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Electric dishwashers for commercial use — Test methods for measuring the performance

National foreword

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**Electric dishwashers for commercial use - Test methods for
measuring the performance**

Lave-vaisselle électriques pour usage collectif - Méthodes
d'essai pour la mesure de l'aptitude à la fonction

Elektrische Geschirrspüler für den gewerblichen Gebrauch -
Messverfahren für Gebrauchseigenschaften

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European foreword

This document (EN 50593:2017) has been prepared by CLC/TC 59X "Performance of household and similar electrical appliances".

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2018-01-16
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2020-01-16

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This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association.

1 Scope

This European Standard applies for manually loaded undercounter one-tank and one-tank hood type electrically heated dishwashing machines for washing plates, dishes, glassware, cutlery and similar articles.

These machines are used in commercial kitchens, such as restaurants, canteens, hospitals and in businesses such as bakeries, butcher shops, etc.

This European Standard does not apply to commercial dishwashers with transport systems (flight-type and rack conveyor dishwashers) and utensil washers.

This European Standard does not apply to undercounter water-change dishwashers.

This European Standard does not apply to appliances designed exclusively for industrial purposes.

The object is to state and define the principal performance characteristics of electric dishwashers for commercial use and to describe the standard methods of measuring these characteristics.

The characteristics are measured by washing plates.

This European Standard does not address safety requirements.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for the application 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.

EN 10088 (all parts), *Stainless steels*

3 Terms and definitions

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

NOTE The following definitions are related to the appliance.

3.1

commercial dishwasher

electric dishwasher which is specially designed for use in commercial environment and which cleans and rinses dishes, glasses, cutlery, and, in some cases, cooking utensils by chemical, mechanical, thermal and electrical treatment

Note 1 to entry: Commercial dishwashers evaluated with a specific drying operation at the end of the programme should be declared as such in the test report.

3.1.1

under counter one tank dishwasher

manually loaded, programmable, undercounter front loader with one detergent-circulating zone and a fresh water rinse

Note 1 to entry: The washware is cleaned using a detergent solution that is regenerated. The technical equipment is geared to the performance that is required in the specific application.

3.1.2

hood-type dishwasher

manually loaded, programmable, hood-type, pass-through machine with typically one detergent-circulating zone and a fresh water rinse

3.2

operation

event that occurs during the dishwasher programme such as cleaning and rinsing

3.3

programme

series of operations which are pre-defined within the dishwasher and which are declared by the manufacturer as suitable for cleaning certain washware

3.4

cycle

complete cleaning process, as defined by the programme selected, consisting of a series of operations (washing, rinsing, drying etc.) and including any operations that occur after the completion of the programme

Note 1 to entry: Examples of **operations** that may occur after the completion of the **programme** are refilling of the boiler, heating, pumps, fans, etc.

3.5

programme time

time which is measured from the initiation of the programme (excluding any user programmed delay) until an end of programme indicator is showing the end of the programme

Note 1 to entry: If there is no end of programme indicator, the programme time is equal to the cycle time.

3.6

cycle time

time which is measured from the initiation of the programme (excluding any user programmed delay) until all activity ceases (i.e. the end of the cycle)

3.7

automatic dispenser

device activated automatically which injects or dispenses detergent or rinse agent one or more times into the dishwasher at predetermined points in the dishwasher cycle

3.8

ready-to-use mode

mode after which the dishwasher has been filled with water, the water has been heated (ready for operation) and the machine is ready to start the cycle as indicated in the instructions for use

3.9

rack

removable support for holding washware in the dishwasher

3.10

energy consuming element

electrical consumer (e.g. heaters, fans, pumps, etc.) in the dishwasher

Note 1 to entry: The control system is not considered as an energy consuming element.

3.11

washware

materials and utensils that come into contact with foodstuffs and re-usable crates/containers which are cleaned in a commercial dishwasher

Note 1 to entry: Examples of washware are plates, crockery, cutlery, kitchen equipment, glasses, pots, containers, crates and trays made of materials such as porcelain, plastic, glass, stainless steel and silver as well as coated materials.

3.12

treating agents

chemical products used to clean or rinse, as rinse aids or descalers, when treating washware in dishwashers

3.12.1

detergent

chemical product used to remove soiling from washware and which counteracts resoiling from the detergent solution

3.12.2

detergent solution

water mixed with detergent in the detergent circulation tank

3.12.3

rinse aid

chemical agent added to the water in the final rinsing operation which decreases the interfacial tension of the rinse aid solution

Note 1 to entry: It improves the drying effect and the reduction of water marks.

3.12.4

rinse aid solution

fresh water mixed with rinse aid used for fresh water rinsing

3.13

pre-cleaning

removal of loose waste and leftover food on the washware and emptying of hollow vessels

Note 1 to entry: Pre-cleaning is generally implemented by pushing the residue into waste containers and – if possible – by rinsing the washware with water. Pre-cleaning reduces the soiling of the dishwasher and improves the cleaning result.

3.14

ballast soil

artificial soil for testing certain machine characteristics

3.15

fresh water rinsing

washing process after cleaning during which the washware is sprayed with a rinse aid solution to remove residues of detergent solution, dissolved and undissolved dirt particles

3.16

drying

process in which the moisture drips, vaporises or evaporates from the surface of the washware

3.17

cleaning

removal of soiling

3.18

re-soiling

soiling of the washware e.g. on the rear side of the washware by the cleaning process which causes a deterioration of the cleaning result

3.19

contact time

time during which the detergent solution is in contact with the washware

3.20

cleaning process

process including at least one washing process and one fresh water rinsing process

3.21

operating time

period during which the dishwasher is operational

3.22

spray system

sum of all pipelines, jets and spray pipes required to circulate and spray detergent and rinse aid solutions

3.23

water softener

device which reduces the hardness of water

3.24

start-up time

time needed for the initial fill

3.25

initial fill

first water filling process between activation of the machine and reaching the ready-to-use mode

4 List of measurements

The performance and consumption characteristics are determined as follows:

- cleaning and resoiling performance test according to Clause 6;
- energy, water consumption and time measurement according to Clause 7.

Rinsing performance measurement is under consideration.

5 General conditions for measurements

5.1 General

The dishwasher manufacturer's instructions regarding installation and use of the commercial dishwasher shall be followed, except if they stand in conflict. In this case this standard shall prevail.

The cleaning and resoiling performance test according to Clause 6 and the energy and water consumption and time measurement according to Clause 7 are done together.

Note: deactivate the automatic start for appliances with automatic start cycle when the door/hood is closed.

All testing shall be performed on the same machine.

Before commencing measurements, the commercial dishwasher shall be checked to ensure that it is operating properly.

All tests shall be started with the appliances at the ambient conditions according to 5.5 .

For all tests, the appliance shall be free-standing in the room without any excess coverage other than originally equipped. All protective surface cover foils shall be removed.

5.2 Conditioning of the machine under test and sequence of test procedures

Before conducting the performance tests, the dishwasher shall be initially filled and dosed with reference detergent (specified in 5.7) and reference rinse aid (specified in 5.8). No additional cycles shall be carried out on the machine under test between the consecutive steps of the following procedures. All parts of the machine shall be inspected and any residues shall be removed.