



**SLOVENSKI STANDARD**  
**SIST EN 45501:1995**  
**01-avgust-1995**

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**Metrological aspects of non-automatic weighing instruments (OIML R76:1988)**

Metrological aspects of non-automatic weighing instruments

Metrologische Aspekte der nichtselbsttätigen Waagen

Aspects métrologiques des instruments de pesage a fonctionnement non automatique

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**Ta slovenski standard je istoveten z: EN 45501:1992**

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**ICS:**

17.060      Merjenje prostornine, mase,      Measurement of volume,  
gostote, viskoznosti      mass, density, viscosity

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English version

## Metrological aspects of non-automatic weighing instruments

Aspects métrologiques des instruments de pesage  
à fonctionnement non automatique

Metrologische Aspekte der nichtselbsttätigen  
Waagen

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English version

Amends EN 45501, October 1992

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Aspects métrologiques des  
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Metrologische Aspekte  
nichtselbsttätiger Waagen

This corrigendum becomes effective on **1993-08-31** for incorporation in the three official language versions of the EN.

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The Joint European Standards Organization

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Bibliography

## **Foreword**

This European Standard has been prepared by a Joint CEN/CENELEC Working Group on Non-automatic weighing instruments.

A Reference Document on "Metrological aspects of non-automatic weighing instruments", prepared by the Bureau International de Métrologie Légale (BIML) on basis of the Recommendation OIML R 76, edition 1988, was submitted to the common CEN/CENELEC PQ procedure from 1989-01-20 to 1989-04-20.

The above mentioned working group has prepared a draft European Standard in view of the results of the PQ procedures, which has been available to CEN/CENELEC for formal vote and has been accepted.

According to the CEN/CENELEC Rules, the following countries are bound to implement this European Standard: Belgium, Denmark, Germany, Finland, France, Greece, Ireland, Iceland, Italy, Luxembourg, the Netherlands, Norway, Austria, Portugal, Sweden, Switzerland, Spain and United Kingdom.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 1993, and conflicting national standards shall be withdrawn at the latest by April 1995.

## **INTRODUCTION**

This European Standard has been adapted from the

OIML-Recommendation R76-1, Edition 1992,  
NON-AUTOMATIC WEIGHING INSTRUMENTS  
Part 1: Metrological and technical requirements - Tests

by a Joint Working Group from CEN and CENELEC. It was elaborated following a standardization request from the Commission of the European Communities (CEC) and the Secretariat of the European Free Trade Association (EFTA) to CEN and CENELEC, to establish European Standard(s) related to Council Directive 90/384/EEC on Non-Automatic Weighing Instruments.

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## TERMINOLOGY

The vocabulary used in this European Standard conforms to the

"International Vocabulary  
of Basic and General Terms  
in Metrology"  
(1984 edition)

published in the name of

BIPM	International Bureau of Weights and Measures
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
OIML	International Organization for Legal Metrology

and to the

"Vocabulary of Legal Metrology"  
(1978 edition, as amended in 1987)

published by OIML.

Where these vocabularies do not adequately define terms specific to weighing instruments and where additional terms are required, the following definitions apply.

Wherever these terms appear in the text of this European Standard, they are identified by capital letters to draw attention to the definitions. An alphabetic list - see end of Terminology - helps to find the definitions.

### T.1 General definitions

#### T.1.1 Weighing instrument

Measuring instrument that serves to determine the mass of a body by using the action of gravity on this body.

The instrument may also be used to determine other quantities, magnitudes, parameters or characteristics related to mass.

According to its method of operation, a weighing instrument is classified as an automatic or non-automatic instrument.

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#### T.1.2 Non-automatic weighing instrument

Instrument that requires the intervention of an operator during the weighing process, for example to deposit on or remove from the receptor the load to be measured and also to obtain the result.

The instrument permits direct observation of the weighing results, either displayed or printed; both possibilities are covered by the word "indication".

Note 1: Terms such as "indicate", "indicating component" and their derivatives, do not include printing.

A non-automatic weighing instrument may be:

- graduated or non-graduated,
- self-indicating, semi-self-indicating or non-self-indicating.

Note 2: In this European Standard a non-automatic weighing instrument is called an "instrument".

#### **T.1.2.1 Graduated instrument**

Instrument allowing the direct reading of the complete or partial weighing result.

#### **T.1.2.2 Non-graduated instrument**

Instrument not fitted with a scale numbered in units of mass.

#### **T.1.2.3 Self-indicating instrument**

Instrument in which the position of equilibrium is obtained without the intervention of an operator.

#### **T.1.2.4 Semi-self-indicating instrument**

Instrument with a self-indication weighing range, in which the operator intervenes to alter the limits of this range.

#### **T.1.2.5 Non-self-indicating instrument**

Instrument in which the position of equilibrium is obtained entirely by the operator.

#### **T.1.2.6 Electronic instrument**

Instrument equipped with electronic devices.

#### **T.1.2.7 Instrument with price scales**

Instrument that indicates the price to pay by means of price charts or scales related to a range of unit prices.

#### **T.1.2.8 Price-computing instrument**

Instrument that calculates the price to pay on the basis of the indicated mass and the unit price.

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### **T.1.2.9 Price-labelling instrument**

Price-computing instrument that prints the weight value, unit price and price to pay for prepackages.

### **T.1.2.10 Self-service instrument**

Instrument that is intended to be operated by the customer

## **T.1.3 Indications provided by an instrument**

### **T.1.3.1 Primary indications**

Indications, signals and symbols that are subject to requirements of this European Standard.

### **T.1.3.2 Secondary indications**

Indications, signals and symbols that are not primary indications.

## **T.2 Construction of an instrument**

In this European Standard the term "device" is used for any means by which a specific function is performed, irrespective of the physical realization, e.g. by a mechanism or a key initiating an operation; the device may be a small part or a major portion of an instrument.

### **T.2.1 Main devices**

#### **T.2.1.1 Load receptor**

Part of the instrument intended to receive the load.

#### **T.2.1.2 Load-transmitting device**

Part of the instrument for transmitting the force produced by the load acting on the load receptor, to the load-measuring device.

#### **T.2.1.3 Load-measuring device**

Part of the instrument for measuring the mass of the load by means of an equilibrium device for balancing the force coming from the load-transmitting device, and an indicating or printing device.

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### **T.2.2 Module**

Part of an instrument which performs a specific function, can be examined separately and is subject to specified partial error limits.

## T.2.3 Electronic parts

### T.2.3.1 Electronic device

A device employing electronic sub-assemblies and performing a specific function. An electronic device is usually manufactured as a separate unit and can be independently tested.

Note: An electronic device, as defined above, may be a complete instrument (e.g., instrument for direct sales to the public) or part of an instrument (e.g., printer, indicator ...).

### T.2.3.2 Electronic sub-assembly

A part of an electronic device, employing electronic components and having a recognizable function of its own.

Examples: A/D converter, display matrix,...

### T.2.3.3 Electronic component

The smallest physical entity that uses electron or hole conduction in semi-conductors, gases or in a vacuum.

## T.2.4 Indicating device (of a weighing instrument)

Part of the load-measuring device on which the direct reading of the result is obtained.

### T.2.4.1 Indicating component

Component indicating the equilibrium and/or the result.

On an instrument with one position of equilibrium it indicates only the equilibrium (so-called zero).

On an instrument with several positions of equilibrium it indicates both the equilibrium and the result. On an electronic instrument, this is the display.

### T.2.4.2 Scale mark

A line or other mark on an indicating component corresponding to a specified value of mass.

### T.2.4.3 Scale base

An imaginary line through the centres of all the shortest scale marks.

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## T.2.5 Auxiliary indicating devices

### T.2.5.1 Rider

Detachable poise of small mass that may be placed and moved either on a graduated bar integral with the beam or on the beam itself.

### T.2.5.2 Device for interpolation of reading (vernier or nonius)

Device connected to the indicating element and sub-dividing the scale of an instrument, without special adjustment.

### T.2.5.3 Complementary indicating device

Adjustable device by means of which it is possible to estimate, in units of mass, the value corresponding to the distance between a scale mark and the indicating component.

### T.2.5.4 Indicating device with a differentiated scale division

Digital indicating device of which the last figure after the decimal marker is clearly differentiated from other figures.

## T.2.6 Extended indicating device

A device temporarily changing the actual scale interval (d) to a value less than the verification scale interval (e) following a manual command.

## T.2.7 Supplementary devices

### T.2.7.1 Levelling device

Device for setting an instrument to its reference position.

### T.2.7.2 Zero-setting device

Device for setting the indication to zero when there is no load on the load receptor.

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#### T.2.7.2.1 Non-automatic zero-setting device

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Device for setting the indication to zero by an operator.

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#### T.2.7.2.2 Semi-automatic zero-setting device

Device for setting the indication to zero automatically following a manual command.

### **T.2.7.2.3 Automatic zero-setting device**

Device for setting the indication to zero automatically without the intervention of an operator.

### **T.2.7.2.4 Initial zero-setting device**

Device for setting the indication to zero automatically at the time the instrument is switched on and before it is ready for use.

### **T.2.7.3 Zero-tracking device**

Device for maintaining the zero indication within certain limits automatically.

### **T.2.7.4 Tare device**

Device for setting the indication to zero when a load is on the load receptor:

- without altering the weighing range for net loads (additive tare device) or
- reducing the weighing range for net loads (subtractive tare device).

It may function as:

- a non-automatic device (load balanced by an operator),
- a semi-automatic device (load balanced automatically following a single manual command),
- an automatic device (load balanced automatically without the intervention of an operator).

#### **T.2.7.4.1 Tare-balancing device**

Tare device without indication of the tare value when the instrument is loaded.

#### **T.2.7.4.2 Tare-weighing device**

Tare device that stores the tare value and is capable of indicating or printing it whether or not the instrument is loaded.

#### **T.2.7.5 Preset tare device**

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Device for subtracting a preset tare value from a gross or net weight value and indicating the result of the calculation. The weighing range for net loads is reduced accordingly.

#### **T.2.7.6 Locking device**

Device for immobilizing all or part of the mechanism of an instrument.

### **T.2.7.7 Auxiliary verification device**

Device permitting separate verification of one or more main devices of an instrument.

### **T.2.7.8 Selection device for load receptors and load-measuring devices**

Device for attaching one or more load receptors to one or more load-measuring devices, whatever intermediate load-transmitting devices are used.

### **T.2.7.9 Indication stabilizing device**

Device for maintaining a stable indication under given conditions.

## **T.3 Metrological characteristics of an instrument**

### **T.3.1 Weighing capacity**

#### **T.3.1.1 Maximum capacity (Max)**

Maximum weighing capacity, not taking into account the additive tare capacity.

#### **T.3.1.2 Minimum capacity (Min)**

Value of the load below which the weighing results may be subject to an excessive relative error.

#### **T.3.1.3 Self-indication capacity**

Weighing capacity within which equilibrium is obtained without the intervention of an operator.

#### **T.3.1.4 Weighing range**

Range between the minimum and maximum capacities.

#### **T.3.1.5 Extension interval of self-indication**

Value by which it is possible to extend the range of self-indication within the weighing range.

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#### **T.3.1.6 Maximum tare effect (T +, T-)**

Maximum capacity of the additive tare device or the subtractive tare device.

#### **T.3.1.7 Maximum safe load (Lim)**

Maximum static load that can be carried by the instrument without permanently altering its metrological qualities.

### **T.3.2 Scale divisions**