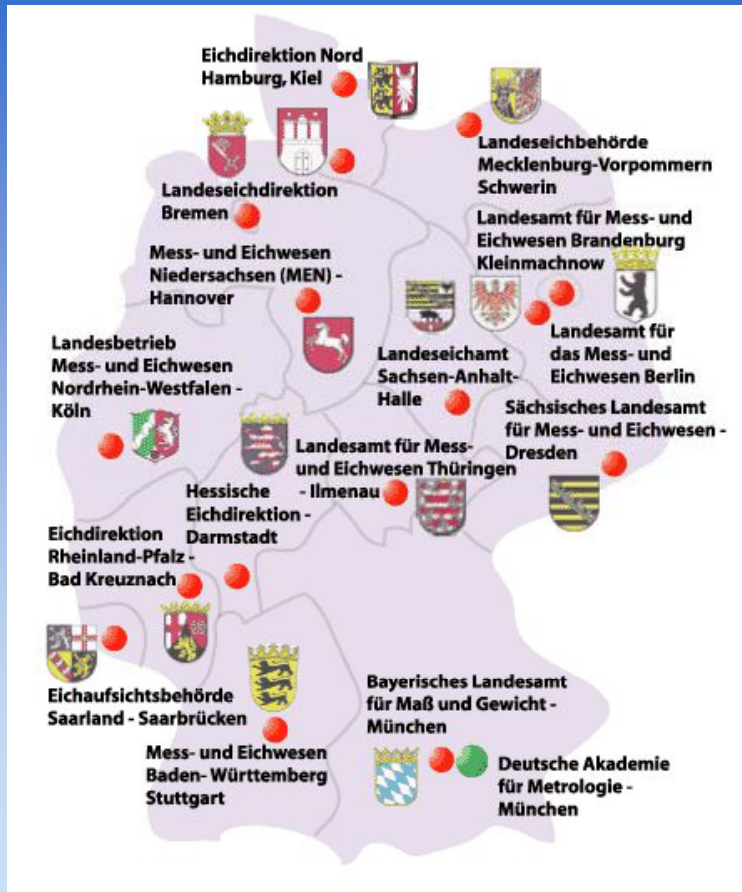
- one certificate for whole Europe
- saves cost and time
- harmonized requirements
- time to market much shorter



# 1. Legal Metrology in Europe and Germany

national act

+ European directives



## Topics:

- Legal metrology in Europe and espec. in Germany
- **The „New Approach“ of the European Community**
- The Measuring Instruments Directive of the EC
- Towards a new legal metrology system in Germany

## 2. The “New Approach” of the EC

### Starting point (before 1995):

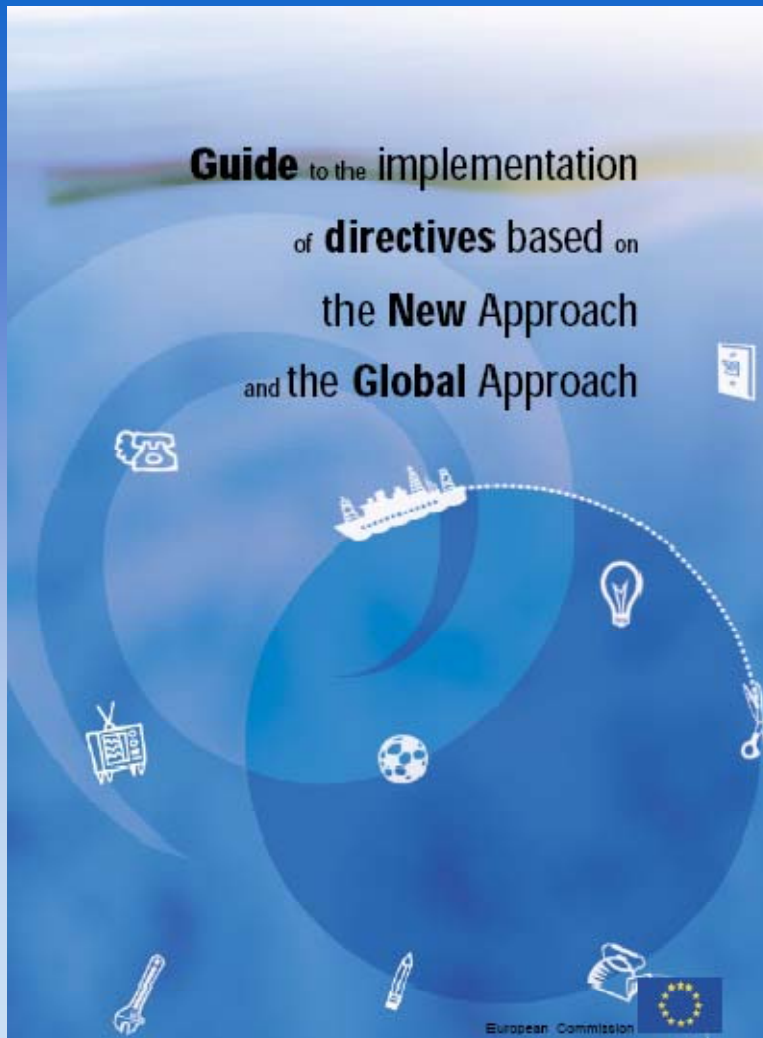
- 15 Member States\* with own ideas about „fair trade“ and „consumer protection“
- 11 “Old Approach” technical Directives
- WELMEC-Type approval agreements on the basis of 7 OIML-Recommendations
- “New Approach” directive for Non-Automatic Weighing Instruments (NAWI)

\*) 2008: 27 Member-(+ 3 Candidate-),  
3 EEA-States, Switzerland, Turkey



(WELMEC = Western European Legal METrology Cooperation)

## 2. The “New Approach” of the EC



### „blue guide“ (1999):

- how to place goods in the EC-market and how to put them into use
- responsibilities (manufacturer, user ...)
- EC declaration of conformity (CE marking)
- notified bodies
- market surveillance

### New Approach principles:

- Harmonisation is limited to essential requirements.
- Only products fulfilling the essential requirements may be placed on the market and put into use.
- Harmonised standards, which have been published in the Official EU-Journal and which have been transposed into national standards, are presumed to be conform to the corresponding essential requirements.



### New Approach principles:

- Application of harmonised standards or other technical specifications remains voluntary, and manufacturers are free to choose any technical solution that provides compliance with the essential requirements.
- Manufacturers may choose between different conformity assessment procedures provided for in the corresponding directive („Global Approach“).



### The “Global Approach”:

- is a modular approach, offering harmonised conformity assessment procedures to the manufacturers
- opens the possibility to take into account the manufacturers internal design and production control activities
- allows a complete assessment until placing a measuring instrument on the market / putting into use
- should provide a high level of confidence to the product

**MID:** The conformity assessment procedures must be performed under the responsibility of a Notified Body, who is under the surveillance of a member state



### Basis: European harmonised standards

**Presumption of conformity** with the essential requirements in full or in part if the instrument complies with :

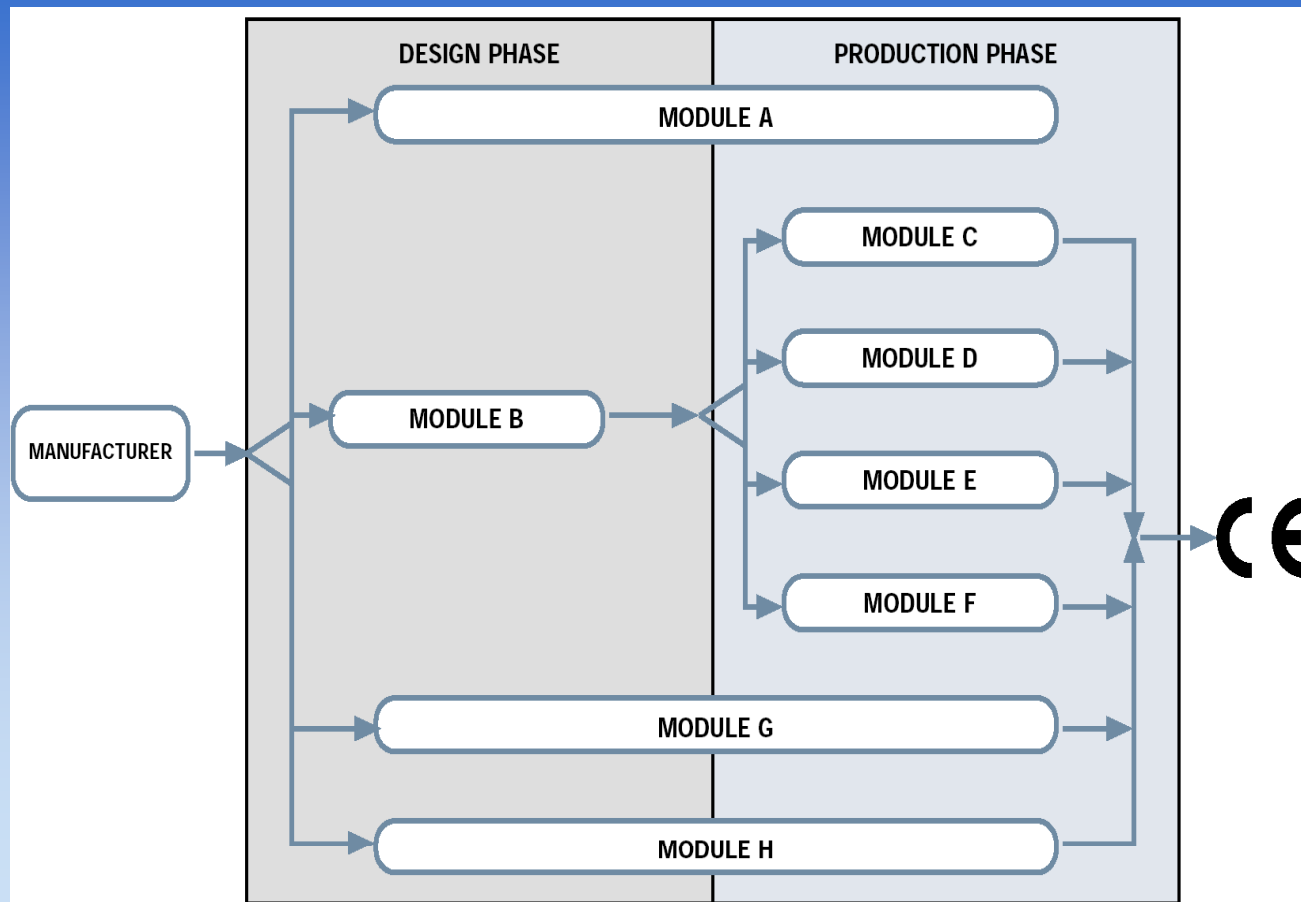
- Harmonised European Standard (CEN/CENELEC)
- Normative Documents, e.g. drawn up by OIML,

in full or in part referenced in the C series of the Official Journal of the European Communities

Where an instrument not complies with referenced standards or documents, the Notified Body is in charge that the instrument meets the provisions of the Directive

## 2. The “New Approach” of the EC

### Simplified flow chart of conformity assessment procedures (Global Approach)



(“Blue Guide”: [www.newapproach.org](http://www.newapproach.org))

## 2. The “New Approach” of the EC

www.newapproach.org

New Approach Standardization in the Internal Market - Mozilla Firefox

Datei Bearbeiten Ansicht Chronik Lesezeichen Extras Hilfe

http://www.newapproach.org/

Meistbesuchte Seiten PTB PTB Intern PTB Physikalisch-Technisc... Erste Schritte Aktuelle Nachrichten

# New Approach Standardisation in the Internal Market

**Home**

Directives & Standards

Search by Keywords

Questions & Answers

Standards Sales Points

The New Approach and European standardisation have contributed significantly to the development of the Single Market. The success of the European standardisation system, in removing technical barriers to trade, has played a vital role in ensuring the free movement of goods between Member States.

This Web site has been realised to increase the visibility of New Approach Standardisation in Europe and to provide information on the standardisation process. This site provides access to information on standards and routes into the standardisation process, irrespective of which of the three European Standards Organisations is responsible for the standards applicable to the products:

Information on the New Approach legislation is available in the Guide to the Implementation of Directives based on New Approach and Global Approach.

This Web site represents the joint efforts of the three European Standards Organisations (CEN, CENELEC and ETSI) together with both the European Commission and EFTA.

**Disclaimer:** This information is of a general nature and is not a legal advice. Neither the European Commission, EFTA, CEN, CENELEC, ETSI nor any person acting on behalf of these Institutions/Organisations is responsible for the use which might be made of the information.

### Revision of the New Approach by the „New Legal Framework“ (23rd June 2008):

**DECISION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL  
ON A COMMON FRAMEWORK FOR THE MARKETING OF PRODUCTS,  
AND REPEALING DECISION 93/465/EEC**

**REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL  
SETTING OUT THE REQUIREMENTS FOR ACCREDITATION AND  
MARKET SURVEILLANCE RELATING TO THE MARKETING OF PRODUCTS,  
AND REPEALING REGULATION (EEC) No 339/93**

## Topics:

- Legal metrology in Europe and espec. in Germany
- The „New Approach“ of the European Community
- **The Measuring Instruments Directive of the EC**
- Towards a new legal metrology system in Germany

### 3. The Measuring Instruments Directive (MID)

## Directive of the European Parliament and of the Council on Measuring Instruments

relevant for 31 European countries (2004/22/EC)

=

Measuring Instruments Directive = **MID**

30.4.2004

EN

Official Journal of the European Union

L 135/1

I

*(Acts whose publication is obligatory)*

**DIRECTIVE 2004/22/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL**

**of 31 March 2004**

**on measuring instruments**

*(Text with EEA relevance)*

### 3. The Measuring Instruments Directive (MID)

One single European market  
for 10 kinds of instruments



### 3. The Measuring Instruments Directive (MID)

MI-001 Water Meters

MI-002 Gas Meters and Volume Conversion Devices

MI-003 Active Electrical Energy Meters

MI-004 Heat Meters

(MI-001 to MI-004: for utility measuring purposes)

MI-005 Measuring Systems for the Measurement of Quantities of Liquids other than Water

MI-006 Automatic Weighing Instruments

MI-007 Taximeters

MI-008 Material Measures (length, capacity measure)

MI-009 Dimensional Measuring Instruments (e.g. area)

MI-010 Exhaust Gas Analysers



#### Basic Principle:

Regulations for legally controlled instruments are limited until “placing on the market” and/or “putting into use”

- Member states remain responsible for their legal metrological control (choice of controlled instruments, market surveillance), but
- National metrological control shall not lead to barriers for free movement of measuring instruments and
- Directives have to be implemented into national legislation.

## What is regulated in the Member States? (Regulated Instruments in % of Member States):

Resid.I Com.I Industr. Utility meters (consumer protection)

100%, 97 % , 97 % MI-003 Active Electrical Energy Meters

93 % , 83 % , 74 % MI-001 Clean cold Water Meters

93 % , 93 % , 93 % MI-002 Gas Meters

89 % , 85 % , 85 % MI-001 Clean warm Water Meters

85 % , 89 % , 89 % MI-002 Volume conversion devices

82 % , 78 % , 78 % MI-004 Heat Meters

(Resid.= residential use, Com. = commercial use, Industr. = industrial use)

#### Regulated Instruments in % Member States:

100 %	MI-005	Fuel Dispensers	(consum. prot.)
97 %	MI-006	Automatic Weighing Instrum.	(fair trade)
97 %	MI-005	Systems on Road Tankers	(fair trade)
93 %	MI-005	Systems for Milk	(fair trade)
89 %	MI-007	Taximeters	(consum. prot.)
85 %	MI-010	Exhaust Gas Analysers	(environment)
82 %	MI-008	Material Measures: Length	(consum.prot.)
74 %	MI-008	Capacity measures	(taxes)
70 %	MI-009	Dimensional Measuring Instruments	

### Structure of the MID:

- 1) **Articles**, regulating the procedures:  
Definitions, Procedures for implementation, obligations, regulations,  
Criteria to be satisfied by the notified bodies,  
Necessary technical documentation from manufacturer,  
Safeguard clause in the case of non conformity,  
Changes and further development of the MID
- 2) General **Essential Requirements** (Annex I)
- 3) Conformity **Assessment Procedures** (Annexes A - H1)
- 4) Instrument **Specific Essential Requirements**  
(Annexes MI-001 to MI-010)

#### Essential Requirements: All instruments (Annex I)

- Correct measurement: Allowable Errors, Durability
- Influence Quantities: Mechananic, Climatic, Electromagnetic
- Suitability for use, reproducibility
- Verifiability: Metrolog. relevant parts, also for instruments in use
- Additional functionalities, not under legal control
- Protection against corruption (Hard- and Software)
- Easy identification of metrological relevant Hard- and Software
- Information to accompany the instruments
- Indication of the result: (Metrologically controlled display for the consumer as the basis of the price to pay)
- Further processing of data to conclude trading transaction

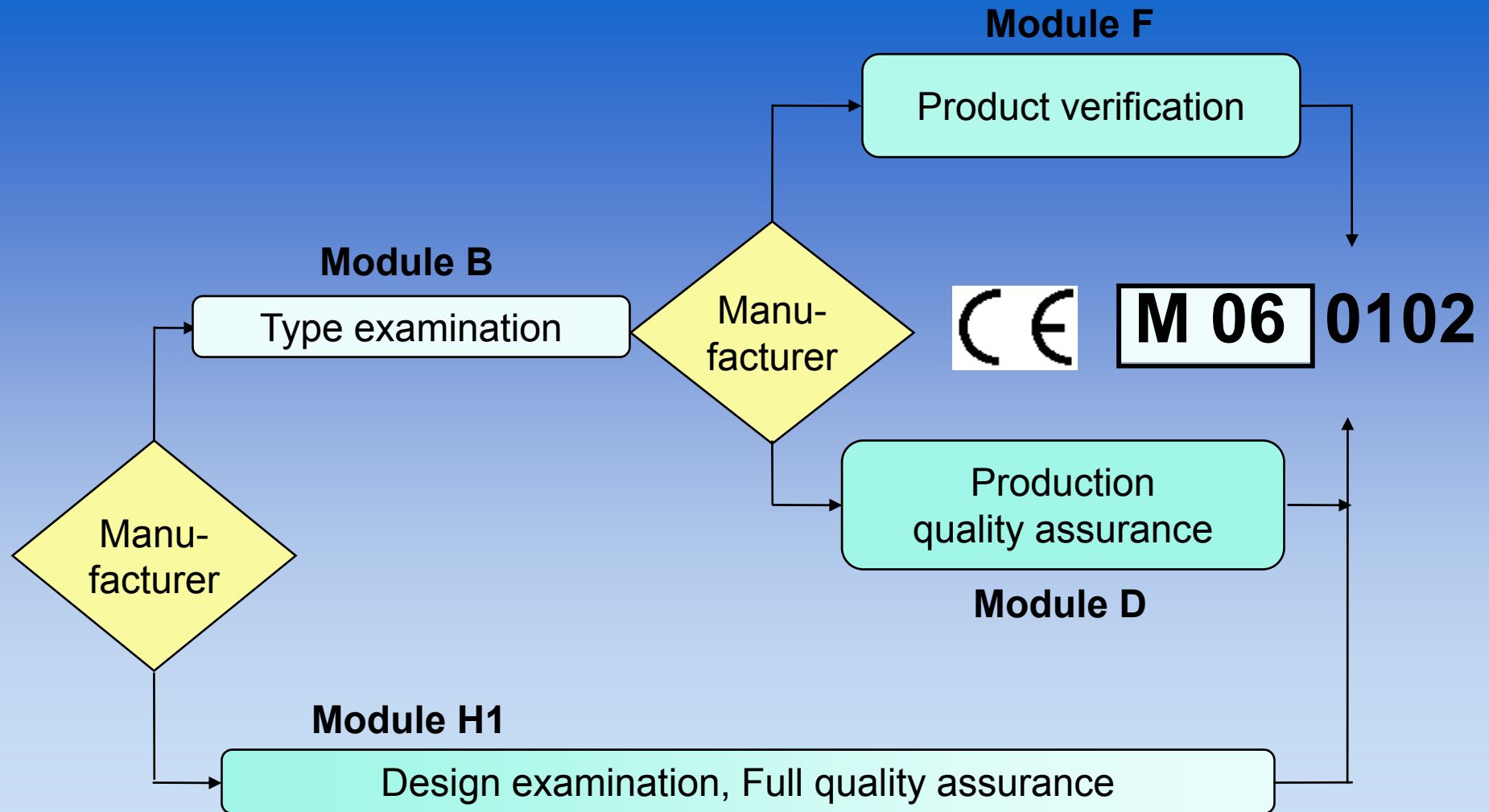
#### Instrument specific Essential Requirements (Annexes MI-001 to MI-010)

- Rated operating conditions (climatic, mechan., electromagn.)
- Maximum permissible Errors (MPE) at rated operating cond.
- Permissible effects of disturbances
- Indication of the result
- Allowed Conformity Assessment Procedures

If applicable:

- Accuracy classes
- Conditions for putting into use
- Suitability / Durability
- Requirements for sub assemblies with conformity assessment

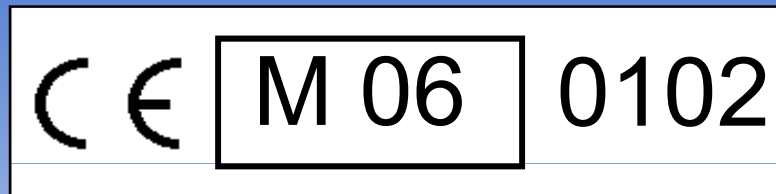
### 3. The Measuring Instruments Directive (MID)



### 3. The Measuring Instruments Directive (MID)

#### Ticket for the EC-Market since 30<sup>th</sup> October 2006:

CE marking and supplementary metrology marking, affixed under the responsibility of the manufacturer:



**CE** = Conformity to applicable technical harmonisation Directives

**M** = Conformity to the legal metrology Directive 2004/22/EC

**06** = Year of affixing the CE- and the metrology marking

**0102** = Identification no. of the notified body, responsible for the conformity assessment procedure for 'placing on the market' and/or 'putting into use'



## Topics:

- Legal metrology in Europe and espec. in Germany
- The „New Approach“ of the European Community
- The Measuring Instruments Directive of the EC
- **Towards a new legal metrology system in Germany**

### Actual status in Germany:

- **Conventional type approval under German law**  
(with first national verification and national re-verification)
- **EC type approval (old EC-directives)**  
(with first European verification and national re-verification)
- **EC-Directive Non-Automatic Weighing Instruments (NAWI)**  
(EC type examination (B))  
(conformity assessment (D or F)) and national re-verification)
- **EC-Directive Measuring Instruments Directive (MID)**  
(Modules A to H + submodules)  
(and national re-verification)

## 4. Towards a new German legal metrology system **PTB**

### Actual status in Germany:

- **Conventional type approval**
- **old EC-Directives**  
(EC type approval )
- **EC-Directive NAWI**  
(EC type examination)
- **EC-Directive MID**  
(EC type examination)

**PTB**

**public authority**  
(non-selectable)

**public authority**  
(selectable)

**notified body**  
(selectable)

**notified body**  
(selectable)

## 4. Towards a new German legal metrology system **PTB**

### Intention of the EC:

**old EC-Directives**  
(EC type approval )



**EC-Directive MID**  
(EC type examination)

# 4. Towards a new German legal metrology system **PTB**

**nationally  
regulated  
measuring  
instruments**



**EC-Directive NAWI**  
(EC type examination)



**EC-Directive MID**  
(EC type examination)



**conformity assessment procedures**

modules

A to H

modules

B,D,F,G

modules

A to H

# 4. Towards a new German legal metrology system **PTB**

## General procedure:

1. new instrument

Who is acting?

manufacturer

2. conformity assessment of a new instrument

manuf./NB

3. declaration on conformity

manuf./NB

market  
surveillance

public author.

4. conformity assessment for instrument in use

user ⇔ NB

user  
surveillance

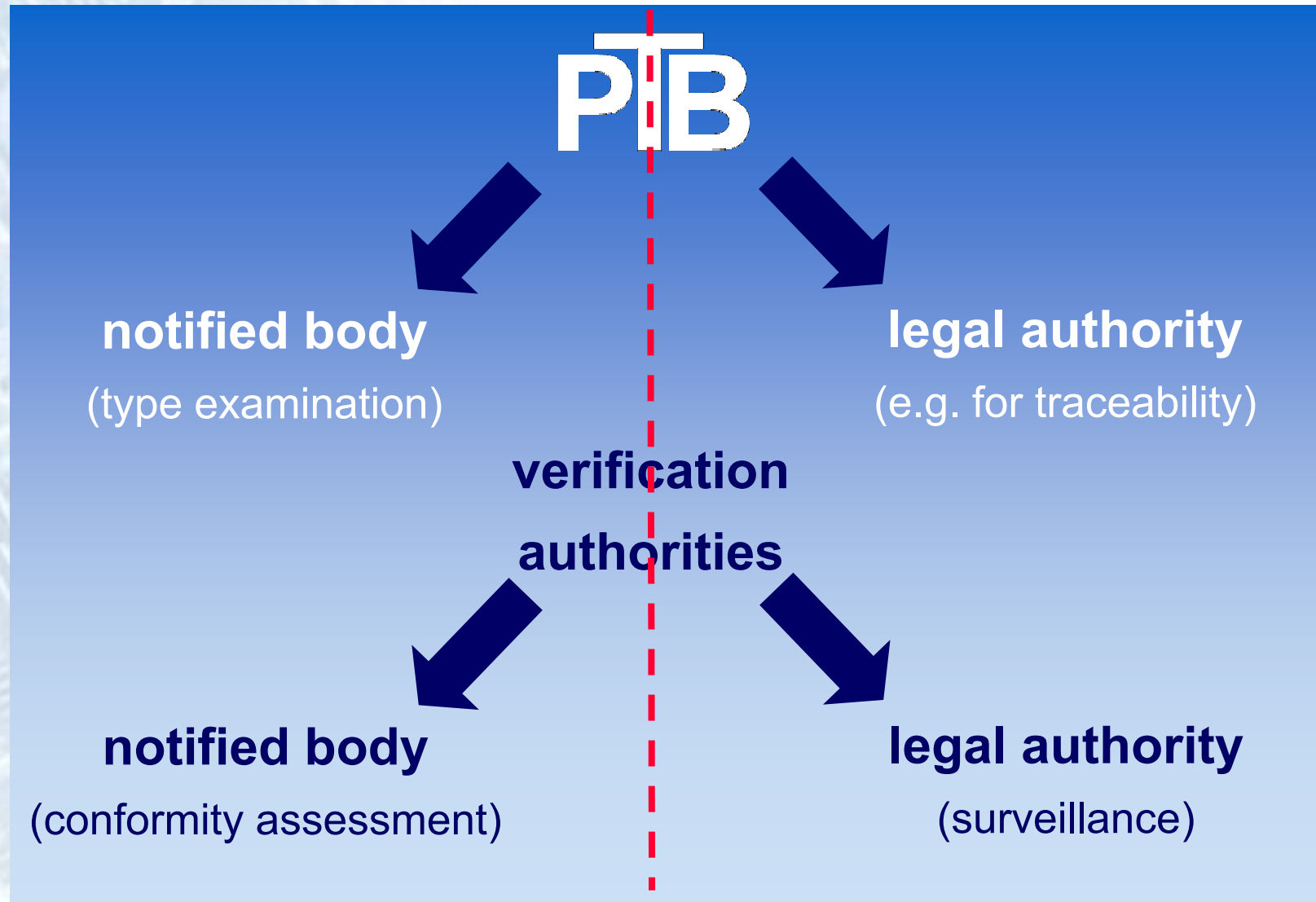
public author.

5. conformity assessment for instrument in use

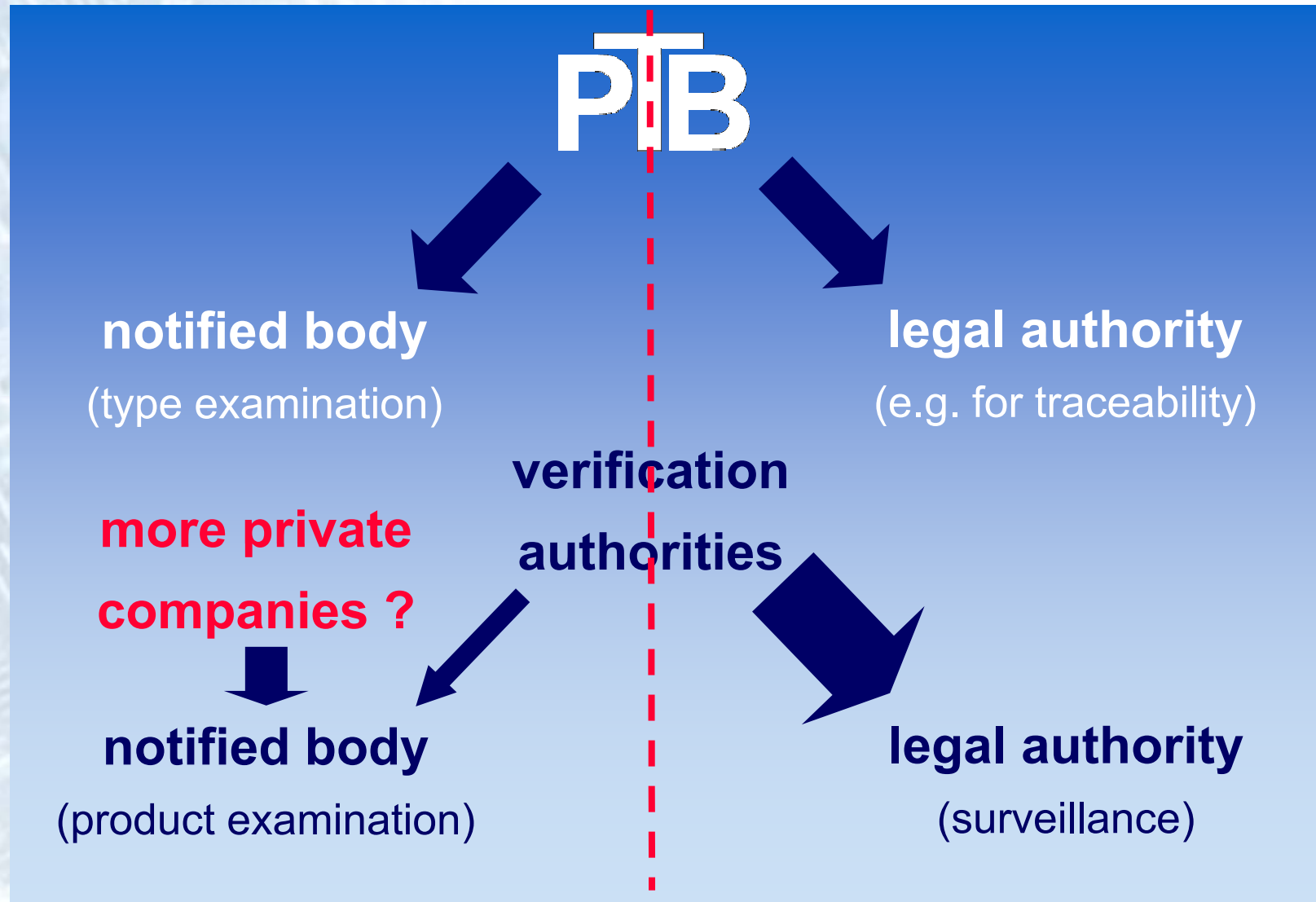
user ⇔ NB

...

## 4. Towards a new German legal metrology system **PTB**



## 4. Towards a new German legal metrology system **PTB**



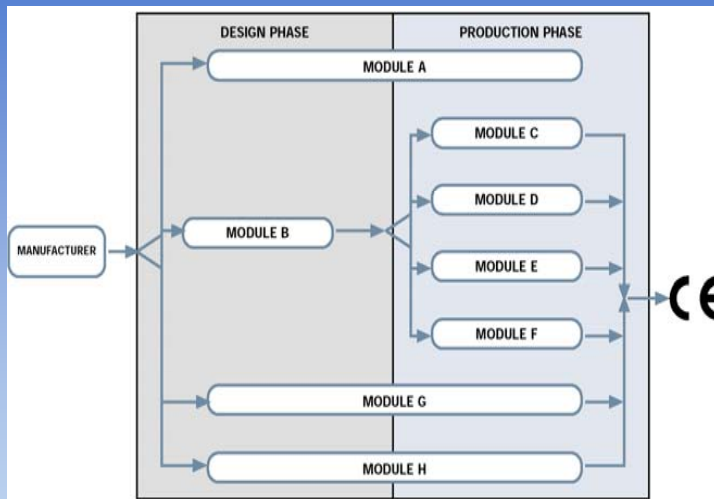


## Which experience does exist now?

1. Legal metrology carried out only by publ. authorities  
(for more than 4000 years)
2. Legal metrology carried out by public authorities  
and legally controlled companies  
(for about 50 years)
3. Legal metrology carried by  
(usually accred.) public or private Notified Bodies  
combined with surveillance by public authorities  
(for about 20 years)

# What is the optimum? (personal point of view!)

placing on the market  
and/or putting into use



harmonized requirements  
and procedures, little costs  
and fast time-to-market

instruments in use

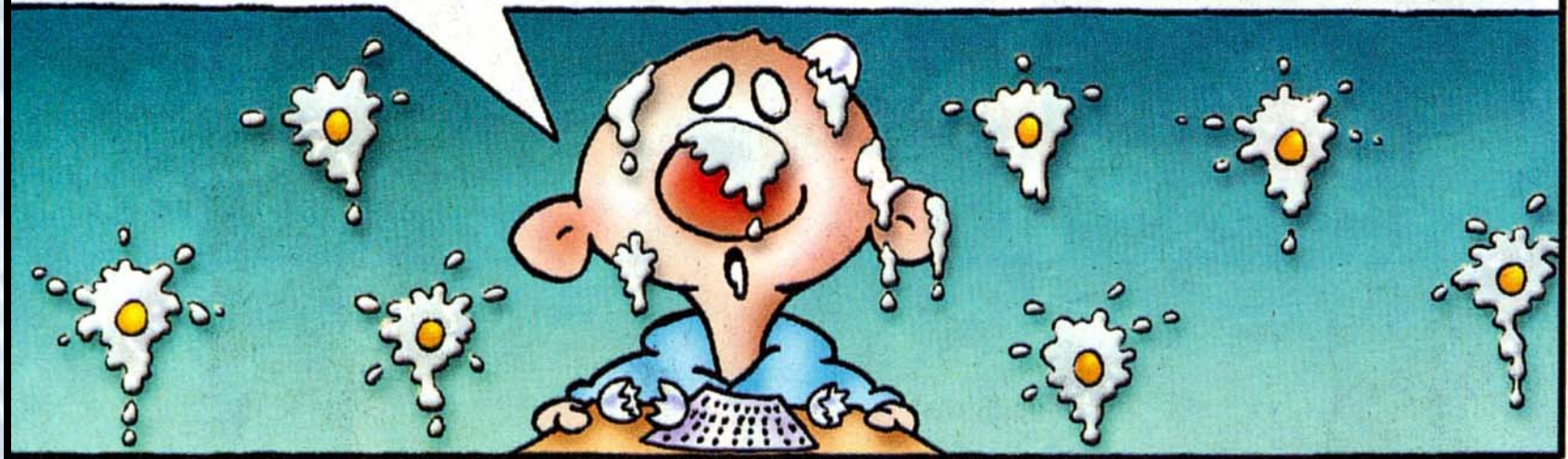
public authorities



legally controlled  
companies

carrying out first verification  
and re-verification  
(no accreditation necessary,  
no conf. assessment +  
extra surveillance)

At the end of my talk I like to thank you for your kind attention !



... and many thanks to my colleague  
Dr. Christian Mengersen for contributing to this talk

**Questions, Remarks ?**