SLOVENSKI STANDARD
SIST EN 132400:2002/A2:2002

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Sectional specification: Fixed capacitors for electromagnetic interference suppression and connection to the supply mains (Assessment level D) - Amendment A2

Sectional Specification: Fixed capacitors for electromagnetic interference suppression and connection to the supply mains (Assessment level D)

Rahmenspezifikation: Festkondensatoren zur Unterdrückung elektromagnetischer Störungen, geeignet für Netzbetrieb (Gütebestätigungsstufe D)

Spécification intermédiaire: Condensateurs fixes d'antiparasitage et raccordement à l'alimentation (Niveau d'assurance D)

Ta slovenski standard je istoveten z: **EN 132400:1994/A2:1998**

ICS:

31.060.10	Fiksni kondenzatorji	Fixed capacitors
33.100.20	Imunost	Immunity

SIST EN 132400:2002/A2:2002 **en**

EUROPEAN STANDARD

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English version

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This amendment A2 modifies the European Standard EN 132400:1994; it was approved by CENELEC on 1997-03-11. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This amendment exists 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 Central Secretariat has the same status as the official versions.

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CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

This amendment to the European Standard EN 132400 was prepared by CENELEC/TC CECG/SC 40XA, Capacitors.

It contains the combined texts of two draft amendments which were submitted to the CENELEC Unique Acceptance Procedure. The text of the first draft amendment was approved as amendment A1 on 1996–12-09; that of the second as amendment A2 on 1997-03-11.

This amendment A2 includes amendment A1.

The following dates were fixed:

– latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	1999-01-01
– latest date by which the national standards conflicting with the amendment have to be withdrawn	(dow)	1999-01-01

The following changes are to be made to EN 132400:1994:

- delete pages 3, 4, 17, 18, 21, 22, 23, 34 and 35;
- insert the new pages 3, 4, 17, 18, 21, 21a, 22, 23, 23a, 34, 35 and 55.

CONTENTS

Section/Clause

1 - GENERAL

1.1 Scope

This specification applies to fixed capacitors and resistor-capacitor combinations for electromagnetic interference suppression (formerly called radio interference suppression) for use within, or associated with, electronic or electrical apparatus and machines where the capacitors will be connected to a mains supply with a voltage not exceeding 500 V d.c. or 500 V a.c. (r.m.s.) between conductors or 250 V d.c. or 250 V a.c. (r.m.s.) between any one conductor and earth and with a frequency not exceeding 100 Hz.

This specification prescribes tests which are appropriate when the suppression capacitor is to be connected to the supply mains. The relevant equipment specification may also prescribe other circuit positions where capacitors meeting the requirements of this specification shall be used.

Combinations of two or more capacitors within one enclosure are included within the scope of this specification.

Series resistor-capacitor combinations are within the scope of this specification provided that the resistor is in the same enclosure, and the resultant equivalent series resistance of the combination does not exceed 1 kΩ.

Parallel resistor-capacitor combinations where the resistor acts as a discharge resistor for the capacitor are within the scope of this specification.

Capacitors for special environmental conditions (e.g. drip-proof, splash-proof) may have to comply with additional requirements.

NOTE - For notes on the application of electromagnetic interference suppression capacitors see IEC-940.

1.2 Object

The principal object of this specification is to prescribe preferred ratings and characteristics and to select from EN 130000, the appropriate quality assessment procedures, tests and measuring methods and to give general performance requirements for this type of capacitor. Test severities and requirements prescribed in detail specifications referring to this sectional specification shall be of equal or higher performance level, because lower performance levels are not permitted.

A further object of this specification is to provide a test schedule for safety approval.

1.3 Related Documents

ISO 3 (1973)	Preferred Numbers - Series of Preferred Numbers
IEC 60-1 (1989)	High Voltage Test Techniques: Part 1: General Definitions and Test Requirements

3 - ASSESSMENT PROCEDURES

3.1 Primary stage of manufacture

For wound capacitors the primary stage of manufacture is the winding of the capacitor element. For single-layer ceramic capacitors it is the metallization of the dielectric to form the electrodes. For other types of capacitor it shall be the same as that given in the sectional specification for the dielectric used.

3.2 Structurally similar components

Capacitors considered as being structurally similar are capacitors produced with essentially the same processes and materials, though they may be of different case sizes and capacitance values, but of the same class and rated voltage.

3.3 Certified records of released lots

The information required in 3.5.1 of EN 130000 shall be made available when prescribed in the detail specification and when requested by a customer. After the endurance test the parameters for which variables information is required are capacitance change, resistance change (for RC-units), tangent of loss angle and insulation resistance.

3.4 Approval testing

3.4.1 Safety tests only approval

Table 3 and Annex A1 form a schedule limited to tests concerning safety only requirements.The schedule to be used for safety test only approval will be on the basis of fixed sample sizes according to 3.5.3(2) of EN 130000 as given in 3.4.3 and Table 3 of this specification. Prior to the approval testing being carried out it is necessary to submit to the certification body a declaration of design (see Annex F) registering essential data and basic design details of the capacitors for which approval is sought.

3.4.2 Qualification approval

Table 4 and Annex A2 are to be used when qualification approval is sought.

The procedures for qualification approval testing are given in 3.5 of the generic specification EN 130000. The schedules to be used for qualification approval testing on the basis of lot-by-lot and periodic testing according to 3.5.3(1) of EN 130000 are given in 3.5 and Tables 5 and 6 of this specification. The schedule to be used for qualification approval testing on the basis of fixed sample sizes according to 3.5.3(2) of EN 130000 is given in 3.4.3 and Table 4 of this specification. For the two procedures the sample sizes and the number of non-conforming items shall be of comparable order. The test conditions and requirements shall be the same. Qualification approval according to the fixed sample sizes of Table 4 is preferred.

3.4.3 Qualification approval on the basis of the fixed sample size procedure

3.4.3.1 Sampling

Capacitors of each technology, rated voltage, class and sub-class shall be separately qualified. The total number of capacitors of each rated voltage in each group is given in Tables 3 and 4. For multi-section capacitors containing sections of different classes and for lead-through capacitors, larger numbers are required as indicated.

The sample shall contain equal numbers of specimens of the highest and lowest capacitance values in the range to be qualified, except for the passive flammability test of 4.17 and the active flammability test of 4.18. For the passive flammability test the rules of sampling in 4.17, Note 6 to Table 3 and Note 9 to Table 4 shall be followed. For the active flammability test the rules of sampling in 4.18 shall be followed. Where only one capacitance value is involved, the total number of capacitors as stated in Tables 3 and 4 shall be tested. Spare specimens are permitted as follows:

a) One per capacitance value which may be used to replace the permitted non-conforming item in Group 0.

b) The remainder of the spare specimens may be required if it is necessary to repeat any test according to the provisions of Note 1 of either Table 3 or Table 4.

The numbers given in Group 0 assume that all subgroups are applicable. If this is not so, the numbers may be reduced accordingly.

When additional groups are introduced into the qualification approval test schedule, the number of specimens required for Group 0 shall be increased by the same number as that required for the additional groups.

Tables 3 and 4 give the number of specimens to be tested in each group or sub-group together with the permissible number of non-conforming items in each case.

Where a range of capacitors to be qualified employs significantly different materials the samples for groups 2 and 3 shall contain a minimum of 3 specimens of each dielectric material.

3.4.3.2 Tests

One of the complete series of tests indicated in Table 3 or Table 4 is required for the approval of capacitors of a single rated voltage covered by one detail specification. The tests of each group shall be carried out in the order given.

The whole sample shall be subjected to the tests of Group 0 and then subdivided for the other groups.

A specimen found to be a non-conforming item during the tests of Group 0 shall not be used for the other groups.

"One non-conforming item" is counted when a capacitor has not satisfied the whole or part of the tests of a group.

The approval is granted when the number of non-conforming items does not exceed the specified number of permissible non-conforming items for each group and sub-group and the total number of permissible non-conforming items.

NOTE - Table 3 and Annex A1 or Table 4 and Annex A2 form the fixed sample size test schedule, where Table 3 or Table 4 includes the details for the sampling and permissible non-conforming items for the different tests or groups of tests.

TABLE 4 (concluded)

Notes to Table 4

1) If one non-conforming item is obtained, all the tests of the group shall be repeated on a new sample and then no further non-conforming items are permitted. The non-conforming item obtained in the first sample shall be counted for the total non-conforming items permitted in the last column.
2) For Y-capacitors no permanent short-circuit failures are permitted.
3) If applicable.
4) If required in the detail specification.
5) If multi-section capacitors consisting of X- and Y-capacitors are to be tested, 12 specimens shall be taken for the tests on the X-capacitors and 12 other specimens for the tests on the Y-capacitors.
6) Additional capacitors if lead-through capacitors are tested.
7) Whichever is prescribed by the detail specification.
8) Not required for RC-units, or for capacitors other than those of metallized film or metallized paper construction.
9) The smallest, a medium (in the case of more than four case sizes) and the largest case size shall be tested. Of each case size, three specimens of the maximum capacitance and three specimens of the minimum capacitance shall be tested, which leads to six specimens per case size.
10) Attention is drawn to the option of carrying out a combined voltage/current test as prescribed in 4.14.6.
11) See 4.18. No electrical measurements are required.

TABLE 5

TEST SCHEDULE AND SAMPLING PLAN FOR LOT-BY-LOT TESTS

SAFETY TESTS ONLY

Group	Clause number and test referred to Section 4 of this specification	Inspection level IL	Acceptable quality level AQL%
A0	4.2.2 Capacitance 4.2.4 Resistance[1)] 4.2.1 Voltage proof 4.2.5 Insulation resistance	100 %[2)]	
A1	4.1 Visual examination[3)] Dimensions	II	1,5

1) If applicable
2) May be carried out as end-of-line testing
3) This test may be replaced by in-production testing if the manufacturer installs SPC on dimensional measurements or other mechanisms to avoid parts exceeding limits.

ASSESSMENT LEVEL D

Group	Clause number and test referred to Section 4	Inspection level IL	Acceptable quality level AQL%
A1	4.1 Visual examination 4.1 Dimensions (gauging)	II	1,5
A2	4.2.2 Capacitance 4.2.4 Resistance[1)] 4.2.3 Tangent of loss angle (metallized and ceramic capacitors only) 4.2.1 Voltage proof (Test A) 4.2.5 Insulation resistance (Test A)	II	0,25
B1	4.5 Solderability[1)]	S-3	2,5

1) If applicable