International Standard 67

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Muscovite mica blocks, thins and films — Grading by size

Mica muscovite en blocs, en feuilles minces et en lamelles — Classification dimensionnelle par grades

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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 67 was developed by Technical Committee ISO/TC 56, *Mica*.

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Austria	Ireland	South Africa, Rep. of
Bulgaria	Italy	Spain
Canada	Japan	United Kingdom
Czechoslovakia	Mexico	USA
France	Netherlands	USSR
Greece	New Zealand	Yugoslavia
Hungary	Portugal	
India	Romania	

No member body had expressed disapproval of the document.

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0 Introduction

Muscovite mica constitutes one of the two principal types of mica, the other being phlogopite mica the grading of which is dealt with by ISO 444. For the corresponding complementary classification of muscovite mica according to visual quality, reference should be made to ISO 2185.

1 Scope and field of application

This International Standard specifies a standard method for grading muscovite mica blocks, thins and films according to size. It also specifies trimming requirements and defines relevant terms used in the trade.

2 References

ISO 444, *Phlogopite mica blocks, thins and splittings — Grading by size.*

ISO 2185, *Muscovite mica blocks, thins and films — Visual classification.*

3 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1 crude mica: Crude crystals or books, as extracted from the mine.

3.2 cobbing: The process of removing dirt and rock from crude mica.

3.3 rifting: The process of splitting cobbed mica into sheets of suitable thicknesses.

3.4 trimming; dressing: The process of removing major flaws from rifted mica. Trimming may be accomplished with fingers, sickle or knife. Mica is then named after the implement used, sickle-trimmed mica, thumb-trimmed mica.

3.5 sickle-trimmed mica: Crude mica cobbed, rifted and trimmed with a sickle to eliminate major flaws and left with an irregular outline and bevelled edges.

3.6 knife-trimmed mica: Sickle-trimmed mica, further refined with a knife to eliminate interior defects and also such defects as may have been overlooked by the sickle-cutter.

3.7 thumb-trimmed mica: Rifted mica, trimmed with thumb and other fingers.

3.8 full-trimmed mica: Rifted mica, trimmed on all sides, eliminating all cracks, reeves and cross-grains.

3.9 half-trimmed mica: Rifted mica trimmed on two sides, with at least two-thirds of the pieces trimmed on two adjacent sides, and the balance of the pieces trimmed on the two parallel long sides, with no cracks extending into the area by which the piece is graded. The foregoing does not apply to sizes 06 and 16 (grades 6 and 5 1/2), for which at least one of the two trimmed sides must be free of cracks, and no cracks may extend into the area by which the piece is graded. It shall be possible to cut from the mica rectangles of accepted size and quality with a mass loss not exceeding 60 % based on the total inspection sample.

3.10 Madras rounds: Madras mica, cut with shears into oval or circular shapes.

3.11 commercial forms of mica: Mica known as blocks, thins, films and splittings.

3.12 blocks: Knife-trimmed mica of a specified minimum thickness which may be, with a maximum tolerance of 5 % (*m*/*m*),

either 0,20 mm with a tolerance limit at 0,18 mm, or

0,18 mm with a tolerance limit at 0,15 mm,

as agreed between the interested parties.

3.13 thins: Knife-trimmed mica in any specified thickness between 0,05 mm and 0,18 mm.

3.14 films: Knife-trimmed mica split to any specified range of thicknesses.

3.15 splittings[1]: Laminae split from blocks and thins, the thickness of ten of which taken together does not exceed 0,28 mm.

3.16 scrap: Mica by-product obtained in the course of producing graded mica.

3.17 "A": Series of rulings or striations intersecting at an angle of about 60°.

3.18 cracks: Irregular visible fractures within a crystal that may be natural or may arise from blasting, rough handling, etc.

3.19 cross-grains; jatahi; reeves: Tangled laminations giving imperfect cleavage which results in tears or breaks during splitting.

3.20 haircracks; hairline cracks: Minute irregular cracks that are barely noticeable until mica is split into films, resulting in torn films.

3.21 herring-bones: Numerous rulings that intersect to form a series of "V's", the legs making angles of about 120° and meeting at the apex to produce a herring-bone, horse-tail or feather structure.

3.22 hole: A perforation, sometimes minute, through the laminae.

3.23 ribboned mica; ruled mica: Mica which breaks into strips because of parallel fractures.

3.24 ribs; ridges: Crenellations in the form of steps.

3.25 tangle sheel: A piece of mica that splits well in some places but tears in others, producing a large percentage of partial films. Sometimes the term is applied to the intergrowth of mica crystals.

3.26 "V" cuts; figure cuts: Edge cuts converging towards the central area of the mica piece.

3.27 wedge: A piece of mica which, on splitting, yields pieces thicker at one end than at the other.

4 Grading method

4.1 Principle

The standard grading method for all-trimmed muscovite mica in based on the maximum usable rectangle (usable area) that may be cut from the specimen, and not on its total area. For half-trimmed muscovite mica, see 3.9. Madras rounds and certain variations of thumb-trimmed mica shall be graded on the basis of the usable circle.

4.2 Grade designations

The grade designations for muscovite mica blocks, thins and films and the corresponding areas of the usable rectangles, with minimum dimensions of the shorter side, are given in table 1 and shown in the figure. Each grade of mica in a consignment shall contain a natural distribution of sizes from the minimum to the maximum area specified for the grade.

4.3 Sequence of operations

All specimens to be graded shall be trimmed prior to grading. The trimmed samples shall be graded according to the procedure laid down in clause 6. In addition to size-grading, all muscovite blocks, thins and films shall fulfil, with respect to the usable rectangle, the requirements of the desired visual quality, as specified in ISO 2185.

5 Trimming

5.1 Full-trimmed mica

5.1.1 Requirements

Full-trimmed muscovite mica blocks, thins and films shall be trimmed to remove all cracks, reeves, cross-grains, etc., so as to comply with the specifications for the desired visual quality. Trimming shall follow the natural contour of the mica. As far as possible, all marginal cracks should be removed by recutting.

5.1.2 Usable rectangle

The total area of each piece of full-trimmed mica for sizes 40 (grade 4) and above shall not exceed 1,54 times the area of the largest usable rectangle; in other words, the total area shall have a rectangular yield of at least 65 %, with the tolerance that no more than 5 % (m/m) of blocks, by mass, may have a yield less than 65 %. For full-trimmed mica up to size 20 (grade 5), the total area of each piece shall not exceed twice

1) For further information concerning splittings, see ISO 444.

Table 1 — Standard grading for muscovite mica blocks, thins and films

Grade designation		Area of usable rectangle		Minimum dimension of shorter side of usable rectangle	Permissible tolerance for a lot in a consignment
new[1] (Size)	old (Grade or number)	cm² from (incl.)	to (excl.)	cm	
630	OOEE Special	645,2 and	above	10,2	Nil
500	OEE Special	516,1	645,2	10,2	Nil
400	EE Special	387,1	516,1	10,2	Nil
315	E Special	309,7	387,1	10,2	Nil
250	Special	232,3	309,7	8,9	Nil
160	1	154,8	232,3	7,6	5 % of pieces having width down to and including 5,1 cm
100	2	96,8	154,8	5,1	5 % of pieces having width down to and including 3,8 cm
63	3	64,5	96,8	5,1	5 % of pieces having width down to and including 3,8 cm
40	4	38,7	64,5	3,8	5 % of pieces having width down to and including 2,5 cm
20	5	19,4	38,7	2,5	Nil
16	5 1/2	14,5	19,4	2,2	Nil
06	6	6,4	14,5	1,9	Nil
05	7	4,8	6,4	1,6	Nil

1) These designations are based on the R 20 series of preferred numbers, in accordance with ISO 3, *Preferred numbers — Series of preferred numbers.*

the area of the largest usable rectangle; in other words, the total area shall have a rectangular yield of at least 50 %, with the tolerance that no more than 5 % (m/m) of blocks, by mass, may have a yield of less than 50 %.

5.2 Half-trimmed mica

5.2.1 Requirements

Half-trimmed muscovite mica blocks, thins and films shall be trimmed on two sides. At least two-thirds of the pieces shall be trimmed on two adjacent sides, while the balance shall be trimmed on the two parallel long sides, with no cracks extending into the usable rectangle (area by which the piece is graded). For sizes 06 and 16 (grades 6 and 5 1/2), at least one of the two trimmed sides shall be free of cracks, and no cracks may extend into the usable rectangle.

5.2.2 Usable rectangle

For half-trimmed blocks or thins, the usable rectangle is the total area within the rectangle of acceptable size and quality, which shall be not less than 40 % of the total area, based on the total inspection sample; that is, its cutting shall not involve a mass loss exceeding 60 % of the mass of the total inspection sample.

5.3 "V" cuts

If limitation as to the size, number and frequency of "V" cuts is desired, it shall be subject to agreement between the interested parties. If mica without any "V" cut is demanded by the buyer, it shall be supplied by the seller subject to mutual agreement.

5.4 Finishing

Muscovite mica blocks shall be finished with sickle- or knife-cut bevelled edges.

6 Grading procedure

6.1 Grading chart

The range of the areas and the minimum dimensions of the shorter side of the usable rectangle for the various grades, given in table 1, applies for the grading of all muscovite mica blocks, thins and films. A grading chart, based on this table and shown in the figure, or templates prepared in accordance with it, shall be used for grading in accordance with the procedure specified in 6.2.

6.1.1 Thumb-trimmed mica

This may also be graded according to the additional grades, based on the usable circle, given in table 2.

Table 2 — Additional grades for thumb-trimmed mica

Grade	Diameter of usable circle
	cm
Small punch	2,54
Punch	3,81
Circle	5,08

6.1.2 Madras rounds

These shall be graded to yield usable circles of the diameters given in table 3.

Table 3 — Additional grades for Madras rounds

Grade	Diameter of usable circle
	mm
25 to 29	25 to 29
30 to 34	30 to 34
35 to 39	35 to 39
40 to 44	40 to 44
45 to 49	45 to 49
50 to 54	50 to 54
55 and upwards	55 and upwards

6.2 Grading procedure

6.2.1 The sample to be graded is laid upon the chart or the corresponding template so that it covers point O and has its maximum and minimum dimensions extending along and covering lines OA and OB respectively. It is shifted until the usable area completely covers the largest rectangle, determined by a diagonal extending from O to a point lying in one of the regions designated as follows:

05 (No. 7)
06 (No. 6)
16 (No. 5 1/2)
20 (No. 5)
40 (No. 4)
⋮
500 (OEE Special)
630 (OOEE Special)

The number of the region in which the diagonal of the rectangle terminates designates the size (grade or number) of the sample.

6.2.2 In the case of blocks, all dimensions apply to the smaller surface measured from the foot of the bevel-trimmed edge.

6.2.3 In no case shall a crack extend into the usable area.

7 Tolerance

In any one batch or shipment, a tolerance of 5 % by mass of the next lower grade is permitted.