**Annex 1**

**EFFECTS OF NON-HARMONISATION - CAPACITY SERVING MEASURES**

Before October 30, 2006 capacity serving measures (CSMs) in Slovenia were subject to the following regulations:

- national legislation in general
- OIML R29 for CSM

After October 30, 2006 new EU Directive MID was made effective bringing about a change in these regulations:

- MID (2004/22/EC; annex MI-008,chapter II)
- new OIML Recommendation as a harmonized document to be used with MID.

Maximum permissible errors given by OIML R 29 are as follows (for T = 20.0 $^{0}$ C):

| CSM | Nominal capacities ($V_n$) | MPE |
|---|---|---|
| Transfer measures | All | $\pm$3 % of $V_n$ |
| Drinking measures | $V_n$ < 100 ml<br>$V_n \geq$ 100 ml | $\pm$5 % of $V_n$<br>$\pm$3 % of $V_n$ |

An action of market surveillance was recently launched by Slovenian authorities based upon statistical sampling on batches of CSMs in accordance with ISO 2859-1: 1989. The criteria for sampling were as follows:

- Table 1 – Sampling size code letters, General inspection levels: II)
- Table III-A – Double sampling plans for normal inspection, acceptable quality levels: 2,5

*Example:*
*Batch size: 5 000*
*Sample size:*

- *first sample – 125 items $\Rightarrow$ Ac number: 5; Re number: 9*
- *cumulative sample – 250 items $\Rightarrow$ Ac number: 12; Re number: 13*

The results of this exercise can be summarized as follows:

- number of products (types of CSMs): **17**
- number of manufacturers: 8
- number of complying products: 7
- number of non-complying products: **10**

Glass – chalices extensively used in practice were identified as the most problematic capacity serving measure. A detailed technical analysis of these results showed that different criteria and approaches to read gauge marks against meniscuses were the main reason of non-compliance here as summarized below:

- OIML R-29, MID annex MI-008 – not covered

- DIN EN 76, Germany and Austrian legislation:

  "The filling volume is the volume of water that can be filled up to **lower rim** of the gauge when the items is set on a plane surface."

- practice in chemical laboratory - ISO 4787-1984 standard:

  The meniscus shall be set so that the plane of the **upper edge** of the graduation line is horizontally tangential to the lowest point of the meniscus…"

- OIML TC8/WG1: Committee draft OIML/CD2 (vote and comments by 31 October 2005):

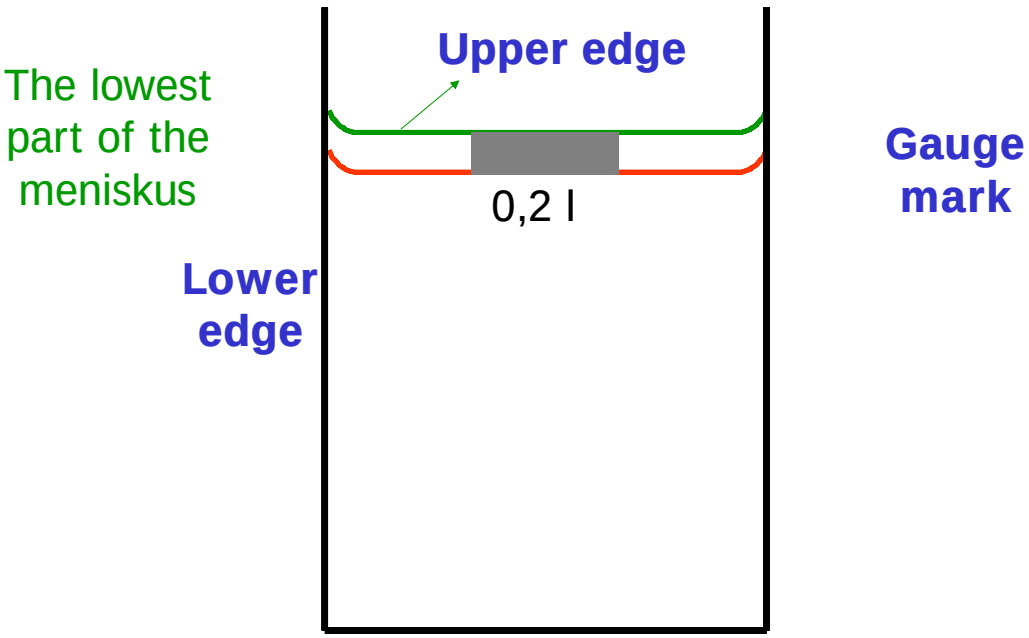
  Vessels for commercial transaction (supersedes documents: R4, R29, R45, R96)

  6. FILLING SPECIFICATIONS

  6.1 Vessels with gauge marks

  "Filled to the gauge mark" is when the lowest part of the meniscus formed by the liquid is tangential to the **upper edge of the gauge mark**.

The difference between 2 approaches used in practice are illustrated on the following figure:




The following general conclusions can be drawn form this exercise:

- regular actions of market surveillance of CSM are needed;

- bodies responsible for market surveillance in individual countries need common criteria for evaluation of tests, in this case for reading meniscuses against gauge marks.

This case can serve as an example of how legal metrological control can be negatively influenced by insufficient harmonization of technical regulations in different countries even at present when a nearly complete alignment of the underlying standards can be expected. Often it happens when standardization activities of different standardization bodies overlap as in this case (e.g. OIML versus ISO, OIML versus IEC), arguably as a result of a different representation of interest groups on the responsible technical committees. The importance of proper metrological control in this case is especially crucial as CSMs are often not subject, for practical reasons, to pattern approval and subsequent verification so that the initial verification is the **only** element of legal metrological control in place.