SLOVENSKI STANDARD
SIST ENV 12875-1:2000

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Odpornost posode in pribora za domačo uporabo proti mehanskemu pranju - 1. del: Referenčna preskusna metoda

Mechanical dishwashing resistance of domestic utensils - Part 1: Reference test method

Mechanische Geschirrspülmaschinenbeständigkeit von Haushaltwaren - Teil 1: Referenz -Prüfvefahren

Résistance mécanique au lave-vaisselle des ustensiles a usage domestique - Partie 1: Méthode d'essai de référence

Ta slovenski standard je istoveten z: **ENV 12875-1:1998**

ICS:

97.040.40	Pomivalni stroji	Dishwashers
97.040.60	Kuhinjska posoda, jedilni servisi in jedilni pribor	Cookware, cutlery and flatware

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Descriptors: household appliances, kitchen utensils, food-container contact, materials, washing tests, dishwashing tests

English version

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This European Prestandard (ENV) was approved by CEN on 14 December 1997 as a prospective standard for provisional application.

The period of validity of this ENV is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the ENV can be converted into a European Standard.

CEN members are required to announce the existence of this ENV in the same way as for an EN and to make the ENV available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the ENV) until the final decision about the possible conversion of the ENV into an EN is reached.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This European Prestandard has been prepared by Technical Committee CEN/TC 194 "Utensils in contact with food", the secretariat of which is held by BSI.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this European Prestandard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

This Part of this European Standard specifies a test method for the determination of the mechanical dishwashing resistance of domestic articles. The results obtained according to this European Standard are intended to serve for comparison purposes for the dishwashing resistance of the different domestic articles and give an indication of resistance only under the standard conditions of this test.

The dishwasher test method described in this part of this European Standard is both time consuming and expensive. However, no single accelerated and inexpensive test is available which gives comparable results to the dishwasher test for the whole variety of utensils made of various materials which are cleaned in dishwashers. The test method described here is to be used as a reference method for dishwashing resistance.

Accelerated test methods may be used instead of the reference test method provided that valid comparison to the dishwasher test is shown.

An accelerated test for ceramic tableware is being developed and will become Part 2 of this standard when comparability to the reference test method has been proven. Accelerated tests for further products are under consideration.

NOTE: Consideration should be given to the normal use of each type of domestic article and its normal frequency of mechanical dishwashing.

1 Scope

This European Prestandard specifies a method for testing the resistance of domestic articles made from ceramic, glass, glass ceramic, vitreous enamel, metal and plastics under the combined chemical, thermal and mechanical stresses of mechanical dishwashing in domestic dishwashers.

It specifies a reference test method for domestic dishwashing only. It does not define the number of dishwashing cycles which any given product shall withstand.

2 Normative references

This European Prestandard incorporates by dated or undated reference provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

EN 60335-1	Safety of household and similar electrical appliances - Part 1: General requirements (IEC 335-1 : 1991 Modified)
EN 60335-2-5	Safety of household and similar electrical appliances - Part 2: Particular requirements for dishwashers (IEC 335-2 : 1992,

	modified)
IEC 436/A3 : 1994	Methods for measuring the performance of electric dishwashers : Incorporating Amendment 3.
ISO 6059 : 1984	Water quality - Determination of the sum of calcium and magnesium - EDTA titrimetric method
ISO 8288 : 1986	Water quality - Determination of cobalt, nickel, copper, zinc, cadmium and lead - Flame atomic absorption spectrometric methods
ISO 9297 : 1989	Water quality - Determination of chloride - Silver nitrate titration with chromate indicator (Mohr's method)

3 Definitions

For the purposes of this standard, the following definitions apply.

3.1 dishwashing resistance: Ability of the article to withstand a number of test cycles without significant changes.

3.2 test dishwasher: A special domestic dishwashing machine, which washes, rinses and dries articles, and which simulates the mean stresses of a domestic dishwashing machine.

3.3 test cycle: Series of operations for the washing, rinsing and drying of the articles.

3.4 basket: Rack or partitioned container for placing articles in a test dishwasher.

3.5 cleaning agent: Mixture of chemicals for use in a dishwasher for improvement of its soil removal capability.

3.6 cleaning agent dispenser, automatic: Device which dispenses a defined portion of cleaning agent at the appropriate time during the test cycle.

3.7 rinse agent: Mixture containing reagents which lower the surface tension, normally added to improve the drying effect and reduce the precipitation of salts .

3.8 rinse agent dispenser: Device from which a defined volume of rinse agent is automatically dispensed at the appropriate time during the test cycle.

3.9 water softener: Device which reduces the hardness of water by a cation exchange system.

3.10 normal corrected vision: The naked eye corrected to normal vision if necessary.

NOTE: This is usually by the wearing of spectacles.

4 Principle

Unused articles are repeatedly exposed to a standardized test cycle in a test dishwasher which simulates usual household dishwashing machines. The test dishwasher is a machine in which a washing cycle consists of several partial steps: prewash, a cleaning step using alkaline cleaner, an intermediate rinse step, and the final rinse during which a rinse aid is added. The washing cycle is followed by a drying step.

The test dishwasher is fully loaded.

After testing the articles are inspected for deviations from the original according to the conditions specified in the relevant standards for various groups of products.

5 Reagents

5.1 Feedwater

The feedwater used shall be drinking water and shall have a temperature of (15 ± 5) °C. It shall be softened by the cation exchanger as specified in **6.1**.

NOTE 1: Attention is drawn to EU directive 80/778/EEC and any national legislation relating to drinking water.

For testing metal articles, the chloride ion content shall not exceed 150 mg l^{-1} when determined in accordance with ISO 9297 : 1989.

For testing plastics articles, the copper content shall not exceed 0,03 mg l^{-1} when determined in accordance with ISO 8288 : 1986.

NOTE 2: A higher copper content results in a noticeable yellowing of plastics.

5.2 Cleaning and rinse agents

For the purpose of this test, cleaning detergent A containing phosphate, and the acidic rinse agent formula II, as given in IEC 436, Amendment 3 shall be used.

6 Features of the test dishwasher

6.1 Water softener (cation exchanger), which shall be controlled to give a water hardness $c(Ca^{2+} + Mg^{2+})$ of between 0 and 0,2 mmol/litre [1]), when tested in accordance with ISO 6059 : 1984.

6.2 Heat supply sufficient to provide the heating rate specified in **8.3.c).**

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[1]) 1 mmol/litre = 5,6 °DH or 1 °DH = 0,1786 mmol/litre

6.3 Constant water quantity for each washing cycle of (6,0 ± 0,5) l, with a water pressure of between 5 N/cm^2 and 100 N/cm^2.

6.4 Automatic proportioning devices to deliver the required amount of cleaning and rinse agents in each test cycle.

6.5 Automatic fully opening door or means of reducing temperature and humidity at an equivalent rate following completion of the washing cycle.

6.6 Thermostat with an accuracy of ± 1 °C.

6.7 Automation to the effect that the complete washing cycle specified in **8.3** is performed and repeated automatically.

6.8 Counter which records the number of washing cycles.

6.9 For safety requirements the dishwasher shall comply with EN 60335-1 and EN 60335-2-5.

7 Test specimens

For each article a sufficient number of unused specimens of identical shape, size and surface finish shall be tested and further specimens shall be retained for reference.

NOTE: It is recommended that at least three test specimens are tested in order to obtain representative results.

The specimens shall be free of surface contamination, e.g. by washing by hand in a mild liquid detergent at about 45 °C. The specimens shall be examined for any quality defects, and these shall be noted.

8 Procedure

8.1 Preparation of test dishwasher

When testing metal articles, after each regeneration of the ion exchanger with sodium chloride, run one test cycle (see **8.3**) with no test specimens.

8.2 Loading the test dishwasher

The test dishwasher shall be fully loaded, using dummy articles to fill excess capacity if necessary. Each specimen shall be placed in the appropriate basket making sure that the specimens will not come into contact with each other during testing. All surfaces shall be equally exposed to the water spray, and the specimens shall be positioned in a way that avoids the formation of water pools. It is permissible to simultaneously wash several different types of domestic articles of ceramic, glass, metal or plastic

NOTE:. The risk of interaction between different materials should be considered. Where there is such a risk, such specimens should not be tested together.

If it is necessary to withdraw a test specimen during the test, it shall be replaced by a similar article.

8.3 Test cycle

The test cycle shall comprise the following stages.

a) Draining the dishwasher by pump.

b) Prewashing the test specimens in the dishwasher by:
   i) filling the dishwasher with feedwater (see **5.1**);
   ii) circulating the feedwater for (5 ± 0,5) min;
   iii) draining the dishwasher by pump.

c) Washing the test specimens in the dishwasher by:
   i) filling the dishwasher with feedwater and (24 ± 3) g cleaning agent (see **5.2**) per (6,0 ± 0,5) litre of feedwater;
   ii) heating to (60 ± 2) °C while circulating the feedwater and cleaning agent for (20 ± 1) min;
   iii) circulating the feedwater and cleaning agent for a further (10 ± 1) min without heating;
   iv) draining the dishwasher by pump.

d) Intermediate rinsing the test specimens in the dishwasher by:
   i) filling the dishwasher with feedwater;
   ii) circulating the feedwater for (3 ± 0,5) min;
   iii) draining the dishwasher by pump.

e) Final rinsing the test specimens in the dishwasher by:
   i) filling the dishwasher with feedwater;
   ii) heating to (65 ± 2) °C while circulating the feedwater;
   iii) measuring when a temperature of between 40 °C and 45 °C has been reached, and adding between 2,5 g and 3,0 g of rinse agent (see **5.3**) per (6,0 ± 0,5) litre of feedwater.
   iv) measuring when a temperature of (65 ± 2) °C has been reached and draining the dishwasher by pump.

f) Drying the test specimens in the dishwasher by retaining them in the dishwasher for:
   i) (10 ± 1) min with the door closed;
   ii) (30 ± 1) min with the door open.