

GRANITE



# Indian Minerals Yearbook 2015

(Part- III : MINERAL REVIEWS)

54<sup>th</sup> Edition

**GRANITE**

(FINAL RELEASE)

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

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## 24 Granite

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Granite technically refers to a light-coloured granulose plutonic rock composed of feldspars, plagioclase, quartz (35% approx.) and minor amounts (45% approx.) of mafic minerals, such as, biotite, hornblende, pyroxene, iron oxides, etc. But, in commercial parlance, the term granite has become synonymous with all those crystalline rocks which have pleasing colours, strength to bear the processes of quarrying and cutting & polishing and which are used commonly for decorative purposes. Being more resistant to wear and tear as well as weathering, granite is most sought-after stone to be used for building as well as decorative stone. The fascination for granite is due to its amenability for taking mirror-like polish, high compressive strength, longevity and aesthetics. India possesses enormous deposits of all types of dimension stones. It is one of the largest producers of dimension stones in the world. The Dimension Stone Industry employs a workforce of over one million at its various sectors. This Industry plays a vital role in the economy of the states like Tamil Nadu, Andhra Pradesh, Karnataka and Rajasthan. Rural economy of many developing States like Madhya Pradesh, Uttar Pradesh, Odisha and North-Eastern States is dependent on this Industry.

Within the country, granite used for decorative purposes is considered costly when compared with other materials, hence, its utilisation and trade in the domestic front has been relatively low when compared to its export potential.

### RESOURCES

India is endowed with abundant resources of a wide variety of granite comprising over 200 shades. As on 1.4.2010, resources of granite dimension stone of all types are estimated at 46,230 million cubic metres. Of these resources, 264 million cubic metres (less than 1%) fall under reserves category, while the remaining 45,967 million cubic metres or about 99% fall under resources category.

Of the total granite reserves, about 36 million cubic metres of all grades fall under proved category while 228 million cubic metres falls under probable category.

About 92% reserves relate to coloured granite, 7% relates to black granite and the balance 1% fall under unclassified.

Statewise breakup of total resources reveals that Karnataka & Rajasthan share about 20% each of the resources which are followed by Jharkhand (19%), Gujarat (18%), Andhra Pradesh (5%) and Madhya Pradesh (4%). These states together account for 86% of the total resources. Gradewise classification reveals that about 7% of the total resources fall under black granite while 92% under coloured granite. About 1% resources are of unclassified grade.

The details of reserves/resources as on 1.4.2010 are given in Table-1.

### PRIME VARIETIES OF INDIAN GRANITE

In the world market, there are nearly 300 varieties of granite of which India supplies about 200 varieties. Out of these, prime varieties represent a wide spectrum of colour, texture and structure. These prime varieties have substantial resource base. Commercial names of granite are derived from area, colour, patterns, etc.

Karnataka specialises in the production of Ruby red, Chilly red, Cera grey, Kanakpura multicolour, Himalayan blue and Sira grey varieties of granite. Andhra Pradesh is famous for Black Galaxy, Srikakulam blue and Black varieties of granite while Tamil Nadu is abundant in Jet-black & Tipu-white, Kashmir-white and Paradiso sea green varieties of granite. Odisha specialises in Pink granite, Silver grey, Sea weed Green, Chilka blue, Grey wave varieties of granite. Availability of varieties of granite in various States is furnished in Table- 2.

### EXPLORATION & DEVELOPMENT

The increase in demand both in domestic and international markets for new varieties of granite has prompted DMG, Government of Rajasthan to get significantly engaged in exploration activities. The details of work carried out by the State Directorates of Chhattisgarh and Rajasthan in 2014-15 are summarised in Table- 3.

**Table – 1 : Reserves/Resources of Granite (Dimension stone) as on 1.4.2010**  
(By Grades/States)

(In 000' cubic metres)

Grade/State	Reserves				Remaining resources					Total resources (A+B)			
	Proved STD111	Probable		Total (A)	Feasibility STD211	Pre-feasibility		Measured STD331	Indicated STD332		Inferred STD333	Reconnaissance STD334	Total (B)
		STD121	STD122			STD221	STD222						
<b>All India : Total</b>	<b>35741</b>	<b>201377</b>	<b>26574</b>	<b>263692</b>	<b>38462</b>	<b>51990</b>	<b>8234</b>	<b>837325</b>	<b>2063964</b>	<b>42499338</b>	<b>467296</b>	<b>45966608</b>	<b>46230300</b>
<b>By Grades</b>													
Black Granite	6936	6060	3909	16906	-	45690	1	50934	466039	2572581	23538	3158783	3175688
Coloured Granite	28805	195316	22665	246786	38462	6300	8233	786391	1276125	39843847	443518	42402875	42649661
Unclassified	-	-	-	-	-	-	-	-	321800	82911	240	404951	404951
<b>By States</b>													
Andhra Pradesh	-	-	-	-	-	-	-	-	-	2360396	-	2360396	2360396
Assam	-	-	-	-	-	-	-	-	800	583150	-	583950	583950
Bihar	-	-	-	-	-	-	-	-	179000	698612	-	877612	877612
Chhattisgarh	-	-	-	-	-	-	-	-	-	50057	-	50057	50057
Gujarat	-	-	-	-	-	-	-	-	-	8501947	-	8501947	8501947
Haryana	-	-	-	-	-	-	-	-	-	34000	-	34000	34000
Jharkhand	-	-	-	-	-	-	-	-	651300	8197110	26930	8875340	8875340
Karnataka	26363	19389	21836	67587	-	-	-	238	1231625	8012784	25659	9270306	9337893
Kerala	140	-	-	140	-	-	-	-	99	2570	-	2669	2808
Madhya Pradesh	-	160	-	160	-	-	-	-	-	1885924	108000	1993924	1994084
Maharashtra	-	-	-	-	-	6300	-	486925	-	665622	-	1158847	1158847
Meghalaya	-	-	-	-	-	-	-	-	-	-	286467	286467	286467
Odisha	-	80000	-	80000	-	-	-	330328	-	1432492	240	1763060	1843060
Rajasthan	5581	100380	4500	110461	38462	-	-	-	-	9021742	20000	9080204	9190665
Tamil Nadu	-	1448	238	1686	-	45690	8234	7	-	503818	-	557749	559435
Telangana	-	-	-	-	-	-	-	-	-	45494	-	45494	45494
Uttar Pradesh	-	-	-	-	-	-	-	-	-	494819	-	494819	494819
West Bengal	3658	-	-	3658	-	-	-	19827	11140	8802	-	29768	33426

Figures rounded off.

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**Table – 2 : Varieties of Granite in Various States**

State	Variety
Andhra Pradesh	Black galaxy, Srikakulam blue, Steel grey, Paradiso, Anantapur grey, Silver galaxy, etc.
Bihar	Tiger skin, Mayurakshi blue, Sawan rose, English teak, Black-cheeta, etc.
Gujarat	Sonabadi grey, Balaram pink, Ajapur Galaxy, Godhra grey, Maharaja tiger-black, etc.
Haryana	Steel-grey porphyry, Purplish granite porphyry, Deep pink.
Karnataka	Ruby red, Fish Belly, Himalayan blue, Sira grey, Red multi, Tumkur porphyry, Hassan green, Magadi pink, Tiger black, etc.
Kerala	Tropical green, Paradiso, Kerala white, etc.
Maharashtra	Grey silk, Light pink, Jhansi red, etc.
Madhya Pradesh	Multicoloured, Black granite, etc.
Odisha	Berhampur blue, Silver grey, Seaweed green, Chilka blue, Red pearl, Jeypur and Keonjhar black, etc.
Rajasthan	Mokalsar green, Nagina green, Rosy pink, Blue Pearl, Chima pink, Bala flower, Platinum-white, etc.
Tamil Nadu	Kashmir white, Rawsilk, Paradiso, Pink multi, Colombo Juparana, Tiger skin, Kunnam black, Turaiyur blue, etc.
Uttar Pradesh	Ruby red, Jhansi red, Grey granite, Black granite, etc.
West Bengal	Bero pink porphyry, Streaky gneiss, Purulia black, Birbhum pink, Spotty black, etc.

**Table – 3 : Details of Exploration for Granite during 2014-15**

Agency/ State/ District	Location/ Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
<b>DMG,</b>							
<b>Chhattisgarh</b>							
Kanker	Mudpar-Bundeli- Bhanbhera area	1:50000 1:4000	30 -	-	-	-	Occurrences of block granite (dolorite) found as hillock with dimension of 500 m x 150 m. Granite is suitable for cutting and polishing. Resources of 54,000 cubic metre were estimated.
<b>Rajasthan</b>							
Barmer	N/v Sura Narpatan, Basra	1:50000 1:10000	15 4	-	-	18	Granite is creamish- pinkish to brownish grey in colour and found as hillock with 1200 m in length, 600-800 m in width & height up to 70 m. Granite is suitable for cutting and polishing. Resources were not estimated.
	N/v Ner Sura Charanan	1:50000 1:10000 1:4000	200 15 4	-	-	-	Granite is pinkish to brownish grey in colour. The granite body was found scattered in about 0.5 sq.km area.
Bhilwara	N/v Phakoliya, Bhagjana, etc. Tehsil Kareda	1:50000 1:4000	10.50 1	-	-	-	Granite is suitable for cutting and polishing. Resources were not estimated.
Jalore	N/v Bala, Sugalia Jodha, Tehsil Ahore	1:2000	3	-	-	-	The granite of the area is greenish grey, creamish, light pinkish in colour with dimensions of 1020 m x 740 m & 320 m x 240 m. Resources were not estimated.

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### PRODUCTION

Granite is declared as a “Minor Mineral,” under the MMDR Act, 1957 and, therefore, falls under the purview of the State Governments. The data on production of granite, therefore, lacks precision as acquisition-delays makes it difficult to draw a conclusion. The production of granite compiled from the data received from various states for 2011-12 to 2013-14 is, however, detailed in Table-4.

Major production of granite in raw as well as processed form is generally from Andhra Pradesh, Rajasthan, Karnataka, Tamil Nadu and Gujarat.

The important granite producing centres in Tamil Nadu are located at Dharmapuri, Erode, Madurai, Salem, Virudhunagar and Villupuram districts.

In Rajasthan, production centres are mainly spread in the districts of Jalore, Pali, Sirohi, Barmer, Ajmer, Jaisalmer, Jhunjhunu and Jodhpur. Karnataka is another important producer of granite varieties with production centres predominantly located at the districts of Bengaluru, Mysuru, Kalaburgi, Hassan, Raichur and Kolar. The occurrences of granite have been reported from three districts of Uttar Pradesh, namely Lalitpur, Mahoba and Banda. Almost the entire production was reported from Lalitpur district. In Andhra Pradesh, important mining areas are located in the districts of Chittoor, Anantapur, Kurnool, Prakasam, Srikakulam and in Telangana, Warangal, Karimnagar and Khammam districts.

The granite resources of Gujarat are located in the districts of Mehasana, Banaskantha, Sabarkantha, Panchmahal, Dahod, Vadodara, Amreli, Bhavnagar and Kachchh. Bihar, Kerala, Odisha and West Bengal also produce granite.

Details regarding production of processed granite are not available. However, it could be contrived from the data on processed material exported from which production level in the country with addition of 5 to 15% for internal use could be estimated. From all available data, it could be concluded that India is in a comfortable position to produce the required quantity of granite to meet the demand of both domestic as well as export markets.

### MINING

Production of blocks of considerable size and weight is a special feature of granite mining. The process and equipment used for granite mining differ considerably from those used for mining other minerals. The mining of granite involves two important stages of operation the first actual block splitting either from sheet rock or boulder and the second operation involves many items of works, such as removal of weathered zone or overburden, opening of faces, lifting of cut blocks, transportation and many other ancillary work before and after block splitting.

**Table – 4 : Production of Granite, 2011-12 to 2013-14  
(By States)**

		(Value in ₹'000)					
State	Unit	2011-12		2012-13		2013-14 (P)	
		Quantity	Value	Quantity	Value	Quantity	Value
<b>India</b>	-	-	<b>54198761</b>	-	<b>66764237</b>	<b>82182957</b>	
Andhra Pradesh	cu m	1255683	32381485	1787880	47674423	2063453	60051935
Chhattisgarh	cu m	-	136	948	1896	405	810
Gujarat	tonne	-	-	242496	113473	212608	114300
Jammu & Kashmir	tonne	138147	14706	265393	17955	-	-
Karnataka	cu m	358490	11187507	304015	9681453	331754	10733541
Kerala	cu m	13101469	7860881	15227651	3806913	13974374	6318395
Madhya Pradesh	tonne	27968	153059	28256	34417	43267	148289
Rajasthan	tonne	1077000	1581250	2850000	4373700	3147059	3737218
Tamil Nadu	cu m	266889	757230	273958	748469	273958	748469
Uttar Pradesh	cu m	23334	262507	23077	311538	24445	330000

*Source: State Governments.*

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The block splitting from the sheet rocks or boulders is mainly done manually or in some cases by semi-mechanised methods, whereas the other operations, such as, removal of overburden, lifting & transportation of cut blocks, etc. are carried out by mechanised methods. There are a few mines which have adopted the modern method of block splitting by using flame-jet burner and diamond wire saw for cutting. Heavy-duty derrick cranes of capacity to handle 50-tonne blocks from a depth of more than 60 m has brought revolution in granite quarrying by way of augmenting output with less cost. The percentage recovery of granite on the whole is quite low and it varies from 5 to 15% because of the prevalent unscientific mining method.

One of the modern and scientific mining methods adopted recently to enhance the recovery of dimensional blocks is that 'Water Jet Cutting' technique. In this technique, water with tremendous pressure is passed through an orifice to form a jet. This jet is used to cut into the primary blocks as well as secondary blocks. The cutting loss in this process is minimum and there is no damage to adjacent block as in case of blasting.

## PROCESSING INDUSTRY

The processing of granite in India is an age-old phenomenon and started in a small way in 1930s when some trimmed blocks as kerbstones were exported to the UK. Since then, semi-hand-worked or hand-polished granite tombstones found their acceptability in the UK. Granite processing basically involves sawing or cutting of raw blocks into the tiles/slabs of required size & thickness and polishing of sawn-off surfaces. Other ancillary functions involve edge cutting, milling, boring and contouring for enhancing the quality and price of production. In India, the Processing Industry is in three sectors, namely, small-scale units, medium-scale units and 100% export-oriented units (EOU). The Processing Industry of granite in the country has developed over the years, and the share in exports of processed material has increased manifold.

Centre for Development of Stones (CDOS), registered as a non-profit making Society, is the common facilities centre for the entire stone industry, including granite, established under the National Programme for Development of Stone Industry in India (NPDSI), which is a joint effort of Govt. of India and United Nations Industrial Development Organisation (UNIDO). CDOS was set up as an autonomous organisation by Govt. of

Rajasthan and Rajasthan State Industrial Development & Investment Corp'n. Ltd (RIICO) at Jaipur, with an objective to develop, promote and support the Dimensional Stone Sector and related industries in India. It also has testing centre for stones that conforms to international standards.

## USES & SPECIFICATIONS

### Uses

Granite is the most sought-after among all building stones. In ancient times, granite pillars and beams were preferred material to support the huge structures of temples and palaces and for making protective walls around them. With the invention of modern tools of greater hardness and polishing ability, the use of granite has rather increased on account of its aesthetic value. The modern motorised tools of tungsten carbide and brazed diamond have enabled the user to cut & polish granite as per the specifications of the Building Sector. Presently, cut and polished granite slabs of 20 mm thickness are preferred for flooring, while tiles of 10 or 12 mm thickness are used for cladding. In addition, gravestones and monuments of various shapes and sizes are also in vogue. The flexibility of the cutting tools have engendered creation of many artifacts of granite for decorative purposes.

Granite also finds its application in making garden furniture, such as, benches, fountains and many other articles which are used for landscaping and/or decorative purposes. The cut-to-size small blocks are used as cobblestone, kerbstone, road sidings and for many other innovative purposes.

Crude granites are utilised for structural purpose after little dressing & sizing, whereas processed granites are used mostly in the construction of buildings and monuments and for interiors and exterior facing. Granites, because of its superior wear resistance and non-denting quality, are used as parts in various meteorological and engineering instruments, such as, surface plates, straight edges, parallels, cubes, V' blocks and work-mounting tables of co-ordinate measuring machines.

The surface plates are used as flat datum surface whenever precise measurements of dimensions and geometrical relationships are to be carried out. For this purpose, harder variety of granite is required so that it can bear the high-degree of grinding, polishing and calibration for achieving flat surface. For its use as surface plates, granites should have properties such as, close grain size, homogeneity, high density and hardness, uniform colour, low moisture absorption and should be free from flaws.

## Specifications

The properties of granite which are normally valued for exploitation are compressive strength, tensile strength, density, p-wave velocity, etc. For marketability, other requirements like colour, texture, granularity, size, water absorption, porosity, hardness, moisture content, etc. are also essential. Raw blocks should be free from normal defects like fractures, joints, shears, hairline cracks, segregation, veins, etc. (Table-5)

A snippet of BIS specifications for granite are highlighted below:

### ***IS: 3316 - 1974 (First Revision; Reaffirmed 2008) Specifications for Structural Granite***

This Standard covers section, grading and strength requirements of structural granite for various constructional uses. The general requirements as per the specifications are that granite shall be free from flaws, injurious veins, cavities and similar imperfections that would impair its structural integrity and would affect adversely its strength and appearance. The strength requirements as per IS: 3316-1974 are as follows:

- i) The compressive strength when tested according to IS: 1121 (Part 1) - 1974 (Reaffirmed 2008) shall not be less than 1,000 kg/cm<sup>2</sup>.
- ii) The true specific gravity when tested according to IS:1122-1974 (Reaffirmed 2008) shall not be less than 2.6.
- iii) The water absorption when tested according to IS: 1124-1974 (Reaffirmed 2008) shall not be more than 0.50%.

The shape of slabs shall be rectangular or square and of specified dimensions with tolerance in length and breadth as 12 mm and thickness 1 mm. The dimensions of blocks for masonry shall be as specified. The tolerance allowed for facing blocks is 15 mm.

### ***IS:14223 (Part 1) - 1995; (Reaffirmed 2012) Specifications for Polished Building Stones: Part I Granite***

This Standard covers physical properties and finish requirements of polished granites used for various purposes. The general requirements as per the specifications are that the granite should be free from all imperfections and deleterious minerals that may interfere with the appearance, strength, structural integrity and its amenability to take good polish. Imperfections are mostly imparted by the textural variations which is a function of degree of uniformity and the distribution of the constituent minerals. Hairline cracks/joints, flower, moles, knots, white and dark lines due to segregation of light-coloured minerals in multicoloured granite and ferromagnesium minerals in light-coloured granites are considered to be imperfections. Granite should be free from deleterious minerals, such as, pyrite, marcasite, biotite, chlorite and ilmenite which interfere with the colour and appearance on weathering and also affect polishing characteristics.

The shapes of the slabs shall be rectangular or square and of specified dimensions with a tolerance in length and breadth as +2 mm and thickness +1 mm. The bottom face may be rough but the top surface shall be fine-polished and joint faces shall be dressed with the top surface without hollowness and spalling off.

The physical properties of granite shall conform to the requirements given in Table-5. Surface of the polished granite shall be mirror-finish without any hairline crack. The polish on the surface shall be checked with glassometer and shall not be less than 95 percent.

On the international scene, with the formulation of European Economy, the CEN Norm has come into force. As per CEN TC 246, various standards of stones have been formulated. The objectives of these standards are to necessitate the companies to have the tests conducted for the different stones that are commercialised so as to profit the users the choice of the stone with desired physical characteristics according to the purpose intended. It has become mandatory for every company doing business with European Union to mark their products with 'CE' marking from March 2004 onwards.

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**Table – 5 : Physical Properties of Granite as per IS : 14223 (Part 1) -1995 (Reaffirmed 2012)**

Sl. No.	Characteristic	Requirements	
		Pink granite	Multicoloured & grey granites
1	Moisture content (%) (max)	0.15	0.15
2	Dry density (m/v)	2.58 to 2.63	2.60 to 2.68
3	Apparent specific gravity (min)	2.75	2.75
4	Water absorption (%) (max)	0.50	0.50
5	Porosity (%)	1.02 to 2.50	1 to 2
6	Compressive strength (kg/cm <sup>2</sup> )	1000-1500	1300-2200
7	Tensile strength (kg/cm <sup>2</sup> ) (min)	90	90
8	Shear strength (kg/cm <sup>2</sup> )	280-425	300-540
9	Hardness (Mohs' scale)	6 to 7	6 to 7
10	Hardness (Schmidt No.)	80-100	85-110
11	Hardness (Shore No.)	50-60	46 to 61
12	Ultrasonic pulse velocity	5000	5000
13	Resistance to wear	Not greater than 2 mm on an average and 2.5 mm for any individual specimen	Not greater than 2 mm on an average and 2.5 mm for any individual specimen

### POLICY

Granite is a 'Minor Mineral' under the MMDR Act, 1957. The grant of various mineral concessions for granite is, therefore, administered under the Minor Mineral Concession Rules of the respective State Governments. However, the Granite Conservation and Development Rules, 1999 aims at uniform rules for conservation, systematic development and scientific exploitation of granite resources. GCDR, 1999 inter alia, provides for:

Prospecting Licences (PL) prior to granting mining lease; Period of PL; Minimum and maximum period of mining lease and for renewals; Minimum and maximum area of lease; Preparation of scheme of prospecting; Mining Plan to be prepared for grant of mining lease; etc.

As per the Export-Import policy for 2009-14 and the Foreign Trade Policy thereunder, the imports of granite monumental and building stone that fall under Heading No. 2516 (whether or not roughly trimmed or cut, by sawing or otherwise, into blocks or slabs of a rectangular shape) are restricted. On the other hand, worked granite blocks/tiles under Sub-heading 680223 can be imported freely. There are no restrictions on exports of granite and items under Chapter 25 and Chapter 68.

### ENVIRONMENT

The mining of granite, started initially in the bouldery zone, had little damage to the environment. As more and more blocks in huge sizes were required to meet the demand, the sheet rock was approached by making cut in the ground and by removing top soil or overburden, which resulted in general degradation of environment.

Environmental problems are similar to any opencast mining operations. The blasting and movement of heavy vehicles generate dust and aggravate air pollution in addition to noise pollution.

The processing of granite requires huge quantities of water for cutting and polishing. In some cases, kerosene and lime water are used as coolants for cutting purpose. Although most of the kerosene and lime is recycled yet there are always chances that these coolants get mixed with natural water courses.

Sludge generated during cutting needs proper disposal to avoid increased silting and pollution of the natural waterways.

For abating environmental pollution, guidelines have been spelt out in GCDR, 1999. The technology for making artificial stone called Terrazzo will prove to be a boon for the utilisation of waste generated during mining and processing.

## WORLD REVIEW

World dimension granite and marble production, including the United States, was estimated to be approximately 142 Mt in 2013, the last year for which data were available. Although some small-scale production was likely in many nations, dimension granite and marble were produced and officially reported in 29 countries. The top five producing countries in 2013 were, in descending order by tonnage, China, Turkey, India, Iran and Italy, and these countries accounted for about 72% of the world's dimension granite and marble production. Global production of dimension granite and marble increased by 14% in 2013 compared with that of 2012. The United States ranked 18<sup>th</sup> in world production of dimension granite and marble in 2013.

## FOREIGN TRADE

### Exports

Granite is an important commodity amongst ores and minerals that have tremendous export potential. It is mainly traded in the form of crude or roughly trimmed blocks, as cut blocks & slabs; and as polished blocks & tiles. The export value of granite (total) decreased to ₹ 9,832 crore in 2014-15 from ₹ 9,869 crore in 2013-14. The share of granite (others) was 56% at ₹ 5,552 crore while that of crude or roughly trimmed blocks was about 35% at ₹ 3,392 crores. Similarly, the share of granite (polished blocks/tiles) was 5% at ₹ 523 crore while granite (cut blocks/slabs) was 4% at ₹ 366 crore. China was the most important buyer for granite and its share in the total value of exports of granite was 31%, followed by USA (16%), Turkey and Germany (4% each) (Tables- 6 to 10).

### Imports

In 2014-15, imports of granite (total) decreased marginally to 65,265 tonnes from 71,378 tonnes in the previous year. Out of the total imports, 44,233 tonnes were of crude or roughly trimmed granite, 6,290 tonnes of cut blocks/slabs, 5,017 tonnes of polished blocks/tiles and 9,725 tonnes of other granite. Granite was mostly imported from Norway (38%), Brazil (17%) and Finland (10%) (Tables- 11 to 15).

**Table – 6 : Exports of Granite :Total  
(By Countries)**

Country	2013-14		2014-15(P)	
	Qty	Value	Qty	Value
	(t)	(₹'000)	(t)	(₹'000)
<b>All Countries</b>	<b>6802309</b>	<b>98685772</b>	<b>6563271</b>	<b>98322398</b>
China	4484850	32660873	4195377	30221046
USA	481000	16132951	408444	16004513
Turkey	135744	3920445	154471	4309348
Germany	74530	3485290	83251	4051034
UAE	115246	2714147	130321	3153750
Italy	142949	2805264	172934	3116493
UK	62029	3037862	57471	2951367
Poland	71807	2047242	88789	2611222
Belgium	67707	2104150	74987	2138022
Chinese Taipei/ Taiwan	163033	1993681	163692	1894617
Other countries	1003414	27783867	1033534	27870986

**Table – 7: Exports of Granite  
(Crude or Roughly Trimmed)  
(By Countries)**

Country	2013-14		2014-15(P)	
	Qty	Value	Qty	Value
	(t)	(₹'000)	(t)	(₹'000)
<b>All Countries</b>	<b>4622452</b>	<b>34705710</b>	<b>4508446</b>	<b>33917164</b>
China	4061786	28262862	3863841	26833711
Chinese Taipei/ Taiwan	150008	1773800	154274	1668959
Italy	100008	1280867	132261	1567565
Hong Kong	91763	862659	110670	982779
Vietnam	46589	606103	49832	588916
Belgium	30975	389700	43424	522086
Poland	23376	271164	31736	384707
Croatia	14892	176530	18321	234179
Thailand	15112	212835	15160	218207
Norway	25515	115498	21260	142036
Other countries	62428	753692	67667	774019

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**Table – 8 : Exports of Granite  
(Cut Blocks/Slabs)  
(By Countries)**

Country	2013-14		2014-15(P)	
	Qty	Value	Qty	Value
	(t)	(₹'000)	(t)	(₹'000)
<b>All Countries</b>	<b>587137</b>	<b>4843967</b>	<b>407990</b>	<b>3659898</b>
China	353767	3241610	253721	2280578
Hong Kong	33298	404504	47678	541650
USA	137883	514346	76351	300550
Chinese Taipei/ Taiwan	9404	141547	7255	186754
Thailand	5944	72023	7222	96463
Vietnam	6664	88541	3021	50318
Sri Lanka	2706	56301	1950	42304
UAE	1064	10728	942	13273
Indonesia	376	9695	411	12173
Nepal	956	9715	930	12047
Other countries	35075	294957	8509	123788

**Table – 9 : Exports of Granite (Others)  
(By Countries)**

Country	2013-14		2014-15(P)	
	Qty	Value	Qty	Value
	(t)	(₹'000)	(t)	(₹'000)
<b>All Countries</b>	<b>1368930</b>	<b>52680472</b>	<b>1450179</b>	<b>55519131</b>
USA	308699	14357101	307808	14914400
Turkey	131303	3810445	153137	4273185
Germany	61219	2953868	67948	3475778
UAE	102204	2458463	116761	2834810
UK	53290	2810304	49781	2745151
Poland	42340	1603797	54401	2116774
Libya	87496	2664222	54435	1675719
Canada	25970	1497484	31097	1642565
Italy	34002	1318933	36522	1423793
Belgium	26504	1387389	25538	1351624
Other countries	495903	17818466	552751	19065332

**Table – 10 : Exports of Granite  
(Polished Blocks/Tiles)  
(By Countries)**

Country	2013-14		2014-15(P)	
	Qty	Value	Qty	Value
	(t)	(₹'000)	(t)	(₹'000)
<b>All Countries</b>	<b>223790</b>	<b>6455623</b>	<b>196656</b>	<b>5226205</b>
China	63724	1065677	73182	1006883
USA	24396	1156931	13012	660344
Germany	11225	509652	11930	543052
Saudi Arabia	22202	430436	14596	294152
UAE	10683	223868	9895	266784
Nigeria	11662	323544	8221	263950
Belgium	5119	260226	5922	263175
UK	4594	196204	4093	163433
Russia	5312	168532	3993	135434
France	1501	104034	1960	131735
Other countries	63372	2016519	49852	1497263

**Table – 11: Imports of Granite: Total  
(By Countries)**

Country	2013-14		2014-15(P)	
	Qty	Value	Qty	Value
	(t)	(₹'000)	(t)	(₹'000)
<b>All Countries</b>	<b>71378</b>	<b>2402008</b>	<b>65265</b>	<b>2261146</b>
Norway	20421	659004	25008	776898
Brazil	9338	390160	11078	384537
Sri Lanka	2932	117447	3771	271721
China	12863	445850	4997	256487
Ukraine	3601	114430	3802	129622
Italy	2876	141681	1992	106575
Finland	4441	81503	6264	90135
Angola	2086	77775	2750	81925
South Africa	3419	112745	3195	80345
Spain	860	23666	738	23809
Other countries	8541	237747	1670	59092

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**Table – 12 : Imports of Granite  
(Crude or Roughly Trimmed)  
(By Countries)**

Country	2013-14		2014-15(P)	
	Qty	Value	Qty	Value
	(t)	(₹'000)	(t)	(₹'000)
<b>All Countries</b>	<b>40563</b>	<b>1299814</b>	<b>44233</b>	<b>1289495</b>
Norway	15371	508900	20350	620709
Brazil	8143	315483	8948	281073
Ukraine	2944	98319	3041	111704
Finland	4106	71314	5393	77257
Angola	2002	72992	2099	63061
South Africa	2152	65738	2088	58965
Italy	958	33800	961	36657
Madagascar	172	8468	493	17137
Spain	759	19840	584	15124
Germany	480	9565	136	4792
Other countries	3476	95395	140	3016

**Table – 13 : Imports of Granite  
(Cut Blocks/Slabs)  
(By Countries)**

Country	2013-14		2014-15(P)	
	Qty	Value	Qty	Value
	(t)	(₹'000)	(t)	(₹'000)
<b>All Countries</b>	<b>7849</b>	<b>200368</b>	<b>6290</b>	<b>210530</b>
Norway	4246	116828	3279	115511
Brazil	23	1026	593	34351
Angola	-	-	451	14427
China	432	7777	427	11912
Ukraine	164	4017	399	8428
Italy	120	3122	312	7748
Finland	335	10189	580	7548
Spain	75	2678	107	6639
South Africa	415	10293	65	1950
Oman	-	-	30	1051
Other countries	2039	44438	47	965

**Table – 14 : Imports of Granite  
(Polished Blocks/Tiles)  
(By Countries)**

Country	2013-14		2014-15(P)	
	Qty	Value	Qty	Value
	(t)	(₹'000)	(t)	(₹'000)
<b>All Countries</b>	<b>4060</b>	<b>130545</b>	<b>5017</b>	<b>130523</b>
Norway	804	33276	1072	34228
China	489	20365	902	24818
Brazil	335	24829	564	23147
South Africa	86	2963	803	13642
Ukraine	183	3894	292	7404
Sri Lanka	1633	22420	471	5243
Italy	41	1619	99	5148
Finland	-	-	284	4965
Angola	-	-	200	4437
Mozambique	-	-	160	3348
Other countries	489	21179	170	4143

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**Table – 15 : Imports of Granite (Others)  
(By Countries)**

Country	2013-14		2014-15(P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
<b>All Countries</b>	<b>18906</b>	<b>771281</b>	<b>9725</b>	<b>630598</b>
Sri Lanka	1289	94626	3300	266477
China	11942	417709	3668	219757
Italy	1757	103139	620	57021
Brazil	837	48821	973	45966
Saudi Arabia	508	17734	258	8870
Norway	-	-	307	6451
South Africa	766	33751	239	5789
USA	16	645	26	2585
Hong Kong	-	-	30	2230
Ukraine	310	8200	70	2086
Other countries	1481	46656	234	13366

## FUTURE OUTLOOK

India possesses one of the best granite deposits in the world having excellent varieties comprising over 200 shades. India accounts for over 20% of the world resources in granite. The total granite resources in India as on 1.4.2010 are: 46,230 million cu m. As per the Report of the Working Group for 12<sup>th</sup> Plan (2012-17), the Indian stone production during 2009-10 was 35,342 thousand tonnes, and in value terms, the estimated turnover of the Indian Dimensional Stone market in 2009-10 was of the order of ₹ 30,000 crore out of which the southern states accounted for ₹ 18,000 crore, Rajasthan ₹ 7,000 crore and the rest of India ₹ 5,000 crore. Granite alone accounts for 2/3<sup>rd</sup> of the value of production.

As per the Report for 12<sup>th</sup> Plan, the Dimension stone market is said to grow at a fervent pace as the demand for granite, marble, sandstone and other dimension stones and stone products is on the rise and are anticipated to grow 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 the Industry expects to consolidate for augmentation of prospects. The Working Group for 12<sup>th</sup> Plan has recommended that well-planned, concerted and dedicated efforts are essentially needed for promotion of Indian stones to galvanise their export prospects. The emphasis needs to be on popularisation of Indian stones in both the traditional markets as well as other niche

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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 could render the much-needed fillip to the industry as a whole. Alternatively, other options for exporting granite and marble in processed form to maximise export earnings are to develop and promote artifacts, 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 for 12<sup>th</sup> Plan had observed that the present investment in Dimensional Stone Industry in India is at ₹ 20,000 crore. Further, it was observed that with the right policy support, the total turnover of the sector could rise to around ₹ 30,000 crore in 2009-10 and even higher to over ₹ 40,000 crore by 2012-13, and thereafter, double in every five years considering an estimated growth rate of 15%. To sustain this level of anticipated growth, there must be a protracted growth, investment flow into this sector to the tune of ₹ 1,07,500 crore by 2022-23 (including foreign investment).