

LIMESTONE AND OTHER CALCAREOUS MATERIALS



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LIMESTONE & OTHER CALCAREOUS MATERIALS

(FINAL RELEASE)

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The term limestone is applied to any calcareous sedimentary rock consisting essentially of carbonates. The two most important constituents are calcite and dolomite. Limestone often contains magnesium carbonate, either as dolomite $\text{CaMg}(\text{CO}_3)_2$ or magnesite (MgCO_3) mixed with calcite. Such rocks are termed as 'dolomitic' or 'magnesian' limestone. Limestones altered by dynamic or contact metamorphism become coarsely crystalline and are referred to as 'marbles' and 'crystalline limestones'. Other common varieties of limestones are 'marl', 'oolite' (oolitic limestone), shelly limestone, algal limestone, coral limestone, pisolitic limestone, crinoidal limestone, travertine, onyx, hydraulic limestone, lithographic limestone, etc. However, the limestone which is used by industries in bulk quantity is a bedded type sedimentary limestone.

Other calcareous material used by industry are 'chalk', a white, extremely fine-grained, usually soft and friable variety of limestone, composed largely of microscopic small remains of foraminifera and broken shelly fragments; 'kankar', irregular nodules and concretions of impure calcium carbonate of all sizes found in the older surface alluvium or soils; and 'limeshell', the thick calcareous shells of molluscs deposited in the form of beds as well as present in ancient lakes and shallow seas. A limestone rock which separates well along the stratification into a few centimetres thick slab is termed 'flagstone'. The dimensional limestone used for building and ornamental stone purposes is discussed in the Reviews on 'Marble' and 'Slate, Sandstone & Other Dimension Stones'.

RESOURCES

The total resources of limestone of all categories and grades as per UNFC system as

on 1.4.2010 are estimated at 184,935 million tonnes, of which 14,926 million tonnes (8%) are placed under reserves category and 170,009 million tonnes (92%) are under remaining resources category. Karnataka is the leading state having 28% of the total resources followed by Andhra Pradesh, Gujarat and Rajasthan (11% each), Telangana (9%), Chhattisgarh (5%), Madhya Pradesh (4%) and remaining 21% by other states. Gradewise, cement grade (Portland) has leading share of about 68% followed by Unclassified grades (13%) and BF grade (7%). Remaining (16%) are others. (Table-1(A)).

The total resources of chalk of all categories and grades as per UNFC system as on 1.4.2010 are estimated in Gujarat at 4.92 million tonnes of which 4.33 million tonnes (88%) are under reserves category and 0.59 million tonnes (12%) are under remaining resources category (Table-1(B)).

The total resources of marl of all categories and grades as per UNFC system as on 1.4.2010 are estimated in Gujarat State only at 151.68 million tonnes of which 139.98 million tonnes (92%) are under reserves category and 11.70 million tonnes (8%) are under remaining resources category (Table - 1 (C)).

EXPLORATION & DEVELOPMENT

Exploration was carried out by GSI in the state of Sikkim, Himachal Pradesh, Meghalaya and Rajasthan. Directorates of Mining and Geology of Chhattisgarh and Rajasthan and Mineral Exploration Corporation Limited in the state of Nagaland also carried out exploration for limestone. Details of work carried out are furnished in Table-2.

LIMESTONE AND OTHER CALCAREOUS MATERIALS

Table – 1(A) : Reserves/Resources of Limestone as on 1.04.2010
(By Grades/States)

(In '000 tonnes)

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	8978583	3650574	2297234	14926392	1827583	3739470	6309489	22040640	124835558	4396981	170008720	184935112	
By Grades													
Chemical	189441	4094	42988	236522	40413	91817	569507	17074	1823217	2301101	-	4843129	5079652
S.M.S.(O.H.)	148323	864528	2284	1015135	1990	279167	729551	469116	454149	1825195	239223	3998392	5013527
S.M.S.(L.D.)	1619	98635	155	100409	810	9928	11364	1019	49894	123965	-	196979	297388
S.M.S.(O.H. & L.D. mixed)	22842	-	-	22842	-	-	-	-	2604	167182	-	169786	192628
B.F.	432522	455504	42720	930747	97375	26225	63246	467190	966030	11137050	13313	12770428	13701174
S.M.S. & B.F. mixed	4910	211614	2956	219480	24171	25138	36038	2000	122103	780680	240733	1230862	1450342
Cement (portland)	7475616	1638178	2102094	11215887	1564469	3192817	4799174	4884690	12802454	82928360	3516270	113688234	124904122
Cement (white)	1503	-	759	2263	4742	2066	1976	117000	-	2256	-	128039	130302
Cement (portland & white)	80266	5082	1110	86458	5103	13495	13119	338670	60000	506445	39000	975833	1062291
Cement (blendable/beneficial)	232608	55367	27316	315290	30317	37274	2672	43047	43776	438833	-	595918	911208
B.F. & cement mixed	13149	14135	26468	53753	-	26608	6119	485	-	76843	-	110056	163809
S.M.S.,chemical & paper	1059	-	273	1331	25	2169	1303	-	-	1228617	-	1232114	1233446
Paper	28343	-	448	28791	466	56	131	120678	27073	748560	-	896964	925755
Others	83074	14450	9058	106582	11264	19016	22972	162376	515695	2876988	253007	3861317	3967899
Unclassified	115052	26687	38305	180044	46132	7325	44287	190717	5094328	18780431	74468	24237689	24417733
Not-known	148255	262301	300	410857	307	6366	8030	44938	79318	913053	20967	1072980	1483836
By States													
Andhra Pradesh	1426745	235126	590969	2252840	171812	53170	386526	58874	189657	16967376	122648	17950064	20202904
Arunachal Pradesh	-	-	-	-	-	-	-	-	49220	433575	-	482795	482795
Assam	183788	152562	-	336350	10902	9828	4257	154644	34200	897161	-	1110992	1447342
Bihar	7822	-	795	8617	-	6123	6689	86379	38210	709522	-	846923	855540
Chhattisgarh	856930	10962	30004	897896	46468	742220	80465	1331984	480812	5379600	-	8061550	8959446
Daman & Diu	-	-	-	-	-	-	-	-	-	128670	-	128670	128670
Gujarat	542498	72263	195715	810475	60640	88866	159549	18728	858265	18014634	-	19200681	20011157

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LIMESTONE AND OTHER CALCAREOUS MATERIALS

Table-1(A) (Concid)

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		
		STD121	STD122			STD221	STD222				STD334		Total (B)
Haryana	-	-	-	-	1425	15507	3382	-	2200	52163	-	74677	74677
Himachal Pradesh	541555	226170	209638	977363	48410	44097	21220	1525202	1891	2830449	433	4471702	5449064
Jammu & Kashmir	257480	5525	54100	317106	421116	21686	165199	43621	-	1001420	203	1274246	1591352
Jharkhand	144259	4105	54713	203077	8364	7704	9672	9534	12125	372131	11803	431333	634410
Karnataka	538927	486300	72518	1097745	171995	394671	453541	1573788	13919929	34579866	8240	51102029	52199775
Kerala	12959	-	-	12959	122659	77	1576	21161	2888	35228	-	183589	196548
Madhya Pradesh	460445	1166513	24865	1651823	287634	204089	88311	514783	560472	3971168	264247	5890703	7542526
Maharashtra	589789	176015	60794	826598	464232	176987	52152	28470	159309	1114112	-	1995262	2821860
Manipur	-	-	-	-	-	-	-	19953	2138	23962	-	46053	46053
Meghalaya	138207	94459	-	232666	36898	23400	-	460107	2811179	13941438	-	17273022	17505688
Nagaland	825	-	-	825	-	-	-	-	1010000	27000	-	1037000	1037825
Odisha	280588	466627	126717	873932	3225	49045	241871	133600	44562	386952	49800	909055	1782987
Puducherry	-	-	-	-	-	-	-	4433	4333	6966	-	15732	15732
Rajasthan	1740173	91434	428111	2259717	141539	1607076	4438479	467462	720874	11110360	914330	19400121	21659838
Sikkim	-	-	-	-	-	-	-	-	-	2380	-	2380	2380
Tamil Nadu	199243	115705	55165	370112	19229	55984	42014	69951	32169	460412	-	679759	1049871
Telangana	1057097	347383	391504	1795984	139869	11475	73412	156972	885847	11144634	3025277	15437488	17233472
Uttar Pradesh	-	-	-	-	45130	135590	21050	142763	40000	31200	-	415733	415733
Uttarakhand	-	-	1051	1051	5035	91872	59378	29486	164879	1191059	-	1541709	1542760
West Bengal	-	-	-	-	-	-	-	7104	15482	22120	-	44706	44706

Figures rounded off.

LIMESTONE AND OTHER CALCAREOUS MATERIALS

Table – 1 (B) : Reserves/Resources of Chalk as on 1.04.2010
(By Grades/States)

(In '000 tonnes)

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	3266	537 528	4332	184	5 127	-	-	269	-	585	4917
By State											
Gujarat	3266	537 528	4332	184	5 127	-	-	269	-	585	4917

Figures rounded off.

Table – 1 (C) : Reserves/Resources of Marl as on 1.04.2010
(By Grades/States)

(In tonnes)

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	133236150	4650000 2090000	139976150	11704870	-	-	-	-	-	11704870	151681020
By Grade											
Unclassified	133236150	4650000 2090000	139976150	11704870	-	-	-	-	-	11704870	151681020
By State											
Gujarat	133236150	4650000 2090000	139976150	11704870	-	-	-	-	-	11704870	151681020

Figures rounded off.

LIMESTONE AND OTHER CALCAREOUS MATERIALS

Table – 2 : Details of Exploration Activities for Limestone, 2014-15

Agency/ State/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
GSI							
Meghalaya							
Jaintia Hills	North of Larket Block, Litang valley	-	-	07	768.05	-	A G3 stage investigation for limestone was taken up. The maximum thickness of limestone (120 m) has been intersected in borehole JNLK-6. Kopili Formation and Prang limestone contain microfossils like Numulites, Alviolina, Discocyclina etc., bivalves like Pecten, Oyster and gastropod like Conus, Fusus, Oliva etc. On the basis of the analytical results received, the samples of three boreholes indicate presence of 38 m thick SMS grade limestone.
East Khasi Hills	Mawlong-Ishamati Block of Shella-Bholaganj Belt	-	-	-	822.60	-	A G3 stage investigation was taken up. The main litho units observed are limestone, which is fossiliferous of Shella Formation and shale of Kopili Formation with intercalated bands of sandstone. The beds of limestone are trending E-W with sub horizontal dip 5°-12° toward south. The analytical results of core samples show two zones of chemical grade limestone viz. 0.0 m to 70.05 m = 70.05 m, with CaO 50.15%, MgO 1.24%, SiO ₂ 3.1% and 79.20 m to 140.40 m = 60.10 m, with CaO 50.80%, MgO 1.30%, SiO ₂ 3.15%.
Sikkim							
South & West Sikkim	Namchi Nayabazar & Bijanbari	-	-	-	-	-	The rocks exposed area belong to the undifferentiated Proterozoic Daling Group and Gondwana Supergroup. The Daling Group is represented by the Gorubathan Formation comprising of phyllite and quartzite and is thrust over the Gondwana rocks. The Gondwana Supergroup is represented by the Damuda Formation and the Rangit pebble beds, although the latter unit is observed only at Tatapani Gompha area and at Lower Subuk. Dolomite is the main litho unit of the Buxa Formation and occurs at Tatapani Gompha, Reshi Bazar, Tinzirbung and Kolbung. A small body of dolomite was also observed at Sagbari. Dolomite covers about 25% of the total study area and the remaining area comprises of Daling and Gondwana Supergroup. Stromatolites of the genus Collenia showing small domal structures were

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LIMESTONE AND OTHER CALCAREOUS MATERIALS

Table-2 (Contd.)

Agency/ State/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Himachal Pradesh							observed in the boulders of dolomites at Tatapani Gompha area. At the JPCL dam site, on the left bank of the Rangit River, Tinzirbung-Suldung road section and at Subuk, these dolomites are found intercalated with the purple phyllite and quartzite. Analytical results of the dolomites indicate CaO with maximum value of 30.4% and minimum of 14.73% and an average of 24.68% and MgO with minimum value of 11.75% and maximum value of 20.54% and an average of 16.83%. All the dolomite samples have high LOI values with an average of 38.
Sirmaur	Saindhar Syncline	-	-	-	-	-	A G4 stage investigation for assessment of limestone/ dolomite was taken up in Lower Member of Kauriyala Formation (Krol 'C') of Krol Group in Saindhar Syncline to assess the grade and reserves of limestone/ dolomite bands for the use in cement, steel, fertiliser, poultry grit and glass industries etc. Geologically, the study area comprises the dominant carbonate suite or rocks with subordinate argillite of the Krol Group. The rock exposed in the area belongs to Krol 'B', 'C' and Krol 'D'. Krol 'B' (Jarashi Formation) is represented by distinctly laminated grey, purple, olive green and red shale with lenses of impure limestone (2m to 5m thick). Rocks of Kauriyala Formation exposed in the area belong to Krol 'C' (Lower member) and Krol 'D' (Middle member), Krol 'C' (Lower member) is mainly divisible into dark grey dolomitic limestone and whitish grey dolomitic limestone Krol 'D' exhibits purple, khaki and dark grey shale and grey dolomite with chert bands (1.5 cm to 5 Cm thick). Well developed algal mats, 10 cm to 15 Cm thick band of oolitic limestone and one metre thick bed of grey coloured nodular dolomitic limestone are observed in Krol 'D'. The analytical results of the channel samples are not encouraging to categorise the commodity for any particular industrial use.

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LIMESTONE AND OTHER CALCAREOUS MATERIALS

Table-2 (Contd.)

Agency/ State/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Rajasthan Bandah area Jaisalmer		-	-	10	334.50	213	G-4 stage investigation for low silica SMS grade limestone was taken up. Borehole (JRB-1) intersected limestone from 1.00 m - 21.62 m with four bands of hard & compact limestone. Borehole (JRB-3) intersected limestone from 1.00m-12.88 m with two bands of hard & compact limestone. Results match with the specification of Chemically SMS grade limestone and 11 nos samples show on an average SiO ₂ -5.83%, CaO-50.89%, MgO-0.35%, Fe ₂ O ₃ -0.74% & Al ₂ O ₃ -0.39% respectively, which matches with the specification of cement grade limestone.
Rajasthan Miyun ki Dhani (west)	Jaisalmer District	-	-	18	900	616	G-4 stage investigation was carried out. All the boreholes were drilled up to the depth of 50 m below ground level. In all the boreholes hard compact limestone has been intersected with different thickness. The variation in thicknesses is ranging between 2.5 m to 28 m. In most of the boreholes the hard and compact limestone bearing zone is occurring continuously and in some of the boreholes this limestone is occurring intermittently with the moderately hard clayey limestone, chalky limestone, foraminiferal/bioclastic limestone, foraminiferal marl, sub-bentonitic clay, calcareous clay and grey shale. Out of 274 nos. core samples, the results of 60 nos. indicate the grade matching with SMS(LD) grade with maximum CaO-55.06% and minimum CaO-50.35% and the grade of 62 nos. are matching with the SMS (OH).

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LIMESTONE AND OTHER CALCAREOUS MATERIALS

Table-2 (Contd.)

Agency/ State/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
DGM Rajasthan							
Nagaur	Block No.3 N/v Harima and Pitasar	1:2000 (1cm=20m)	3.0	09 (comp- leted) 03 (under process)	553	-	The area comprises with rocks of Bilara group of Marwar Supergroup. The rocks are horizontally bedded limestone and dolomitic limestone parted with calcareous reddish shales. The rocks of Bilara group in the area occurs directly as exposures or below recent to sub recent formations as sand and lime- kankar zone of 1m to 3m thickness. The thickness of limestone and dolomitic limestone is confirmed only upto the depth of exploratory boreholes put in the area upto 50 mtrs but it is continuing much deeper upto the basement rocks at Jodhpur group. These boreholes intersected limestone beds of cumulative thickness from 3.0 M to 29.05 mts. The dolomitic limestone is earthy white to grey colour, medium to coarse grained, crystalline texture and at top surface elephant skin weathering present. The limestone is good quality high grade. It is carneous, grey and pink in colour at some places, is having laminated cherty bands and is generally crystalline fine to medium grain in texture. Reserves estimated during the year is 65.49 million tonnes in Pitasar block and 1.21 million tons in somna block were estimated. Reserve/Resources estimated during the year at 343.11 million tonnes of cement grade.
Nagaur	Block No.4 N/v Bher-Gobhan	-	-	23	866	688	
Chittorgarh	Anjankhera Nilod	-	10	9	527	349	Geologically the area is occupied by siliceous dolomitic, graphite schist and quartzite belonging to Rajpura-Dariba Group and gneisses garnetiferous mica, schist, silicified quartzite calc sillicate/biotitic limestone and amphibolites of mangalwar complex of Bhilwara supergroup. Crystalline limestone band is exposed intermittently about 5 km in length with width varries from 50-100 m grey to grayish white crystalline biotitic limestone intersected in all the boreholes from 0-69 m in depth.

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LIMESTONE AND OTHER CALCAREOUS MATERIALS

Table-2 (Contd.)

Agency/ State/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Chittorgarh	Rasulpura Bansa & Pirkhera Phachar Ahiran	1:4000	3.0	3	163	82 (45 chip samp- ling 37 spot samp- ling)	Geologically, the area comprises Nimbahera limestone and shales of Khorip group of lower Vindhyan belonging to proterozoic era. These are trending in N-S with 10° to 25° rolling dips. The Nimbahera shales are also known as Bari shales. These conformably lies over Binota shale and underlain by Nimbahera limestone. Two cement grade limestone blocks have been identified suitable for mining. Resources were not yet calculated.
Dungarpur Nandi	Rama, Dad, Ahara, Bhatoli, Munger, Sabla	-	162 (RMS-150 RGM-10 DGM-2)	-	-	100	The grey to pinkish coloured medium to coarse grained, compact & crystalline limestone band was surveyed and mapped. It occurs on the lithological contact of Balicha and Banswara formations exposing phyllite, muscovite-biotite schist on western contact and granite gneisses/schist, amphibolite respectively. The white, grey and pink in colour, medium to coarse grained compact and crystalline limestone band of about 6 km strike length with average width 10 m to 100 m composed limestone band is exposed from the village Dhani south east of Rama, in the northern extremity extended to north of village Podla Jani. Resources will be estimated after completion of final exploration.
Alwar	Near villages Bithloda, Mandha, Bhankri, Karoi, Nayalas etc.	1:4000	4	10	966	178	The block comprises of limestone, calc sillicate, phyllite, schist etc. rocks belonging to Ajabgarh group of Delhi Super group intruded by quartz, pegmatite of post Delhi age. Concealed limestone occurrences have been reported N/v Bithloda, Jaten ki Dhani, Mandha, Torda etc. The exploration is proposed in three blocks viz. (i) Mohanpura-Jodhpura (about 6.5 km) (ii) Mandla to Torda (about 5 km) and (iii) Pachudala to Karoi (about 7.0 km).

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LIMESTONE AND OTHER CALCAREOUS MATERIALS

Table-2 (Contd.)

Agency/ State/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Pali	Bherla-Serva & Ambikaravava	1:10000	10.00	-	-	24	Limestone was found exposed for a strike length of more than 15 km with 100 m-500 m width in NE of Bherla & Serva villages. Outcrops of limestone have been notified n/v Sela for strike length of more than 400 m. The limestone is bluish grey to grey in colour, crystalline, medium to fine grained & appears to be cement grade in nature. The area is occupied by limestone calc-silicate rocks and biotite schist of Kumbhalgarh of Delhi Super Group and Erinpura granites traversed by acid and basic intrusion of Phulad ophilite suits at places.
Jaisalmer	N/V Sam (Rahu Ka Par)	1:50000 (RMS) 1:10000 (RGM) 1:2000 (DGM)	100 15 4.5	29	1282	703	Area comprises an outcrop of hard compact bouldary limestone underlain by chalky limestone of Khuiala formation and overlain by pseudo conglomeratic iron stone of shumar formation with sand. The limestone is horizontally disposed. It is creamish pinkish to whitish in colour & fossiliferous in nature. Area was found potential for cement & SMS grad limestone. About 219 million tonnes of cement grade & 20.50 million tonnes of SMS grade limestone were estimated.
	N/V Amar- sagar	1:50000 (RMS) 1:10000 (RGM) 1:2000 (DGM)	50 10 2	-	-	-	Area comprises of yellowish limestone of Jaisalmer formation trending NE-SW direction. The Mounds, escarpments of outcrops of limestone are almost horizontal to local gentle dipping toward NW. Limestone is fossiliferous in nature. The area comprises 0.3m -1m surface brownish yellowish siliceous fossiliferous limestone underlain by yellowish fine grained limestone bed/ yellow marble (0.30 m - 1m).

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LIMESTONE AND OTHER CALCAREOUS MATERIALS

Table-2 (Contd.)

Agency/ State/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Udaipur	Sayra-podarda Rabachh	1:50000	300	-	-	38	NE-SW dipping easterly forming contact with granite trend with moderate to high dips toward East. Four crystalline calcitic limestone band with tiny mica flakes have been located.
		1:10000	20				
		1:4000	2.5				
Jhalawar	N/V Gadiya Semli Bhawani Jhinkriya	1:50000	150	-	-	40	Geologically, the area comprises deccan trap (Basalt) and intertrappean beds of cretaceous to Eocene age. The basalt is generally greenish to blackish in colour, fractured and weathered in nature. Total resources of limestone were estimated at 2.14 million tonnes.
		1:10000	16				
		1:2000	2.7				
Ajmer	A/V Pilwa, Chimvati Dhandota etc.	1:50000	150	-	-	25	Geologically rock of the area belonging to Ajabgarh group of Delhi supergroup alongwith intrusives phulod ophiolite suite, Sendra Ambaji synorogenic granite and Erinpura granite. Rock types encountered in the area are mica schist, quartzite, Conglomerate, limestone, dolomitic, limestone, calcium sillicate, granite, amphibolite, pegmatite and vein quartz. General trend of rock formations in NE-SW with 50 ⁰ -70 ⁰ dip due west.
		1:10000	10				
		1:2000	4				
	A/V Shyamgarh, Pakriyawas, Kanakhedha, Kesapura	1:10000	10	-	-	105	Geologically, the area comprises calc gneisses, calc, sillicate, limestone, quartzite, mica schist of Kumbhatgarh group of Delhi Super Group alongwith intrusive of granites, pegmatite and vein quartz etc.
		1:2000	4				
	N/V Khalipura, Dowari Dowari Davri, Jabriya etc.	1:50000	150	-	-	40	Geologically, the rocks of the area belong to Rajmahal formation at Bhilwara Supergroup along with post Bhilwara intrusive General trend of rock formation is NE-SW. Six limestone bands along with calc-sillicate containing in about 150 m-1500 m strike length with 50-250 m width have been mapped. Limestone is greyish to greenish grey coloured.
		1:10000	10				
		1:2000	30				

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LIMESTONE AND OTHER CALCAREOUS MATERIALS

Table-2 (Concl.d.)

Agency/ State/ District	Location Area/ Block	Mapping		Drilling		Sampling (No.)	Remarks Reserves/Resources estimated
		Scale	Area (sq km)	No. of boreholes	Meterage		
Chattisgarh Raipur	Kesala area	1:50000 1:40000	77 1.598	37	1111.55	1056	The rock formation of the area belongs to Raipur Group of Chattisgarh Super group. Main lithounits are shale limestone & laterite. Limestone is mostly horizontally bedded, trending NE-SW. Depth of limestone confined upto 34 m, colour is grey to pink, hard compact, massive and stromatolitic. Total 514.68 lakh tonnes resources of limestone were estimated.
Rajnandgaon	Tekapar area	1:50000 1:40000	29 1.00	34	1015.15	951	Regionally the limestone deposit belongs to Chandi formation of Raipur group of Chattisgarh basin and extends almost in E-W. The explored area mostly occupied by residual soil with sporadic outcrops of purple, grey stromatolite limestone. Purple and grey shale bands are encountered in boreholes. Formations are horizontally bedded with E-W elongation. Total 589.70 lakh tonnes resources of limestone (inferred) were estimated.
Janjgir-champa	Dhabadih	1:50000 1:40000	408 2.06	42	1317.70	1121	The area is occupied by limestone, dolomite and shale. Limestone is grey to pinkish brown and stromatolitic in nature and it belongs to chandi formation of Raipur group.
MECL Nagaland Kiphire	Mimi- pyakatsu Block	1:1000	4.50	05	531.50	239 (primary) 28 (check sample) 75 (Com- posite sample) 133 out ceop sample)	The deposit consists of thick limestone bands associated with feldspar quartzite of mini formation of lower Eocene to upper Cretaceous age. It is undelain by Soramati formation and overlain by opholite series, Salumi formation and Phakphur formation. Thus formation occurs as continuous to discontinuous bands with general trend of NE-SW with dip of 60° to 70° towards north-west.

LIMESTONE AND OTHER CALCAREOUS MATERIALS

PRODUCTION, STOCKS AND PRICES

Limestone

The production of limestone in 2014-15 at 292.8 million tonnes increased by about 4% as compared to that of the previous year owing to high demand in the market.

There were 740 reporting mines in 2014-15 as against 779 during the previous year. Twenty five mines, each producing more than 3 million tonnes per annum contributed about 41% of the total production of limestone in 2014-15. The share of 13 mines, each in the production range of 2 to 3 million tonnes was about 11% of the total production. About 23% of the total production was contributed by 46 mines, each producing 1 to 2 million tonnes, annually. The remaining 25% of the total production was reported by 656 mines and four associated mines during the year. Twenty five principal producers contributed about 79% of the total production. About 4% of the production was reported by public sector mines as against 4.1% in the previous year.

About 97% of the total production of limestone during 2014-15 was of cement grade, 2% of iron & steel grade and the rest 1% consisted of chemical grade.

Rajasthan was the leading producing state accounting for (21%) of the total production of limestone, followed by Madhya Pradesh (13%), Andhra Pradesh (12%), Gujarat (9%), Karnataka, Telangana, Chhattisgarh and Tamil Nadu (8% each), Himachal Pradesh and Maharashtra (4% each) and the remaining 5% was contributed by Meghalaya, Odisha, Uttar Pradesh, Jharkhand, Assam, Kerala, Bihar and Jammu & Kashmir.

Mine-head closing stock of limestone for the year 2014-15 was 13.3 million tonnes as against 12.4 million tonnes for the previous year.

Average daily labour employment in limestone mines in 2014-15 was 21,655 as against 22,977 in the previous year (Tables - 3 to 7).

The prices of limestone are furnished in the General Review on 'Prices'.

Table – 3 : Principal Producers of Limestone 2014-15

Name and address of producer	Location of mine	
	State	District
UltraTech Cement Ltd, 'B' Wing, Ahura Centre, 2 nd Floor, Mahakali Caves Road, Andheri (E), Mumbai-400 093, Maharashtra.	Andhra Pradesh	Kurnool
	Chhattisgarh	Raipur
	Gujarat	Amreli
		Kachchh
	Karnataka	Kalaburagi
	Madhya Pradesh	Neemuch
	Maharashtra	Chandrapur
	Rajasthan	Chittorgarh
		Jaipur
		Nagaur
	Tamil Nadu	Ariyalur
Ambuja Cement Ltd, Elegant Business Park, MIDC Cross Road B Off Andheri Kurla Road, Andher-(East), Mumbai - 400 059 Maharashtra	Chhattisgarh	Raipur
	Gujarat	Junagadh
	Himachal Pradesh	Solan
	Maharashtra	Chandrapur
The ACC Ltd, Cement House, 121, Maharshi Karve Road, Mumbai – 400 020, Maharashtra.	Rajasthan	Pali
	Chhattisgarh	Durg
	Himachal Pradesh	Bilaspur
	Jharkhand	Singhbhum (W)
	Karnataka	Kalaburagi
	Madhya Pradesh	Katni
	Maharashtra	Yavatmal
	Rajasthan	Bundi
	Tamil Nadu	Coimbatore
	Odisha	Bargarh
Jaiprakash Associates Ltd, Sector – 128, Noida – 201 304, Uttar Pradesh.	Andhra Pradesh	Krishna
	Gujarat	Kachchh
	Madhya Pradesh	Rewa
		Sidhi
		Satna
Shree Cement Ltd, Post Box No. 33 Bangur Nagar, Beawar – 305 901, Rajasthan.	Himachal Pradesh	Solan
	Uttar Pradesh	Sonbhadra
The India Cement Ltd, Coromandel Towers, 93, Santhome High Road, Karpagam Avenue, Raja Annamalai Puram, Chennai – 600 028, Tamil Nadu.	Chhattisgarh	Raipur
	Rajasthan	Ajmer
		Pali
	Andhra Pradesh	Cuddapah
	Telangana	Nalgonda
		Ranga-Reddy
	Tamil Nadu	Ariyalur
		Perambalur
		Salem
	Tirunelveli	
	Thoothukudi	

(Contd.)

LIMESTONE AND OTHER CALCAREOUS MATERIALS

**Table – 3 : Principal Producers of Limestone
2014-15**

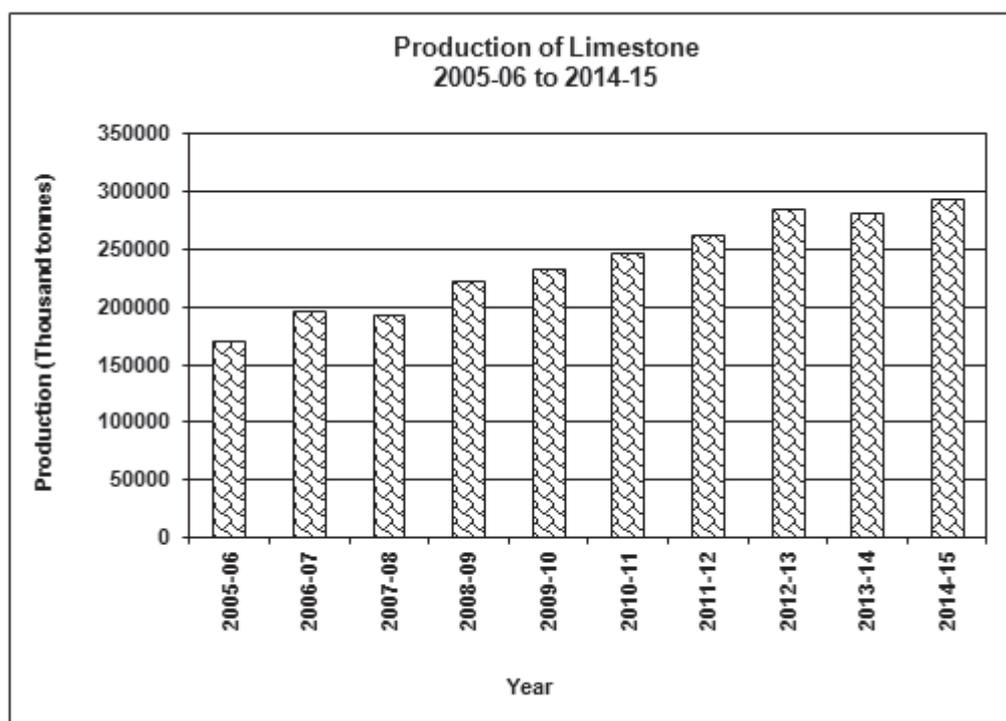
Name and address of producer	Location of mine	
	State	District
Century Textiles & Industries Ltd, Century Bhawan, Dr. Annie Besant Road, Worli, Mumbai- 400 030, Maharashtra.	Chhattisgarh Madhya Pradesh Maharashtra	Raipur Satna Chandrapur
The Ramco Cements Ltd, 5th Floor, Auras Corporate Centre, 98, Dr Radhakrishanan Salai, Mylapore- 600 004, Chennai.	Andhra Pradesh Karnataka Tamil Nadu	Krishna Chitradurga Ariyalur Perambalur Thoothukudi Virudhunagar
Lafarge India Private Ltd, (Company) Equinox Business Park Tower-3, East Wing 4th Floor, Off Bandra Kurla Complex, LBSR Road, Kurla-West, Mumbai-400 070.	Chhattisgarh Rajasthan	Janjgir- Champa Raipur Chittorgarh
J. K. Lakshmi Cement Ltd, JK Puram, Basantgarh Pindwara -307 019, Rajasthan.	Chhattisgarh Rajasthan	Durg Sirohi
J. K. Cement Limited, Kamla Tower, Kanpur-208 001, Uttar Pradesh.	Rajasthan Karnataka	Chittorgarh Nagaur Bagallkot
Dalmia Cement Ltd (Bharat) Dalmiapuram, Main Road, Lalgudi, Thiruchirapalli- 621 651, Tamil Nadu.	Andhra Pradesh Tamil Nadu	Cuddapah Ariyalur Thiruchira- palli
Chettinad Cement Corp. Ltd, 6 th Floor, Rani Seethai Hall Building, 603, Anna Salai, Chennai – 600 006, Tamil Nadu.	Tamil Nadu Karnataka	Ariyalur Dindigul Karur Perambalur Kalaburagi
Birla Corporation Ltd, Birla Building,9/1 R. N. Mukherjee Road, Kolkata – 700 001, West Bengal.	Madhya Pradesh Rajasthan	Satna Chittorgarh
Kesoram Industries Ltd, 9/1, R. N. Mukherjee Road, 8 th Floor, Kolkata – 700 001.	Telangana Karnataka	Karimnagar Kalaburgi

(Contd.)

Table - 3 (Contd.)

Name and address of producer	Location of mine	
	State	District
Binani Cement Ltd, 610-C, Axis Mall. 6th Floor, Action Area 1C, Rajarhat Road Kolkata-700 156 West Bengal	Rajasthan	Sirohi
Zuari Cement Ltd, Krishna Nagar, Yerraguntla-516 311, Andhra Pradesh.	Andhra Pradesh	Cuddapah Nalgonda
A.P. Mineral Dev. Corp. Ltd, 3 rd Floor Rear Block, HMWSSB, Premises, Khairatabad, Hyderabad – 500 004, Andhra Pradesh.	Telangana	Adilabad
Prism Cement Ltd, 305, Laxmi Niwas Apartments, Ameerpeth, Hyderabad-500 016, Andhra Pradesh.	Madhya Pradesh	Satna
My Home Industries Ltd, 9 th Floor, Block-3, My Home Hub, Madhapur, Hyderabad-500 081, Andhra Pradesh.	Telangana	Nalgonda
Wonder Cement Ltd. R.K.Nagar, Nimbahera,-301 601,	Rajasthan	Chittorgarh
Penna Cement Industries Ltd, Lakshmi Nivas Plot No.-705, Road No.-03, Banjara Hills, Hyderabad-500 034, Andhra Pradesh.	Andhra Pradesh Telangana	Anantapur Kurnool Nalgonda
Sanghi Industries Ltd, 10 th Floor, Kataria Arcade, Opp.S.G.Highway, P.O. Makaraba, Ahmedabad-380 051, Gujarat.	Gujarat	Kachchh
Bharathi Cements Co. Ltd. 8-2-626, Reliance Majestic RoadNo.10, Banjara Hills, Hyderabad - 500 034 Andhra Pradesh	Andhra Pradesh	Cuddapah
Heidel Berge CementIndia Limited, 9th Floor, Infinity Tower C, DLF Cyber City, Phase-II Gurgaon-122 002 Haryana.	Madhya Pradesh Karnataka	Damoh Tumakuru

LIMESTONE AND OTHER CALCAREOUS MATERIALS



**Table – 4 : Production of Limestone, 2012-13 to 2014 -15
(By States)**

(Qty in '000 tonnes; Value in ₹'000)

State	2012-13		2013-14		2014-15(P)	
	Quantity	Value	Quantity	Value	Quantity	Value
India	285030	47973173	280863	51332006	292810	52117464
Andhra Pradesh	36544	5565061	34331	5495772	35435	5623833
Assam	384	98879	203	50378	665	117917
Bihar	588	223401	549	247877	473	162106
Chhattisgarh	20172	3752473	21217	4249587	23505	4882559
Gujarat	26071	3393162	23373	3159255	25729	3381545
Himachal Pradesh	13104	1692641	11935	1663036	12718	1928022
Jammu & Kashmir	192	26917	193	26996	131	18278
Jharkhand	1861	517771	1678	646546	792	277778
Karnataka	21132	3147566	21590	2833943	24031	3315013
Kerala	488	229727	501	234597	511	252130
Madhya Pradesh	35536	5017896	37832	6330551	38972	6041252
Maharashtra	11924	1820480	10997	1629631	12086	2016552
Meghalaya	4032	2016961	3616	2344472	3696	2401689
Odisha	3912	1344027	3718	1578044	3409	1074234
Rajasthan	52540	9192487	56754	10604183	61544	11050125
Tamil Nadu	26442	5217805	24112	5538596	22205	5337446
Telangana	26894	4112018	25120	3986981	23956	3747633
Uttar Pradesh	3214	603901	3144	711561	2952	489352

LIMESTONE AND OTHER CALCAREOUS MATERIALS

**Table – 5 : Production of Limestone, 2013-14 and 2014-15
(By Frequency Groups)**

Production group (In tonnes)	No. of mines		Production for the group (‘000 tonnes)		Percentage in total production		Cumulative percentage	
	2013-14	2014-15(P)	2013-14	2014-15(P)	2013-14	2014-15(P)	2013-14	2014-15(P)
All Groups	779(4)	740(4)	280863	292810	100.00	100.00	-	-
Up to 10000	333(3)	302(4)	876	849	0.31	0.29	0.31	0.29
10001 - 50000	156(1)	138	3844	3559	1.37	1.22	1.68	1.51
50001 - 100000	58	63	4401	4788	1.57	1.64	3.25	3.15
100001 - 200000	40	46	5661	6671	2.02	2.28	5.27	5.43
200001 - 300000	16	19	4134	4918	1.47	1.68	6.74	7.11
300001 - 400000	26	23	9061	8177	3.23	2.79	9.97	9.9
400001 - 500000	18	13	8362	5987	2.98	2.04	12.95	11.94
500001 - 600000	10	18	5478	9966	1.95	3.4	14.9	15.34
600001 - 700000	9	4	5697	2608	2.03	0.89	16.93	16.23
700001 - 800000	7	7	5216	5153	1.86	1.76	18.79	17.99
800001 - 900000	9	15	7585	12657	2.7	4.32	21.49	22.31
900001 - 1000000	6	8	5736	7555	2.04	2.58	23.53	24.89
1000001 - 2000000	56	46	74965	67316	26.69	22.99	50.22	47.88
2000001 -3000000	10	13	25532	31786	9.09	10.86	59.31	58.74
3000001 & above	25	25	114315	120820	40.7	41.26	100.00	100.00

(): Figures in parentheses indicate associated mine of limestone with chalk, dolomite & shale.

**Table – 7 : Mine-head closing Stocks of Limestone, 2013-14 & 2014-15
(By States/Grades)**

(In '000 tonnes)

State	2013-14					2014-15 (P)				
	Grades					Grades				
	Cement	Iron & Steel	Chem.	Others	Total	Cement	Iron & Steel	Chem.	Others	Total
India	9569	1719	1116	-	12404	9784	2466	1022	-	13272
Andhra Pradesh	461	50	4	-	515	586	26	4	-	616
Assam	43	-	-	-	43	42	-	-	-	42
Chhattisgarh	77	21	-	-	98	189	25	-	-	214
Gujarat	2238	-	1097	-	3335	2323	-	994	-	3317
Himachal Pradesh	52	73	-	-	125	138	48	-	-	186
Jammu & Kashmir	2	-	-	-	2	3	1	-	-	4
Jharkhand	11	179	-	-	190	76	431	-	-	507
Karnataka	2180	286	-	-	2466	2108	440	-	-	2548
Kerala	3	-	-	-	3	6	-	-	-	6
Madhya Pradesh	1089	221	14	-	1324	1321	392	11	-	1713
Maharashtra	66	22	-	-	88	10	21	-	-	31
Meghalaya	58	-	1	-	59	78	-	2	-	80
Odisha	109	432	-	-	541	121	437	-	-	558
Rajasthan	1497	107	-	-	1604	1305	357	-	-	1662
Tamil Nadu	689	328	-	-	1017	409	288	11	-	708
Telangana	994	-	-	-	994	1069	-	-	-	1069

LIMESTONE AND OTHER CALCAREOUS MATERIALS

Table - 6 : Production of Limestone, 2013-14 & 2014-15
(By Sectors/States/Districts/Grades)

State/District	2013-14										2014-15 (P)											
	Grades					Total					Grades					Total						
	No. of mines	Cement	Iron & Steel	Chem.	Others	Qty	Value	No. of mines	Cement	Iron & Steel	Chem.	Others	Qty	Value	No. of mines	Cement	Iron & Steel	Chem.	Others	Qty	Value	
India	779(4)	271670	6420	2773	-	280863	51332006	740(4)	283091	6931	2788	-	292810	52117464								
Public sector	21	7389	4246	-	-	11635	3033390	23	7721	4156	-	-	11877	3388417								
Private sector	758(4)	264281	2174	2773	-	269228	48298616	717(4)	275370	2775	2788	-	280933	48729047								
Andhra Pradesh	74(3)	33770	554	7	-	34331	5495772	70(3)	34985	439	11	-	35435	5623833								
Anantapur	11(1)	1501	-	1	-	1502	198863	10(1)	1424	-	-	-	1424	197092								
Cuddapah	8(1)	10011	-	-	-	10011	1343835	8(1)	10284	-	-	-	10284	1382922								
Guntur	9	3581	114	-	-	3695	611042	8	3648	80	-	-	3728	595255								
Krishna	11	6829	402	-	-	7231	1734807	11	7284	345	-	-	7629	1750871								
Kurnool	35(1)	11848	38	6	-	11892	1607225	33(1)	12345	14	11	-	12370	1697693								
Assam	2	203	-	-	-	203	50378	2	665	-	-	-	665	117917								
Karbi Anglong	1	129	-	-	-	129	35667	1	112	-	-	-	112	32699								
North Cachar Hills	1	74	-	-	-	74	14711	1	553	-	-	-	553	85218								
Bihar	2	549	-	-	-	549	247877	1	473	-	-	-	473	162106								
Rohtas	2	549	-	-	-	549	247877	1	473	-	-	-	473	162106								
Chhattisgarh	67	20912	305	-	-	21217	4249587	62	23134	371	-	-	23505	4882559								
Balodabaza	1*	-	-	-	-	-	-	1*	-	-	-	-	-	-								
Bastar	12	49	-	-	-	49	18035	10	31	-	-	-	31	11008								
Durg	29	1370	305	-	-	1675	572276	27	1617	371	-	-	1988	671143								
Janjgir-Champa	2	1999	-	-	-	1999	484765	2	2196	-	-	-	2196	514146								
Kabirdham	1	++	-	-	-	-	23	1	++	-	-	-	-	42								
Raigarh	1	6	-	-	-	6	1356	1	7	-	-	-	7	1716								
Raipur	20	17488	-	-	-	17488	3173132	19	19283	-	-	-	19283	3684504								
Rajnandgaon	1*	-	-	-	-	-	-	1*	-	-	-	-	-	-								

(Contd.)

LIMESTONE AND OTHER CALCAREOUS MATERIALS

Table - 6 (Contd.)

State/District	2013-14										2014-15 (P)											
	Grades					Total					Grades					Total						
	No. of mines	Cement	Iron & Steel	Chem.	Others	Qty	Value	No. of mines	Cement	Iron & Steel	Chem.	Others	Qty	Value	No. of mines	Cement	Iron & Steel	Chem.	Others	Qty	Value	
Gujarat	120	20746	-	2627	-	23373	3159255	115	23078	-	2651	-	25729	3381545								
Amreli	2	5482	-	-	-	5482	813797	2	5572	-	-	-	5572	878264								
Jamnagar	20	718	-	178	-	896	103994	25	1010	-	151	-	1161	157546								
Junagadh	64	5745	-	1304	-	7049	977664	57	6281	-	955	-	7236	963441								
Kachchh	8	7221	-	-	-	7221	758712	6	8670	-	-	-	8670	805516								
Porbandar	25	1506	-	1145	-	2651	487595	24	1545	-	1545	-	3090	576778								
Surat	1	74	-	-	-	74	17493	1*	-	-	-	-	-	-								
Himachal Pradesh	20	11668	267	-	-	11935	1663036	17	12410	308	-	-	12718	1928022								
Bilaspur	1	3320	-	-	-	3320	429699	1	3579	-	-	-	3579	469382								
Mandi	-	-	-	-	-	-	-	1*	-	-	-	-	-	-								
Sirmaur	17	402	267	-	-	669	224417	13	598	308	-	-	906	317412								
Solan	2	7946	-	-	-	7946	1008920	2	8233	-	-	-	8233	1141228								
Jammu & Kashmir	1	193	-	-	-	193	26996	2	125	6	-	-	131	18278								
Pulwama	1	193	-	-	-	193	26996	2	125	6	-	-	131	18278								
Jharkhand	8	1669	9	-	-	1678	646546	8	792	-	-	-	792	277778								
Garwah	3	-	6	-	-	6	7512	3*	-	-	-	-	-	-								
Singbhum (West)	5	1669	3	-	-	1672	639034	5	792	-	-	-	792	277778								
Karnataka	54	20940	650	-	-	21590	2833943	60	23490	541	-	-	24031	3315013								
Bagalkot	36	2172	620	-	-	2792	635738	40	3023	503	-	-	3526	744620								
Belagavi	6	127	22	-	-	149	38463	7	72	12	-	-	84	25428								
Chitradurga	2	168	-	-	-	168	54596	3	98	-	-	-	98	21728								
Kalaburgi	7	18305	-	-	-	18305	2044010	7	20104	-	-	-	20104	2433797								
Shivomogga	1	-	8	-	-	8	1800	1	-	25	-	-	25	6065								
Tumakuru	2	168	-	-	-	168	59336	2	193	1	-	-	194	83375								

(Contd.)

LIMESTONE AND OTHER CALCAREOUS MATERIALS

Table - 6 (Contd.)

State/District	2013-14										2014-15 (P)											
	Grades					Total					Grades					Total						
	No. of mines	Cement	Iron & Steel	Chem.	Others	Qty	Value	No. of mines	Cement	Iron & Steel	Chem.	Others	Qty	Value	No. of mines	Cement	Iron & Steel	Chem.	Others	Qty	Value	
Kerala	1	501	-	-	-	501	234597	1	511	-	-	-	511	252130								
Palakkad	1	501	-	-	-	501	234597	1	511	-	-	-	511	252130								
Madhya Pradesh	125	36001	1776	55	-	37832	6330551	114	36724	2202	46	-	38972	6041252								
Damoh	2	3138	-	-	-	3138	648835	2	3759	-	-	-	3759	453303								
Dhar	14	104	-	-	-	104	14172	13	107	-	-	-	107	14927								
Jabalpur	1	-	14	-	-	14	2399	1	-	18	-	-	18	3111								
Katni	42	4019	1574	55	-	5648	937938	40	3999	1810	44	-	5853	1056321								
Narasinghapur	1	20	-	-	-	20	8986	-	-	-	-	-	-	-								
Nemuch	2	4348	-	-	-	4348	686485	2	4539	-	-	-	4539	553439								
Rewa	8	5654	-	-	-	5654	970258	8	5584	-	-	-	5584	951173								
Sagar	-	-	-	-	-	-	-	2*	-	-	-	-	-	-								
Satna	54	17479	188	-	-	17667	2931397	45	17519	374	2	-	17895	2869753								
Sidhi	1	1239	-	-	-	1239	130081	1	1217	-	-	-	1217	139225								
Maharashtra	17	10972	25	-	-	10997	1629631	17	12083	3	-	-	12086	2016552								
Chandrapur	8	8687	13	-	-	8700	1261004	8	9248	1	-	-	9249	1715714								
Yavatmal	9	2285	12	-	-	2297	368627	9	2835	2	-	-	2837	300838								
Meghalaya	14	3535	-	81	-	3616	2344472	14	3629	-	67	-	3696	2401689								
Jaintia Hills	11	1477	-	-	-	1477	304224	11	1603	-	-	-	1603	321309								
Khasi Hills East	3	2058	-	81	-	2139	2040248	3	2026	-	67	-	2093	2080380								
Odisha	6(1)	3644	74	-	-	3718	1578044	6(1)	3334	75	-	-	3409	1074234								
Bargarh	1	1002	-	-	-	1002	424668	1	515	-	-	-	515	175255								
Korapat	1*	-	-	-	-	-	-	1	29	-	-	-	29	295160								
Sundergarh	4(1)	2642	74	-	-	2716	1153376	4(1)	2790	75	-	-	2865	893819								

(Contd.)

LIMESTONE AND OTHER CALCAREOUS MATERIALS

Table - 6 (Concl.d.)

State/District	2013-14										2014-15 (P)											
	Grades					Total					Grades					Total						
	No. of mines	Cement	Iron & Steel	Chem.	Others	Qty	Value	No. of mines	Cement	Iron & Steel	Chem.	Others	Qty	Value	No. of mines	Cement	Iron & Steel	Chem.	Others	Qty	Value	
Rajasthan	27	54999	1755	-	-	56754	10604183	28	59431	2113	-	-	61544	11050125								
Ajmer	1	1602	-	-	-	1602	280199	1	1635	-	-	-	1635	264459								
Banswara	1	1271	-	-	-	1271	190321	1	1231	-	-	-	1231	211941								
Bundi	1	614	-	-	-	614	152922	1	585	-	-	-	585	151859								
Chittorgarh	9	15743	-	-	-	15743	2770926	9	18062	-	-	-	18062	2657897								
Jaipur	1	4385	-	-	-	4385	698561	1	4188	-	-	-	4188	684441								
Jaisalmer	2	303	1755	-	-	2058	786046	2	593	2113	-	-	2706	1137521								
Kota	1	1605	-	-	-	1605	399085	1	2435	-	-	-	2435	520994								
Nagaur	4	659	-	-	-	659	201830	5	921	-	-	-	921	288331								
Pali	3	16387	-	-	-	16387	2634753	3	17747	-	-	-	17747	2796431								
Sikar	1*	-	-	-	-	-	-	1	5	-	-	-	5	969								
Sirohi	3	12430	-	-	-	12430	2489540	3	12029	-	-	-	12029	2335282								
Tamil Nadu	206	23104	1005	3	-	24112	5538596	190	21319	873	13	-	22205	5337446								
Ariyalur	38	10436	788	-	-	11224	2337890	41	10210	730	-	-	10940	2552318								
Coimbatore	4	959	-	-	-	959	255284	4	986	-	-	-	986	269950								
Dindigul	20	2366	24	1	-	2391	554402	14	2303	15	10	-	2328	605401								
Karur	15	679	24	-	-	703	208386	15	666	40	-	-	706	207332								
Madurai	5	11	17	2	-	30	20960	6	4	11	3	-	18	14660								
Namakkal	15	11	12	-	-	23	8553	9	1	15	-	-	16	5194								
Perambalur	23	3913	70	-	-	3983	925256	21	3287	-	-	-	3287	765043								
Salem	22	422	6	-	-	428	199559	20	416	7	-	-	423	113796								
Thoothukudi/Tuticorin	10	707	4	-	-	711	188219	7	633	3	-	-	636	185994								
Tiruchirapalli	6	2181	-	-	-	2181	254713	11	1948	-	-	-	1948	272222								
Tirunelveli	38	1136	42	-	-	1178	478594	30	680	40	-	-	720	283177								
Virudhunagar	10	283	18	-	-	301	106780	12	185	12	-	-	197	62359								
Telangana	33	25120	-	-	-	25120	3986981	31	23956	-	-	-	23956	3747633								
Adilabad	3	4345	-	-	-	4345	732114	3	4387	-	-	-	4387	778303								
Karimnagar	1	1110	-	-	-	1110	447386	1	867	-	-	-	867	342348								
Nalgonda	25	15343	-	-	-	15343	2262248	23	14794	-	-	-	14794	2124082								
Rangareddy	4	4322	-	-	-	4322	545233	4	3908	-	-	-	3908	502900								
Uttar Pradesh	2	3144	-	-	-	3144	711561	2	2952	-	-	-	2952	489352								
Sonbhadra	2	3144	-	-	-	3144	711561	2	2952	-	-	-	2952	489352								

Figures in parentheses indicate associated mine of limestone with dolomite.

*Only labour reported.

LIMESTONE AND OTHER CALCAREOUS MATERIALS

Limeshell

The production of limeshell at 16,150 tonnes during 2014-15 decreased by 13.8% as compared to the preceding year due to a slump in the market.

There were 6 reporting mines in both the years 2013-14 and 2014-15. Three principal producers accounted for 81% of the total production during the year. The share of public sector was 20% in 2014-15.

Almost entire production of limeshell was reported from Kerala and nominal production was reported by one mine located in Tamil Nadu (Tables - 8 to 10).

Mine-head closing stock of limeshell in the year 2014-15 was 2,268 tonnes as against 2,341 tonnes in the previous year (Table - 11).

The average daily employment of labour during the year 2014-15 was 563 as against 549 in the previous year.

Table – 8 : Principal Producers of Limeshell 2014-15

Name and address of producer	Location of mine	
	State	District
The Vaikom Limeshell Co.op Society Ltd, No. 3145, P.O. Pallippurathussery, Vaikom-686 606, Distt. Kottayam, Kerala.	Kerala	Kottayam
The Travancore Cements Ltd, Kerala Nattakom, Distt. Kottayam, Kerala-686 013.		Kottayam
Muhamma Clam Marketing Society Ltd, Muhamma Post, Alappuzha-688 525 Kerala.	Kerala	Alappuzha

Table – 9 : Production of Limeshell, 2012-13 to 2014-15 (By States)

(Qty in tonnes; Value in ₹'000)

State	2012-13		2013-14		2014-15(P)	
	Quantity	Value	Quantity	Value	Quantity	Value
India	24044	41930	18750	35162	16150	36183
Kerala	23939	41825	18690	35102	16120	36153
Tamil Nadu	105	105	60	60	30	30

Table – 10 : Production of Limeshell, 2013-14 & 2014-15 (By Sectors/States/Districts)

(Qty in tonnes; Value in ₹'000)

State/District	2013-14			2014-15(P)		
	No. of mines	Quantity	Value	No. of mines	Quantity	Value
India	6	18750	35162	6	16150	36183
Public sector	1	8390	8113	1	3263	3155
Private sector	5	10360	27049	5	12887	33028
Kerala	5	18690	35102	5	16120	36153
Alappuzha	2	4540	13329	2	4806	13496
Kottayam	3	14150	21773	3	11314	22657
Tamil Nadu	1	60	60	1	30	30
Cuddalore	1	60	60	1	30	30

Table – 11 : Mine-head Stocks of Limeshell, 2013-14 & 2014-15 (By States)

(In tonnes)

State	2013-14	2014-15 (P)
India	2341	2268
Karnataka	1926	1951
Kerala	390	293
Tamil Nadu	25	24

(P) :provisional

LIMESTONE AND OTHER CALCAREOUS MATERIALS

Limekankar

As per GOI notification S.O.423 (E) dated 10th February 2015, limekankar has been declared as 'Minor Mineral'. Hence, the production beyond January, 2015 is not available with IBM. The production of limekankar at 1,11,382 tonnes in 2014-15 decreased by 20% during the year as compared to that in the previous year owing to lower demand in the market.

There were one reporting mines in 2014-15 as against two in the previous year. The entire production of limekankar during the year was reported from Tamil Nadu (Tables -12 to14).

Mine-head closing stock in the year 2014-15 were 1,53,833 tonnes as against 1,62,117 tonnes in the previous year (Table -15).

The average daily employment of labour in 2014-15 was 18 as against 20 in the previous year.

Table – 12 : Principal Producers of Limekankar 2014-15

Name and address of producer	Location of mine	
	State	District
The Ramco Cements Ltd, Auras Corporate Centre 5th Floor, 98-A Dr. Radhakrishna Road, Mylapore, Chennai-600 004, Tamil Nadu.	Tamil Nadu	Virudhunagar

Table - 13 : Production of Limekankar, 2012-13 to 2014-15 (By States)

(Qty in tonnes; Value in ₹'000)

State	2012-13		2013-14		2014-15*(P)	
	Quantity	Value	Quantity	Value	Quantity	Value
India/Tamil Nadu	192426	43564	140088	28435	111382	21089

*Data upto Jan,2015

Table – 14 : Production of Limekankar, 2013-14 and 2014-15 (By Sectors/States/Districts)

(Qty in tonnes; Value in ₹'000)

State/District	2013-14			2014-15*(P)		
	No. of mines	Quantity	Value	No. of mines	Quantity	Value
India/Private sector	2	140088	28435	1	111382	21089
Tamil Nadu/Virudhunagar	2	140088	28435	1	111382	21089

*Data upto Jan,2015

Table – 15 : Mine-head closing stocks of Limekankar 2013-14 & 2014-15 (By States)

(In tonnes)

State	2013-14	2014-15*(P)
India	162117	153833
Andhra Pradesh	117	116
Tamil Nadu	162000	153717

*Data upto Jan,2015

Chalk

As per GOI notification S.O.423 (E) dated 10th February 2015, chalk has been declared as 'Minor Mineral'. Hence, the production beyond January, 2015

is not available with IBM. The production of chalk at 94 thousand tonnes in 2014-15 decreased by 34% as compared to previous full year.

There were 91 reporting mines of chalk in 2014-15 as against 109 mines in 2013-14. In both years, the entire production of chalk was reported by private sector mines located in Gujarat. The contribution of 15 principal producers in total production during 2014-15 (up to January, 2015) was 42 percent (Tables- 16 to 18).

Mine-head closing stock of chalk for the year 2014-15 was 74 thousand tonnes as against 77 thousand tonnes in the previous year (Table -19).

The average daily employment of labour during 2014-15 was 1,011 as against 1,158 in the previous year.

LIMESTONE AND OTHER CALCAREOUS MATERIALS

Table – 16 : Principal Producers of Chalk 2014-15

Name & address of producer	Location of mine	
	State	District
Porbandar Industrial Products, Harish Mansion, Post, Box.27, Porbandar-360 575, Gujarat.	Gujarat	Porbandar
Rambhai Kanabhai Sagar, At – Aditpara, Adityana- 360 545, Distt. Porbandar, Gujarat.	Gujarat	Porbandar
Saurashtra Minerals Pvt. Ltd, East Kadia Plots, Porbandar-360 575, Gujarat.	Gujarat	Porbandar
Hashim Nazr Ali Merchant, 1st Floor, Hawda Building, Near Bhavsinhji Park, Porbandar-360 575 Gujarat.	Gujarat	Porbandar
Shreenathji White Chalk Co., Near Patel Samaj, Opp. Civil Hospital, Upelta-364 90, Rajkot, Gujarat.	Gujarat	Rajkot
Patel Jivabhai Kalahai & Thakershi Kalabhai & Co., P.O. Adityana, Taluka- Ranavav, Porbandar - 360 545, Gujarat.	Gujarat	Porbandar
P. Dattani & Co., M. G. Road, Porbandar-360 575, Gujarat.	Gujarat	Porbandar
Khyati Minerals, Adityana, Panchayat Chowk, Ranavav - 360 545, Gujarat.	Gujarat	Porbandar

(Contd.)

Table - 16 (Concl.)

Name & address of producer	Location of mine	
	State	District
Girdhar Hemraj & Co., Panjarapole Road, Porbandar - 365 575 Gujarat.	Gujarat	Porbandar
Universal Mineral Industries, Barvan Ness, Ranavav-360 560, Distt. Porbandar, Gujarat.	Gujarat	Porbandar
Indian Clay Industries, Taluka- Ranavav, Adityana- 360 545, Distt. Porbandar, Gujarat.	Gujarat	Porbandar
Shreenathji Minerals & Chemical Industry, P.O. Adityana, Ranavav - 360 545, Gujarat.	Gujarat	Porbandar
Shreenathji Minerals, Adityana, P.O. Adityana, Ranavav - 360 545, Gujarat.	Gujarat	Porbandar
Vasudev Minerals, 1 st Floor, Opp.Mama Kotha, Near Bhavsinjji Park, Distt. Porbandar- 360 575, Gujarat.	Gujarat	Porbandar
Shree Geeta Trading Co. Adityana, Distt. Porbandar- 360 545 Gujarat.	Gujarat	Porbandar

Table – 17 : Production of Chalk, 2012-13 to 2014-15

(By State)

(Qty in tonnes; Value in ₹'000)

State	2012-13		2013-14		2014-15*(P)	
	Quantity	Value	Quantity	Value	Quantity	Value
India/ Gujarat	175516	88301	142696	72900	94467	49974

*Data ; upto January 2015

LIMESTONE AND OTHER CALCAREOUS MATERIALS

**Table – 18 : Production of Chalk, 2013-14 & 2014-15
(By Sector/State/Districts)**

(Qty in tonnes; Value in ₹'000)

State/District	2013-14			2014-15*(P)		
	No. of mines	Quantity	Value	No. of mines	Quantity	Value
India/ Private sector	109	142696	72900	91	94467	49974
Gujarat	109	142696	72900	91	94467	49974
Jamnagar	8	8190	3195	9	4597	2166
Porbandar	84	118506	63828	66	77275	42807
Rajkot	17	16000	5877	16	12595	5001

*Data up to January 2015

**Table – 19 : Mine-head Stocks of Chalk, 2013-14 & 2014-15
(By State)**

(In tonnes)

State	2013-14	2014-15* (P)
India/ Gujarat	77338	73553

*Data up to January, 2015

Marl

Production of marl during 2014-15 was 2,179 thousand tonnes as compared to 3,254 thousand tonnes in the preceding year. The entire production of marl was reported as associate mineral with limestone in both the years. There were six associate mines reporting production of Marl during 2014-15 as against seven during the previous year. The entire

production was reported by private sector mines.

As regards to state-wise production, Gujarat contributed 99.9% production and the remaining only 0.1% was by Tamil Nadu (Tables - 20 to 22).

Mine-head closing stock of marl for the year 2014-15 was 1,022 thousand tonnes as against 1,263 thousand tonnes in the previous year (Table - 23).

Table – 20 : Principal Producers of Marl, 2014-15

Name and address of producer	Location of mine	
	State	District
*Ultratech Cement Ltd, B-Wing, 2 nd Floor, Ahura Centre, Mahakali Caves Road, Andheri (E), Mumbai- 400 093.	Gujarat	Amreli
* Ambuja Cement Limited, Elegant Business Park, MIDC, Cross Road B Off Andheri, Kurla Road Andheri East, Mumbai - 400 059	Gujarat	Amreli
*Gujarat Sidhee Cement Ltd, N.K.Mehta International House, 178, Backbay Reclamation, Mumbai-400 020.	Gujarat	Junagadh
*Saurashtra Cement Ltd, N.K.Mehta International House, 178, Backbay Reclamation, Mumbai-400 020.	Gujarat	Porbandar
*The Ramco Cements Limited 5th Floor, Auras Corporate Centre, 98, Dr. Radhakrishnan Salai, Mylapore, Chennai - 600 004	Tamil Nadu	Perambalur

* Producing as an associated mineral with Limestone.

LIMESTONE AND OTHER CALCAREOUS MATERIALS

**Table – 21 : Production of Marl, 2012-13 to 2014-15
(By States)**

(Qty in tonnes, Value in ₹'000)

State	2012-13		2013-14		2014-15(P)	
	Quantity	Value	Quantity	Value	Quantity	Value
India	4337009	269366	3254486	280571	2179489	256240
Gujarat	4240183	250348	3216915	270164	2177450	255663
Tamil Nadu	96826	19018	37571	10407	2039	577

**Table – 22 : Production of Marl, 2013-14 to 2014-15
(By Sector/States/Districts)**

(Qty in tonnes; Value in ₹'000)

State/District	2013-14			2014-15(P)		
	No. of mines	Quantity	Value	No. of mines	Quantity	Value
India/ Private Sector	(7)	3254486	280571	(6)	2179489	256240
Gujarat	(6)	3216915	270164	(5)	2177450	255663
Amreli	(2)	1783385	173434	(2)	1733790	216954
Junagadh	(3)	1206843	92650	(2)	429326	37989
Porbandar	(1)	226687	4080	(1)	14334	720
Tamil Nadu/	(1)	37571	10407	(1)	2039	577
Ariyalur	(1)	37571	10407	-	-	-
Perambalur	-	-	-	(1)	2039	577

Figures in parentheses indicate associated mines with limestone.

**Table – 23 : Mine-head Stocks of Marl, 2013- 14 & 2014-15
(By States)**

(Qty. in tonnes)

State	2013-14	2014-15(P)
India	1263494	1021784
Gujarat	918610	804945
Tamil Nadu	344884	216839

MINING & MARKETING

In India, limestone mines are worked by opencast method. Captive mines are mechanised and supply feed to cement and iron & steel units. Some mines have well laid road-cum-rail routes. The large mines are developed by forming benches in overburden and limestone bed. The face length, width and height of the benches correspond to the mining machinery deployed and production schedule. Heavy earth-moving

machinery like 3.3 to 4 cu m capacity hydraulic excavators in combination with 10-35 tonnes dumpers are normally used. Other mines are mainly worked by semi-mechanised and manual opencast mining methods.

In Andhra Pradesh, limestone production from Adilabad and Kurnool districts is used in paper mills, sugar, cement and steel plants. Tile, mosaic, chip and polished stonemakers also use limestone.

LIMESTONE AND OTHER CALCAREOUS MATERIALS

Limestone produced in Bihar is supplied mainly to cement plants, foundries and lime kiln units.

In Raipur and Durg districts of Chhattisgarh, the limestone produced is suitable for Iron & Steel Industry. The Bhilai Steel Plant obtains its requirements of limestone from Nandini mines in Durg district. The cement grade limestone is also produced in the region and there is large cluster of cement plants are in around Raipur.

Limestone produced in Gujarat is consumed mainly in cement and chemical industries and also in textile, foundries and steel plants. The dolomitic limestone in Gujarat is used for making slabs and tiles.

Limestone produced in Himachal Pradesh is supplied to cement plants, paper industry, sugar mills and lime kilns. The production from Bilaspur district is despatched to fertilizer unit of National Fertilizers Ltd, (NFL) at Naya Nangal.

Limestone produced in Jammu & Kashmir is suitable for cement manufacturing.

In Karnataka, limestone is supplied generally to paper mills and cement plants. However, limestone of Kalaburgi district, commonly known as 'Shahabad stones', is used as flag stone or flooring stones.

Limestone from Madhya Pradesh is used in cement, sugar, paper, steel and lime industries.

In Maharashtra, apart from cement and sugar industries, limestone is used in Ferro-manganese Industry as flux and also in Tanning Industry.

Limestone mined in Rajasthan is consumed in captive cement plants on a large scale. Limestone of Nagaur district is utilised as feed for white cement plants as well as in steel plants as low silica SMS grade flux and in Chemical Industry. Crystalline limestone of Rajasthan is widely known as a decorative ornamental stone. The limestone worked in Bundi district and Raghunathgarh in Jaipur district is an excellent flagstone, for use as a paving stone.

The limestone produced in Dehradun-Garhwal areas of Uttarakhand used to be supplied to Sugar, Paper, Steel, Glass, Chemical and Cement

Industries in the past.

Limestone in Tamil Nadu is consumed by various industries like Cement, Steel, Paper, Foundry, Fertilizer and Chemicals.

Limeshell from Kerala is used mainly in Chemical, Cement and White cement Industries. It is also used in the manufacture of polyfibre and in Tanning industry.

USES

Limestone used for industrial purpose falls under 'major mineral', while the use of limestone in lime kilns and for building purposes comes under 'minor mineral' as per Mines and Minerals (Development and Regulation) Act, 1957.

The threshold value of limestone has been revised by IBM, Notification in 2009, as follows:

(i) For limestone deposits in Chhattisgarh, Gujarat, Himachal Pradesh, Madhya Pradesh, Maharashtra, Rajasthan, Uttarakhand & Uttar Pradesh - CaO - 34% (min), MgO - 4% (max).

(ii) For limestone deposits of Andhra Pradesh, Jharkhand, Karnataka, Kerala, Odisha & Tamil Nadu - CaO - 35% (min), MgO - 4% (max), SiO₂ - 18% (max) & Alkalies - 0.5% (max).

The principal use of limestone is in the Cement Industry. Other important uses are as flux in metallurgical processes; in Glass, Ceramic, Paper, Textile and Tanning Industries; for manufacture of calcium carbide, alkali and bleaching powder; for water purification and sugar refining; in fertilizer (calcium ammonium nitrate) and as soil conditioning agent in agriculture; crushed stone for ballast and filler in concrete and asphalt; as rectangular slab in lithography. The whiting (chalk and precipitated limestone) is used as a filler in rubber, oil cloth, paint, cosmetic, tooth paste, shoe polish, etc. Limestone is also used in underground mine dusting to prevent the propagation of explosions.

Lime is prepared by heating limestone in kilns up to 1000°C. The CO₂ released is effluxed and

'quicklime' (CaO) formed remains as hard white lumps. This when slaked with water and mixed with sand, forms mortar or plaster. Commonly, the commercial lime is prepared as dry hydrated lime Ca(OH)_2 by adding to quicklime just the right amount of water (18 parts to 56 parts of CaO). The value of lime for most purposes depends upon its CaO (or CaO + MgO) content.

The manufacture of metallic calcium is one of the latest uses of lime. Calcium is used in reducing organic compounds, desulphurising petroleum, debismuthising lead production of hard lead alloys and calcium-silicon alloys, and in the manufacture of calcium hydride which is further used as an efficient hydrogen carrier.

Limeshell is used mainly in Chemical and White cement Industries. It is also used in the manufacture of polyfibre and in Tanning industry. Lime kankar is used in Cement Industry.

SPECIFICATIONS

Cement Industry

Limestone containing 45% (min) CaO and above is usually preferred in the manufacture of cement. Magnesia, sulphur and phosphorus are regarded as deleterious elements. Limestone should have less than 3% magnesium oxide (MgO), maximum tolerance being 5 percent. The presence of P as P_2O_5 more than 1% slows down considerably the setting time of Portland Cement. Indian cement manufacturers prescribed that the limestone should have CaO 42% (min), Al_2O_3 1 to 2%, Fe_2O_3 1 to 2%, SiO_2 12 to 16% and MgO 4% (max). The broad chemical specifications of cement grade limestone (r.o.m.) for cement manufacture suggested by the National Council for Cement and Building Materials, New Delhi, are given in Table-24.

Table – 24 : Broad Chemical Specifications of Cement Grade (Run-of-Mine) Limestone (Clause 6.1.1)

Oxide component/ Other Constituents	Acceptable range for manufacture of Ordinary Portland Cement (33, 43 & 53 Grade) (percent)	Limiting values taking into con- sideration other types of cements, scope of beneficiation and blending (percent)
CaO	44-52	40(min)
MgO	3.5(max.)	5.0(max)
SiO_2	To satisfy LSF, silica	–
Al_2O_3	Modules and alumina	–
Fe_2O_3	Modules	–
TiO_2	<0.5	<1.0
Mn_2O_3	<0.5	<1.0
R_2O ($\text{Na}_2\text{O} + \text{K}_2\text{O}$)	<0.6	<1.0
Total S as SO_3	<0.6	<0.8
P_2O_5	<0.6	<1.0
Cl	<0.015	<0.05
Free silica	<8.0	<10.0

Source: Report on Norm for limestone deposits for cement manufacture by National Council for Cement and Building Materials, New Delhi, May 2001.

Iron & Steel Industry

In Iron & Steel Industry, limestone is used both in blast furnace and steel melting shop as a flux after calcining. It is also added as flux in self-fluxing iron ore sinters. It has two basic functions in steel making, first to lower the temperature of melting and second, to form calcium silicate which comes out as a slag, as it combines with silica in iron ore.

For use in the blast furnace, the calcium carbonate (CaCO_3) content in limestone should not be usually less than 90 percent. The combined SiO_2 and Al_2O_3 should not exceed 6% though up to 11.5% is allowed; MgO should be within 4% and sulphur and phosphorus as low as possible.

LIMESTONE AND OTHER CALCAREOUS MATERIALS

In Steel Melting Shop (SMS), insolubles in limestone should not exceed more than 4 percent. Good fluxing limestone should naturally be low in acid constituents like silica, alumina, sulphur and phosphorus. Limestone should be dense, massive, preferably fine-grained, compact and non-fritting on burning.

BIS has prescribed specifications for flux grade limestone for use in steel plants as per IS : 10345 - 2004 (Second Revision; Reaffirmed 2009).

Glass Industry

Glass Industry requires high calcium limestone (94.5% CaCO_3) and 97.5% of combined CaCO_3 and MgCO_3 . Iron and other colouring matters are regarded as objectionable and Fe_2O_3 should be up to 0.20% (max). For colourless glass, limestone should contain 98.5% CaCO_3 (min), iron content as Fe_2O_3 should not be more than 0.04%; and for bottle glass, Fe_2O_3 up to 0.05% is used. The BIS specifications (IS : 997 - 1973); First Amendment, (Reaffirmed Feb.2013) for limestone for use in Glass Industry are as follows:

Silica as SiO_2	2.5%
Total iron (Fe_2O_3)	
a) Calcite or marble	0.05%
b) Limestone	0.10%
c) Dolomitic limestone or dolomite	0.15%
Lime (as CaO)	53.0%
Total lime and magnesia (as CaO + MgO)	54.50%

Chemical Industry

The calcium carbide manufacturers generally prefer lime containing 95% CaO (min) with limitations of not more than 3% SiO_2 , not more than 0.95% phosphorus and other impurities not exceeding more than 2%. For the manufacture of bleaching powder, lime containing 95% and

above CaO is required. Total $\text{Fe}_2\text{O}_3 + \text{Al}_2\text{O}_3 + \text{MnO}_2$ should be less than 2%; MgO should be below 2% and SiO_2 less than 1.5%. Bleaching powder is prepared by absorption of chlorine by dry hydrated lime. The hydrated lime should not contain more than 2% excess water. Iron and manganese oxides lead to unsuitability of the product and iron oxides tend to discolour the bleached material. Magnesia renders the bleaching powder hygroscopic. Silica and clay impede solution and settling of bleaching powder.

BIS has prescribed specification for limestone for use in chemical industry as per IS: 3204:1978 (First revision.Feb, 2009).

Sugar Industry

In Sugar Industry, lime is used for clarification of cane and beet juice, viz, removing the impurities from the juice and also for precipitating sugar from impurities. Milk of lime 1% in volume of cane juice is added to pre-heated juice. Limestone used in Sugar Industry must be high in active lime (CaO 80% min), but low in iron, alumina and silica. Magnesia should be less than one percent. Excess silica is undesirable because it separates as a gelatinous precipitate which covers the sugar crystals and retards their growth and filtration. Magnesia is objectionable because magnesium carbonate is soluble in sugar juice. Presence of iron tends to colour the finished product.

The BIS specifications of limestone for chemical industries are furnished in Table - 25.

Fertilizer Industry

Limestone is used only as carrier in the manufacture of calcium ammonium nitrate fertilizer. For this purpose, limestone should contain $\text{MgCO}_3 + \text{CaCO}_3$ 85% (min), SiO_2 5% (max) and acid insolubles 14% (max).

Foundry Industry

The chemical requirements of limestone for use in foundries as per BIS specification (IS : 4140 -1978); has been withdrawn.

LIMESTONE AND OTHER CALCAREOUS MATERIALS

Table – 25 : Specifications of Limestone for Chemical Industry (Bleaching Powder, Caustic Soda, Calcium Carbide and Sugar Industries) (IS : 3204 - 1978;First Revision, Reaffirmed 2013)

Characteristics	Requirement in percent by mass for			
	Bleaching powder	Caustic soda	Calcium carbide	Sugar
Loss on ignition	46.00	46.00	46.00	44.00
SiO ₂ (max)	0.75	–	1.00	2.00
Fe ₂ O ₃ (max)	0.15	–	0.25	–
CaO (min)	54.00	53.00	54.00	50.00
MgO (max)	2.00	1.00	0.80	1.00
Mn ₂ O ₃ (min)	0.06	–	–	–
CO ₂ (min)	42.00	42.00	42.00	41.00
S (max)	–	–	0.10	–
P (max)	–	–	0.01	–
Al ₂ O ₃ +Fe ₂ O ₃ (max)	–	–	0.50	1.50
SiO ₂ +Al ₂ O ₃ +Fe ₂ O ₃ (max)	–	3.00	–	–

INDUSTRY & CONSUMPTION

India was the second largest cement producing country in the world after China. There were 209 large cement plants having an installed capacity of 350 million tonnes in 2014-15 in addition to mini and white cement plants having estimated capacity of around 6 million tonnes per annum. The total installed capacity of cement in 2014-15 was thus about 356 million tpy against 344.78 million tpy in the preceding year. Besides, there are three white cement plants having a total 990,000 tpy capacity. The total production of cement reached 276.93 million tonnes in 2014-15 registering a growth of about 8.15% over the preceding year.

In 2014-15, the total consumption of limestone & other calcareous minerals/ materials, as reported by different industries was 266.41 million tonnes. Cement was the major consuming industry accounting for 93% consumption, followed by iron & steel (5%) and chemical (2%). The remaining consumption was reported by aluminium, alloy steel, sugar, paper, fertiliser, glass, metallurgy, foundry, etc. Consumption of limestone and other calcareous materials from 2012-13 to 2014-15 is given in Tables - 26(A), 26(B) and 26 (C). Information on consumption of limestone in Iron & Steel industry by principal plants is given in Table - 26(D).

LIMESTONE AND OTHER CALCAREOUS MATERIALS

**Table - 26 (A) : Consumption* of Limestone, 2012-13 to 2014-15
(By Industries)**

(In tonnes)

Industry	2012-13	2013-14(R)	2014-15(P)
All Industries	240242700	239578000	239260100
Aluminium	203100(4)	203100(4)	204500(4)
Alloy steel	639100(7)	39100(7)	246600(7)
Cement	222354600(124)	221753100(124)	221089400(124)
Chemical	3002900(23)	3002900(23)	3002900(23)
Fertiliser	149400(5)	149800(5)	149700(5)
Ferro-alloys	11600(20)	11800(20)	11600(20)
Foundry	29200(26)	23500(26)	27300(26)
Glass	103400(29)	127300(29)	122300(29)
Iron & Steel	11414500(36)	11962900(36)	12005500(36)
Metallurgy	41400(2)	41400(2)	41400(2)
Paper	121900(16)	121900(16)	121800(16)
Sugar	890000(10)	856200(10)	954300(10)
Others**	1281600(44)	1285000(44)	1282800(44)

Figures rounded off.

Figures in parentheses denote the number of units in organised sector.

* Paucity of data hence coverage may not be complete.

** Include asbestos products, ceramic, electrode, explosive, lead & zinc, mining machinery, paint, pesticide, pharmaceutical, refractory, rubber, sponge iron, textile, vanaspati and zinc.

**Table -26 (B) : Consumption* of Other Calcareous Minerals/Materials,
2012-13 to 2014-15
(By Industries)**

(In tonnes)

Industry	2012-13	2013-14(R)	2014-15(P)
All Industries (A+B+C+D)	31003000	31014000	29973900
(A) Cement {(i) + (ii)}	30980200(151)	30991100(152)	29951000(159)
(i) Other Calcareous Material	28495400(140)	28663300(141)	28234600(147)
B F Slag	6083700(45)	6032500(45)	5933100(48)
Fly ash/blue dust	22153500(85)	22369300(85)	22041000(89)
CaCO ₃ sludge / Lime sludge	258200(10)	261500(10)	260500(10)
(ii) Other Calcareous Minerals	2484800(11)	2327800(12)	1716400(12)
Limeshell	13300(1)	13300(1)	13300(1)
Calcareous sea sand	++(1)	++(1)	++(1)
Marble	642400 (3)	642400 (3)	642400 (3)
Marl	1829100(6)	1672100(7)	1060700(7)
(B) Paper/Limeshell	13400 (1)	13400 (1)	13400 (1)
(C) Glass/ B F Slag	9100 (3)	9100 (3)	9100 (3)
(D) Fertiliser/Limeshell	300(1)	400(1)	400(1)

Figures rounded off.

Figures in parentheses denote the number of units in organised sector.

* Paucity of data hence coverage may not be complete.

LIMESTONE AND OTHER CALCAREOUS MATERIALS

Table – 26 (C) : Consumption* of Limestone & Other Calcareous Minerals/Materials, 2012-13 to 2014-15 (By Industries)

(In tonnes)

Industry	2012-13	2013-14(R)	2014-15(P)
All Industries	270645300	275278700	266412800
Aluminium	203100(4)	203100(4)	213200(4)
Alloy steel	39100(7)	39100(7)	39100(7)
Cement	253334800(124)	255838700(126)	246844600(128)
Chemical	3002900(23)	4352900(24)	4280300(24)
Fertiliser	149400(5)	149800(5)	149800(5)
Ferro-alloys	11600(20)	11800(20)	12100(20)
Foundry	29200(26)	23500(26)	23900(27)
Glass	103400(29)	141300(30)	153600(30)
Iron & Steel	11414500(36)	12172300(36)	12243200(36)
Metallurgy	41300(2)	60600(2)	30500(2)
Paper	135300(17)	135300(17)	135300(17)
Sugar	890000(10)	856200(10)	993100(10)
Others**	1290700(47)	1294100(47)	1294100(47)

Figures rounded off.

Figures in parentheses denote the number of units in organised sector.

* Paucity of data hence coverage may not be complete.

** Include asbestos products, ceramic, electrode, explosive, lead & zinc, mining machinery, paint, pesticide, pharmaceutical, refractory, rubber, sponge iron, textile, vanaspati and zinc.

Table – 26 (D) : Consumption* of Limestone in Iron & Steel Industry, 2012-13 to 2014-15 (By Principal Plants)

(In tonnes)

Plant	2012-13	2013-14 (R)	2014-15 (P)
Bhilai Steel Plant	NA	NA	NA
Bokaro Steel Plant	561325	870034	806394
Durgapur Steel Plant	576075	566832	547518
IISCO Steel Plant	11047	26763	116159
Rourkela Steel Plant	NA	762313	928345
Visvesvaraya Iron & Steel Plant	NA	6021	22889
Visakhapatnam Steel Plant	968000	6021	NA
JSW Steel Ltd	47108@	74307@	65164@
Tata Steel Ltd	2706219	2823939	2862838
IDCOL, Kalinga Iron Works Ltd	8163	3514	1419
Tata Metallics Limited	24949	84811	81761
Kirloskar Ferrous Industry Ltd	4563	7237	8557
KIOCL Ltd	41059	51553	21484.50
VISA Steel Plant	NA	NA	NA
Neelachal Ispat Nigam Ltd	NA	NA	NA
Jayaswal Neco Industries Ltd	103794**	96779**	95520**
Sunflag Iron & Steel Co.Ltd	NA	NA	NA

* Paucity of data hence coverage may not be complete.

@ Salem plant

** Raipur Plant

LIMESTONE AND OTHER CALCAREOUS MATERIALS

FOREIGN TRADE

Exports

As per the foreign trade policy 2009-14, the exports of limestone, lime kankar, lime shell and chalk are free. Exports of limestone increased slightly to 3.81 million tonnes in 2014-15 from 2.78 million tonnes in the previous year. Limestone in bulk was exported mainly to neighbouring countries, viz, Bangladesh (97%), while UK & Bhutan (only 1% each). During the same period, exports of chalk also increased marginally to 490 tonnes from 418 tonnes in the previous year. Chalk was exported mainly to Nepal (73%), Saudi Arabia, Oman & Egypt (5% each), Baharain & South Africa (4% each).

Exports of bleaching powder were at 16,976 tonnes in 2014-15 as compared to 12469 tonnes in the previous year. Bleaching powder was exported mainly to Bangladesh (43%), Algeria (11%), USA (8%), Sri Lanka (5%), Cameroon (4%) & Madagascar (3%) besides other countries.

In 2014-15, about 412 tonnes of calcium carbide was exported as against 269 tonnes in the previous year, mainly to UAE (57%), Bangladesh (37%) and Djibouti (6%) (Tables- 27 to 30).

Imports

As per the foreign trade policy 2009-14, the import of limestone, lime kankar, lime shell and chalk are free. Imports of limestone increased slightly to 13.83 million tonnes in 2014-15 from 13.21 million tonnes in the previous year. Imports of chalk in 2014-15 were at 6,714 tonnes as against 17,172 tonnes in the previous year. Limestone was imported mainly from UAE (76%) & Oman (15%), while chalk was imported mainly from Vietnam (97%) & France (1%) besides other countries.

Imports of calcium carbide increased drastically to 78,331 tonnes in 2014-15 from 64,239 tonnes in the previous year. Calcium carbide was imported mainly from China (59%), Bhutan (25%) and Indonesia (11%). The imports of bleaching powder was not available for both current and previous years (Tables- 31 to 34).

Table – 27 : Exports of Limestone (By Countries)

Country	2013-14		2014-15(P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	2779074	3432311	3812679	4671420
Bangladesh	2668993	2512744	3684066	3542496
UK	28388	271311	35929	351812
Bhutan	35453	131283	28510	177263
Nepal	9042	42911	16054	66801
USA	1631	76809	4036	65859
Belgium	5973	64027	6024	64558
Ireland	4410	40264	6869	59323
France	2895	36215	4329	41332
Japan	1786	19206	2489	32522
Italy	2308	23151	2610	29190
Other countries	18195	214390	21763	240264

Table – 28 : Exports of Chalk (By Countries)

Country	2013-14		2014-15(P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	418	3860	490	2978
Nepal	332	2396	358	1211
Saudi Arabia	1	11	25	294
Germany	-	-	1	280
Angola	-	-	11	246
Oman	-	70	25	239
Egypt	13	112	23	193
South Africa	-	-	21	114
Mauritius	1	33	++	88
Bahrain	-	-	20	74
Malaysia	4	196	1	71
Other countries	67	1041	5	169

LIMESTONE AND OTHER CALCAREOUS MATERIALS

**Table – 29 : Exports of Bleaching Powder
(By Countries)**

Country	2013-14		2014-15(P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	12469	469971	16976	667839
Bangladesh	6459	133930	7408	144042
Algeria	1153	79934	1938	117835
USA	231	18820	1349	99799
Cameroon	672	56661	602	43605
Madagascar	112	8199	536	36656
Sri Lanka	568	16399	825	25480
Kenya	++	6	308	24620
South Africa	392	23045	420	23788
Mauritius	154	10422	322	21534
Nepal	619	12253	1336	15757
Other countries	2109	110302	1932	114723

**Table – 30 : Exports of Calcium Carbide
(By Countries)**

Country	2013-14		2014-15(P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	269	14776	412	22973
UAE	168	8440	233	12022
Bangladesh	63	3836	153	9207
Djibouti	-	-	24	1370
Nepal	1	160	++	242
Oman	24	1243	1	106
Kenya	-	-	1	26
Other countries	13	1097	-	-

**Table – 31 : Imports of Limestone
(By Countries)**

Country	2013-14		2014-15(P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	13214179	21580366	13834373	21961663
U A E	9642919	13823852	10509618	13933315
Oman	2299956	3185239	2132145	2984367
Malaysia	479224	2053752	499560	2136958
Vietnam	206150	1270656	262582	1667673
Thailand	245227	491773	199747	485422
Australia	-	-	21094	158227
Egypt	35566	152026	26289	134100
Philippines	170583	293284	60900	109042
China	3737	46901	8225	105856
USA	9206	14474	39472	44086
Other countries	121611	248409	74741	202617

**Table – 32 : Imports of Chalk
(By Countries)**

Country	2013-14		2014-15(P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	17172	108515	6714	47715
Vietnam	16896	102863	6516	39250
China	60	1123	53	3268
France	125	2581	86	2194
Italy	11	895	15	1171
Germany	1	28	7	688
Denmark	-	-	20	403
Japan	23	519	7	329
UK	2	201	2	205
Chinese				
Taipei/Taiwan	-	-	8	185
USA	-	2	++	11
Other countries	54	303	++	11

LIMESTONE AND OTHER CALCAREOUS MATERIALS

**Table – 33 : Imports of Calcium Carbide
(By Countries)**

Country	2013-14		2014-15(P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	64239	2674256	78331	3152508
China	33836	1355969	46136	1727767
Bhutan	20561	877723	19509	901180
Indonesia	-	-	8526	349513
South Africa	9220	415609	4157	173891
New Zealand	-	-	3	83
Thailand	-	-	++	51
Germany	++	15	++	16
Belgium	-	-	++	4
UK	-	-	++	4
Other countries	622	24940	-	-

**Table – 34 : Imports of Bleaching Powder
(By Countries)**

Country	2013-14		2014-15(P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	++	602	++	55
USA	-	-	++	46
Germany	-	-	++	7
UK	++	581	++	2
Other countries	++	21	-	-

FUTURE OUTLOOK

India has huge resources of limestone distributed over different parts of the country. It is comfortably placed in terms of annual capacity and production of cement. Cement-grade limestone occurs in all the limestone-bearing areas, while SMS, BF and chemical-grade limestones occur in selective areas. Concerted efforts to locate SMS and BF grade limestone along

with cement-grade limestone are imperative to meet the growing demand.

As per the Report of the Working Group, Planning Commission of India, the total limestone requirement during 12th Plan (2012-2017) with growth scenario of cement @ 10%, 11% and 12% for the respective GDP growth of 8%, 9% and 10% is projected at 3,163 million tonnes, 3,253 million tonnes and 3,385 million tonnes, respectively.