



SLOVENSKI STANDARD

SIST ENV 13258:2000

01-april-2000

Materiali in predmeti v stiku z živilami - Preskusne metode ugotavljanja odpornosti razpokanja keramičnih predmetov

Materials and articles in contact with foodstuffs - Test methods for crazing resistance of ceramic articles

Werkstoffe und Gegenstände in Kontakt mit Lebensmitteln - Prüfverfahren für die Haarrissbeständigkeit keramischer Gegenstände

Matériaux et articles en contact avec les denrées alimentaires - Méthode d'essai de la résistance au tressailage des articles en céramique

Ta slovenski standard je istoveten z: **ENV 13258:1998**

ICS:

67.250	Materiali in predmeti v stiku z živilami	Materials and articles in contact with foodstuffs
--------	--	---

SIST ENV 13258:2000

en

iTeh STANDARD PREVIEW **(standards.iteh.ai)**

SIST ENV 13258:2000

<https://standards.iteh.ai/catalog/standards/sist/8bfaf14c-eeed-474b-854a-2cbbc9a75c8b/sist-env-13258-2000>

EUROPEAN PRESTANDARD

ENV 13258

PRÉNORME EUROPÉENNE

EUROPÄISCHE VORNORM

December 1998

ICS 67.250; 97.040.60

Descriptors: ceramics, food products, food-container contact, tests, determination, crazing resistance, thermal shock tests, humidity

English version

Materials and articles in contact with foodstuffs - Test methods for crazing resistance of ceramic articles

Matériaux et articles en contact avec les denrées
alimentaires - Méthode d'essai de la résistance au
tressillage des articles en céramique

Werkstoffe und Gegenstände in Kontakt mit Lebensmitteln
- Prüfverfahren für die Haarrißbeständigkeit keramischer
Gegenstände

This European Prestandard (ENV) was approved by CEN on 20 November 1998 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.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

[SIST ENV 13258:2000](https://standards.iteh.ai/catalog/standards/sist/8bfa14c-eccd-474b-854a-2cbbc9a75c8b/sist-env-13258-2000)

<https://standards.iteh.ai/catalog/standards/sist/8bfa14c-eccd-474b-854a-2cbbc9a75c8b/sist-env-13258-2000>



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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Contents	Page
Foreword.....	3
1 Scope.....	3
2 Definitions	3
3 Principles.....	3
4 Apparatus.....	4
5 Samples.....	5
6 Procedure	5
7 Expression Of Results	6
8 Test Report.....	7
Annex A (Informative) Calculation Of A Crazing Resistance Index From Data Obtained By Method A.....	8
Annex B (Informative) Calculation Of A Crazing Resistance Index From Data Obtained By Method B.....	9

SIST ENV 13258:2000
<https://standards.itech.ai/catalog/standards/sist/8bfa14c-eccd-474b-854a-2cbbc9a73c8b/sist-env-13258-2000>

ALINEVOIS ANLIMU
 QUOCUSET VI PROVA'S AS OYKOT
 COTROKOT IN OYAMENUS IN 971
 AMALIGUO
 1983
 TOTO
 COTROKOT IGOTIN ON TOTO



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.

1. SCOPE

This prestandard specifies two test methods (methods A and B) for the determination of crazing resistance of glazed ceramic tableware articles in contact with food with water absorption higher than 0,5 % (determined according to method C of EN 1217:1997). Method A is a test for resistance to crazing due to moisture expansion. Method B is a test for resistance to crazing due to thermal shock and is similar in most respects to EN 1183:1995.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

2. DEFINITIONS

For the purpose of this prestandard the following definitions apply:

<https://standards.iteh.ai/catalog/standards/sist/8bfa14c-eccd-474b-854a-3bb975e8bcracksin13258-0102>

2.1 crazing: Formation of very fine cracks in the glaze caused by either moisture expansion of the body or thermal stress which creates sufficient tension in the glaze to cause it to craze.

2.2 moisture expansion: Expansion of ceramic bodies with high water absorption due to penetration of water vapour through imperfections in the glaze.

2.3 thermal shock: Sudden change in temperature.

3. PRINCIPLES

3.1 Method A

The samples are subjected to saturated steam at a defined pressure for a number of cycles in an autoclave to test resistance to crazing due to moisture expansion. The steam pressure is increased and reduced slowly in order to minimize thermal shock. The samples are examined for crazing after each cycle. A stain is applied to the surface to aid in the detection of crazing cracks.

3.2 Method B

Samples are heated in a test oven and then cooled rapidly in a cold water bath under controlled conditions in order to subject the articles to thermal shock.

Thermal shock tests are repeated using increasing temperature differences. The samples are examined for crazing after each thermal shock test. The water in the cold water bath is stained to aid in the detection of crazing cracks.

4. Apparatus

NOTE: Items 4.1, 4.2 and 4.3 are required for method A and items 4.4, 4.5, 4.6, 4.7 and 4.8 are required for method B.

4.1 Autoclave of sufficient volume to contain several samples, built for a steam pressure of at least 500 kPa. The steam may be provided by either external or internal heating of the autoclave or from a separate steam generator. The autoclave shall be equipped with: a pressure gauge; a safety valve; a means to reduce pressure within the autoclave to atmospheric pressure for safe opening at the end of each cycle and a means of controlling the steam pressure at $340 \text{ kPa} \pm 34 \text{ kPa}$.

4.2 Aqueous solution containing $(5 \pm 1) \text{ g/l}$ of eosine and $(5 \pm 1) \text{ g/l}$ of domestic washing up liquid.

4.3 Soft cotton cloth

4.4 Cold water bath, comprising a bath or tank capable of containing at least five times the apparent volume of the overall dimensions of the samples being tested at one time (including the basket), fitted with a water circulator, a thermometer and a thermostatic control capable of maintaining, for the duration of all the tests, the water temperature to within $\pm 2 \text{ }^{\circ}\text{C}$ of a specified lower temperature, t_2 , within the range $10 \text{ }^{\circ}\text{C}$ to $20 \text{ }^{\circ}\text{C}$.

4.5 Test oven, preferably electrically heated, having a temperature operating range of up to at least $300 \text{ }^{\circ}\text{C}$, fitted with an air circulating device to ensure that the temperature variation does not exceed $\pm 5 \text{ }^{\circ}\text{C}$ and a thermostatic control capable of maintaining the temperature to within $\pm 2 \text{ }^{\circ}\text{C}$ up to $180 \text{ }^{\circ}\text{C}$ and to within $\pm 3 \text{ }^{\circ}\text{C}$ above $180 \text{ }^{\circ}\text{C}$.

4.6 Basket, for testing two or more samples simultaneously, made out of, or coated with, an inert material which will not damage the surface of the samples during the test procedure. The basket is capable of holding the samples in a position which ensures that air escapes and liquid can immediately enter the inside of holloware. The samples are held separately to allow free passage of water between them. The basket is fitted with clamps to prevent the samples from floating when immersed.

NOTE: For the multiple testing of samples, the basket may be combined with an automatic device for inserting it in the test oven (4.5) and transferring it to the cold water bath (4.4).

4.7 Tongs, with tips protected by a heat resisting material such as glass or mineral wool.

4.8 Gloves, gauntlet-type, made from a heat resisting material.

5. Samples

The complete test shall be performed on not less than 7 whole unused samples.

6. Procedure

6.1 Method A

6.1.1 Remove any dirt or loose debris from the samples; examine to verify that they are free from crazing.

6.1.2 Place the samples on a suitable support in the autoclave (4.1) at least 5 cm above the water line at room temperature and in such a way that there is a clear space between them and then close the autoclave.

6.1.3 Raise the pressure in the autoclave gradually for a period of not less than 15 min and not more than 1 h until it reaches 340 kPa and maintain at (340 ± 34) kPa for 2 h.

6.1.4 Allow the pressure in the autoclave to fall to atmospheric. Allow the samples to cool for 1 h and then open the autoclave and remove the test samples.

6.1.5 Immerse the samples in the staining agent (4.2) for (5 ± 1) min, then wipe off the stain with the cotton cloth (4.3).

6.1.6 Inspect each sample immediately for crazing and determine the number of samples which have failed the test.

6.2 Method B

6.2.1 Remove any dirt or loose debris from the samples; dry them if necessary and examine to verify that they are free from crazing.

6.2.2 Fill the cold water bath (4.4) with water containing a staining agent, to a volume equal to not less than five times the apparent overall volume of the samples to be tested (including the volume of the basket) and to a depth sufficient for complete immersion of the samples plus not less than 50 mm

NOTE: A suitable staining agent is eosine introduced at a concentration of (5 ± 1) g/l.

Locate the water bath near to the test oven (4.5) and adjust and maintain the water temperature to within ± 2 °C of the specified lower temperature, t_2 .

6.2.3 Place the samples, either separately or contained in the basket (4.6) in the test oven which has been previously heated to the upper temperature, t_1 . Maintain the samples at this temperature until they have reached equilibrium.

NOTE: The time taken for samples to reach equilibrium with temperature t_1 may be determined by simple experimentation with an equivalent mass of sand. The sand is placed in a beaker with a thermometer inserted into the centre of the body of sand and

heated in the test oven. The time taken to reach temperature t_1 is noted and a safety margin of 5 min is added

6.2.4 Remove the samples from the test oven either, one at a time, holding them with the tongs (4.7), or if the samples are large or contained in a basket with the gloves (4.8). Immerse the samples completely in the cold water bath without impact for a specified period between 8 s and 2 min ensuring that holloware is filled with water.

Complete the process of transferring each sample, or the basket with samples, from opening of the test oven to immersion in (5 ± 1) s. Ensure that the difference in temperature between the test oven and the cold water bath is not more than ± 3 °C from the required temperature at the time of transference.

6.2.5 Remove the samples from the cold water. Inspect each sample immediately for crazing and determine the number of samples which have failed the test.

6.3 Determination of crazing resistance

6.3.1 Method A

Repeat the testing procedure according to method A until all samples have failed.

NOTE: It is envisaged that all samples will fail before the completion of the fifth cycle. Where this does not happen it is considered that the result will not change significantly with extended testing. Therefore, terminate the procedure after the seventh cycle.

6.3.2 Method B

Commence testing with a temperature difference value $t_1 - t_2$ of (100 ± 5) °C and increase t_1 by 20 °C increments.

Repeat the testing procedures according to method B with increasing temperature difference values, $t_1 - t_2$, until all samples have failed.

NOTE: It is envisaged that all samples will fail before a temperature difference value, $t_1 - t_2$, of 200 °C is reached. Where this does not happen it is considered that the result will not change significantly with extended testing. Therefore, terminate the procedure after a temperature difference value, $t_1 - t_2$, of 200 °C is reached.

7. Expression of results

7.1 Crazing

7.1.1 Method A

The cycle number at which each sample fails the crazing test is recorded together with the cumulative time T hours (cycle number $\times 2$ for each sample). Any samples which survive 7 cycles are also reported.

7.1.2 Method B

Samples which craze are recorded as having failed the crazing test at a temperature difference of $t_1 - t_2$. Any samples which survive at the maximum temperature difference of 200 °C are also reported.

7.2 Crazing resistance

7.2.1 Method A

Record the number of failures after each 2 h cycle and the number that survive 7 cycles.

Calculate a Crazing Resistance Index in accordance with the examples given in Annex A.

7.2.2 Method B

Record the number of failures at each temperature difference and the number of samples that survive at the maximum temperature difference of 200 °C.

Calculate a Crazing Resistance Index in accordance with the examples given in Annex B.

8 TEST REPORT

iTeh STANDARD PREVIEW
(standards.iteh.ai)

The test report shall include the following details:

- a) a reference to this European prestandard;
- b) an identification of the samples tested;
- c) the number of samples taken for the test and the sampling method;
- d) for the crazing test:
 - the test method used, i.e. A or B;
 - for each sample the cumulative time for method A or the temperature difference $t_1 - t_2$ in degrees Celsius for method B;
 - the number of samples which failed the test at each cycle for method A or at each temperature increment for method B.
- e) for the Crazing Resistance Index test:
 - the test method used for crazing, i.e. A or B;
 - the Crazing Resistance Index.

NOTE: It is recommended that any unusual features noted during the determinations are also reported.