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Hypothesis-based acceptance sampling for modules F and F1 of the European Measuring Instruments Directive

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Millions of measuring instruments are verified each year before being placed on the markets worldwide. In the EU, such initial conformity assessments are regulated by the Measuring Instruments Directive (MID) and its modules F and F1 allow for statistical acceptance sampling.

This paper re-interprets the acceptance sampling conditions formulated by the MID in the formal framework of hypothesis testing. The new interpretation is contrasted with the one advanced in WELMEC guide 8.10 [1], and its advantages are elaborated. Besides the conceptual advantage of agreeing with a well-known, statistical framework, the new interpretation entails also economic advantages. Namely, it bounds the producers' risk from above, such that measuring instruments with sufficient quality are accepted with a guaranteed probability of no less than 95%. Furthermore, the new interpretation applies unambiguously to finite-sized lots, even very small ones. A new acceptance sampling scheme is derived, because re-interpreting the MID conditions implies that currently available sampling plans are either not admissible or not optimal.

We conclude that the new interpretation is to be preferred and suggest re-formulating the statistical sampling conditions in the MID. Exchange with WELMEC WG 8 is ongoing to revise its guide 8.10 and to recommend application of the new sampling scheme.

[1] WELMEC European Cooperation in Legal Metrology: Working Group 8 (2018), "Measuring Instruments Directive (2014/32/EU): Guide for Generating Sampling Plans for Statistical Verification According to Annex F and F1 of MID 2014/32/EU"

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Special/invited session

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