SLOVENSKI STANDARD
oSIST prEN 50730:2024

01-januar-2024

Profesionalni in komercialni kavni aparati - Metode za merjenje porabe energije in produktivnosti

Professional and commercial coffee machines - Methods for measuring energy consumption and productivity

Professionelle und gewerbliche Kaffeemaschinen - Messmethoden für Energieverbrauch und Produktivität

Machines à café professionnelles et commerciales - Méthodes pour mesurer la consommation énergétique et la productivité

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97.040.50 Majhni gospodinjski aparati Small kitchen appliances

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Professional and commercial coffee machines - Methods for measuring energy consumption and productivity

Machines à café professionnelles et commerciales - Méthodes pour mesurer la consommation énergétique et la productivité

Professionelle und gewerbliche Kaffeemaschinen - Messmethoden für Energieverbrauch und Produktivität

This draft European Standard is submitted to CENELEC members for enquiry.
Deadline for CENELEC: 2024-01-26.

It has been drawn up by CLC/TC 59X.

If this draft becomes a European Standard, CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CENELEC in three official versions (English, French, German).
A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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European foreword

This document prEN 50730 has been prepared by CLC/TC 59X “Performance of household and similar electrical appliances”.

This document is currently submitted to the Enquiry.

The following dates are proposed:

• latest date by which the existence of this document has to be announced at national level	(doa)	dor + 6 months
• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	dor + 12 months
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	dor + 36 months (to be confirmed or modified when voting)

1 Scope

This document applies to professional and commercial coffee machines used for example in kitchens and food preparation areas in restaurants, canteens, hotels, coffee shops, breakfast rooms.

This document does not apply to:

— household appliances;

— machines that use only coffee pods or coffee capsules;

— machines powered by non-electrical energy (i.e. gas);

— milk refrigerators integrated or not into **traditional machines**. Accessory equipment provided together with the machine (e.g. cup warmer, milk refrigerator) is physically separated from the machine.

This document defines methodologies to measure the energy consumption and productivity of coffee machines based on their characteristics.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 7056:1981, *Plastics laboratory ware — Beakers*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at https://www.iso.org/obp
- IEC Electropedia: available at https://www.electropedia.org/

3.1 Coffee machine types

3.1.1
fully automatic machines
coffee machines in which the preparation of the coffee starting from the ingredients up to the delivered beverage is fully controlled by the machine based on the input of the user

Note 1 to entry: The user typically places a cup underneath and presses a button, the machine does the rest.

3.1.2
traditional machines
coffee machines in which the preparation of coffee requires pressurized hot water to pass through grinded coffee by one or more interventions of the user in process of preparation and delivery of coffee

EXAMPLES For intervention of the user the examples are manually filling of grinded coffee in the portafilter and manually emptying after the dispensing of the coffee,

Note 1 to entry: The user prepares coffee (properly grounded), put it into portafilter and mounts the portafilter on the coffee machine, then presses the button.

3.1.3
cold machine
switched off machine, mounted inside the testing chamber, left at testing conditions for a time of 16h 00’ ± 10 min from the end of a heating phase of the machine, all groups on, that lasted at least 1h

3.2
end of beverage delivery
time when the continuous flow of the delivery of the liquid beverage stops

Note 1 to entry: This is not the last drop of beverage delivered.

Note 2 to entry: This is not applicable in case of **steam wand hot milk.**

3.3
delivery time
time from when the command to deliver a beverage is given to the machine to the **end of beverage delivery**

EXAMPLE For command to deliver a beverage: press a button, activate of a lever.

Note 1 to entry: The delivery time ends when the continuous flow stops, not the last drop, see definition 3.2.

3.5 Milk

3.5.1
cold milk
UHT cow liquid milk with a level of fat of 2,5 % to 4 %, a temperature of 5 °C ± 2 °C

Note 1 to entry: UHT means Ultra High Temperature.

3.5.2
direct hot milk
milk delivered by coffee machine by heating up **cold milk**

Note1 to entry: Milk is heated up by steam or by heat exchanger inside the machine.

3.5.3
steam wand hot milk
milk heated up by steam from steam wand inserted into a beaker of **cold milk**

Note1 to entry: In some machines the control of steam from steam wand is automatic, in other machines it is a manual one.

3.6 Buffer times and delivery cycles

3.6.1
short buffer time
SBT
2 min between the starting of one delivery and the starting of the next one within the same cycle

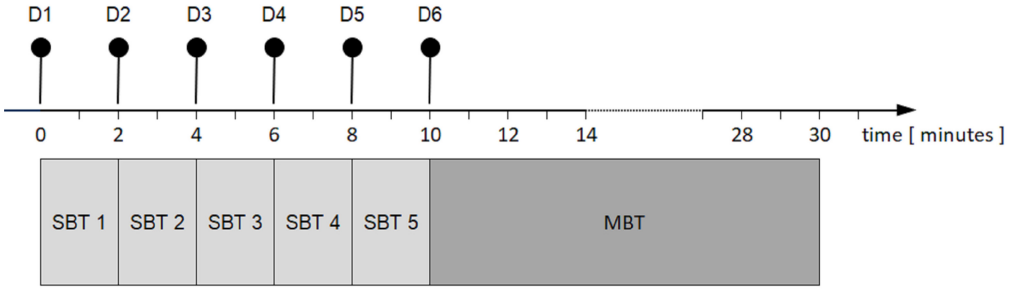
3.6.2
medium buffer time
MBT
20 min between the starting of the last delivery of one cycle and the starting of the first delivery of the next cycle

3.6.3
long buffer time
LBT
60 min between the starting of the last delivery of one activity and the starting of the first delivery of the next activity

3.6.4
delivery cycle 6-2-20
cycle of 6 deliveries of a beverage, the next delivery starting after 2 min from the start of the previous one, where the cycle ends 20 min after the start of the last delivery

Note 1 to entry: See Figure 1 where each dot identifies the start of each delivery.

Note 2 to entry: Only one type of beverage is delivered within the same cycle.



Key

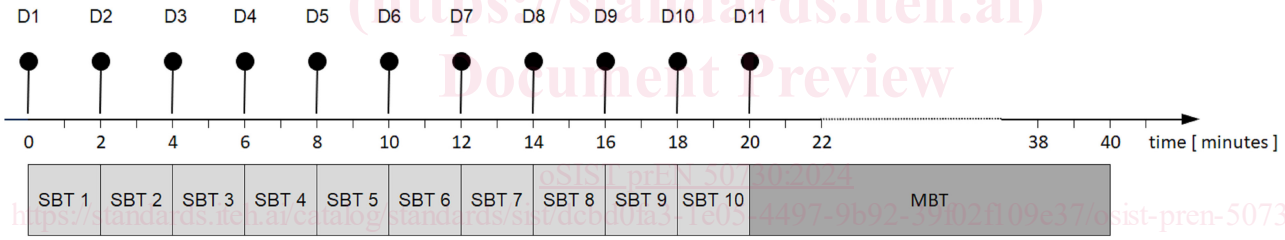
D1, D2, D3, D4, D5, D6	first delivery, second delivery, third delivery, fourth delivery, fifth delivery, sixth delivery
SBT 1, SBT 2, SBT 3, SBT 4, SBT 5	**short buffer time** 1, **short buffer time** 2, **short buffer time** 3,**short buffer time** 4, **short buffer time** 5
MBT	**medium buffer time**

Figure 1 — Delivery cycle 6-2-20

3.6.5
delivery cycle 11-2-20
cycle of 11 deliveries of a beverage, the next delivery starting after 2 min from the start of the previous one, where the cycle ends 20 min after the start of the last delivery

Note 1 to entry: See Figure 2 where each dot identifies the start of each delivery.

Note 2 to entry: Only one type of beverage is delivered within the same cycle.



Key

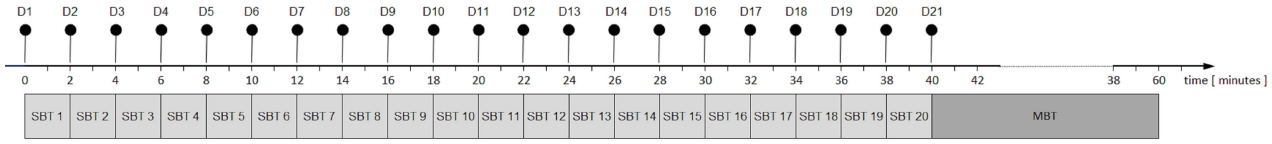
D1, … D11	first delivery, …., eleventh delivery
SBT 1, …. SBT 10	**short buffer time** 1, … **short buffer time** 10
MBT	**medium buffer time**

Figure 2 — delivery cycle 11-2-20

3.6.6
delivery cycle 21-2-20
cycle of 21 deliveries of a beverage, the next delivery starting after 2 min from the start of the previous one, where the cycle ends 20 min after the start of the last delivery

Note 1 to entry: See Figure 3, where each dot identifies the start of each delivery.

Note 2 to entry: Only one type of beverage is delivered within the same cycle.



Key

D1, … D21	first delivery, …., twenty-first delivery
SBT 1, …. SBT 20	**short buffer time** 1, … **short buffer time** 20
MBT	**medium buffer time**

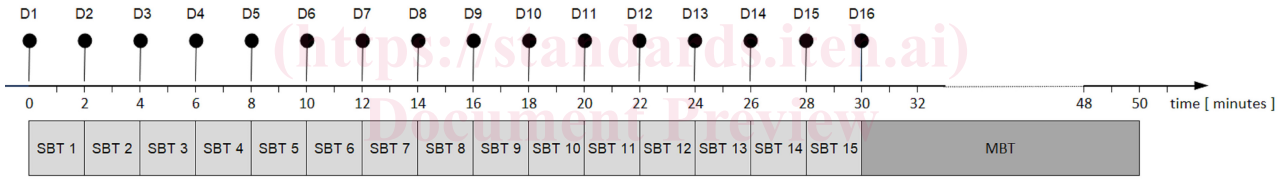
Figure 3 — delivery cycle 21-2-20

3.6.7
delivery control cycle 16-2-20
cycle of 16 deliveries of beverages, the next delivery starting after 2 min from the start of the previous one, where the cycle ends 20 min after the start of the last delivery

Note 1 to entry: See Figure 4, where each dot identifies the start of each delivery.

Note 2 to entry: Depending only one type of beverage is delivered within the same cycle.

Note 3 to entry: This is the cycle used to control the machine delivers any beverage, sequence and mix depending on the machine, within their ranges in order to consider the machine in ready machine mode. This cycle is used for example on the energy saving test, see 5.3.5.



Key

D1, … D16	first delivery, …., sixteenth delivery
SBT 1, …. SBT 15	**short buffer time** 1, … **short buffer time** 15
MBT	**medium buffer time**

Figure 4 — delivery control cycle 16-2-20

3.7 Coffee machine modes

3.7.1
ready machine mode
mode, where each outlet of the coffee machine can deliver each of its deliverable beverages within the ranges at any delivery for **delivery time**, temperature and quantity as specified in 4.2

Note 1 to entry: Applicable ranges according to 4.2: beverage temperature, quantity and **delivery time.**

3.7.2
energy saving mode
mode displayed by the machine where at least one outlet cannot deliver at least one of its deliverable beverages, within the ranges at any delivery for **delivery time**, temperature and quantity as specified in 4.2

Note 1 to entry: In other words, it is the opposite of the **ready machine mode**.

Note 2 to entry: Applicable ranges according to Clause 4.2: beverage temperature, quantity and **delivery time**.

Note 3 to entry: The **energy saving mode** is a state of the machine where usually heating elements or other active elements are energized with lower energy in order to save energy. The normal functioning of the machine is not available. Not all coffee machines are provided with an **energy saving mode**.

Note 4 to entry: The machine can display something by a light (by colour, on, off, flashing), a message on a display as described on the user manual.

Note 5 to entry: How the **energy saving mode** is displayed by the machine, is described in the operating instructions.

3.7.3
soft off mode
mode where the machine is electrically energized but not designed to delivery any beverage

EXAMPLES Network connection, frost protection, timer function, connection of payment systems, lighting, advertising.

Note 1 to entry: The machine is not able to deliver any beverage or not able to perform the intended functions of a coffee machine.

Note 2 to entry: Internal, external, automatic or manual reactivation is required to bring the machine into a **ready machine mode.**

Note 3 to entry: heating elements are off.

Note 4 to entry: pumps are off.

Note 5 to entry: The manufacturer shall specify to the laboratory how to identify the **soft off mode** (according to user manual) using the table in Annex C.

3.8 Ready machine energy at heating, ready test, delivery of café crème and delivery of 2 × espresso

3.8.1
$E_{Ready,Heating}$
energy used by the coffee machine as measured in the last 30 min of the heating test

3.8.2
$E_{Ready,Crème}$
energy used by the coffee machine as measured in the last 10 min of the **medium buffer time** of each of the three **delivery cycle 6-2-20** for the delivery of cafè crème

Note 1 to entry: There are three delivery cycles for café crème.

3.8.3
$E_{Ready,2 \times espresso}$
energy used by the coffee machine as measured in the last 10 min of the **medium buffer time** of each of the three **delivery cycle 21-2-20** for the delivery of 2 × espresso

Note 1 to entry: There are three delivery cycles for 2 × espresso.

3.8.4
$E_{Ready,Ready\ Condition}$
energy used by the coffee machine as measured during the ready test

3.9
waking up time
elapsed (interval) time from when the command to exit from **energy saving mode** is given to the machine, to the time when the machine is back into **ready machine mode**

EXAMPLES for command to deliver a beverage are: press a button, activate of a lever.

Note 1 to entry: Usually, the waking up time is indicated by the manufacturer, at least to the laboratory for testing. If not indicated it is assumed to be 30 min.

4 Requirements

4.1 General

Nominal values of mass of ground coffee as an ingredient of café crème and 2 × espresso are according to Table 1.

Table 1 — Nominal values for ground coffee as an ingredient

Product type	Quantity (mass) [g]
café crème	8
2 × espresso	12

The quantity of ground coffee as an ingredient is verified only during set up (on day 0) of a machine, both for **fully automatic machines** and for stand-alone coffee grinders used for **traditional machines** according to Table 2.

Table 2 — Verification of quantity of ground coffee

Product type	Number of shots of ground coffee	Total Quantity (mass) [g]
café crème	10	80 ± 5
2 × espresso	10	120 ± 5

For **fully automatic machines**, the calibration procedure for café crème and 2 × espresso is specified in the service manual and this information shall be given to the laboratory by Annex C “Information to be provided by the manufacturer to the laboratory” and stated in the test report.

4.2 Beverage temperature, quantity and delivery time

4.2.1 General

The three parameters to evaluate the delivery of any beverage are:

— temperature;

— quantity;

— delivery time.

4.2.2 Quantity of beverage (weight)

4.2.2.1 General

At any delivery, the quantity m_i, measured in g, of the delivered beverage, shall be according to 4.2.2.2.

4.2.2.2 Ranges of values for quantity

Table 3 — Quantity ranges

Beverage type	Reference value [g]	Average Quantity per Delivery Cycle minimum value [g]	Quantity at any Delivery minimum value [g]	Quantity at any Delivery MAXIMUM value [g]	Notes
café crème	130	125	100	150	
2 × espresso	60	50	40	90	
hot water	200	190	180	220	
powdered	200	190	180	220	
direct hot milk	200	NA	192	NA	No upper limit due to different ways of adding steam available.
steam wand hot milk	200	NA	192	NA	Starting from 180 g ± 5 g. If it does not deliver at least 192 g, start from 192 g to 195 g
2 × direct hot milk	400	NA	384	NA	No upper limit due to different ways of adding steam available.
2 × steam wand hot milk	400	NA	384	NA	Starting from 360 g ± 10 g. If it does not deliver at least 384 g, start from 384 g to 390 g
NOTE “2 x **direct hot milk**” and “2 x **steam wand hot milk**” are only for productivity testing.					

4.2.2.3 Average quantity per delivery cycle

The average quantity per delivery cycle is calculated as

$$m_{av} = \frac{1}{n}\sum_{i=1} m_i \qquad (1)$$

where

m_i is the quantity at the delivery “i”;

n is the total number of deliveries in a cycle;

m_{av} is the average quantity.

4.2.3 Temperature of beverage

4.2.3.1 General

At any delivery, the temperature of the delivered beverage, shall be according to 4.2.3.2.