Non–Automatic Weighing Instruments (NAWI)
Technical requirements

Republic of Macedonia, Skopje, 24.08.2017

- ❑ NAWI Definition
- ❑ Legislation to be applied
- ❑ Harmonized standard for NAWI
- ❑ Technical requirements
- ❑ EU verification

NAWI Definition

- **Weighing instrument**

  measuring instrument serving to determine the mass of a body by using the action of gravity on that body.

  A weighing instrument may also serve to determine other mass-related magnitudes, quantities, parameters or characteristics…

NAWI Definition

- **Non-automatic weighing instrument**

  a weighing instrument requiring the intervention of an operator during weighing…

NAWI vs. AWI

- An instrument capable of performing consecutive weighing cycles without any intervention of an operator is always regarded to be an AWI….

…there can be some cases where it is difficult to decide whether the instrument is NAWI or AWI….

Example

- A filling instrument where the operator places the container on the weighing instrument, the fill is done automatically, and the weighing instrument then displays the filled weight allowing the operator to check the amount of the load and remove the container, may be considered as a NAWI or an AWI….

Intervention of a NAWI operator

- Mainly a determination or verifying the weighing result.
- Determining the weighing result includes any intelligent action of the operator that affects the result, such as deciding when an indication is stable or adjusting the weight of the weighed product…

Intervention of a NAWI operator

- Verifying the weighing result means making a decision regarding the acceptance of each weighing result on observing the indication.
- The weighing process allows the operator to take an action which influences the weighing result in the case where the weighing result is not acceptable…

Intervention of a NAWI operator

- the necessity to give an instruction to start the weighing process or to release a load is not relevant in deciding the category of instrument…

Intervention of a NAWI operator – a special case

- An approved NAWI to which one or more robot operators have been added so that no human operator is now involved, is an AWI.

Legislation for NAWI

- **DIRECTIVE 2014/31/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL (of 26 February 2014)**

  on the harmonisation of the laws of the Member States relating to the making available on the market of non-automatic weighing instruments

Legislation for AWI

- MID

  Measuring Instrument Directive

Includes the Annex for AWI

NAWID Contents so called:

- **Essential requirements**

  that to be proved by methods and procedures in harmonized standard for NAWI

- **EN 455501:2015**

  Contents detailed technical requirements…

Examples of essential requirements from NAWID

- Weighing results of an instrument shall be repeatable, and shall be reproducible by the other indicating devices used and in accordance with other methods of balancing used
- The weighing results shall be sufficiently insensitive to changes in the position of the load on the load receptor…

What about the Standard EN 45501:2015?

- Weighing results of an instrument shall be repeatable, and shall be reproducible by the other indicating devices used and in accordance with other methods of balancing used
- **Repeatability**

The difference between the results of several weighings of the same load shall not be greater **than the absolute value of the maximum permissible error** of the instrument for that load…

What about the Standard EN 45501:2015?

The weighing results shall be sufficiently insensitive to changes in the position of the load on the load receptor.

❑ **Eccentric loading**

The indications for different positions of a load shall **conform to the maximum permissible errors**, when the instrument is tested in accordance with 3.6.2.1 to 3.6.2.4.

NAWI Clasification

- The verification scale interval, number of verification scale intervals and the minimum capacity, in relation to the accuracy class of an instrument…

Name	Symbol marked on instrument	Denomination used in this standard
Special accuracy	Ⓘ	I
High accuracy	Ⓘⅈ	II
Medium accuracy	Ⓘⅈⅈ	III
Ordinary accuracy	Ⓘⅈⅈⅈ	IIII

Accuracy class	Verification scale interval, e	Number of verification scale intervals, n = Max/e		Minimum capacity, Min (Lower limit)
		minimum	maximum	
Special (I)	0,001 g ≤ e [a]	50 000 [b]	–	100 e
High (II)	0,001 g ≤ e ≤ 0,05 g 0,1 g ≤ e	100 5 000	100 000 100 000	20 e 50 e
Medium (III)	0,1 g ≤ e ≤ 2 g 5 g ≤ e	100 500	10 000 10 000	20 e 20 e
Ordinary (IIII)	5 g ≤ e	100	1 000	10 e

Maximum permissible errors (MPE)

Maximum permissible errors	For loads, *m*, expressed in verification scale intervals, *e*			
	Class I	**Class II**	**Class III**	**Class IIII**
± 0,5 *e*	$0 \leq m \leq 50\,000$	$0 \leq m \leq 5\,000$	$0 \leq m \leq 500$	$0 \leq m \leq 50$
± 1,0 *e*	$50\,000 < m \leq 200\,000$	$5\,000 < m \leq 20\,000$	$500 < m \leq 2\,000$	$50 < m \leq 200$
± 1,5 *e*	$200\,000 < m$	$20\,000 < m \leq 100\,000$	$2\,000 < m \leq 10\,000$	$200 < m \leq 1\,000$

EU verification (module F)

- The first verification at the time of placing the NAWI on the market

- **In most cases the module B (EU type examination) shall be executed before**

The manufacturer has the full responsibility that

- the NAWI complies with the essential requirements given in the NAWID…
- **It is proved by the EN 45501:2015**

The standard sets up the range of tests…

Verification of conformity to following requirements:

Errors of indication
Accuracy of zero and tare device
Repeatability
Exccentricity
Descrimination (for digital NAWI only at module B)
Other tests in special cases (Unusual design or strange results)

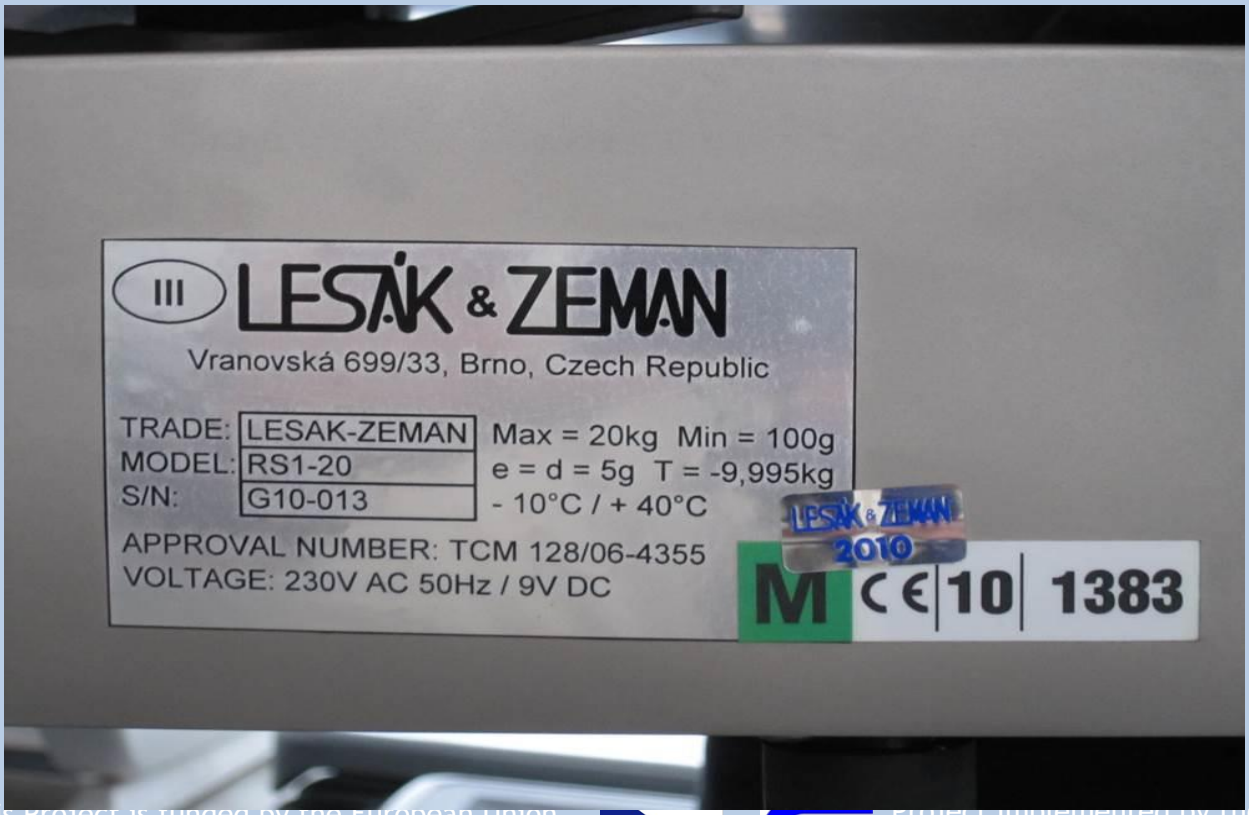
How to perform the tests it is described in EN 45501

- Annex A

It is fully harmonized within the EU member states

- There is no national regulation…

Marking of NAWI



Twinning Project "Strengthening the capacities of the Bureau of Metrology for internal market integration"

Twinning ref. MK 12 IPA EC 01 16 TWL

A Project funded by the European Union and Implemented and led by CMI

Introduction on the market concerning new approach,

MID directives, labeling of meters

Number of EU certificate - f. inst.: **TCM 142/12-4947**

Conformity labeling:

Assurance mark, f. inst. mark of ČMI:

The new NAWID set up the same marking as the MID

Thanks for your attention

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