
International Standard



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Muscovite mica components for electronic equipment — Specification

Composants en mica muscovite pour équipement électronique — Spécifications

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Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 5816 was developed by Technical Committee ISO/TC 56, *Mica*, and was circulated to the member bodies in September 1978.

It has been approved by the member bodies of the following countries :

Brazil	Germany, F. R.	United Kingdom
China	India	USSR
Czechoslovakia	Libyan Arab Jamahiriya	Yugoslavia
Egypt, Arab Rep. of	Romania	
France	South Africa, Rep. of	

No member body expressed disapproval of the document.

Muscovite mica components for electronic equipment — Specification

1 Scope and field of application

This International Standard lays down minimum technical requirements, test methods and acceptance conditions for muscovite mica components used in electronic equipment, vacuum tubes, gas discharge devices, etc.

It is applicable to stamped components of muscovite mica of diameter up to and including 40 mm for use in electronic equipment.

2 Basic dimensions

2.1 Classification

The components are classified into three groups according to size :

- a) Group 1 — Components that will fit into a circle of diameter 15 mm or less.
- b) Group 2 — Components that will fit into a circle of diameter more than 15 mm but not more than 25 mm.
- c) Group 3 — Components that will fit into a circle of diameter more than 25 mm but not more than 40 mm.

2.2 Thickness

The mica components are manufactured in thicknesses ranging from 0,1 to 0,5 mm. The thickness shall be uniform to within 0,02 mm.

3 Technical requirements

3.1 General

The shape and size of the component as well as the tolerances on the dimensions shall be according to the purchaser's drawings agreed to by the supplier.

3.2 Tolerances on thickness

The tolerances on thickness specified in the drawings shall not exceed

- a) the lower tolerance limit — in more than 5 % of the components;

- b) the upper tolerance limit — in more than 20 % of the components.

The amount of deviation shall in no case be more than 0,1 mm.

3.3 Surface characteristics

The surface of the components shall be flat or slightly convex according to the specimen, as agreed to between the parties to the contract.

3.4 Cracks

3.4.1 Through cracks

Through cracks joining the periphery of the components to the inside opening and between the openings are not allowed. The total length of cracks running from opposite directions between any two adjacent openings or any opening and the periphery of the components shall not exceed 1/3 of the space between them; the length of any through cracks running from opposite directions shall not be more than 1/4 of the width of the bridge.

Provided that the interested parties agree, through cracks of lengths up to 3 mm can be allowed if the total length of such cracks from opposite directions between two adjacent openings or between the opening and the periphery of the component does not exceed half the distance between them.

If the distance between the openings is 2 mm or less, the total length of the through cracks running from opposite directions shall not exceed 1/3 of the width of the bridge.

3.4.2 Not-through cracks

Not-through cracks up to a depth of 1/3 of the thickness of the component are allowed between the openings or between the openings and the periphery of the component.

3.5 Holes

Holes within 2 mm of the opening or periphery are not allowed. The exact type of holes which can be permitted shall be agreed to between the interested parties, according to the specimen supplied.

3.6 Foreign material

Inclusion of foreign minerals (such as feldspar, quartz and other minerals of pegmatite) and impurities such as "oil" stains are not allowed.

3.7 Stains

Stains of various colours, other than those due to rust or corrosion, are allowed on the surface of the component provided that the total area covered by the stains does not exceed 10 % of the total surface area of the component for Group 1, and 25 % for Groups 2 and 3.

3.8 Patches

Black patches distributed at distance of less than 1 mm from the periphery of the internal opening and on bridges of width less than 3 mm are not allowed.

3.9 Lamination

The size and type of lamination on the external periphery and on the periphery of the internal openings shall be according to the sample agreed upon by the interested parties.

3.10 Defects and fins

The size, type and location of defects, fins and holes shall be according to the sample agreed upon by the parties to the contract.

3.11 Scratches

Scratches due to knife or blade shall not be considered as grounds for rejection.

3.12 Teeth

Components with chipped-off teeth are not allowed. Such components detected during the test are rejected and counted in the sum of the components not complying with this International Standard (see 5.4).

4 Sampling

4.1 Sample size

From each supply, 0,5 % of the components with a minimum of 100 shall be sampled for testing of the supplied components for compliance with all the requirements of this standard.

Samples shall be taken from not less than five packets of a box.

NOTE — If components of different block stamps are packed in the same box, samples should be taken of each block stamp separately.

5 Test methods and acceptance conditions

5.1 Visual examination

Check the components for compliance with 3.3 to 3.12 by visual inspection and comparison with the specimens.

5.2 Thickness

Measure the thickness of the component with a dial gauge provided with a spherical point and reading to 0,01 mm. Check the uniformity and correctness of the thickness. The radius of the sphere of the clamping terminal shall be 1,6 mm.

5.3 Depth of cracks

Determine the depth to which cracks have penetrated by splitting the component into several parts and measuring the thickness of each individual part with the dial gauge.

5.4 Criteria for acceptance

If the sum of all the components failing to comply with the requirements of 3.3 to 3.12 is less than or equal to 8 % of the samples taken, all the pieces in the box shall be considered as having passed. If the sum of the components which fail is more than 8 %, take twice the number of samples in the same order as the first, and retest.

If then the sum of all the components which fail is less than or equal to 8 % of the samples taken, all the pieces in the box shall be considered as having passed. If the sum of the components which fail is more than 8 %, all the pieces in the box shall be rejected.

5.5 Dimensions of openings

Pack out fifty pieces from the sample batch for verifying the dimensions of the openings with gauges.

5.5.1 Round openings

Check the dimensions of round openings with a set of angular gauges stepped in 0,01 mm. The opening shall be considered to be suitable if the gauge of 1 unit (= 0,01 mm) below the minimum permissible dimension passes freely through it, or if the gauge of 1 unit higher than the maximum permissible dimension in the drawing does not pass through it.

As an alternative, the projection method as given in 5.5.2.1 may be employed, subject to the agreement between the interested parties.

NOTES

1 If the tolerance on the opening is 0,03 mm or less, up to 20 % of the components tested can have openings through which passage is possible for the gauge which is 1 unit above the maximum permissible dimension, or impossible for the gauge which is 1 unit below the minimum permissible dimension; but even in such openings, passage should be possible for the gauge which is 2 units (= 0,02 mm) above the maximum allowed dimension, or impossible for the gauge which is 2 units below the minimum allowed dimensions.

2 If the tolerance on the opening is more than 0,03 mm, not more than 5 % of the components tested can have openings through which passage is possible for the gauge which is 1 unit above the maximum permissible dimension or impossible for the gauge which is 1 unit below the minimum permissible dimension; but even in such openings, passage should be possible for the gauge which is 2 units (= 0,02 mm) above the maximum allowed dimension, or impossible for the gauge which is 2 units below the minimum allowed dimension.

5.5.2 Irregular openings

For determining the layout of the openings as well as the dimensions and shape of irregular openings, take a sample of not less than 5 components from the box. The components shall be adjudged satisfactory if the arithmetic mean of each dimension is within the limits allowed in the drawing. Otherwise, take twice the number of pieces and test again; if in this new test also, inadequacies in the layout of the openings are found, then all the components from this box shall be rejected.

5.5.2.1 Projection method for dimensions of openings

Check the dimensions of irregularly shaped openings with a projector, by the method of superimposing the drawing on the projection of the opening under a magnification of 50 X. The opening shall be adjudged satisfactory if its projection coincides with the drawing and remains within the specified tolerances.

5.5.2.2 Microscopic or projection method for relative disposition of openings

Verify the relative disposition of the openings and the dimensions of the components according to the drawing on an instrumental microscope or in a projector by the method of superimposing the drawing on the projected image of the component under a magnification of 10 to 20 X. The component shall be considered as conforming to the drawing if all the contours of the projected image of the component coincide with the drawing, or its dimensions do not exceed the specified tolerances.

5.6 Geometrical dimensions

The initial basis for the measurement of the geometrical dimensions of the component shall be established according to drawings or catalogues, with the agreement of the interested parties.

5.7 Radii of rounding

Check the radii of rounding in the components by projecting the image and superimposing the drawing over the image.

5.8 Permissible tolerances

The permissible tolerances in measurement are given in the following table.

5.9 Area of stains or patches

Place the component plate to be tested on a stand and illuminate from below. Place on the plate a square piece of translucent graph paper, of side 1 mm; the graph pattern being made up of small squares. Each square of which the stain covers more than half the area, shall be denoted by a plus (+) sign; each square, of which the stain covers less than half the area, shall be denoted by a minus (–) sign and squares where there is no stain shall be given the zero (0) sign.

Table — Permissible measurement tolerances

Dimension	Tolerance
Exposed linear dimensions	$\pm 0,1$ mm
Exposed angular dimensions	$\pm 45'$
Shift of openings from component axis	As specified in drawing; otherwise $\pm 0,05$ mm
Misalignment and other deviations from the form of opening	As specified in drawing; otherwise $\pm 0,05$ mm
Radii of curves in component	$\pm 0,05$ mm
Asymmetry of location of openings	As specified in drawing; otherwise 50 % of tolerance

In this way, mark all the squares inside the plate. For the purpose of evaluation, two categories, namely, squares with the stain, marked with a plus (+) sign; and squares without the stain, marked with a (0) sign shall be taken into account. Of the squares marked with a minus (–) sign, add one half to each category.

The ratio of the number of squares with the stain to the total number of squares gives the percentage area occupied by the stains.

6 Packing, marking, transport and storing

6.1 Packing

The components shall be packed in paper packets, each having a mass from 200 to 500 g. The packets shall be tightly packed in sturdy boxes with inside paper lining. Each box shall contain only components of the same block stamp. The gross mass of each box with the components shall not exceed 10 kg.

NOTE — Components of different block stamps (according to the same drawing) may be packed in the same box, but it is obligatory to indicate the name of the block stamp(s) on each packet.

6.2 Markings on the box

The following information shall be marked on each box :

- name of the manufacturer;
- date of packing;
- number of the box;
- purchaser's name;
- supplier's name;
- name of the article;
- gross and net masses.

6.3 Markings on accompanying document

Each box shall contain an accompanying document signed by the responsible official. This document shall contain the following information :

- a) name of the manufacturer;
- b) date of packing;
- c) number of the box;

- d) reference and number of the drawing of the detail;
- e) number of block stamp(s);
- f) mass and number of the components in the box.

6.4 Transport and storage

During transport and storing, the components shall be protected from moisture and the boxes shall be protected from mechanical damage.

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