

Mechanical dishwashing resistance of utensils —

Part 4: Rapid test for domestic ceramic articles

The European Standard EN 12875-4:2006 has the status of a
British Standard

ICS 67.250; 97.040.40; 97.040.60

National foreword

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The UK participation in its preparation was entrusted to Technical Committee CW/29, Tableware, which has the responsibility to:

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Summary of pages

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March 2006

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English Version

Mechanical dishwashing resistance of utensils - Part 4: Rapid test for domestic ceramic articles

Résistance mécanique au lave-vaisselle des ustensiles -
Partie 4: Essai accéléré pour les articles en céramique à
usage domestique

Spülmaschinenbeständigkeit von Gegenständen - Teil 4:
Schnellverfahren für keramische Haushaltsgegenstände

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Foreword

This document (EN 12875-4:2006) has been prepared by Technical Committee CEN/TC 194 "Utensils in contact with food", the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by September 2006, and conflicting national standards shall be withdrawn at the latest by September 2006.

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Introduction

This European Standard specifies an accelerated test for the determination of the dishwashing resistance of domestic articles made of ceramics.

Further parts of EN 12875, under the general title *Mechanical dishwashing resistance of utensils* that have already been published or are in preparation are as follows:

Part 1: *Reference test method for domestic articles*

Part 2: *Inspection of non-metallic articles*

Part 5: *Rapid test for ceramic catering articles*

No satisfactory statistical correlation has been found between results obtained by the accelerated test (EN 12875-4) and by the reference test method (EN 12875-1). Nevertheless the accelerated test is a useful method for predicting the dishwashing resistance of ceramic tableware products for domestic use.

In case of dispute the test method given in EN 12875-1 is the reference method.

It is intended that the inspection procedure given in EN 12875-2 be used to examine domestic ceramic articles which have been subjected to the rapid test.

1 Scope

This European Standard specifies a rapid method for testing the dishwashing resistance of ceramic articles intended for domestic use. It does not define the number of dishwashing cycles that any given product should withstand.

2 Normative references

The following referenced documents are indispensable for the application of this European standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 12875-1, *Mechanical dishwashing resistance of utensils – Part 1: Reference test method for domestic articles*

EN 12875-2:2001, *Mechanical dishwashing resistance of utensils – Part 2: Inspection of non-metallic articles*

EN ISO 3696:1995, *Water for analytical laboratory use - Specification and test methods (ISO 3696:1987)*

3 Principle

Unused specimens of ware are immersed in a static solution of a specified alkaline dishwashing detergent at (75 ± 1) °C for a total of 32 hours. The specimens are then examined visually and compared with similar, untested pieces to determine any changes in gloss or colour resulting from detergent attack.

4 Reagents

4.1 Specified detergent

The specified detergent shall consist of the following, in the percentages shown by mass:

| | |
|----------------------------------|--------|
| Thermphos NW ¹ | 24,0 % |
| Plurafac LF 403 ¹ | 1,0 % |
| Sodium dichlorisocyanurate | 2,3 % |
| Sodium carbonate | 10.7 % |
| Sodium metasilicate | 25,0 % |
| Sodium metasilicate pentahydrate | 37,0 % |

Detergent shall be stored in a waterproof bag in quantities of no more than 1 kg in a cool and dry atmosphere. It should be used within six months and within one month of opening.

¹ Thermphos NW and Plurafac LF 403 are examples of suitable products available commercially. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by CEN of these products.

4.2 Detergent solution

0,5 % (m/m) aqueous solution of the specified detergent (4.1) shall be prepared with distilled water or water of equivalent purity (grade 3 water as specified in EN ISO 3696:1995). Sufficient detergent solution shall be prepared to ensure that the total ware surface area to test solution volume does not exceed 130 cm²/l.

5 Apparatus

5.1 Stainless steel tank with a close-fitting stainless steel lid, capable of holding at least 10 litres of detergent solution.

5.2 Stainless steel rack to support the test specimens and to separate individual items from the bottom of the tank and from each other, allowing free access for the detergent solution.

NOTE Certain materials will inhibit the attack of an alkaline washing agent on ceramic articles. These include aluminium and zinc, and any contact with this type of material should be avoided.

5.3 Hot water bath surrounding the stainless steel tank and capable of maintaining the solution temperature within the test tank at $(75 \pm 1) ^\circ\text{C}$, and fitted with:

- a) a circulating pump to maintain an even temperature distribution throughout the test tank;
- b) a temperature monitoring device that records any deviation in the temperature of the solution in the tank during the immersion period.

NOTE The bath may be large enough to contain several tanks.

5.4 Inspection site, as specified in EN 12875-2.

5.5 Precision ruler (engineering grade), graduated in millimetres.

5.6 Thermometer, covering the range 50 °C to 90 °C in 0,2 °C graduations.

6 Test specimens

A test specimen shall be any item of ceramic ware that can be completely immersed in the detergent solution. A minimum of four identical pieces of ware shall be available for test.

7 Procedure

7.1 Preparation of test specimens

7.1.1 Remove any surface contamination from the test specimens, e.g. by washing the specimens by hand in a mild liquid detergent at about 45 °C, followed by rinsing and drying with a clean cloth.

7.1.2 Place the test specimens in the inspection site and examine them with normal corrected vision from a distance of (30 ± 10) cm, while the viewing angle is changed. All test specimens of a given type shall be of comparable quality in gloss and colour; discard any specimens that are of inferior quality. Retain one specimen as an untested reference standard.

7.2 Immersion of test specimens

7.2.1 Determine the surface area of the test specimens. Fill the tank with sufficient water (see 4.2) to completely cover the specimens. Check for compliance with the surface area to volume criterion given in 4.2; if the calculated surface area approaches the critical limit of $130 \text{ cm}^2/\text{l}$, a greater volume shall be used.

NOTE When determining the surface area of flatware, it is sufficient to determine the surface area of a flat disc having the same circumference as the ware. For other types of ware allowance should be made for curvature and for handles, etc.

7.2.2 Cover the tank and adjust the water bath temperature to give a test tank temperature of $(75 \pm 1) \text{ }^\circ\text{C}$. Record the tank temperature.

7.2.3 Add sufficient detergent to give a solution of the correct concentration (see 4.2) in the test tank. Stir well to disperse the detergent. Immediately lower the test specimens, in the racks, into the tank and cover with the lid.

7.2.4 After $16\text{h} \pm 10 \text{ min}$, record the temperature in the tank and remove the test specimens. Rinse the test specimens in hot water and rub dry with a clean cloth (the rubbing action will also remove any loose colour).

NOTE Variations of ± 10 minutes on the immersion time have no detectable effect on the result obtained. The immersion time can be measured with any reliable timepiece.

7.2.5 Examine the specimens as described in 7.1.2, comparing tested items with the corresponding untested reference standards and report any changes in gloss or colour using the method described in EN 12875-2.

7.2.6 Repeat the immersion procedure for a further $16\text{h} \pm 10 \text{ min}$ using fresh detergent solution. Remove the test specimens, rinse and dry them as described in 7.2.4.

7.2.7 Re-examine the specimens as described in 7.2.5 after a total of 32 hours immersion. Report any changes in gloss or colour using the method described in EN 12875-2.

8 Test report

The test report shall contain:

- a) a reference to this European Standard, i.e. EN 12875-4:2006;
- b) identification of the articles tested (description), e.g. type, origin and designation of the manufacturer or supplier of the specimens;
- c) place and date of sampling;
- d) date of receipt and date of testing of the specimens;
- e) number of each type of test specimen;
- f) category of articles according to Table 1 of EN 12875-2:2001;
- g) average evaluation figures of all inspectors according to Table 2 of EN 12875-2:2001, after 16 hours immersion;
- h) average evaluation figures of all inspectors according to Table 2 of EN 12875-2:2001, after 32 hours immersion;
- i) any unusual features noted during the inspections.

9 Evaluation of test results

If there is disagreement about the results of testing by different methods, the classification based on the reference test method (EN 12875-1) shall be applied.

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