



SLOVENSKI STANDARD SIST EN 125000:2002

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Generic specification: Cores made of ferrite materials

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Fachgrundspezifikation: Ferritkerne

Spécification générique: Noyaux réalisés à partir de matériaux ferrites

Ta slovenski standard je istoveten z: **EN 125000:1997**

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ICS:

29.100.10	Magnetne komponente	Magnetic components
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EN 125000

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Descriptors: Ferrite cores, generic specification, quality assessment, capability approval, test and measurement procedures

English version

**Generic Specification:
Cores made of ferrite materials**

Spécification générale:
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matériaux ferrites

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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 European Standard 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 European Standard was prepared by the Technical Committee CENELEC TC/CECC SC 51X, Magnetic Components: Cores and soft magnetic materials.

It is based, wherever possible on the Publications of the International Electrotechnical Commission, and in particular on IEC 60367 and IEC 60723.

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 125000 on 1997-10-01.

This European Standard supersedes CECC 25 000:1976 (including its amendment A1:1982).

The following dates were fixed:

- latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 1998-09-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 1998-09-01

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1. GENERAL

1.1 Scope

This Generic Specification is applicable to cores made of ferrite materials. These products are used in a wide range of inductive components required for many applications in almost all industries.

It establishes standard terms, inspection procedures and methods of testing for use in sectional and detail specifications within the CECC System for electronic components.

1.2 Normative references

This European Standard 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 amendments or revision. For undated references the latest edition of the publication referred to applies.

CECC 00 111		Rule of Procedure 11: Specifications
CECC 00 114		Rule of Procedure 14: Quality assessment procedures
CECC 00 200		Register of firms, products and services approved under the CECC System
CECC 00 400		Handbook for the production of CECC documents
EN 60068-2		Basic environmental testing procedures
EN 125500	1996	Magnetic oxide ring cores for interference suppression and low level signal transformer applications
IEC 60027	1971	Letter symbols to be used in electrical technology
IEC 60050		International Electrotechnical Vocabulary (including the Advanced Edition of Section 901 on magnetic materials)
IEC 60133	1985	Dimensions for pot-cores made of magnetic oxides and associated parts
IEC 60205	1966	Calculation of the effective parameters of magnetic piece parts (+ A1:1976 + A2:1981)
IEC 60226	1967	Dimensions of cross-cores (X-cores) made of magnetic oxides and associated parts (+ A1:1982)
IEC 60367-1		Cores for inductors and transformers for telecommunications - Part 1: Measuring Methods (+ A1:1984 + A2:1992)
IEC 60367-2		Cores for inductors and transformers for telecommunications - Part 2: Guides for the drafting of performance specifications (+ A1:1983)
IEC 60367-2A		Cores for inductors and transformers for telecommunications - Part 2: Guides for the drafting of performance specifications - First supplement
IEC 60401	1993	Ferrite materials - Guide on the format of data appearing in manufacturers' catalogues of transformer and inductor cores
IEC 60410	1973	Sampling plans and procedures for inspection by attributes
IEC 60424	1973	Guide to the specification of limits for physical imperfections of parts made from magnetic oxides
IEC 60431	1983	Dimensions of square cores (RM-cores) made of magnetic oxides and associated parts
IEC 60492	1974	Measuring method for aerial rods
IEC 60556	1982	Measuring methods for properties of gyromagnetic materials intended for application at microwave frequencies
IEC 60617	1985	Graphical symbols for diagrams
IEC 60647	1979	Dimensions for magnetic oxide cores intended for use in power supplies (EC-cores)
IEC 60701	1981	Axial lead cores made of magnetic oxide or iron powder
IEC 60723-1	1982	Inductor and transformer cores for telecommunication. Part 1: Generic specification
IEC 60732	1982	Measuring methods for cylinder cores, tube cores and screw cores of magnetic oxide

IEC 61185	1992	Magnetic oxide cores (ETD-cores) intended for use in power supply applications Dimensions
IEC 61246	1994	Magnetic oxide cores (E-cores) of rectangular cross-section and associated parts Dimensions
IEC 61247	1994	PM-cores made of magnetic oxides, and associated parts - Dimensions
IEC 61332	1995	Soft Ferrite material classification
IEC 61333	1996	Marking on U and E ferrite cores
IEC 61596	1995	Magnetic oxide EP-cores and associated parts for use in inductors and transformers Dimensions
ISO 497	1973	Guide to the choice of series of preferred numbers and of series containing more rounded values of preferred numbers
ISO 1000	1981	SI units and recommendations for the use of their multiples and of certain other units
ISO 2859-1	1989	Sampling procedures for inspection by attributes - Part 1: Sampling plans indexed by acceptable quality level (AQL) for lot by lot inspection.
ISO 2859-2	1985	Sampling procedures for inspection by attributes - Part 2: Sampling plans indexed by limiting quality (LQ) for isolated lot inspection.
ISO 9000	1994	Quality and quality assurance standards - Guidelines for selection and use

1.3 Units, symbols and terminology

Units, graphical symbols, letter symbols and terminology shall, whenever possible, be taken from the following documents:

ISO 1000	SI units and recommendations for the use of their multiples and of certain other units.
IEC 60027	Letter symbols to be used in electrical technology.
IEC 60050	International Electrotechnical Vocabulary.

Subclause 1.3.1 and 1.3.2 contain additional terminology and letter symbols applicable to inductor and transformer cores. Subclause 1.3.3 contains a definition of Capability Qualifying Components. Subclause 1.3.4 contains a list of parameters useful for core characterization.

1.3.1 Multiples and sub-multiples of units

In accordance with IEC 60367-2.

1.3.2 Letter symbols

In accordance with IEC 60367-2.

1.3.3 Definitions

The term: Capability Qualifying Components (CQCs) stands for products being produced at given manufacturing process steps.

1.3.4 List of parameters useful for core characterization.

- * Inductance factor A_L
In accordance with subclause 3.4.4 of IEC 60367-2A
 A_L measured at low flux density (corresponding to μ_i or μ_a)
 A_{L1} measured at high flux density (corresponding to μ_a)
 A_{L2} measured for DC-biasing field (corresponding to μ_{rev})
- * Loss factor $\tan\delta/\mu_i$
Loss at low flux density
- * Hysteresis material constant η_B
- * Power loss P
Loss at high flux density

- * Inductance L
Measured at a given frequency
- * Temperature factor of permeability α_F
In accordance with IEC 60367-2A.
- * Disaccommodation factor D_F
In accordance with IEC 60367-2A.

1.4 Standard and preferred values

1.4.1 Dimensions of cores

Cores shall preferably be in accordance with IEC and EN Publications, such as:

Pot-cores	: IEC 60133
Square cores (RM-cores)	: IEC 60431
Toroids	: EN 125500
EC-cores	: IEC 60647
ETD-cores	: IEC 61185
E-cores	: IEC 61246
PM-cores	: IEC 61247
EP-cores	: IEC 61596

1.4.2 Nominal value of inductance factor A_L

Nominal values of the inductance factor should preferably be taken from the R5-series of ISO 497. When other values have been used, these should be taken from another series in that standard.

1.5 Marking of cores and packaging

The marking of the cores and the packaging should be in accordance with available relevant standards (e.g. IEC 61333).

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1.6 Subcontracting

If subcontracting is invoked it shall be in accordance with the requirements of §1.2 CECC 00 114: RP 14 Part II.

1.7 Validity of release

Where applicable the validity of release shall be in accordance with §2.2.5 CECC 00111: RP11 Part III.

2. QUALITY ASSESSMENT PROCEDURES

This clause is divided in two parts :

- * QUALIFICATION APPROVAL Procedures described in subclause 2.1.
- * CAPABILITY APPROVAL Procedures described in subclause 2.2.

2.1 Qualification approval

2.1.1 Primary stage of manufacture

For the purpose of specifications for inductor and transformer cores made of ferrite materials, the primary stage is the final compacting of the powder into a solid form before thermal processing.

2.1.2 Qualification approval procedures

To obtain qualification approval, the manufacturer shall produce test evidence of conformance to the specification requirements on three consecutive lots for lot-by-lot inspection and on one lot for periodic inspection.

Normal inspection shall be used, but where the sample size would give acceptance on zero defective, additional specimens shall be taken to meet the sample size required to give acceptance on one defective.

Alternatively, a special sample may be drawn of cores of the same shape and size. This sample shall be subjected to all tests of Group A and shall then be subdivided for carrying out the subgroups of Groups B and C, each subgroup being carried out on a separate subsample. The subsamples shall be chosen as to allow acceptance when one defective occurs in the subsample. The size of the total sample shall be the sum of the subsample sizes plus two specimens per A_L value to replace the permitted defective(s) in Group A and the specimens lost due to incidents not attributable to the manufacturer.

2.1.3 Quality conformance inspection requirements

The detail specification shall prescribe the tests to be carried out on each inspection lot and those to be carried out for periodic inspection, in accordance with the rules of the appropriate sectional specification.

For continuous production of cores, an inspection lot is defined as all cores having similar shape and size, produced from one batch of material powder, pressed and sintered using essentially the same process, within a given time and irrespective of the effective permeability. The period should normally not exceed one week..

The samples drawn from such an inspection lot shall contain proportional parts of each effective permeability where this can have an influence on the test result.

2.1.3.1 Delayed delivery

In principle, the requirements of CECC 00 100 are not applicable to cores made of ferrite materials only. Unless otherwise specified in the detail specification, cores with a glued fixed part of the adjusting device held in the manufacturers or distributors store for a period of twenty four months after release for delivery of the inspection lot, shall be reexamined for fixing of this device as indicated under Group C testing but to an inspection level S4 (normal testing). In this case, the inspection level may contain all cores having fixed parts of the same design, material and size which has been glued by the same technique. Once such an inspection lot has been satisfactorily reinspected, its quality is reassured for a further twenty four months.

2.1.3.2 Certified test records

Where certified test records are prescribed in the relevant specification and are requested by the purchaser, the following information shall be given, as a minimum :

Attributes information for each test of the lot-by-lot inspection. The contents of the certified test records shall comply with the requirements of CECC 00 100.

2.2 Capability Approval

2.2.1 General

2.2.1.1 Eligibility for Capability Approval

Capability approval may be granted only to a component manufacturer who has been granted manufacturer's approval in accordance to the requirements of subclause 2.1 of document CECC 00 114 : RP 14 Part III.