



Indian Minerals Yearbook 2012

(Part- III : Mineral Reviews)

51st Edition

MICA

(FINAL RELEASE)

**GOVERNMENT OF INDIA
MINISTRY OF MINES
INDIAN BUREAU OF MINES**

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Mica is widely distributed and occurs in igneous, metamorphic and sedimentary regimes. Mica group represents 34 phyllosilicate minerals that exhibits a layered or platy structure. Commercially important mica minerals are muscovite (potash or white mica) and phlogopite (magnesium or amber mica). Granitic pegmatites are the source of muscovite sheet while phlogopite is found in areas of metamorphosed sedimentary rocks into which pegmatite rich granite rocks have been intruded. It possesses highly perfect basal cleavage due to which it can easily and accurately split into very thin sheets or films of any specified thickness. It has a unique combination of elasticity, toughness, flexibility and transparency. It possesses resistance to heat and sudden change in temperature and high dielectric strength. It is chemically inert, stable and does not absorb water.

Over hundred years, India has enjoyed the monopoly in the production and export of sheet mica in the world. Of late, there has been a steady downfall in the production of mica. This declining trend could be attributed to the slow down in the demand of natural mica in the world market due to technological improvements that facilitate use of reconstituted mica and emergence of mica substitutes. However, there are sufficient resources in the country to meet the domestic requirement and export demand.

RESOURCES

Most important mica-bearing pegmatites occur in Andhra Pradesh, Bihar, Jharkhand, Maharashtra and Rajasthan. Occurrences of mica pegmatites are also reported from Gujarat, Haryana, Karnataka, Kerala, Odisha, Tamil Nadu and West Bengal.

As per UNFC, the total resources of mica in the country as on 1.4.2010 are estimated

at 532,237 tonnes out of which 190,741 tonnes are placed under reserves category and 341,496 tonnes under remaining resources category. Andhra Pradesh leads with 41% share in country's total resources followed by Rajasthan (21%), Odisha (20%), Maharashtra (15%), Bihar (2%) and balance (less than 1%) in Jharkhand (Table - 1).

PRODUCTION, STOCKS & PRICES

Mica (Crude)

The production of mica (crude) at 1807 tonnes in 2011-12 increased by about 36% as compared to the preceding year. There were 34 reporting mines of mica during the year as against 32 in the previous year.

Six mines, each producing above 100 tonnes annually accounted for 74% of the total output and eight mines producing 20 tonnes to 100 tonnes annually contributed about 24 percent. The remaining 2% was the contribution of 20 mica mines and one felspar mine each producing less than 20 tonnes annually.

The entire production was reported from private sector during the period under review. Six principal producers accounted for 76% of the total output. Andhra Pradesh continued to be the leading producing state contributing 94% of the total production and remaining six percent was reported from Rajasthan.

The mine-head stocks of mica (crude) were 465 tonnes at the end of year as against 425 tonnes in the beginning of the year 2011-12.

The average daily labour employed in mica mines during 2011-12 was 436 as against 405 in the previous year.

**Table – 1 : Reserves/Resources of Mica as on 1.4.2010
(By Grade/States)**

(In kg)

| Grade/State | Reserves | | | Remaining resources | | | | | Total resources (A+B) | | | | |
|--------------------------|------------------|---------------------------|------------------|-----------------------|----------------------------------|--------------------|---------------------|--------------------|-----------------------|--------------------------|------------------|------------------|-----------|
| | Proved STD111 | Probable STD121 STD122 | Total (A) | Feasibility STD211 | Pre-feasibility STD221 STD222 | Measured STD331 | Indicated STD332 | Inferred STD333 | | Reconnaissance STD334 | Total (B) | | |
| All India : Total | 169840721 | 15268960 | 190741448 | 21427000 | 11317310 | 118867638 | 52723690 | 42504035 | 94427443 | 228415 | 341495531 | 532236979 | |
| By Grade | | | | | | | | | | | | | |
| Unclassified | 169840721 | 15268960 | 190741448 | 21427000 | 11317310 | 118867638 | 52723690 | 42504035 | 94427443 | 228415 | 341495531 | 532236979 | |
| By States | | | | | | | | | | | | | |
| Andhra Pradesh | 162325190 | 15247003 | 2789885 | 180362078 | 7794000 | 5101000 | - | 3750000 | 5502145 | 18277005 | - | 40424150 | 220786228 |
| Bihar | - | 74233 | 74233 | - | - | - | - | - | 12992434 | 7700 | 13000134 | 13074367 | |
| Jharkhand | - | - | - | - | - | - | - | - | 1494430 | 170700 | 1665130 | 1665130 | |
| Maharashtra | - | - | - | - | - | 65916000 | - | - | 15120000 | - | 81036000 | 81036000 | |
| Odisha | - | - | - | - | 6216000 | 52024000 | - | 20328000 | 26712000 | - | 105280000 | 105280000 | |
| Rajasthan | 7515531 | 21957 | 2767649 | 10305137 | 13633000 | 310 | 927638 | 48973690 | 16673890 | 19831574 | 50015 | 100090117 | 110395254 |

Figures rounded off.

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Mica (Waste and Scrap)

The production of mica (waste and scrap) at 13690 tonnes in 2011-12 decreased by 87% compared to the previous year. The contribution of Andhra Pradesh was 51%, Bihar 34% of the total production and that of Rajasthan was 21% percent (Tables - 2 to 6).

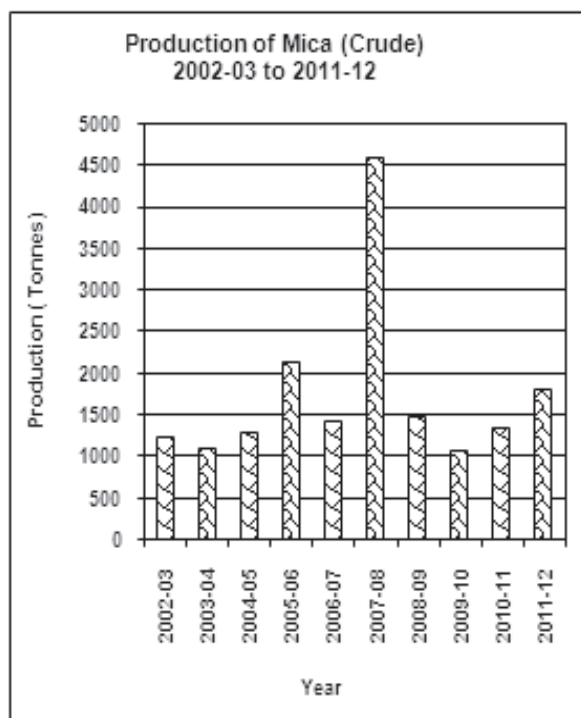


Table – 2 : Principal Producers of Mica, 2011-12

| Name & address of producer | Location of mine | |
|---|------------------|----------|
| | State | District |
| Dwarakananad Reddy, & 4 others, 1-C, Vaibhav Enclave, Manguta layout, Nellore, Andhra Pradesh. | Andhra Pradesh | Nellore |
| S.V.Mahendra Reddy, Mudigedu, Inukurthy Post- Inukurthy, Nellore, Andhra Pradesh. | Andhra Pradesh | Nellore |
| Dwarakananad Reddy, & 7 others, 1-C, Vaibhav Enclave, Manguta layout, Nellore, Andhra Pradesh. | Andhra Pradesh | Nellore |
| Sri Lakshmi Sai Durga Mining Co. 3-188-1, Dhurjetti Nagar, Post- Gudur-1, Nellore, Andhra Pradesh. | Andhra Pradesh | Nellore |
| Mahanth Mica Mines, Managing Partner, Smt. C. Leenaja Reddy, Plot No.7, Door No. 8, Ist Main Road, Kasturba Nagar, Chennai, Tamil Nadu. | Andhra Pradesh | Nellore |
| OM Mica Co. Mine Owner And Mineral Suppliers, Post- Tihari, Ajmer, Rajasthan. | Rajasthan | Ajmer |

Table – 3 : Production of Mica (Crude and Waste & Scrap), 2009-10 to 2011-12 (By States)

(Qty in tonnes; value in ₹ '000)

| State | 2009-10 | | 2010-11 | | 2011-12(P) | |
|---------------------------------|-------------|--------------|-------------|--------------|--------------|--------------|
| | Quantity | Value | Quantity | Value | Quantity | Value |
| Mica (Crude) | | | | | | |
| India | 1061 | 39940 | 1333 | 44505 | 1807 | 61934 |
| Andhra Pradesh | 1057 | 39817 | 1317 | 44124 | 1694 | 59101 |
| Rajasthan | 4 | 123 | 16 | 381 | 113 | 2833 |
| Mica (Waste & Scrap) | | | | | | |
| India | 8098 | - | 7311 | - | 13690 | - |
| Andhra Pradesh | 4394 | - | 4648 | - | 6918 | - |
| Bihar | - | - | 1459 | - | 4632 | - |
| Rajasthan | 3704 | - | 1204 | - | 2140 | - |

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**Table – 4 : Production of Mica (Crude and Waste & Scrap), 2010-11 and 2011-12
(By Sectors/States/Districts)**

(Qty in tonnes; value in ₹'000)

| State/District | 2010-11 | | | 2011-12(P) | | |
|---------------------------------|--------------|-------------|--------------|---------------|--------------|--------------|
| | No. of mines | Quantity | Value | No. of mines | Quantity | Value |
| Mica (Crude) | | | | | | |
| India | 32(4) | 1333 | 44505 | 34(12) | 1807 | 61934 |
| Private sector | 32(4) | 1333 | 44505 | 34(12) | 1807 | 61934 |
| Andhra Pradesh | 28(1) | 1317 | 44124 | 28(2) | 1694 | 59101 |
| Khammam # | 1 | - | - | 1 | - | - |
| Nellore | 27(1) | 1317 | 44124 | 27(2) | 1694 | 59101 |
| Bihar # | 1 | - | - | 1 | - | - |
| Nawada # | 1 | - | - | 1 | - | - |
| Rajasthan | 3(3) | 16 | 381 | 5(10) | 113 | 2833 |
| Ajmer | (1) | 6 | 198 | 1(9) | 113 | 2833 |
| Bhilwara | 2(2) | 10 | 183 | 3(1) | - | - |
| Rajsamand # | 1 | - | - | 1 | - | - |
| Mica (Waste & Scrap) | | | | | | |
| India | * | 7311 | - | * | 13690 | - |
| Private sector | * | 7311 | - | * | 13690 | - |
| Andhra Pradesh | * | 4648 | - | * | 6918 | - |
| Khammam | * | 50 | - | * | 193 | - |
| Nellore | * | 4598 | - | * | 6725 | - |
| Bihar # | * | 1459 | - | * | 4632 | - |
| Nawada # | * | 1459 | - | * | 4632 | - |
| Rajasthan | * | 1204 | - | * | 2140 | - |
| Ajmer | * | - | - | * | 111 | - |
| Bhilwara | * | 1104 | - | * | 2029 | - |
| Rajsamand | * | 100 | - | * | - | - |

* Mines covered under mica (crude).

Production of mica (waste & scrap)/feldspar/quartz only.

Figures in parentheses indicate associated mines.

**Table – 5 : Production of Mica (Crude), 2010-11 and 2011-12(P)
(By Frequency Groups)**

(Qty in tonnes)

| Production group | No. of mines | | Production for the group | | Percentage in total production | | Cumulative percentage | |
|-------------------|--------------|--------------|--------------------------|-------------|--------------------------------|---------------|-----------------------|----------|
| | 2010-11 | 2011-12 | 2010-11 | 2011-12 | 2010-11 | 2011-12 | 2010-11 | 2011-12 |
| All Groups | 32(2) | 34(1) | 1333 | 1807 | 100.00 | 100.00 | - | - |
| Up to 2 | 14(1) | 14(1) | 3 | 1 | 0.23 | 0.06 | 0.23 | 0.06 |
| 2 to 4 | 1 | 3 | 2 | 8 | 0.15 | 0.44 | 0.38 | 0.50 |
| 4 to 6 | 1 | - | 4 | - | 0.30 | - | 0.68 | 0.50 |
| 6 to 8 | (1) | 1 | 6 | 7 | 0.45 | 0.39 | 1.13 | 0.89 |
| 8 to 20 | 5 | 2 | 56 | 16 | 4.20 | 0.89 | 5.33 | 1.78 |
| 20 to 30 | 3 | 3 | 77 | 64 | 5.78 | 3.54 | 11.11 | 5.32 |
| 30 to 40 | 1 | - | 37 | - | 2.77 | - | 13.88 | 5.32 |
| 40 to 100 | 1 | 5 | 69 | 377 | 5.18 | 20.86 | 19.06 | 26.18 |
| Above 100 | 6 | 6 | 1079 | 1334 | 80.94 | 73.82 | 100.00 | 100.00 |

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**Table – 6 : Mine-head Stocks of Mica (Crude), 2011-12(P)
(By States)**

(In tonnes)

| State | At the beginning of the year | At the end of the year |
|----------------|------------------------------|------------------------|
| India | 425 | 465 |
| Andhra Pradesh | 424 | 454 |
| Rajasthan | 1 | 11 |

MINING, MARKETING AND TRANSPORT

All the mica mines were opened up first as prospecting pits. These trial workings were later developed into opencast workings of 5 to 10 m depths known as Upper Challa. The nature & quality of the yield decides as to whether underground method has to be adopted for mining of mica, especially mica-bearing pegmatites. Overhand cut-and-fill method of mining with flat-back and waste-fill methods are practised in mica mines. Pegmatite is opened up by striking vertical or inclined shaft. As mica is confined to hanging wall and footwall contacts and sometimes to core zone, driving and stoping is done only in these areas. The entire pegmatite body is not subjected to stoping, and wall and roof are generally self-supporting. The mines are developed to maximum 100 m depths. Most of the mines have installed haulages for transport of material, electric fans for ventilation and pumps for dewatering.

There has been change in tunnel method of mining in some of the mines by changing into open quarries in recent years. The old method was tunneling, but now some of the old mines have been made into open quarries. With this system, mines now produce felspar, quartz, mica and vermiculite. This system has also enabled use of heavy machinery which resulted into increase in production.

Crude mica produced from the workings is transported to the surface where it is cobbled manually to remove the gangue minerals like quartz, felspar and other associated minerals including waste mica. Skilled labourers dress the hand-cobbled mica with sickle, knife and scissors.

During dressing, the part of mica containing deformities, such as fractures, unevenness and cracks, is removed and only the better material is retained as blocks. Such blocks are classified into various sizes and qualities on the basis of visual estimates. The mica so rejected during dressing is sold as scrap. Mica processing is a labour-intensive activity requiring special skills. The art of manual processing of mica has been acquired by the Indian workers through generations. It has been a cottage industry in the mica mining areas of Bihar, Andhra Pradesh, Jharkhand and Rajasthan.

CONSUMPTION

Complete picture regarding the consumption of mica is not available as there is no adequate coverage of information on various mica-consuming industries. Sheet mica is used mainly in electrical and micanite industries while scrap mica is used in the manufacture of mica paper and ground mica which, in turn, is used in asphaltic roofing, welding electrode, paint, rubber, insulation bricks, etc.

USES

Natural sheet mica is used in electrical and electronic industries in the form of blocks, splittings and films or built-up mica called "micanite". Sheet mica is used to manufacture fabricated and micanite products, such as capacitors and commutator segments. Micanite or built-up mica is partly overlapped, irregular-shaped and arranged as splittings cemented together with either an organic or inorganic binder. Other uses of sheet mica include gauge glasses of high pressure steam boilers, diaphragms of oxygen-breathing equipment, marker dials of

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navigation compasses, quarterwave plates for optical instruments, window covers for radiation pyrometers & thermal regulators, stove window, chimneys for gas & petromax lamps, diaphragms in microwave transmitters and insulation wrappers for high tension radar coils. Besides, high quality natural mica sheets are used in helium-neon lasers where mica sheet works as retardation plate. Of late, mica washers have gained extensive use in computer industry.

Mica paper or reconstituted mica is a paper-like material made by depositing fine flakes of scrap mica as a continuous mat which is then dried. Mica paper is usually impregnated with organic binder. Primary end-uses of mica paper are the same as for micanite or built-up mica.

Micanite is used in electrical insulation mainly because natural mica sheet of sufficient thickness is not always available. This is used in copper commutator segments of DC universal motors and generators, moulding plates from which V-rings are cut and stripped for use in commutators. These moulding plates also find use in the form of tubes and rings as an insulator in transformers, armatures and motor starters. As flexible plates, micanite is also used in electric motors and generator-armatures, field coil insulators & magnet and commutator core insulation. Similarly, as heater plates, micanite is used where high insulation strength at high temperature is required.

In the construction sector, mica scrap/ground mica is used in jointing cement for gypsum boards, asphaltic roofings and damp-proof seal, and insulation boards. Ground mica acts as reinforcing filler in plaster for textured coatings. Mica is used in insulation bricks, slabs and tiles because of its excellent thermal and insulating properties. Dry-ground 50 mesh mica is used in the flux coating for arc welding electrodes, with flux containing 3 to 5% mica powder. In paints, mica in the form of powder is used as filler and as an extender because it provides a smoother consistency, improved workability and imparts increased resistance to water penetration and weathering. Mica is used mainly in four types of paints, such as bituminous emulsions, exterior paints, fire-retardant paints and pearlescent pigments. Mica is added to drilling fluids to get

off the lost circulation zones. The platy structure of mica facilitates the overlapping of particles to form a tight layer or wall, thereby preventing further fluid loss.

Ground mica is used in the rubber industry as a dusting agent and as an inert filler in the production of rubber. Mica fillers increase the hardness, tensile strength and tear resistance of rubber articles. In plastic industry, mica is used as a filler and reinforcer in thermoplastics to improve the electrical properties, flexural strength & modulus, stiffness, heat deflection temperatures and resistance. Dry-ground mica powder is used in small quantities in cosmetic applications. The property of high resistance of mica to the effect of the sun rays, moisture, gases, water and other chemicals, enables the use of dry-ground mica powder in small quantity to improve the decorative coating and lustre of wallpaper, printing and ceiling papers, etc. Wet-ground mica powder is used in paints, cosmetics, rubber, etc. as a filler. Small quantities of scrap mica/ground mica are also used in industries like foundries as coating to foundry cores and moulds, as a dry lubricant to prevent hot bearings from seizing up.

SUBSTITUTES

Mica and its products can be substituted to some extent by using alumina, ceramics, bentonite, glass, mylar polystyrene, fused quartz, silicon, talc, bakelite, teflon, nylon synthetic mica, acrylate polymers, cellulose acetate, fibre glass, etc.

Scrap

Some lightweight aggregates, such as diatomite, vermiculite and perlite may be substituted for ground mica when used as filler. Ground synthetic fluorophlogopite, fluorine-rich mica, may replace natural ground mica for uses that require thermal and electrical properties of mica.

Sheet Mica

Sheet mica is used in electrical components, electronics and atomic force microscopy. Many products can be substituted for mica in electrical and electronic uses. Substitutes include Acrylic,

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Benelex, Cellulose acetate, Delrin, Duranel N, Fibreglass, Fishpaper, Kel F, Kydex, Kapton Lexan, Lucite, Mylar, Nylon, Nylatron, Nomex, Noryl, Phenolics, Plexiglass, Polycarbonate, Polyester, Styrene, Teflon, Vinyl-PVC and Vulcanised Fibre.

SPECIFICATIONS

The Bureau of Indian Standards (BIS) has prepared standards for (a) processed mica, (b) fabricated mica and (c) mica-based products. BIS has brought out the following specifications for mica for various purposes:

IS: 1175 – 1981(First Revision, Reaffirmed 2011): Deals with methods of grading and classification of muscovite mica blocks, thins and films according to visual size, visual qualities and presence of structural imperfections.

IS: 1885 (Part-53)-1980 (Reaffirmed 2007): Deals with electrotechnical vocabulary, part-53, Mica.

IS: 2001-1968: Deals with specifications of fixed silvered mica capacitors.

IS: 2464-1963 (Reaffirmed 2008): Deals with specifications of built-up mica for electrical purposes.

IS: 9043-1979 (Reaffirmed 2011): Deals with grading (by size) of phlogopite mica blocks, thins, films and splittings.

IS: 9044-1979 (Reaffirmed 2011): Deals with methods of measuring thickness of mica blocks, thins, films and splittings.

IS: 9045-1979 (Reaffirmed 2011): Deals with thermal classification of phlogopite mica splittings.

IS : 9299 (Part 3/Sec.1)- 1979 (Reaffirmed 2003): Deals with rigid mica material for commutator separators.

IS: 9299 (Part3/Sec.2)–1982 (Reaffirmed 2003): Deals with moulding mica materials for electrical purposes.

IS : 9299 (Part 3/Sec. 3) – 1982 (Reaffirmed 2008): Deals with flexible mica flake tape for insulation of electrical machines.

IS : 9299 (Part 3/Sec. 4) (Reaffirmed 2008): Deals with rigid mica materials for heating equipment.

IS : 13357 : Methods of grading and visual classification of muscovite mica splittings.

TRADE POLICY

As per the Foreign Trade Policy for 2009-14 and the effective Export-Import Policy, exports and imports of all varieties of mica blocks, splittings, powder, waste and scrap under heading 2525 are allowed without restrictions.

WORLD REVIEW

Very large reserves of mica (Natural), sheet are located mainly in India and Moderate reserve of Mica located at Russia. The data on world reserves of mica (natural), sheet are given in Table - 7.

The world output of mica was 307 thousand tonnes in 2011. China and USA were the leading producers of mica, followed by Republic of Korea, France, Canada and Finland (Table -8).

Table – 7 : World Reserves of Mica (Natural), Sheet (By Principal Countries)

| Country | Reserves |
|----------------------|-------------------|
| World : Total | Very Large |
| India | Very large |
| Russia | Moderate |
| USA | Very small |
| Other countries | Moderate |

Source: Mineral Commodity Summaries, 2013.

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**Table – 8 : World Production of Mica
(By Principal Countries)**

| (In '000 tonnes) | | | |
|-----------------------|-----------------|-----------------|-----------------|
| Country | 2009 | 2010 | 2011 |
| World: Total | 260 | 308 | 307 |
| Argentina | 9 | 10 | 10 ^e |
| Canada ^e | 15 | 15 | 15 |
| China ^e | 91 | 126 | 132 |
| Finland | 9 | 14 | 13 |
| France ^e @ | 18 | 19 | 19 |
| Iran | 7 | 3 | 3 ^e |
| Korea Republic of # | 27 | 36 | 31 |
| Malaysia | 4 | 5 | 4 |
| Russia ^e | 9 | 9 | 9 |
| Spain @ | 4 | 4 | 4 |
| USA @* | 51 ^e | 53 ^e | 50 |
| Other countries | 16 | 14 | 17 |

Source: World Mineral Production, 2007-11.

Mainly sericite.

@ Including mica recovered from mica schists and/or kaolin beneficiation.

* Sold or used by producers.

FOREIGN TRADE**Exports**

Exports of mica (total) increased to 131,777 tonnes in 2011-12 from 126,554 tonnes in the previous year. Almost all the exports were in the form of mica (unmanufactured) at 131,108 tonnes (comprising blocks 4,168 tonnes, splittings 2,246 tonnes, powder 81,151 tonnes, and waste & scrap 43,503 tonnes). The exports of mica (worked) were 669 tonnes (comprising washers & discs 64 tonnes, sheets & strips 93 tonnes, micanite & other built up mica 10 tonnes, other worked mica 492 tonnes and mica bricks 5 tonnes). Besides, nominal quantities of condenser films, plates, cuts, NES were also exported. In 2011-12, exports were mainly to China (54%), Belgium (8%), USA (5%), Germany (3%) and England (2 %) (Tables - 9 to 22).

Imports

Imports of mica (total) increased to 2,458 tonnes in 2011-12 from 1,687 tonnes in the previous year. Out of the total imports in 2011-12, imports of mica (unmanufactured) were 894 tonnes (comprising powder-170 tonnes, splittings 445 tonnes and waste & scrap 146 tonnes). Besides, nominal quantity of block mica was also imported. The 1,564 tonnes imports were of mica (worked) which included condenser films, plates, cuts, NES 121 tonnes, sheets & strips 174 tonnes, micanite and other built up mica 19 tonnes and other worked mica 1234 tonnes, besides 14 tonnes of washers & discs (Tables - 23 to 34).

**Table – 9 : Exports of Mica : Total
(By Countries)**

| Country | 2010-11 | | 2011-12 | |
|----------------------|---------------|------------------|---------------|------------------|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| All Countries | 126554 | 2258655 | 131777 | 2887096 |
| China | 77169 | 1173815 | 71309 | 1268034 |
| Japan | 5414 | 228502 | 5849 | 324428 |
| Belgium | 8745 | 173563 | 10226 | 230352 |
| USA | 3996 | 142717 | 6244 | 217533 |
| France | 54 | 3911 | 2221 | 91267 |
| Finland | 1801 | 40887 | 2640 | 79475 |
| Germany | 3260 | 46442 | 3790 | 65317 |
| Russia | 625 | 30960 | 1022 | 55492 |
| Netherlands | 428 | 19106 | 704 | 48007 |
| UK | 1278 | 34175 | 1050 | 44853 |
| Other countries | 23784 | 364577 | 26722 | 462338 |

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**Table – 10 : Exports of Mica
(Unmanufactured) : Total
(By Countries)**

| Country | 2010-11 | | 2011-12 | |
|----------------------|---------------|------------------|---------------|------------------|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| All Countries | 125844 | 1892086 | 131108 | 2377259 |
| China | 77076 | 1108739 | 71271 | 1228986 |
| Belgium | 8745 | 171577 | 10225 | 229522 |
| Japan | 5353 | 161304 | 5580 | 199856 |
| USA | 3838 | 93784 | 6193 | 122951 |
| France | 53 | 1157 | 2219 | 86888 |
| Finland | 1800 | 40251 | 2640 | 78694 |
| Germany | 3247 | 37521 | 3782 | 51707 |
| Russia | 624 | 26119 | 1020 | 45822 |
| Ukraine | 313 | 1845 | 1045 | 37129 |
| Saudi Arabia | 3510 | 19202 | 7562 | 27461 |
| Other countries | 21285 | 230587 | 19571 | 268243 |

**Table – 11 : Exports of Mica (Blocks)
(By Countries)**

| Country | 2010-11 | | 2011-12 | |
|----------------------|-------------|------------------|-------------|------------------|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| All Countries | 2762 | 114112 | 4168 | 118371 |
| Japan | 1278 | 58591 | 997 | 58668 |
| China | 297 | 27140 | 417 | 43951 |
| Russia | 146 | 7935 | 3 | 3491 |
| Korea, Rep. of | 80 | 2200 | 44 | 2451 |
| Bangladesh | 522 | 1615 | 753 | 1783 |
| UK | ++ | 131 | 3 | 1268 |
| Greece | - | - | ++ | 891 |
| USA | 17 | 1125 | 24 | 848 |
| Slovak Rep | 1 | 759 | 1199 | 830 |
| Hong Kong | 9 | 1195 | 5 | 829 |
| Other countries | 412 | 13421 | 723 | 3361 |

**Table – 12 : Exports of Mica (Splittings)
(By Countries)**

| Country | 2010-11 | | 2011-12 | |
|----------------------|-------------|------------------|-------------|------------------|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| All Countries | 1989 | 63477 | 2246 | 107093 |
| Russia | 16 | 5427 | 47 | 22196 |
| Kazakhstan | 83 | 14505 | 43 | 14404 |
| China | 434 | 14108 | 286 | 12048 |
| USA | 74 | 10267 | 172 | 11073 |
| Ukraine | - | - | 24 | 8872 |
| Japan | 21 | 1999 | 29 | 6605 |
| Lithuania | - | - | 16 | 6520 |
| Algeria | - | - | 955 | 3841 |
| Italy | 57 | 586 | 28 | 2798 |
| Germany | 162 | 4372 | 259 | 9891 |
| Other countries | 1142 | 12213 | 387 | 8845 |

**Table – 13 : Exports of Mica (Powder)
(By Countries)**

| Country | 2010-11 | | 2011-12 | |
|----------------------|--------------|------------------|--------------|------------------|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| All Countries | 86453 | 1263880 | 81151 | 1401193 |
| China | 48414 | 724545 | 34648 | 629266 |
| Belgium | 8232 | 156643 | 9355 | 202476 |
| Japan | 3056 | 78487 | 3836 | 113320 |
| USA | 3272 | 72141 | 5354 | 98771 |
| Finland | 1700 | 37769 | 2640 | 78694 |
| Germany | 2162 | 17821 | 3207 | 32969 |
| Ukraine | 313 | 1845 | 1021 | 28257 |
| Saudi Arabia | 3119 | 17417 | 7425 | 26994 |
| Netherlands | 385 | 3102 | 652 | 19010 |
| Korea Rp | 2684 | 23078 | 707 | 17933 |
| Other countries | 13116 | 131032 | 12306 | 153503 |

**Table – 14 : Exports of Mica (Waste & Scrap)
(By Countries)**

| Country | 2010-11 | | 2011-12 | |
|----------------------|--------------|------------------|--------------|------------------|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| All Countries | 34632 | 450102 | 43503 | 749864 |
| China | 27923 | 342572 | 35880 | 543070 |
| France | - | - | 2159 | 85239 |
| Belgium | 383 | 11784 | 870 | 27046 |
| Japan | 998 | 22227 | 718 | 21262 |
| Russia | 462 | 12662 | 725 | 17718 |
| Czech Republic | 121 | 3293 | 482 | 13962 |
| USA | 515 | 10250 | 643 | 12259 |
| Germany | 923 | 15272 | 286 | 8240 |
| Romania | 173 | 3839 | 170 | 4715 |
| Iran | 498 | 4376 | 400 | 4390 |
| Other countries | 2636 | 23827 | 1170 | 11963 |

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**Table – 15 : Exports of Mica (Worked) : Total
(By Countries)**

| Country | 2010-11 | | 2011-12 | |
|----------------------|------------|------------------|------------|------------------|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| All Countries | 710 | 366569 | 669 | 509837 |
| Japan | 61 | 67198 | 269 | 124572 |
| USA | 118 | 48933 | 51 | 94583 |
| China | 93 | 65076 | 38 | 39048 |
| UK | 27 | 22993 | 48 | 35244 |
| Mexico | 34 | 41771 | 35 | 33788 |
| Netherlands | 43 | 16005 | 52 | 28786 |
| Hong Kong | 132 | 24919 | 35 | 26343 |
| Korea, Rep. of | 6 | 6060 | 17 | 15182 |
| Germany | 13 | 8921 | 8 | 13610 |
| Russia | 1 | 4841 | 2 | 9669 |
| Other countries | 182 | 59852 | 114 | 89012 |

**Table – 16 : Exports of Mica (Condenser Films)
(By Countries)**

| Country | 2010-11 | | 2011-12 | |
|----------------------|------------|------------------|------------|------------------|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| All Countries | 8 | 515 | 40 | 738 |
| China | 8 | 373 | 40 | 651 |
| Russia | ++ | 96 | ++ | 87 |
| Other countries | ++ | 46 | - | - |

**Table – 17 : Exports of Mica
(Cond. Films, Plates, Cuts (NES)
(By Countries)**

| Country | 2010-11 | | 2011-12 | |
|---------------------------|------------|------------------|------------|------------------|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| All Countries | 3 | 2570 | 5 | 18066 |
| Japan | - | - | 1 | 10454 |
| USA | 2 | 1551 | 2 | 5851 |
| Chinese Taipei/ Taiwan | - | - | 1 | 378 |
| South Africa | - | - | 1 | 368 |
| Tanzania Rep | - | - | ++ | 221 |
| Poland | ++ | 83 | ++ | 213 |
| Korea | - | - | ++ | 144 |
| Germany | - | - | ++ | 102 |
| Italy | ++ | 36 | ++ | 101 |
| UK | - | - | ++ | 76 |
| Other countries | 1 | 900 | ++ | 158 |

**Table – 18 : Exports of Mica
(Washers & Discs)
(By Countries)**

| Country | 2010-11 | | 2011-12 | |
|---------------------------|------------|------------------|------------|------------------|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| All Countries | 56 | 61280 | 64 | 57821 |
| Mexico | 34 | 41751 | 35 | 33780 |
| USA | 6 | 7874 | 5 | 10087 |
| Japan | 3 | 3064 | 8 | 6018 |
| Hong Kong | 2 | 1229 | 2 | 1574 |
| Germany | ++ | 12 | 2 | 1370 |
| Egypt | - | - | 8 | 780 |
| Poland | ++ | 396 | ++ | 712 |
| Belgium | - | - | 1 | 682 |
| UK | ++ | 24 | ++ | 642 |
| Chinese Taipei/ Taiwan | 1 | 373 | 1 | 509 |
| Other countries | 10 | 6557 | 2 | 1667 |

**Table – 19 : Exports of Mica
(Sheets & Strips)
(By Countries)**

| Country | 2010-11 | | 2011-12 | |
|---------------------------|------------|------------------|------------|------------------|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| All Countries | 47 | 25731 | 93 | 89832 |
| Japan | 3 | 2785 | 28 | 21546 |
| UK | 3 | 3387 | 9 | 17135 |
| USA | 3 | 2232 | 7 | 10259 |
| China | 19 | 7629 | 8 | 8485 |
| Hong Kong | 3 | 1960 | 9 | 6280 |
| Korea Rp | - | - | 9 | 5656 |
| Chinese Taipei/ Taiwan | 1 | 743 | 6 | 2656 |
| Korea Dp Rp | - | - | 4 | 2620 |
| Canada | 3 | 532 | 6 | 2344 |
| France | ++ | 261 | 1 | 1669 |
| Other countries | 12 | 6202 | 6 | 11182 |

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Table – 20: Exports of Micanite & Other Built-Up Mica (By Countries)

| Country | 2010-11 | | 2011-12 | |
|---------------------------|----------|---------------|-----------|---------------|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| All Countries | 8 | 4342 | 10 | 4087 |
| Venezuela | ++ | 183 | 3 | 732 |
| Brazil | 1 | 413 | 1 | 710 |
| Hong Kong | 1 | 308 | 1 | 592 |
| Georgia | - | - | ++ | 499 |
| Malaysia | 1 | 396 | 1 | 486 |
| South Africa | 2 | 723 | 2 | 386 |
| Thailand | ++ | 52 | 1 | 267 |
| Philippines | - | - | ++ | 215 |
| Egypt | 2 | 354 | 1 | 122 |
| Chinese Taipei/ Taiwan | 1 | 140 | ++ | 52 |
| Other countries | ++ | 1773 | ++ | 26 |

Table – 23 : Imports of Mica : Total (By Countries)

| Country | 2010-11 | | 2011-12 | |
|----------------------|-------------|---------------|-------------|---------------|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| All Countries | 1687 | 411461 | 2458 | 599808 |
| Switzerland | 344 | 169561 | 269 | 157473 |
| China | 536 | 53999 | 849 | 119271 |
| Austria | 335 | 114179 | 180 | 110788 |
| Germany | 44 | 13042 | 110 | 42558 |
| Japan | 39 | 3899 | 81 | 25869 |
| Malaysia | 43 | 15099 | 84 | 23173 |
| UK | 112 | 16525 | 40 | 19296 |
| Brazil | 9 | 669 | 25 | 18773 |
| USA | 14 | 4247 | 173 | 16390 |
| Russia | | | 178 | 9788 |
| Other countries | 211 | 20241 | 469 | 56429 |

Table – 21 : Exports of Mica (Bricks) (By Countries)

| Country | 2010-11 | | 2011-12 | |
|----------------------|------------|---------------|----------|---------------|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| All Countries | 189 | 3388 | 5 | 426 |
| Korea Rp | - | - | 1 | 177 |
| UAE | - | - | ++ | 144 |
| Japan | - | - | 4 | 105 |
| Other countries | 189 | 3388 | - | - |

Table – 24 : Imports of Mica (Unmanufactured) : Total (By Countries)

| Country | 2010-11 | | 2011-12 | |
|----------------------|------------|---------------|------------|---------------|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| All Countries | 409 | 13603 | 894 | 28004 |
| Russia | - | - | 173 | 7503 |
| China | 186 | 3959 | 278 | 6582 |
| Japan | 23 | 2243 | 25 | 3568 |
| Sri Lanka | 35 | 714 | 180 | 3468 |
| USA | 9 | 1205 | 144 | 2151 |
| Thailand | - | - | 20 | 823 |
| Norway | 9 | 524 | 17 | 724 |
| Spain | 2 | 422 | 3 | 692 |
| Korea Rep. of | - | - | 14 | 665 |
| Germany | 5 | 610 | 19 | 344 |
| Other countries | 140 | 3926 | 21 | 1484 |

Table – 22 : Exports of Mica Worked (Others) (By Countries)

| Country | 2010-11 | | 2011-12 | |
|----------------------|------------|---------------|------------|---------------|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| All Countries | 407 | 269258 | 492 | 339605 |
| Japan | 55 | 61349 | 228 | 86448 |
| USA | 18 | 35456 | 37 | 68383 |
| China | 73 | 56761 | 30 | 30487 |
| Netherlands | 42 | 15284 | 52 | 28786 |
| Hong Kong | 126 | 21422 | 23 | 17897 |
| UK | 24 | 19238 | 39 | 17391 |
| Germany | 13 | 8549 | 5 | 10548 |
| Korea Rp | 5 | 5604 | 7 | 9205 |
| Russia | 1 | 3355 | 2 | 9005 |
| Turkey | 3 | 1928 | 12 | 7635 |
| Other countries | 47 | 40312 | 57 | 53820 |

Table – 25 : Imports of Mica (Blocks) (By Countries)

| Country | 2010-11 | | 2011-12 | |
|----------------------|-----------|---------------|------------|---------------|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| All Countries | ++ | 12 | 133 | 963 |
| USA | - | - | 133 | 963 |
| Other countries | ++ | 12 | - | - |

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**Table – 26 : Imports of Mica (Splittings)
(By Countries)**

| Country | 2010-11 | | 2011-12 | |
|----------------------|------------|------------------|------------|------------------|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| All Countries | 258 | 4707 | 445 | 14998 |
| Russia | - | - | 173 | 7503 |
| China | 136 | 2165 | 223 | 4360 |
| Japan | - | - | 17 | 2270 |
| Sri Lanka | - | - | 25 | 473 |
| Germany | - | - | 3 | 199 |
| UK | - | - | 2 | 115 |
| Italy | - | - | 2 | 78 |
| Other countries | 122 | 2542 | - | - |

**Table – 29 : Imports of Mica (Worked) : Total
(By Countries)**

| Country | 2010-11 | | 2011-12 | |
|----------------------|-------------|------------------|-------------|------------------|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| All Countries | 1278 | 397858 | 1564 | 571804 |
| Switzerland | 344 | 169561 | 269 | 157473 |
| China | 350 | 50040 | 571 | 112689 |
| Austria | 335 | 114179 | 180 | 110788 |
| Germany | 39 | 12432 | 91 | 42213 |
| Malaysia | 43 | 15099 | 84 | 23173 |
| Japan | 16 | 1656 | 56 | 22300 |
| UK | 111 | 16445 | 38 | 19181 |
| Brazil | 4 | 479 | 25 | 18773 |
| USA | 5 | 3042 | 29 | 14239 |
| Korea, Rep. | 6 | 4981 | 11 | 8126 |
| Other countries | 25 | 9944 | 210 | 42849 |

**Table – 27 : Imports of Mica (Powder)
(By Countries)**

| Country | 2010-11 | | 2011-12 | |
|----------------------|------------|------------------|------------|------------------|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| All Countries | 126 | 8429 | 170 | 9258 |
| China | 50 | 1793 | 55 | 2222 |
| Japan | 23 | 2243 | 8 | 1299 |
| USA | 9 | 1205 | 10 | 1148 |
| Thailand | - | - | 20 | 823 |
| Norway | 9 | 524 | 17 | 724 |
| Spain | 2 | 422 | 3 | 692 |
| Korea Rep. | - | - | 14 | 665 |
| Canada | - | - | 5 | 338 |
| France | 2 | 182 | 4 | 331 |
| Denmark | 4 | 150 | 6 | 253 |
| Other countries | 27 | 1910 | 28 | 763 |

**Table – 30 : Imports of Mica
(Condenser Films, Plates, Cuts, NES)
(By Countries)**

| Country | 2010-11 | | 2011-12 | |
|----------------------|------------|------------------|------------|------------------|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| All Countries | 92 | 48778 | 121 | 412.33 |
| Switzerland | 61 | 39875 | 52 | 24051 |
| Germany | 17 | 3651 | 20 | 8938 |
| China | 3 | 299 | 11 | 2942 |
| Japan | - | - | 4 | 1292 |
| Korea | - | - | 1 | 1277 |
| Belgium | - | - | 27 | 1096 |
| USA | - | - | 4 | 831 |
| UK | 9 | 2942 | 1 | 728 |
| Hong Kong | - | - | 1 | 37 |
| Malaysia | - | - | ++ | 22 |
| Other Countries | 2 | 2011 | ++ | 19 |

**Table – 28 : Imports of Mica (Waste & Scrap)
(By Countries)**

| Country | 2010-11 | | 2011-12 | |
|----------------------|------------|------------------|------------|------------------|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| All Countries | 25 | 455 | 146 | 2785 |
| Sri Lanka | 25 | 455 | 145 | 2744 |
| USA | - | - | 1 | 41 |

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**Table – 31 : Imports of Mica
(Washers & Discs)
(By Countries)**

| Country | 2010-11 | | 2011-12 | |
|----------------------|------------|------------------|------------|------------------|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| All Countries | 1 | 221 | 14 | 3248 |
| UK | - | - | 4 | 1272 |
| China | 1 | 143 | 7 | 1098 |
| USA | ++ | 78 | 1 | 568 |
| Germany | - | - | 2 | 284 |
| Switzerland | - | - | ++ | 25 |
| Other countries | - | - | ++ | 1 |

**Table – 32 : Imports of Mica
(Sheets & Strips)
(By Countries)**

| Country | 2010-11 | | 2011-12 | |
|----------------------|------------|------------------|------------|------------------|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| All Countries | 203 | 9356 | 174 | 23676 |
| Germany | - | - | 5 | 9936 |
| China | 123 | 4956 | 145 | 6365 |
| UK | 80 | 4388 | 2 | 3942 |
| Italy | - | - | ++ | 1658 |
| Japan | ++ | 12 | 16 | 1614 |
| Belgium | - | - | 6 | 160 |
| Other countries | - | - | ++ | 1 |

**Table – 33 : Imports of Micanite & Other
Built-up Mica
(By Countries)**

| Country | 2010-11 | | 2011-12 | |
|----------------------|------------|------------------|------------|------------------|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| All Countries | 22 | 2122 | 19 | 2928 |
| China | 9 | 1159 | 13 | 1993 |
| Mayanmar | - | - | 6 | 935 |
| Other countries | 13 | 963 | - | - |

**Table – 34 : Imports of Mica Worked
(Others)
(By Countries)**

| Country | 2010-11 | | 2011-12 | |
|----------------------|------------|------------------|-------------|------------------|
| | Qty (t) | Value (₹'000) | Qty (t) | Value (₹'000) |
| All Countries | 956 | 335992 | 1234 | 500035 |
| Switzerland | 283 | 129686 | 217 | 133397 |
| Austria | 333 | 112167 | 180 | 110788 |
| China | 214 | 43484 | 394 | 100083 |
| Malaysia | 43 | 15099 | 84 | 23151 |
| Germany | 18 | 7498 | 64 | 23055 |
| Japan | 3 | 680 | 36 | 19394 |
| Brazil | 4 | 479 | 25 | 18773 |
| UK | 22 | 9115 | 31 | 13239 |
| USA | 5 | 2965 | 24 | 12840 |
| Sweden | 5 | 2085 | 19 | 7838 |
| Other countries | 26 | 12734 | 160 | 37477 |

FUTURE OUTLOOK

There are sufficient resources of mica in the country to meet the domestic demand and export requirement. As per the Report of the Sub Group for the 12th Plan (2012-17), Planning Commission of India, there appears to be good demand for wet ground mica especially in the manufacture of pearlescent pigments which are increasingly used in the automotive industry. The Sub Group has recommended that establishment of wet ground mica plants based on imported know-how in the country needs to be encouraged. The quality of Indian ground mica powder is acceptable to

foreign buyers. However, they prefer that the material should be free from iron and consistency in the mesh size in the powder. The Sub Group has underlined the need for efforts in this direction. It has also opined that process know-how for recovery of substantial concentration of lithium, rubidium and cesium values contained in some of the mica deposits in the country needs to be developed.

For boosting exports, it would be necessary for Indian Mica Industry to manufacture an export fabricated & value-added mica-based products, such as mica paper, micanite sheets and mica based paper.

