

MARBLE



Indian Minerals Yearbook 2015

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54th Edition

MARBLE

(FINAL RELEASE)

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MINISTRY OF MINES
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Marble is a 'minor mineral' as defined under Clause (e) of Section 3 of Mines and Minerals (Development & Regulation) Act, 1957. The term "marble" is derived from the Latin word *Marmor* which in turn is said to have been coined from Greek word *Marmorous*, meaning shining stone. It is known for its pleasant colours, smooth and uniform texture, moderate hardness, amenability to be quarried into big blocks, smooth & shiny polished surface and silky feel. Marble occupies a unique position among other dimension stones because of its aesthetic value.

In terms of geological definition, it is a metamorphosed limestone produced by re-crystallisation under condition of thermal and also regional metamorphism. In commercial parlance, all calcareous rocks capable of taking polish are classed as marbles. Furthermore, serpentine rocks containing little calcium or magnesium carbonates, if attractive and capable of taking good polish are also classed as marbles. The calcareous stones like onyx, travertine and some limestone have also been classed as marbles. Marble is not a prime export commodity like the dimension stone and granite. Its internal demand has always remained high and most of the production added with recent increase in imports is consumed within the country. Marble is

the most preferred stone in India among all dimension stones. Most of the units in the marble industry are in the small scale sector.

RESOURCES

The occurrences of marble have been reported from many states, viz, Rajasthan, Gujarat, Haryana, Andhra Pradesh, Madhya Pradesh, Jammu & Kashmir, Maharashtra, Sikkim, Uttar Pradesh and West Bengal. Among the above states, marble deposits of economic importance are localised in Rajasthan, Gujarat, Haryana and Madhya Pradesh.

Rajasthan has the distinction of having the best among Indian resources of good quality marble. Out of 33 districts, 20 districts have marble in one or the other form. The important regions of marble occurrences in Rajasthan are:

- i) Udaipur - Rajsamand - Chittorgarh region;
- ii) Makrana - Kishangarh region;
- iii) Banswara - Dungarpur region;
- iv) Andhi (Jaipur) - Jhiri (Alwar) region; and
- v) Jaisalmer region.

The important deposits of marble in Rajasthan are given in Table - 1.

Table – 1 : Important Deposits of Marble in Rajasthan

Sl.No.	Name of deposit	District
i)	Agaria, Amet, Kelwa, Morwad, Kotri, Parvati, Morchana, Vani, Talai, Sapra, Ka Guda, Thodi Nijharana, Umti, Jhanjer, Arna, Dharmita, Koyal.	Rajsamand
ii)	Makrana, Borawad (White), Chausira, Dungri, Paharkuan (pink) Kumari, Ulodi, Pink Range, Kala Nada Talab.	Nagaur
iii)	Rikhabdeo, Odwas, Darauli, Tidi, Jaspura, Masaron Ki Obri (Green), Paduna, Babarmal, Devimata (Pink), Sarvadi, Manpur, Lohagarh, Kela Kuan (Black), Modi Chipala (White)	Udaipur
iv)	Tripura Sundari, Bhimkund, Khema-Talai, Bhanwaria-Talai, Kotharia, Vithaldeo, Prithvipura, Paloda, Oda-Bassi.	Banswara
v)	Andhi, Bhainslana, Todi-ka-Bas, Kotputli, Raisala, Nimla.	Jaipur
vi)	Jhiri, Rajgarh, Badampur, Moti-Dungri, Dadhikar, Kho, Baldegarh, Malana, Goverdhanpura.	Alwar
vii)	Selwara, Ideria, Perwa-Serwa, Khandra, Deri, Morthala, Ajari.	Sirohi
viii)	Jahajpur, Manohargarh, Asind, Banera, Shahpura, Sarankhera, Kanti, Munjras, Panchanpura, Malola, Pansel.	Bhilwara
ix)	Narwar, Sardhana, Sursura, Kali-Dungari, Torka, Ladpura, Roopnagar, Kekri, Umaria, Sawar, Ganeshnagar.	Ajmer
x)	Patan, Kela-Dungari (Maonda).	Sikar
xi)	Dagota.	Dausa
xii)	Umar, Pagara.	Bundi
xiii)	Sabla, Nandli-dad, Peeth, Manpur, Dachki, Mal Surata (Green Serpentic).	Dungarpur
xiv)	Mandal Deh.	Chittorgarh
xv)	Pachori Chadi, Moriya-Munjasar, Au, Indolai ki Dhani.	Jodhpur
xvi)	Bar-Sendra Sarangwa, Kundal, Dujara, Diyana, Khiwandi, Kantatiya, Sewari.	Pali
xvii)	Dunkar, Bidasar, Charla.	Churu
xviii)	Moolsagar, Amarsagar, Habur, Narpia, Sipla, Badabag, Jethwai.	Jaisalmer

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The marbles of Rajasthan are in various colours and shades. The Makrana area is famous for pure white crystalline marble. Other varieties found in Makrana area are Albata, Adanga, Dongri Pink, etc. The marble from Rajsamand area is mined extensively. It is off-white and greyish-white. The internationally acclaimed variety of green marble comes from Rikhabdeo-Kesariaji area, 60 km away from Udaipur. The green marble has various shades of green with white and black network and patches. The marble from Babarmal is pink and is marketed as Indian Pink. It is a fine-grained hard marble having black and white bands. The marble from Bhilwara is white to off-white, fine to medium-grained hard marble having black and white bands. The marble from Banswara is white to off-white dolomitic marble and is soft. It is used generally for cladding purpose. The white to greyish-white marbles of Jaipur area are being sold under the trade name Andhi Pista, a white marble having green laths of serpentine; onyx; Indo-Italian and Black Marble. The Bhainslana marble is dark-black.

Gujarat has vast resources of marble in Banaskantha, Bharuch, Vadodara, Kachchh and Panchmahal districts. The Ambaji area in Banaskantha district and Chinchpura area in Vadodara district are the main producing centres. The white marble of Ambaji is known for its amenability to carving. Other deposits in Banaskantha district are Jarivav, Kumbharia, Kateswar, Bheroj and Khikla. Marble of Vadodara district occurs in various shades, viz, green, white, pink and cream. Marble of Bharuch varies in colour from black to green and red. The yellow marble of Kachchh is thin-bedded, sometimes fossiliferous and blockable deposits occur at Bhulawara-Chinchpura belt.

In Haryana, marble deposits are located in the district of Mahendragarh. Most important localities are Antri-Beharipur, Zainpur, Chappra-Bibipur, Nangaldurgu, Islampur and Dhanota-Dhancholi. Marble of this area occurs in variegated colours and banded forms. It enjoys the reputation as 'Patiala Marble' with black and white bands.

Of late, the world-famous marble rocks 'Bhedaghat' near Jabalpur in Madhya Pradesh have attracted entrepreneurs from Rajasthan. The extension of these rocks located in between Jabalpur and Katni is being quarried. The marble from these areas is exploited for its off-white, fine-

grained, banded attributes. A number of quarries are under operation.

Marble deposits of Maharashtra are of calcitic and dolomitic type which are located in the areas of Katta-Hiwara, Kadbikhera, Sakaritola, Pauni, Chorbaoli, Deolapar, Mansar, Kandri, Chargaon, Junewani villages in Nagpur district. In Katta-Hiwara, the marble is light-pink to grey in colour. The marble of Kadbikhera-Sakaritola is pink calcitic marble while the marble deposits of Mansar and Kandri areas are dolomitic type.

In Uttarakhand, thick impersistent bands of white marble occur in massive limestone in Pithoragarh district.

In Mirzapur district of Uttar Pradesh, two marble deposits at Hingha and Geria are of good quality and can yield blocks for limited requirement.

In Jharkhand, huge deposits of marble are available in Semra-Salatua and adjoining areas of Palamu. Pink marble occurrences are reported from Hesadih area, Singhbhum district.

The marbles of Khammam area Andhra Pradesh are white and green. Occurrences of pink, purple, yellow and variegated marbles are reported in Cuddapah, Kurnool and Anantapur districts. The dolomitic marble of Cuddapah, Kurnool and Anantapur districts is other upcoming resource centre for off-white, coloured, greyish-black marbles which take good polish and are being exploited by private entrepreneurs.

On the basis of available data, IBM has prepared a mineral inventory of marble reserves and resources as per UNFC system as on 1.4.2010 which is furnished in Table - 2. The total resources of all grades of marble are placed at 1,931 million tonnes. Of these, only about 276 million tonnes (14%) fall under 'reserves' category and about 1655 million tonnes (86%) under 'remaining resources' category. Gradewise, about 27% resources fall under unclassified and not-known grades, 55% under off-colour grade and 17% under white colour grade. The available data on marble resources reveal that about 64% resources are in Rajasthan and 21% in Jammu & Kashmir. The remaining resources are distributed mainly in Gujarat, Chhattisgarh, Maharashtra, Haryana, Uttarakhand and Sikkim in descending order.

**Table – 2 : Reserves/Resources of Marble as on 1.04.2010
(By Grades/States)**

State/Grade	Reserves					Remaining resources					Total resources (A+B)
	Proved STD111	Probable		Total A	Pre-feasibility		Indicated STD332	Inferred STD333	Reconnaissance STD334	Total B	
		STD121	STD122		STD221	STD222					
All India : Total	103736	172661	98	276495	29842	72289	107129	1445708	-	1654968	1931463
By Grades											
White Colour	72700	124504	-	197204	-	81	-	133442	-	133523	330727
Off Colour	31036	48059	-	79095	27805	48352	107129	809104	-	992390	1071485
Unclassified	-	-	-	-	-	21870	-	498512	-	520382	520382
Not-Known	-	98	98	196	2037	1986	-	4650	-	8673	8869
By States											
Chhattisgarh	-	-	-	-	-	-	-	83000	-	83000	83000
Gujarat	-	-	-	-	26571	45000	17129	34871	-	123571	123571
Haryana	-	-	-	-	1234	1602	-	19492	-	22328	22328
Jammu & Kashmir	-	-	-	-	-	-	-	404703	-	404703	404703
Maharashtra	-	324	-	324	-	81	-	57642	-	57723	58047
Rajasthan	103736	172337	98	276171	2037	25606	90000	837615	-	955258	1231429
Sikkim	-	-	-	-	-	-	-	2382	-	2382	2382
Telangana	-	-	-	-	-	-	-	3	-	3	3
Uttarakhand	-	-	-	-	-	-	-	6000	-	6000	6000

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Figures rounded off.

PRODUCTION

The total production value of marble decreased to 1541.91 crore in 2013-14 from 1912.99 crore in 2012-13. Rajasthan alone accounted for about 88% output value followed by Gujarat (10%) and remaining 2% shared by Madhya Pradesh, Andhra Pradesh and Jammu & Kashmir (Table- 3).

Table – 3: Value of Production of Marble, 2011-12 to 2013-14 (By States)

State	(Value in ₹'000)		
	2011-12	2012-13	2013-14 (P)
India	16012403	19129861	15419081
Andhra Pradesh	81534	13744	37
Gujarat	399729	1945115	1607500
Jammu & Kashmir	295	537	310
Madhya Pradesh	358015	54565	262388
Rajasthan	15172830	17115900	13548846

Source: State Governments.

EXPLORATION & DEVELOPMENT

During the year 2014-15, DGM, Rajasthan carried out exploration for marble near villages Paloda, Odabassi etc. in tahsil Garhi of Banswara district, Rajasthan. The exploration work included regional and detailed geological mapping over an area of 10 sq. km and 1.5 sq. km respectively and fourteen samples were collected.

MINING AND PROCESSING

Mining of marble or any dimension stone is different from conventional mining practices. In conventional mining method, mined out minerals are obtained in small-size fractions whereas, in dimension stone mining, large-size intact blocks without minor cracks or damages are extracted.

Marble mining in India is done from ages and has been perfected by trial and error method for extracting larger blocks by manual means. With

the advent of advanced mining machinery and improved methods of cutting and mining have largely transformed the marble mining methods and have led to increased production. Presently, mining of marble is done by manual, semi-mechanised and mechanised means. But in general, majority of mines adopt the semi-mechanised method of mining. The various stages in mining marbles are as follows:

The removal of overburden is generally carried out with heavy earth-moving machinery. In some cases, the weathered zone is removed by drilling holes by jackhammers and slim drill machines. These holes are charged with explosives and under controlled blasting methods, the overburden material is loosened out. It is then removed using heavy earth-moving machinery, such as excavators, tippers and loaders.

After removal of overburden and capping, the marble is exposed at suitable places. After studying the topography and keeping in view the further development of quarry, a key block is marked for removal or for quarry front cut. At this stage, it is necessary to study the joint or fracture pattern in order to ascertain recovery of large-size block.

In manual operation, a line of shallow holes is made and by driving in wedges with feathers by continuous hammering, a fracture is developed along the already drilled holes, and the block is made free from all the sides. The block thus freed from the in situ rock is either pulled by chains or pulley system or is pushed by driving logs, etc. After the block is toppled, it is again cut and dressed for getting a parallel-piped shape.

In the semi-mechanised operation, jackhammers, slim drills, line drilling machines are used for drilling holes in a predetermined line. The remaining operation is more or less similar to manual mining except for lifting and pulling where cranes, winches, dozers, etc. are used. But in the above mentioned processes, the wastage is high and the size of the blocks recovered is small and seldom free from defects. However, to overcome these problems, the quarry front cut is made by using slim drill machines, diamond wire saw, quarry master, diamond belt saw machines and chain saw machines.

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The slim drill machines and quarry masters are used to drill holes through which diamond wire saw is passed and the block is cut by continuous motion of the diamond wire saw. Once the block is cut, it is toppled with the help of hydrobags, pneumatic pillows, air-jacks, etc. The blocks cut this way are of exact sizes with minimum losses. The lifting and loading of blocks are done by Derrick cranes and using various types of loaders.

Processing of marble is done in two stages. The first stage of processing involves cutting the blocks into 2 to 3 cm thick slabs by using gang saws, wire saws and circular saws. In marble tile plant, the required thickness of tiles is 10 or 12 mm. For cutting, circular saws are used. In general, the slabs are sold as it is but in case of tiles, they are polished using various pneumatically-operated or other polishing machines, such as, line polishers, trimmed and cut to size, buffed and chamfered using different types of machines before being sold.

Rajasthan has about 95% processing capacity in the country. There are a number of gang saws and many automatic tiling plants that are in operation. Important processing centres in the State are Makrana, Jaipur, Alwar, Ajmer, Udaipur, Nathdwara, Rajsamand, Abu Road Banswara, Chittorgarh and Kishangarh. The capacity for marble slab production in the state is around 1,000 million sq ft per annum and for polished tiles, it is 3,000 million sq ft. In Gujarat, there are about 22 processing units located at Ahmedabad, Ambaji and Vadodara. India has a rich tradition of processing stones and carving jalis, pillars, garden furniture, floral and other design by expert craftsmen. Presently, art collectors from world over seem to demand hand-carved articles produced especially in Makrana. Congruent with this trend, Stone Fairs are regularly organised in Rajasthan to promote stone artifacts produced and to provide the necessary impetus to sculptors and craftsmen.

CLASSIFICATION

A variety of marbles are produced and marketed under various trade names on the basis

of colour, shade and pattern. These are i) Plain White Marble ii) Panther Marble iii) White- Veined Marble iv) Plain Black Marble v) Black Zebra Marble vi) Green Marble vii) Pink Adanga Marble viii) Pink Marble ix) Grey Marble and x) Brown Marble.

In addition, many new varieties of marble have been brought into the folds of classification especially after opening of new mining areas. The important new types other than the ones classified by BIS are given below:

1. Yellow marble from Jaisalmer.
2. Pista marble (amphibolite variety) from Andhi-Jhiri belt, Jaipur, Alwar and Dausa districts, Rajasthan.
3. Brown green and golden ultramafics from Dunkar, Churu district, Rajasthan.
4. Chocolate-brown and English teak wood marble from Jodhpur district, Rajasthan.
5. Parrot green marble from Jhilo, Sikar district, Rajasthan.
6. Chocolate-brown or wood-finish marble from Mandaldeh, Chittorgarh district, Rajasthan.
7. Purple marble from Tripura Sundari, Banswara district, Rajasthan.
8. Blue marble from Desuri, Pali district, Rajasthan.

The marbles have also been classified by their genesis and chemical composition as under:

i) Calcite Marble: It is a crystalline variety of limestone containing not more than 5% magnesium carbonate. Colour and designwise, it may vary from grey to white to any colour, and even figurative light- brown to pink.

ii) Dolomitic Marble: It is a crystalline variety of limestone containing not less than 5% or more than 20% magnesium carbonate as dolomite molecules.

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iii) Dolomite Marble: It is a crystalline variety of dolomite containing in excess of 20% magnesium carbonate as dolomite molecules. It has variegated colours and textures. The main advantage of this marble is availability of exotic colours and patterns and its low maintenance cost. Marbles of Banswara in Rajasthan belong to this category.

iv) Siliceous Limestone: It is a limestone containing high silica with smooth appearance due to fine-grained texture. It is difficult to cut and polish this type of marble but once polished, it gives a pleasant look. It is available in several colours and designs. The pink marble of Babarmal and Indo-Italian variety from Alwar belongs to this category.

v) Limestone: Several varieties of limestone are being exploited and used as marble. The Oolitic limestone of UK, Black Marble of Bhainslana, Katra & Sirohi and Golden-yellow Marble of Jaisalmer belong to this category. This type requires frequent maintenance in the form of polishing as they are non-metamorphosed and hence, are softer in nature.

vi) Serpentine or Green Marble: This marble is characterised mainly by the presence of a large amount of serpentine mineral. It has various shades of green varying from parrot-green to dark-green and is known for having varying degrees of veinlet intensities of other minerals. Most of the green marbles from Gogunda, Rikhabdeo, Kesariyaji and Dungarpur belong to this category. This marble is mostly used for panelling. The darker variety of this marble has been termed as Verde Antique.

vii) Onyx: It is a dense crystalline form of lime carbonate deposited usually from cold water solutions. It is generally transparent to translucent and shows a characteristic variegated colour layering due to mode of deposition. Such type of marble is found in Kupwara district in Jammu and Kashmir. It is used for making decorative articles.

viii) Travertine Marbles: It is a variety of limestone regarded as a product of chemical precipitation from hot springs. The depositional history has left exotic patterns. When this is cut into thin slabs and polished, it become translucent.

POLICY

The Central Government has notified Marble Development and Conservation Rules, 2002 (notified on 15.5.2002) for conservation, systematic development and scientific mining of marble with a purpose to provide a uniform framework that would be applicable throughout the country. The maximum period for which a lease may be granted shall not exceed thirty years and minimum period shall not be less than twenty years. Further, no lease is to be granted unless there is mining plan duly approved by the State Government or any person authorised in this behalf by that Government. Normally, the minimum area of the lease to be granted should not be less than 4 hectares and maximum area shall not exceed 50 hectares.

As per the Export-Import Policy, 2009-14, and the Foreign Trade Policy thereunder, the imports of crude or roughly-trimmed, marble & travertine blocks, slabs and ecaussine & calcareous monumental or building stone are restricted while imports of alabaster are freely allowed under heading No. 2515. On the other hand the import of items falls under ITC(HS) Code 68022110 to 68022190 are freely allowed. The Ministry of Commerce and Industry, Deptt. of Commerce, vide notification No.65 (RE-2010)/2009-14. S.O.1802(E), dated 4.8.2011 has amended in the Schedule I (Imports) of the ITC(HS) Classification of Export and Import items. After amendment the entry would read as "Import permitted freely provided cif value is US\$60 and above per square metre. Import of marble, classified under chapter 25 and 68 from Bhutan shall be subjected to a combined annual quota of 10 lakh sq.ft (5,882 tonnes). The quota came into effect from the date of this Notification (i.e.No.69 (RE - 2010)/2009-14 dated

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1.9.2011 and shall operate on financial year basis. Monitoring and allocation of the quota shall be made by the Government of Bhutan. The annual quota for import of marble from Bhutan will be 5,882 tonnes as against 1,847 tonnes previously as per Directorate General of Foreign Trade.

USES AND SPECIFICATIONS

Marble is used widely in buildings, monuments and sculptures. Its utility value lies in its beauty, strength and resistance to fire and erosion. Marble has its application in interior and exterior wall cladding, interior and exterior paving, fireplace facing and hearth, lavatory tops, residential and commercial counter tops, table tops, statues and novelty items. The other non-conventional uses of marble are in toothpaste, paint, whitening, agricultural lime, etc.

Different marble varieties are used basically as both interior and exterior vertical wall cladding and flooring. Their use as structural elements (masonry), statues, epitaphs, graves, etc. is quantitatively less with funeral art accounting for the largest percentage. In interior applications such as, for floors, marble is used in the form of 20 mm thick cut-to-size slabs. The slabs are also used for interior and outer facings, stairs, table tops, kitchen platforms, etc. The tiles in sizes ranging from 10 x 10 cm to 60 x 60 cm are used for floors, dadoes and for skirting in thickness ranging from 10 to 20 mm. The selected marble blocks free from cracks and other inclusions are used for making artifacts, such as, carved figures, handrails and balustrade for staircases, jalis, fire places, flower vases and many other pieces of art.

Indian standards for marbles (blocks, slabs and tiles) IS:1130-1969 (reaffirmed in 2008) are summarised as under:

i) Classification: Marble shall be classified as white and coloured categories.

ii) General requirements: Marble shall be free from foreign inclusions and prominent cracks.

iii) Sizes: Marble blocks shall be supplied in lengths ranging from 30 to 250 cm, widths 30 to 100 cm and thicknesses 30 to 100 cm. The slabs shall be supplied in lengths ranging from 70 to 250 cm, widths 30 to 100 cm and thicknesses from 20 to 150 mm. The tiles shall be supplied preferably in sizes of 10 x 10 cm, 20 x 20 cm, 30 x 30 cm, 40 x 40 cm, 50 x 50 cm and 60 x 60 cm with thickness ranging from 18 to 24 mm in the same piece.

Other sizes as agreed upon by supplier and purchaser may also be supplied.

iv) Physical properties: The physical properties of blocks, slabs and tiles shall conform to the requirements, as given under:

Physical Properties of Marble

Sl. No.	Characteristic	Requirement	Method of Test
1)	Moisture absorption after 24 hours immersion in cold water	0.4% max by weight	IS : 1124-1974
2)	Hardness	3 min.	Mohs' scale
3)	Specific gravity	2.5 min.	IS : 1122-1974

v) Workmanship: The edge of slabs and tiles shall be true. The finishes shall be sand and/or abrasive-finish, honed-finish or polished-finish.

ENVIRONMENT

The environmental degradation during mining of marble is akin to any opencast mining activities, i.e., degradation and removal of top soil, mined out pits disturbing local flora & fauna and water table of the area. In addition, the rejected blocks, unsized blocks and rubbles generated from mining of blocks and from overburden when dumped unsystematically pose serious hazards.

Recently utilisation of smaller blocks in tilling plant has created a new way for judicious utilisation of the mineral resource.

The processing waste of marble cutting plants comes out in the form of 'Marble Slurry'. This marble slurry is being dumped by the processing plants at the nearest site available or in the notified areas marked for dumping near the plants. The major environmental problems due to marble slurry are listed below:

- 1) The slurry when dumped on open land affects adversely the productivity of the land as it reduces the porosity and prevents ground water recharge.
- 2) Areas with dumped slurry cannot support vegetation.
- 3) After drying, the finer fraction of slurry becomes airborne and causes serious air pollution which is not only detrimental to human beings but also to vegetation and machinery.

The TIFAC (Technology Information Forecasting and Assessment Council) in collaboration with Regional Research Laboratories and Central Building Research Institute (CBRI), Roorkee, have found many uses of slurry by developing masonry cement, distempers, tiles, cellular concrete, gypsum plaster-based plane/fibre-reinforced boards and blocks.

As per research paper published in American Journal of Engineering Research, marble slurry can be utilised on a large scale only by construction industry. After determining the different properties of marble slurry in the laboratory, it is concluded that it can be used in cement concrete, replacing sand by 30 %, the result showed the concrete to be of equal strength.

WORLD REVIEW

Resources of natural stones are substantial in the world and almost every country produces dimension stones. Major exporting countries of marble in the world are China, Italy, India, Spain, Turkey, Greece, Brazil and Portugal.

FOREIGN TRADE

Exports

Exports of marble (total) decreased to 3,25,705 tonnes in 2014-15 from 3,37,937 tonnes in the previous year. Out of total marble exported in 2014-15, exports of dressed marble was 2,09,954 tonnes (64%), and exports of other marbles was 115,751 tonnes (36%). Exports were mainly to China and Nepal (19%) each, Egypt (16%) and USA (7%) (Tables- 4 to 6).

Imports

Imports of marble (total) increased to 779,330 tonnes in 2014-15 from 757,948 tonnes in the previous year. Imports of dressed marble at 641,493 tonnes accounted 82% of the total imports in 2014-15 while the remaining 18% imports were of other marbles. Main suppliers of marble were Italy (42%), followed by Turkey (25%), China, Oman (7%) each and Vietnam (6%) (Tables- 7 to 9).

Table – 4 : Exports of Marble : Total (By Countries)

Country	2013-14		2014-15 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	337937	5703435	325705	5990599
USA	16405	914597	23952	1063143
Egypt	40619	605018	51025	756345
Nepal	35226	464451	62870	597888
China	92820	885043	63143	589551
Saudi Arabia	7735	177220	7071	340303
Italy	16722	277518	18993	310505
Hong Kong	28962	286731	21559	242962
UAE	8872	213706	8071	231562
Turkey	6263	126446	3911	101788
Chinese Taipei/				
Taiwan	4912	77055	4776	91576
Other countries	79401	1675650	60334	1664976

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**Table – 5 : Exports of Marble (Dressed)
(By Countries)**

Country	2013-14		2014-15(P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	231149	2916976	209954	2809935
Nepal	32356	426191	50989	572173
China	90363	828207	58512	536787
Egypt	17706	214011	28379	395493
Hong Kong	23975	214214	21557	241944
Italy	13561	169932	16564	231102
USA	6353	338917	5776	212130
Chinese Taipei/ Taiwan	4345	54957	3915	55741
Saudi Arabia	1496	23818	1570	38176
UK	902	24887	1001	37007
Vietnam	1013	23842	1069	35056
Other countries	39079	598000	20622	454326

**Table – 6 : Exports of Marble (Others)
(By Countries)**

Country	2013 -14		2014-15(P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	106788	2786459	115751	3180664
USA	10052	575680	18176	851013
Egypt	22913	391007	22646	360852
Saudi Arabia	6239	153402	5501	302127
UAE	6221	158416	7016	199296
Turkey	3617	78779	3144	82502
Italy	3161	107586	2429	79404
Algeria	4690	79216	4920	78066
Pakistan	4622	74014	4239	67846
Canada	932	48780	980	61912
Belgium	564	34126	1021	53722
Other countries	43777	1085453	45679	1043924

**Table – 7 : Imports of Marble :(Total)
(By Countries)**

Country	2013-14		2014-15(P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	757948	22107203	779330	23848492
Italy	338611	8548055	324953	8085199
Turkey	165351	3759097	194755	4474249
China	50215	2731113	57741	3607848
Oman	44694	2356956	50837	3044205
Vietnam	60754	1404039	43994	1067420
Sri Lanka	15897	960709	13657	913003
Greece	13893	410023	20157	534775
Egypt	28499	629608	19142	450276
Iran	12448	282432	17606	394537
Portugal	4226	251458	4439	298919
Other countries	23360	773713	32049	978061

**Table – 8 : Imports of Marble (Dressed)
(By Countries)**

Country	2013-14		2014-15(P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	626229	14418612	641493	14868734
Italy	322788	7456543	314878	7350347
Turkey	158929	3493019	187935	4145297
Vietnam	58304	1253015	41991	937842
Greece	11957	280229	18652	433967
Egypt	27988	602031	18569	411124
Iran	12200	273211	17566	391434
China	8903	280815	11371	346863
Spain	8336	189536	8754	197729
Portugal	1714	62885	2182	102389
UAE	1434	34632	3844	93902
Other countries	13676	492696	15751	457840

MARBLE

**Table – 9 : Imports of Marble (Others)
(By Countries)**

Country	2013-14		2014-15(P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	131719	7688591	137832	8979758
China	41312	2450298	46370	3260985
Oman	41969	2218797	49289	2951708
Sri Lanka	14957	899439	13124	876484
Italy	15823	1091512	10075	734853
Turkey	6422	266077	6820	328953
Portugal	2512	188573	2257	196530
Bhutan	517	54173	1830	166701
Vietnam	2450	151024	2003	129578
Greece	1936	129794	1505	100808
Spain	1123	78856	1837	89576
Other countries	2698	160048	2722	143582

FUTURE OUTLOOK

As per the Report of the Working Group for 12th Five Year Plan, the demand for marble and other dimension stones, viz, granite, sandstone, etc. and stone products is anticipated to scale up at around 15% CAGR. A similar rate of growth in exports can also be achieved with the help of suitable policy framework, infrastructure and other facilities which are expected to be provided to the industry. The Working Group has recommended that there is a strong need for well-planned, concerted and dedicated efforts towards export promotion of Indian stones. The emphasis needs to be on popularisation of Indian stones in both the traditional markets and exploration of new avenues by strengthening the activities of the Centre for Development of Stones (C-DOS) in Rajasthan by upgrading it into a national centre of excellence. Centre for Development of Stones (C-DOS), Rajasthan, a state government agency has been recommended to be upgraded and redesignated as a National agency for technology/skill upgradation, market

development support, etc. for marble. A separate national agency is required to be established in southern India for development of granite and other stones. The Working Group has stressed on the alternative option for exporting granite and marble in processed form to maximise export earnings to develop and promote artifacts and special decorative and ornamental items of high value addition. There is tremendous skill in the country which can be explored and supported with special incentives. This can certainly bring about substantial foreign exchange addition as well as significant employment generation.

The Working Group has observed that the present investment in dimensional stone industry in India is estimated at ₹20,000 crore. It is expected that given the right policy support, the total turnover of the sector would be over ₹40,000 crore by 2012-13 and would be double every five years considering an estimated growth rate of 15%. To sustain this growth, it is estimated that investment in this sector will have to go up to about ₹1,07,500 crore by 2022-23 (including foreign investment).

The Working Group has also made the following suggestions:

In order to promote the dimension stone industry by taking country as a whole there is a need to have a suitable rate of royalty in all the states.

Initiatives need to be taken in the form of fiscal measures as customs and excise duties to encourage import of dimension stones rather than finished products. This will encourage value addition and transfer of technology in the field of dimension stones in the country, which will contribute in employment generation and foreign exchange earnings for GDP growth.

The dimensional stone sector should be given the status of industry so that it can qualify for the fiscal benefits, like financial incentives, low cost loans, etc.