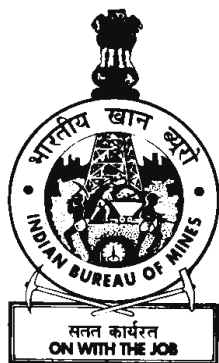


LIMESTONE AND OTHER CALCAREOUS MATERIALS



# **Indian Minerals Yearbook 2013**

**(Part- III : Mineral Reviews)**

**52<sup>nd</sup> Edition**

## **LIMESTONE & OTHER CALCAREOUS MINERALS**

**(ADVANCE RELEASE)**

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

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**January, 2015**

## 32 Limestone & Other Calcareous Materials

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 ( $\text{MgCO}_3$ ) mixed with calcite. It is then termed 'dolomitic' or 'magnesian' limestone. Such limestone contains 10 to 40%  $\text{MgCO}_3$ . 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 is 'chalk', a white, extremely fine-grained, usually soft and friable variety of limestone, composed wholly or 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 slabs 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 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 (20%), Rajasthan (12%), Gujarat (11%), Meghalaya (9%) and Chhattisgarh (5%). Gradewise, cement grade has leading share of about 69% followed by SMS & BF grades (12%) and chemical grade (3%). Remaining 16% are others, not-known and unclassified grades (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 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 at 151.68 million tonnes of which 139.98 million tonnes (92%) are under reserves category and 11.70 million tonnes are under remaining resources category (Table - 1 (C)).

### EXPLORATION & DEVELOPMENT

GSI conducted exploration for limestone in Andhra Pradesh, Meghalaya and Rajasthan. Directorates of Mining and Geology of Himachal Pradesh, Chhattisgarh and Rajasthan also carried out exploration for limestone. Mineral Exploration Corporation Ltd (MECL) also engaged in exploration of limestone. Details of work carried out by these organisations are given in Table-2.

**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<br>STD111 | Probable |         | Total<br>(A) | Feasibility<br>STD211 | Pre-feasibility |         | Measured<br>STD331 | Indicated<br>STD332 | Inferred<br>STD333 | Reconnaissance<br>STD334 | Total<br>(B) |                       |
|                                 |                  | STD121   | STD122  |              |                       | STD221          | STD222  |                    |                     |                    |                          |              |                       |
| All India: Total                | 8978583          | 3650574  | 2297234 | 14926392     | 1827583               | 3739470         | 6309489 | 6858999            | 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/beneficiable) | 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                  | 2483095          | 581935   | 983048  | 4048078      | 311682                | 64645           | 460685  | 215847             | 1075504             | 28112011           | 3147926                  | 33388299     | 37436377              |
| 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 (Conclld.)

| Grade/State      | Reserves         |          |        |              | Remaining resources   |                 |         |                    |                     |                    |                          |              | Total<br>resources<br>(A+B) |
|------------------|------------------|----------|--------|--------------|-----------------------|-----------------|---------|--------------------|---------------------|--------------------|--------------------------|--------------|-----------------------------|
|                  | Proved<br>STD111 | Probable |        | Total<br>(A) | Feasibility<br>STD211 | Pre-feasibility |         | Measured<br>STD331 | Indicated<br>STD332 | Inferred<br>STD333 | Reconnaissance<br>STD334 | Total<br>(B) |                             |
|                  |                  | STD121   | STD122 |              |                       | STD221          | STD222  |                    |                     |                    |                          |              |                             |
| 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       | 42116                 | 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                     |
| 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.

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

(In '000 tonnes)

| Grade/State       | Reserves         |          |        |              | Remaining resources   |                 |        |                    |                     |                    |                          |              | Total<br>resources<br>(A+B) |
|-------------------|------------------|----------|--------|--------------|-----------------------|-----------------|--------|--------------------|---------------------|--------------------|--------------------------|--------------|-----------------------------|
|                   | Proved<br>STD111 | Probable |        | Total<br>(A) | Feasibility<br>STD211 | Pre-feasibility |        | Measured<br>STD331 | Indicated<br>STD332 | Inferred<br>STD333 | Reconnaissance<br>STD334 | Total<br>(B) |                             |
|                   |                  | STD121   | STD122 |              |                       | STD221          | STD222 |                    |                     |                    |                          |              |                             |
| All India : Total | 3266             | 537      | 528    | 4332         | 184                   | 5               | 127    | -                  | -                   | 269                | -                        | 585          | 4917                        |
| By Grade          |                  |          |        |              |                       |                 |        |                    |                     |                    |                          |              |                             |
| Unclassified      | 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<br>STD111 | Probable |         | Total<br>(A) | Feasibility<br>STD211 | Pre-feasibility |        | Measured<br>STD331 | Indicated<br>STD332 | Inferred<br>STD333 | Reconnaissance<br>STD334 | Total<br>(B) |                       |
|                               |                  | STD121   | STD122  |              |                       | STD221          | STD222 |                    |                     |                    |                          |              |                       |
| All India : Total<br>By Grade | 133236150        | 4650000  | 2090000 | 139976150    | 11704870              | -               | -      | -                  | -                   | -                  | -                        | 11704870     | 151681020             |
| All grades                    | 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, 2012-13**

| Agency/<br>State/<br>District                                | Location<br>Area/<br>Block | Mapping             |                 | Drilling            |          | Sampling<br>(No.) | Remarks<br>Reserves/Resources estimated                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------------------------------|----------------------------|---------------------|-----------------|---------------------|----------|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                              |                            | Scale               | Area<br>(sq km) | No. of<br>boreholes | Meterage |                   |                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Department<br/>of Industries<br/>Himachal<br/>Pradesh</b> |                            |                     |                 |                     |          |                   |                                                                                                                                                                                                                                                                                                                                                                                              |
| Shimla                                                       | Gumma-<br>Rohana           | -                   | -               | 04                  | 365.2    | -                 | Gumma Rohana limestone deposit mainly includes Deoban Group which is further defined into 3 formations.Tiontar formation comprises of varying thickness of greenish shale with thin arenite interbeds.                                                                                                                                                                                       |
| Mandi                                                        | Dhara-<br>Badhu            | -                   | -               | 03                  | 151.4    | -                 | This deposit mainly occurs in shali group. No resources has been estimated.                                                                                                                                                                                                                                                                                                                  |
| <b>DGM<br/>Chhattisgarh</b>                                  |                            |                     |                 |                     |          |                   |                                                                                                                                                                                                                                                                                                                                                                                              |
| Raipur                                                       | Kesla                      | 1:50,000<br>1:4,000 | 60.0<br>1.76    | 24                  | 805.90   | 874               | Objective of exploration was to identify blocks suitable for cement grade limestone. Main litholog in this area are shale, limestone & laterite. Limestone is mostly horizontally bedded and depth of limestone is confined up to 34 m. Limestone of this area is grey, pink, hard compact massive & stromatolitic. About 54.88 million tonnes of limestone resources were estimated.        |
| Raipur                                                       | Tekapar-<br>Kalkasa        | 1:50000<br>1:4000   | 90.0<br>2.0     | 9                   | 249.0    | 265               | The explored area is mostly occupied by residual soil with sporadic outcrops of purple grey stromatolitic limestone. Occurrences of purple & grey shales were also noticed in boreholes. Objective of exploration was to identify blocks suitable for cement grade limestone. About 16.5 million tonnes of limestone resources were estimated.                                               |
| Sukma                                                        | Birsatpal                  | 1:50000<br>1:4000   | 285.0<br>2.44   | -                   | -        | 85                | Objective of exploration was to search new location of limestone. Area is occupied by arenaceous & calcarious rocks of sabri group. The upper calcarious formation of this group is represented by grey to dark grey laminated limestone. Occurrences of cement grade limestone were demarcated around village Birsatpal. About 0.2 million tonnes of cement grades limestone resources were |

(Contd.)

# LIMESTONE AND OTHER CALCAREOUS MATERIALS

Table-2 (Contd.)

Table 2 (Contd.)

| Agency/<br>State/<br>District | Location<br>Area/<br>Block | Mapping  |                 | Drilling            |          | Sampling<br>(No.) | Remarks<br>Reserves/Resources estimated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------|----------------------------|----------|-----------------|---------------------|----------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                               |                            | Scale    | Area<br>(sq km) | No. of<br>boreholes | Meterage |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>MECL</b>                   |                            |          |                 |                     |          |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Meghalaya<br>Jaintia Hills    | Tongnul SE<br>Sub block    | 1:50,000 | 1.10            | 8                   | 1148.50  | 483               | The main objective was to determine the depth continuity of limestone and to upgrade earlier estimates. Sedimentary rocks of tertiary age was exposed in and around the area from Khliehriat in the west to Litang river valley in the east. The limestone is a bedded deposit striking NNE-SSW. The thickness of limestone band varies from 53.43 m -145 m based on sub-surface data. About 274.04 million tonnes of limestone resources were estimated with avg. grade 2.27% SiO <sub>2</sub> , 50.79% CaO, 1.57% MgO, 0.95% Al <sub>2</sub> O <sub>3</sub> , 1.17% Fe <sub>2</sub> O <sub>3</sub> , 41.57% LOI. |
| Chhattisgarh                  | Bastar                     | 1:50,000 | 50.00           | -                   | -        | 15                | The main objective of exploration was to assess the quality of limestone in the areas between already prospected blocks in Bastar region. Limestone occurs as small mounds & is horizontally bedded with local warping. Outcrops were observed in an area 0.90 X 0.30 km with a thickness up to 10 m. About 0.5 million tonnes of cement grade limestone resources were estimated.                                                                                                                                                                                                                                 |
| <b>DGM</b>                    |                            |          |                 |                     |          |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Rajasthan</b>              |                            |          |                 |                     |          |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Nagaur                        | N/v Harima                 | 1:2000   | 20              | 21                  | 611      | 386               | The main rock types of this area are dolomitic limestone/high grade limestone which are bedded in nature & shows horizontal disposition. The main objective of exploration was to investigate various horizon of cement grade limestone to set up cement plant. Cement grade limestone was intersected in all the boreholes in the form of repeated horizons having cumulative thickness of 7.50 m - 25 m. About 4.60 million tonnes resources of cement grade limestone were estimated.                                                                                                                           |

(Contd.)

# LIMESTONE AND OTHER CALCAREOUS MATERIALS

Table-2 (Contd.)

| Agency/<br>State/<br>District | Location<br>Area/<br>Block          | Mapping  |                 | Drilling            |          | Sampling<br>(No.) | Remarks<br>Reserves/Resources estimated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------|-------------------------------------|----------|-----------------|---------------------|----------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                               |                                     | Scale    | Area<br>(sq km) | No. of<br>boreholes | Meterage |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Rajasthan</b>              |                                     |          |                 |                     |          |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Nagaur                        | N/v Jathera<br>Kharat &<br>Surpalia | 1:10,000 | 10.0            | -                   | -        | 17                | The main rock types are dolomitic limestone/high grade limestone, which are bedded in nature and shows horizontal disposition. Besides these rock of other formation like alluvium of recent to subrecent & gypsum of tertiary formation also occurs. At 1 km east of Jathera & 1 km South of Janjolai villages, occurrences of limestone were noticed in alluvium covered areas. In pit section 2 m thick zone of fine to medium grained grey colour limestone were noticed below 1-2 m thick zone of alluvium and cherty dolomitic limestone, 1 m thick bed of gypsum was also mapped N/v Kharat & is traced up to Sarar Nasar village. Resources were not estimated.                                                                                                 |
| -do-                          | N/v Bher<br>Godhan                  | 1:10,000 | 15.0<br>2.0     | 19                  | 775.50   | -                 | The main rock types of this area are dolomitic limestone/high grade limestone, which are bedded in nature & shows horizontal deposition. Two to seven zones of fine to medium grained grey colour and crystalline limestone zones were intersected having 1.50-19.25 m thickness. The cement grade limestone bands were noticed in pit section which was overlain by 1 to 1.5 m thick zone of dolomitic limestone or alluvium to the south of Godhan. The thickness of limestone zone were noticed which varies from 2.5-3 m which is further continuing in depth. To the SE of village Godhan outcrops of dolomitic limestone were mapped which is cement to chemical grade in quality. About 25.16 million tonnes of cement grade limestone resources were estimated. |
| Jaipur &<br>Alwar             | N/v<br>Baragaon                     | 1:4000   | 100             | -                   | 600      | 1                 | Objective of exploration was to investigate horizons of high grade limestone. Limestone belonging to Ajabgarh group of Delhi Super Group were reported from tubewells N/v Baragaon. Resources were not estimated.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

(Contd.)

# LIMESTONE AND OTHER CALCAREOUS MATERIALS

Table-2 (Contd.)

| Agency/<br>State/<br>District | Location<br>Area/<br>Block | Mapping |                 | Drilling            |          | Sampling<br>(No.) | Remarks<br>Reserves/Resources estimated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------|----------------------------|---------|-----------------|---------------------|----------|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                               |                            | Scale   | Area<br>(sq km) | No. of<br>boreholes | Meterage |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>GSI</b>                    |                            |         |                 |                     |          |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Andhra Pradesh</b>         |                            |         |                 |                     |          |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Guntur                        | Pulipadu & Gujrala         | 1:5,000 | 5.0             | 20                  | -        | -                 | Prospecting stage (G-3) exploration for assessment of limestone resources was taken up. A total number of 20 bore holes of 60 m depth have been drilled in 500 m x 500 m grid. Core drilling has been done for 3 boreholes and the DTH drilling has been carried out for the remaining 17 boreholes. In all the bore holes limestone is present beyond the depth of 60 m. In northern part of the area the soil and weathered limestone thickness is very high (about 90 ft). Towards the surface (up to 5-7m depth) the colour of limestone is gray. The variegated nature is observed up to the depth of about 30 m. At higher depth, limestone the colour turns to gray to dark gray. Narrow bands of shale limestone (< 1m thick) and thin brecciated zones (few cm thick) are also present. Chemical result of bed rock samples shows more than 50% of the samples contain high (>40%) CaO, but the SiO <sub>2</sub> content is inversely proportional with CaO. Resource estimation work for different grades of limestone is in progress. Investigation has been completed. |
| <b>Rajasthan</b>              |                            |         |                 |                     |          |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Jaisalmer                     | -                          | 1:5,000 | 2.5             | 9                   | 450      | 355               | Reconnaissance stage investigation (G-4) was taken up to locate low silica SMS (LD-grade) limestone. The achievement of field target includes photo-geological study of 100 sq. km area supplemented by mapping. Core samples of limestone have been submitted for chemical analysis. The analytical results are awaited. In all the boreholes the limestone has been intersected. The major part of the area is occupied by soil with few outcrops of foraminiferal limestone. The investigation has been completed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

(Contd.)

## LIMESTONE AND OTHER CALCAREOUS MATERIALS

Table-2 (Concl.)

| Agency/<br>State/<br>District | Location<br>Area/<br>Block    | Mapping |                 | Drilling            |          | Sampling<br>(No.) | Remarks<br>Reserves/Resources estimated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------|-------------------------------|---------|-----------------|---------------------|----------|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                               |                               | Scale   | Area<br>(sq km) | No. of<br>boreholes | Meterage |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Rajasthan</b>              |                               |         |                 |                     |          |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Jaisalmer                     | Sabhu ka toba-<br>Asutar area | -       | 2.50<br>1.25    | -                   | -        | -                 | Reconnaissance stage investigation (G-4) was Carried to locate low silica SMS ( LD- grade) limestone. Small patches of limestone are exposed in arcuate shape exposures covering an area of about 0.24 sq kms along eastern bank of IGNP canal. The limestone belong to the Khuiala formation of Upper Tertiary age and the physical and chemical properties of limestone tentatively confirms with specifications for the low silica SMS grade( LD-grade) limestone. The main lithology exposed in the area is iron stone fragments of Shumar Formation and calcrete, which occur as small mounds.The investigation has been completed. |

## PRODUCTION, STOCKS AND PRICES

### Limestone

The production of limestone in 2012-13 at about 279.7 million tonnes increased by 7% as compared to that of the previous year. Owing to more demand in the market some of the principal producers of limestone reported more production during the year.

There were 723 reporting mines in 2012-13 as against 716 during the previous year. Twenty four mines, each producing more than three million tonnes per annum contributed about 41% of the total production of limestone in 2012-13. The share of 9 mines, each in the production range of 2 to 3 million tonnes was 8% of the total production. About 28% of the total production was contributed by 57 mines, each producing 1 to 2 million tonnes annually. The remaining 23% of the total production was reported by 633 limestone mines and 2 associated mines during the year. Twenty four principal producers contributed about 77% of the total

production. About 4.5% of the production was reported by public sector mines as in the previous year.

About 96% of the total production of limestone during 2012-13 was of cement grade, 2% of iron & steel grade and the rest 2% consisted of chemical and other grades.

Andhra Pradesh was the leading producing state accounting for (22%) of the total production of limestone, followed by Rajasthan (19%), Madhya Pradesh (12%), Gujarat & Tamil Nadu (9% each), Karnataka (8%), Chhattisgarh (7%), Himachal Pradesh (5%), Maharashtra (4%) and the remaining 5% was contributed by Odisha, Meghalaya, Uttar Pradesh, Jharkhand, Kerala, Bihar, Assam and Jammu & Kashmir.

Mine-head stocks of limestone at the end of the year 2012-13 were 12.6 million tonnes as against 13.2 million tonnes at the beginning of the year.

Average daily labour employment in limestone mines in 2012-13 was 22,615 as against 23,058 in the previous year.(Tables- 3 to 7).

LIMESTONE AND OTHER CALCAREOUS MATERIALS

**Table – 3 : Principal Producers of Limestone  
2012-13**

| Name and address<br>of producer                                                                                                                    | Location of mine                                                                                     |                                                                                                                               |
|----------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                    | State                                                                                                | District                                                                                                                      |
| Ultra Tech Cement Ltd,<br>'B' Wing,Ahura Centre,<br>2 <sup>nd</sup> Floor, Mahakali<br>Caves Road, Andheri (E),<br>Mumbai-400 093,<br>Maharashtra. | Andhra Pradesh<br>Chhattisgarh<br>Gujarat<br>Karnataka<br>Madhya Pradesh<br>Maharashtra<br>Rajasthan | Kurnool<br>Raipur<br>Amreli<br>Gulbarga<br>Neemuch<br>Chandrapur<br>Chittorgarh<br>Jaipur<br>Nagaur<br>Ariyalur<br>Perambalur |
| Ambuja Cement Ltd,<br>P.O. Ambujanagar,<br>Tq : Kodinar,<br>Junagadh-362 715,<br>Gujarat.                                                          | Chhattisgarh<br>Gujarat<br>Himachal Pradesh<br>Maharashtra<br>Rajasthan                              | Raipur<br>Junagadh<br>Solani<br>Chandrapur<br>Pali                                                                            |
| The ACC Ltd,<br>Cement House, 121,<br>Maharshi Karve Road,<br>Mumbai – 400 020,<br>Maharashtra.                                                    | Andhra Pradesh<br>Chhattisgarh<br>Himachal Pradesh<br>Jharkhand                                      | Adilabad<br>Durg<br>Bilaspur<br>Singhbhum<br>(W)                                                                              |
|                                                                                                                                                    | Karnataka<br>Madhya Pradesh<br>Maharashtra<br>Rajasthan<br>Tamil Nadu                                | Gulbarga<br>Katni<br>Yavatmal<br>Bundi<br>Coimbatore                                                                          |
| Jaiprakash Associates Ltd,<br>Sector – 128,<br>Noida – 201 304,<br>Uttar Pradesh.                                                                  | Gujarat<br>Madhya Pradesh<br>Himachal Pradesh<br>Uttar Pradesh                                       | Kachchh<br>Rewa<br>Sidhi<br>Solani<br>Sonbhadra                                                                               |
| Shree Cement Ltd,<br>Bangur Nagar,<br>Post Box No. 33,<br>Beawar – 305 901,<br>Rajasthan.                                                          | Rajasthan                                                                                            | Ajmer<br>Pali                                                                                                                 |
| The India Cement Ltd,<br>“Dhun Building”<br>4 <sup>th</sup> Floor, 827,<br>Anna Salai,<br>Chennai – 600 002.<br>Tamil Nadu.                        | Andhra Pradesh<br>Tamil Nadu                                                                         | Cuddapah<br>Nalgonda<br>Ranga -<br>Reddy<br>Ariyalur<br>Perambalur<br>Tirunelveli<br>Thoothu-<br>kudi<br>Virudhu-<br>nagar    |
| Binani Cement Ltd,<br>37/2,Chinar Park,<br>New Town,Rajarhat<br>Dist-24 Parganas<br>North-700 157,<br>West Bengal.                                 | Rajasthan                                                                                            | Sirohi                                                                                                                        |

Table - 3 (Contd.)

| Name and address<br>of producer                                                                                                                                              | Location of mine                          |                                                                                           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------------------------------------------------------------------------------------------|
|                                                                                                                                                                              | State                                     | District                                                                                  |
| Madras Cement Ltd,<br>Ramamandiram,<br>P.O.Rajapalayam-626 117,<br>Virudh Nagar,<br>Tamil Nadu.                                                                              | Andhra Pradesh<br>Karnataka<br>Tamil Nadu | Krishna<br>Chitradurga<br>Ariyalur<br>Perambalur<br>Thoothu-<br>kudi<br>Virudhu-<br>nagar |
| Dalmia Cement Ltd,<br>P. O. Dalmiapuram,<br>Thiruchirapalli-621 651,<br>Tamil Nadu.                                                                                          | Andhra Pradesh<br>Tamil Nadu              | Cuddapah<br>Ariyalur<br>Perambalur<br>Thiruchira-<br>palli                                |
| Chettinad Cement Corp. Ltd,<br>6 <sup>th</sup> Floor, Rani Seethai<br>Hall Building,<br>603, Anna Salai,<br>Chennai – 600 006<br>Tamil Nadu.                                 | Tamil Nadu                                | Ariyalur<br>Dindigul<br>Karur<br>Perambalur                                               |
| J. K. Cement Works,<br>Kamla Tower,<br>Kanpur-208 001,<br>Uttar Pradesh.                                                                                                     | Rajasthan<br>Karnataka                    | Chittorgarh<br>Nagaur<br>Bagalkot                                                         |
| Kesoram Industries Ltd,<br>9/1, R. N. Mukherjee Road,<br>Kolkata – 700 001.                                                                                                  | Andhra Pradesh<br>Karnataka               | Karimnagar<br>Gulbarga                                                                    |
| J. K. Lakshmi Cement Ltd,<br>P.O. Jaykaypuram,<br>Sirohi,<br>Rajasthan.                                                                                                      | Rajasthan                                 | Sirohi                                                                                    |
| Lafarge India Private Ltd,<br>Crescenzo Building<br>B-wing,10th Floor<br>C-38,C-39,G-Block<br>Bandra Kurla Complex,<br>Bandra East<br>229, Nariman Point,<br>Mumbai-400 051. | Chhattisgarh                              | Janjgir-<br>Champa<br>Raipur                                                              |
| Zuari Cement Ltd,<br>Krishna Nagar,<br>Yerraguntla-516 311,<br>Andhra Pradesh.                                                                                               | Andhra Pradesh                            | Cuddapah<br>Nalgonda                                                                      |
| A.P. Mineral Dev.<br>Corpn. Ltd, 3 <sup>rd</sup> Floor<br>Rear Block, HMWSSB,<br>Premises, Khairatabad,<br>Hyderabad – 500 004.                                              | Andhra Pradesh                            | Adilabad                                                                                  |

(Contd.)

# LIMESTONE AND OTHER CALCAREOUS MATERIALS

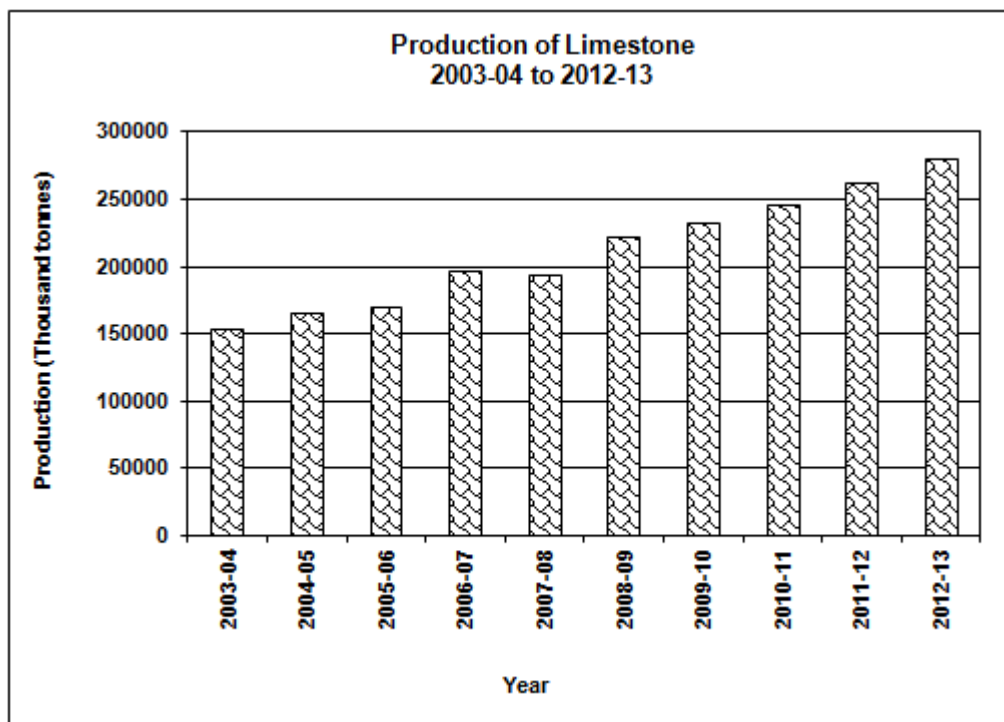
Table - 3 (Contd.)

| Name and address of producer                                                                                                    | Location of mine                              |                               |
|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------------------------------|
|                                                                                                                                 | State                                         | District                      |
| Birla Corporation Ltd,<br>Birla Building,9/1<br>R. N. Mukherjee Road,<br>Kolkata – 700 001,<br>West Bengal.                     | Madhya Pradesh<br>Rajasthan                   | Satna<br>Chittorgarh          |
| Bharathi Cements<br>Corporation Pvt. Ltd,<br>8-2-626, Reliance Majestic,<br>Road No.-10, Banjara Hills,<br>Hyderabad – 500 034. | Andhra Pradesh                                | Cuddapah                      |
| My Home Industries Ltd,<br>9 <sup>th</sup> Floor, Block-3,<br>My Home Hub, Madhapur,<br>Hyderabad-500 081,<br>Andhra Pradesh.   | Andhra Pradesh                                | Nalgonda                      |
| Century Textiles &<br>Industries Ltd,<br>Century Bhawan,<br>Dr. Annie Besant Road,<br>Mumbai– 400 025,<br>Maharashtra.          | Chhattisgarh<br>Madhya Pradesh<br>Maharashtra | Raipur<br>Satna<br>Chandrapur |

(Contd.)

Table - 3 (Concltd.)

| Name and address of producer                                                                                             | Location of mine                 |                  |
|--------------------------------------------------------------------------------------------------------------------------|----------------------------------|------------------|
|                                                                                                                          | State                            | District         |
| Sanghi Industries Ltd,<br>P.O. Sanghipuram,<br>Taluka- Abdasa Kachchh,<br>Gujarat- 370 511.                              | Gujarat                          | Kachchh          |
| Prism Cement Ltd,<br>305, Laxmi Niwas,<br>Apartments, Ameerpeth,<br>Hyderabad-500 016,<br>Andhra Pradesh.                | Andhra Pradesh<br>Madhya Pradesh | Kurnool<br>Satna |
| Penna Cement Industries<br>Ltd, Plot No.-705,<br>Road No.-03,<br>Banjara Hills,<br>Hyderabad-500 034,<br>Andhra Pradesh. | Andhra Pradesh                   | Anantapur        |
| OCL India Ltd,<br>Rajgangpur<br>Rajgangpur-770017<br>Odisha                                                              | Odisha                           | Sundergarh       |



## LIMESTONE AND OTHER CALCAREOUS MATERIALS

**Table – 4 : Production of Limestone, 2010-11 to 2012 -13  
(By States)**

(Qty in '000 tonnes; Value in ₹'000)

| State            | 2010-11       |                 | 2011-12       |                 | 2012-13(P)    |                 |
|------------------|---------------|-----------------|---------------|-----------------|---------------|-----------------|
|                  | Quantity      | Value           | Quantity      | Value           | Quantity      | Value           |
| <b>India</b>     | <b>246336</b> | <b>36349567</b> | <b>262568</b> | <b>40768303</b> | <b>279736</b> | <b>43216622</b> |
| Andhra Pradesh   | 52633         | 7375266         | 54602         | 7777269         | 62115         | 8643469         |
| Assam            | 350           | 82772           | 248           | 62585           | 296           | 77363           |
| Bihar            | 872           | 292511          | 507           | 142686          | 567           | 172447          |
| Chhattisgarh     | 19241         | 2997759         | 20465         | 3477724         | 20161         | 3546988         |
| Gujarat          | 22500         | 2773002         | 24098         | 2918566         | 25538         | 3010799         |
| Himachal Pradesh | 11927         | 1437928         | 10801         | 1196206         | 13051         | 1571745         |
| Jammu & Kashmir  | 154           | 26991           | 225           | 34162           | 192           | 26917           |
| Jharkhand        | 1996          | 453107          | 2480          | 557622          | 1857          | 539794          |
| Karnataka        | 18595         | 1933439         | 20276         | 2770647         | 21072         | 3102526         |
| Kerala           | 530           | 115506          | 539           | 216493          | 495           | 119709          |
| Madhya Pradesh   | 33276         | 4785685         | 34072         | 4344022         | 33942         | 4333915         |
| Maharashtra      | 9905          | 1120117         | 12281         | 1516232         | 11927         | 1639506         |
| Meghalaya        | 1783          | 374170          | 4216          | 1607232         | 3893          | 1962575         |
| Odisha           | 3923          | 1102597         | 3136          | 1153269         | 4058          | 1309996         |
| Rajasthan        | 44773         | 7212296         | 47982         | 8113633         | 52065         | 7931464         |
| Tamil Nadu       | 20566         | 3765907         | 23643         | 4365037         | 25203         | 4782287         |
| Uttar Pradesh    | 3312          | 500514          | 2997          | 514918          | 3304          | 445122          |

LIMESTONE AND OTHER CALCAREOUS MATERIALS

**Table – 5 : Production of Limestone, 2011-12 and 2012-13(P)**  
(By Frequency Groups)

| Production group<br>(In tonnes) | No. of mines  |               | Production for the group<br>(’000 tonnes) |               | Percentage in total<br>production |               | Cumulative<br>percentage |         |
|---------------------------------|---------------|---------------|-------------------------------------------|---------------|-----------------------------------|---------------|--------------------------|---------|
|                                 | 2011-12       | 2012-13       | 2011-12                                   | 2012-13       | 2011-12                           | 2012-13       | 2011-12                  | 2012-13 |
| <b>All Groups</b>               | <b>716(4)</b> | <b>723(2)</b> | <b>262568</b>                             | <b>279736</b> | <b>100.00</b>                     | <b>100.00</b> | -                        | -       |
| Up to 10000                     | 311(4)        | 290(2)        | 781                                       | 707           | 0.30                              | 0.25          | 0.30                     | 0.25    |
| 10001 - 50000                   | 143           | 140           | 3510                                      | 3403          | 1.34                              | 1.22          | 1.64                     | 1.47    |
| 50001 - 100000                  | 44            | 55            | 3175                                      | 4034          | 1.21                              | 1.44          | 2.85                     | 2.91    |
| 100001 - 200000                 | 38            | 41            | 5684                                      | 5893          | 2.16                              | 2.11          | 5.01                     | 5.02    |
| 200001 - 300000                 | 19            | 27            | 4579                                      | 6692          | 1.74                              | 2.39          | 6.75                     | 7.41    |
| 300001 - 400000                 | 17            | 21            | 6122                                      | 7534          | 2.33                              | 2.69          | 9.08                     | 10.10   |
| 400001 - 500000                 | 14            | 20            | 6518                                      | 9101          | 2.48                              | 3.25          | 11.56                    | 13.35   |
| 500001 - 600000                 | 12            | 11            | 6678                                      | 5990          | 2.54                              | 2.14          | 14.10                    | 15.49   |
| 600001 - 700000                 | 5             | 10            | 3290                                      | 6459          | 1.25                              | 2.31          | 15.35                    | 17.80   |
| 700001 - 800000                 | 11            | 5             | 8174                                      | 3769          | 3.11                              | 1.35          | 18.46                    | 19.15   |
| 800001 - 900000                 | 7             | 6             | 5804                                      | 5129          | 2.21                              | 1.83          | 20.67                    | 20.98   |
| 900001 - 1000000                | 11            | 7             | 10291                                     | 6635          | 3.92                              | 2.37          | 24.59                    | 23.35   |
| 1000001 - 2000000               | 53            | 57            | 72750                                     | 78476         | 27.71                             | 28.05         | 52.30                    | 51.40   |
| 2000001 - 3000000               | 11            | 9             | 27508                                     | 21983         | 10.48                             | 7.86          | 62.78                    | 59.26   |
| 3000001 & above                 | 20            | 24            | 97704                                     | 113931        | 37.22                             | 40.74         | 100.00                   | 100.00  |

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

**Table – 7 : Mine-head Stocks of Limestone, 2012-13**  
(By States/Grades)

(In '000 tonnes)

| State            | At the beginning of the year |              |            |            |              | At the end of the year (P) |              |             |          |              |
|------------------|------------------------------|--------------|------------|------------|--------------|----------------------------|--------------|-------------|----------|--------------|
|                  | Grades                       |              |            |            |              | Grades                     |              |             |          |              |
|                  | Cement                       | Iron & Steel | Chem.      | Others     | Total        | Cement                     | Iron & Steel | Chem.       | Others   | Total        |
| <b>India</b>     | <b>11088</b>                 | <b>1046</b>  | <b>944</b> | <b>132</b> | <b>13210</b> | <b>10084</b>               | <b>1496</b>  | <b>1031</b> | <b>9</b> | <b>12620</b> |
| Andhra Pradesh   | 1526                         | 16           | 14         | 5          | 1561         | 1541                       | 39           | 3           | 8        | 1591         |
| Assam            | 63                           | -            | -          | -          | 63           | 78                         | -            | -           | -        | 78           |
| Chhattisgarh     | 127                          | 33           | -          | -          | 160          | 68                         | 129          | -           | -        | 197          |
| Gujarat          | 2852                         | -            | 930        | -          | 3782         | 2925                       | -            | 985         | -        | 3910         |
| Himachal Pradesh | 11                           | 54           | -          | -          | 65           | 59                         | 97           | -           | -        | 156          |
| Jammu & Kashmir  | 2                            | -            | -          | -          | 2            | 2                          | -            | -           | -        | 2            |
| Jharkhand        | 11                           | 207          | -          | -          | 218          | 43                         | 175          | -           | -        | 218          |
| Karnataka        | 2823                         | 64           | -          | -          | 2887         | 2316                       | 339          | -           | -        | 2655         |
| Kerala           | 29                           | -            | -          | -          | 29           | 4                          | -            | -           | -        | 4            |
| Madhya Pradesh   | 714                          | 120          | -          | -          | 834          | 393                        | 212          | 40          | -        | 645          |
| Maharashtra      | 3                            | 60           | -          | -          | 63           | 67                         | ++           | -           | -        | 67           |
| Meghalaya        | 242                          | -            | ++         | -          | 242          | 242                        | -            | 1           | -        | 243          |
| Odisha           | 152                          | 446          | -          | -          | 598          | 87                         | 401          | -           | -        | 488          |
| Rajasthan        | 1511                         | 1            | -          | 127        | 1639         | 1503                       | 73           | -           | -        | 1576         |
| Tamil Nadu       | 1022                         | 45           | -          | -          | 1067         | 756                        | 31           | 2           | 1        | 790          |

**Table – 6 : Production of Limestone, 2011-12 & 2012 -13**  
(By Sectors/States/Districts/Grades)

(Qty in '000 tonnes; value in ₹ '000)

| State/District        | 2011-12        |               |                 |             |            |               |                 | 2012-13(P)      |               |                 |             |            |               |                 |
|-----------------------|----------------|---------------|-----------------|-------------|------------|---------------|-----------------|-----------------|---------------|-----------------|-------------|------------|---------------|-----------------|
|                       | Grades         |               |                 |             |            | Total         |                 | Grades          |               |                 |             |            | Total         |                 |
|                       | No.of<br>mines | Cement        | Iron &<br>Steel | Chem.       | Others     | Qty           | Value           | No. of<br>mines | Cement        | Iron &<br>Steel | Chem.       | Others     | Qty           | Value           |
| <b>India</b>          | <b>716(4)</b>  | <b>246093</b> | <b>11757</b>    | <b>4014</b> | <b>704</b> | <b>262568</b> | <b>40768303</b> | <b>723(2)</b>   | <b>269596</b> | <b>5811</b>     | <b>3902</b> | <b>427</b> | <b>279736</b> | <b>43216622</b> |
| Public sector         | 30             | 8893          | 3873            | -           | 436        | 13202         | 3201339         | 28              | 8929          | 3392            | -           | 379        | 12700         | 2786688         |
| Private sector        | 686(4)         | 237200        | 7884            | <b>4014</b> | 268        | 249366        | 37566964        | 695(2)          | 260667        | 2419            | 3902        | 48         | 267036        | 40429934        |
| <b>Andhra Pradesh</b> | <b>97(2)</b>   | <b>54041</b>  | <b>439</b>      | <b>52</b>   | <b>70</b>  | <b>54602</b>  | <b>7777269</b>  | <b>99(2)</b>    | <b>61596</b>  | <b>494</b>      | <b>3</b>    | <b>22</b>  | <b>62115</b>  | <b>8643469</b>  |
| Adilabad              | 2              | 4097          | -               | -           | -          | 4097          | 602863          | 3               | 4301          | -               | -           | -          | 4301          | 639697          |
| Anantapur             | 9              | 1452          | -               | ++          | -          | 1452          | 155118          | 9(1)            | 1702          | -               | 1           | 15         | 1718          | 173413          |
| Cuddapah              | 6              | 9680          | -               | -           | -          | 9680          | 1301259         | 6               | 11334         | -               | -           | -          | 11334         | 1321185         |
| Guntur                | 6              | 3690          | -               | -           | -          | 3690          | 615439          | 8               | 3494          | 13              | -           | -          | 3507          | 547362          |
| Karimnagar            | 1              | 1070          | -               | -           | -          | 1070          | 319256          | 1               | 1230          | -               | -           | -          | 1230          | 507496          |
| Krishna               | 8              | 3933          | 439             | -           | -          | 4372          | 877301          | 9               | 6890          | 418             | -           | -          | 7308          | 1292422         |
| Kurnool               | 35(2)          | 10116         | -               | 52          | 70         | 10238         | 1280720         | 33(1)           | 11624         | 63              | 2           | 7          | 11696         | 1438777         |
| Nalgonda              | 26             | 15788         | -               | -           | -          | 15788         | 2119010         | 26              | 17031         | -               | -           | -          | 17031         | 2240318         |
| Ranga Reddy           | 4              | 4215          | -               | -           | -          | 4215          | 506303          | 4               | 3990          | -               | -           | -          | 3990          | 482799          |
| <b>Assam</b>          | <b>3</b>       | <b>248</b>    | -               | -           | -          | <b>248</b>    | <b>62585</b>    | <b>2</b>        | <b>296</b>    | -               | -           | -          | <b>296</b>    | <b>77363</b>    |
| Karbi Anglong         | 1              | 194           | -               | -           | -          | 194           | 53638           | 1               | 208           | -               | -           | -          | 208           | 57743           |
| North Cachar Hills    | 2              | 54            | -               | -           | -          | 54            | 8947            | 1               | 88            | -               | -           | -          | 88            | 19620           |
| <b>Bihar</b>          | <b>2</b>       | <b>507</b>    | -               | -           | -          | <b>507</b>    | <b>142686</b>   | <b>2</b>        | <b>567</b>    | -               | -           | -          | <b>567</b>    | <b>172447</b>   |
| Rohtas                | 2              | 507           | -               | -           | -          | 507           | 142686          | 2               | 567           | -               | -           | -          | 567           | 172447          |
| <b>Chhattisgarh</b>   | <b>51</b>      | <b>20256</b>  | <b>209</b>      | -           | ++         | <b>20465</b>  | <b>3477724</b>  | <b>52</b>       | <b>19840</b>  | <b>321</b>      | -           | ++         | <b>20161</b>  | <b>3546988</b>  |
| Bastar                | 9              | 22            | -               | -           | ++         | 22            | 8019            | 10              | 28            | -               | -           | ++         | 28            | 7862            |
| Durg                  | 27             | 1175          | 209             | -           | -          | 1384          | 402095          | 26              | 1303          | 321             | -           | -          | 1624          | 508955          |
| Janjgir-Champa        | 3              | 2016          | -               | -           | 2140       | 2016          | 353425          | 2               | 1985          | -               | -           | -          | 1985          | 439042          |
| Raigarh               | 1              | 3             | -               | -           | -          | 3             | 578             | 1               | 3             | -               | -           | -          | 3             | 671             |
| Raipur                | 10             | 17040         | -               | -           | -          | 17040         | 2713576         | 12              | 16521         | -               | -           | -          | 16521         | 2590446         |
| Rajnandgaon           | 1              | ++            | -               | -           | -          | ++            | 31              | 1               | ++            | -               | -           | -          | ++            | 12              |

LIMESTONE AND OTHER CALCAREOUS MATERIALS

(Contd.)

Table - 6 (Contd.)

| State/District             | 2011-12        |              |                 |             |        |              |                | 2012-13(P)      |              |                 |             |        |              |                |
|----------------------------|----------------|--------------|-----------------|-------------|--------|--------------|----------------|-----------------|--------------|-----------------|-------------|--------|--------------|----------------|
|                            | Grades         |              |                 |             |        | Total        |                | Grades          |              |                 |             |        | Total        |                |
|                            | No.of<br>mines | Cement       | Iron &<br>Steel | Chem.       | Others | Qty          | Value          | No. of<br>mines | Cement       | Iron &<br>Steel | Chem.       | Others | Qty          | Value          |
| <b>Gujarat</b>             | <b>106(1)</b>  | <b>20276</b> | -               | <b>3822</b> | -      | <b>24098</b> | <b>2918566</b> | <b>114</b>      | <b>21838</b> | -               | <b>3700</b> | -      | <b>25538</b> | <b>3010799</b> |
| Amreli                     | 2              | 5795         | -               | -           | -      | 5795         | 748766         | 2               | 5914         | -               | -           | -      | 5914         | 790651         |
| Jamnagar                   | 22             | 1137         | -               | 994         | -      | 2131         | 224127         | 21              | 1163         | -               | 1031        | -      | 2194         | 224613         |
| Junagadh                   | 55             | 5384         | -               | 1662        | -      | 7046         | 928149         | 63              | 5816         | -               | 1381        | -      | 7197         | 855920         |
| Kachchh                    | 5              | 6860         | -               | ++          | -      | 6860         | 616019         | 6               | 7450         | -               | ++          | -      | 7450         | 642552         |
| Porbandar                  | 22(1)          | 1100         | -               | 1166        | -      | 2266         | 401505         | 21              | 1324         | -               | 1288        | -      | 2612         | 468892         |
| Surat                      | -              | -            | -               | -           | -      | -            | -              | 1               | 171          | -               | -           | -      | 171          | 28171          |
| <b>Himachal Pradesh</b>    | <b>25</b>      | <b>10318</b> | <b>483</b>      | -           | -      | <b>10801</b> | <b>1196206</b> | <b>19</b>       | <b>12720</b> | <b>331</b>      | -           | -      | <b>13051</b> | <b>1571745</b> |
| Bilaspur                   | 1              | 2351         | -               | -           | -      | 2351         | 223349         | 1               | 3521         | -               | -           | -      | 3521         | 403570         |
| Mandi                      | 1*             | -            | -               | -           | -      | -            | -              | -               | -            | -               | -           | -      | -            | -              |
| Sirmour                    | 21             | 387          | 483             | -           | -      | 870          | 215922         | 16              | 522          | 331             | -           | -      | 853          | 224737         |
| Solan                      | 2              | 7580         | -               | -           | -      | 7580         | 756935         | 2               | 8677         | -               | -           | -      | 8677         | 937438         |
| <b>Jammu &amp; Kashmir</b> | <b>1</b>       | <b>225</b>   | -               | -           | -      | <b>225</b>   | <b>34162</b>   | <b>1</b>        | <b>192</b>   | -               | -           | -      | <b>192</b>   | <b>26917</b>   |
| Pulwama                    | 1              | 225          | -               | -           | -      | 225          | 34162          | 1               | 192          | -               | -           | -      | 192          | 26917          |
| <b>Jharkhand</b>           | <b>18</b>      | <b>45</b>    | <b>2435</b>     | -           | -      | <b>2480</b>  | <b>557622</b>  | <b>12</b>       | <b>1763</b>  | <b>94</b>       | -           | -      | <b>1857</b>  | <b>539794</b>  |
| Bokaro                     | 1              | 1            | -               | -           | -      | 1            | 185            | 1               | 1            | -               | -           | -      | 1            | 144            |
| Garwah                     | 3              | -            | 77              | -           | -      | 77           | 49071          | 3               | -            | 92              | -           | -      | 92           | 21158          |
| Hazaribagh                 | 4              | 5            | -               | -           | -      | 5            | 1329           | -               | -            | -               | -           | -      | -            | -              |
| Palamu                     | 1              | -            | 11              | -           | -      | 11           | 4484           | 1               | -            | 2               | -           | -      | 2            | 638            |
| Ranchi                     | 1              | -            | 40              | -           | -      | 40           | 10369          | 1               | 8            | -               | -           | -      | 8            | 2103           |
| Singhbhum (West)           | 8              | 39           | 2307            | -           | -      | 2346         | 492184         | 6               | 1754         | -               | -           | -      | 1754         | 515751         |
| <b>Karnataka</b>           | <b>72</b>      | <b>20120</b> | <b>156</b>      | -           | -      | <b>20276</b> | <b>2770627</b> | <b>64</b>       | <b>20717</b> | <b>355</b>      | -           | -      | <b>21072</b> | <b>3102526</b> |
| Bagalkot                   | 49             | 3066         | 146             | -           | -      | 3212         | 423935         | 47              | 3096         | 302             | -           | -      | 3398         | 620253         |
| Belgaum                    | 11             | 130          | 10              | -           | -      | 140          | 29873          | 7               | 47           | 25              | -           | -      | 72           | 18743          |
| Chitradurga                | 3              | 142          | -               | -           | -      | 142          | 44500          | 2               | 162          | -               | -           | -      | 162          | 33559          |
| Gulbarga                   | 5              | 16400        | -               | -           | -      | 16400        | 2166074        | 5               | 17161        | -               | -           | -      | 17161        | 2345205        |
| Shimoga                    | 1              | 42           | -               | -           | -      | 42           | 9374           | 1               | -            | 28              | -           | -      | 28           | 6338           |
| Tumkur                     | 3              | 340          | -               | -           | -      | 340          | 96871          | 2               | 251          | -               | -           | -      | 251          | 78428          |

(Contd.)

LIMESTONE AND OTHER CALCAREOUS MATERIALS

Table - 6 (Contd.)

| State/District        | 2011-12      |              |              |            |        |              |                | 2012-13(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              |
| <b>Kerala</b>         | <b>1</b>     | <b>539</b>   | -            | -          | -      | <b>539</b>   | <b>216493</b>  | <b>1</b>     | <b>495</b>   | -            | -          | -      | <b>495</b>   | <b>119709</b>      |
| Palakkad              | 1            | 539          | -            | -          | -      | 539          | 216493         | 1            | 495          | -            | -          | -      | 495          | 119709             |
| <b>Madhya Pradesh</b> | <b>119</b>   | <b>32751</b> | <b>1321</b>  | -          | -      | <b>34072</b> | <b>4344022</b> | <b>110</b>   | <b>32250</b> | <b>1638</b>  | <b>54</b>  | -      | <b>33942</b> | <b>4333915</b>     |
| Damoh                 | 2            | 1519         | -            | -          | -      | 1519         | 186995         | 2            | 2092         | -            | -          | -      | 2092         | 253653             |
| Dhar                  | 5            | 40           | 12           | -          | -      | 52           | 5185           | 13           | 75           | 2            | -          | -      | 77           | 7973               |
| Jabalpur              | 1            | -            | -            | -          | -      | -            | -              | 1            | -            | 30           | -          | -      | 30           | 4500               |
| Katni                 | 43           | 4071         | 1217         | -          | -      | 5288         | 876150         | 36           | 4008         | 1364         | 53         | -      | 5425         | 739195             |
| Narsimhapur           | 1            | 3            | -            | -          | -      | 3            | 592            | -            | -            | -            | -          | -      | -            | -                  |
| Neemuch               | 2            | 4453         | -            | -          | -      | 4453         | 432398         | 3            | 4450         | -            | -          | -      | 4450         | 430523             |
| Rewa                  | 8            | 5757         | -            | -          | -      | 5757         | 791638         | 8            | 5722         | -            | -          | -      | 5722         | 805213             |
| Satna                 | 56           | 15795        | 92           | -          | -      | 15887        | 1936342        | 46           | 14740        | 242          | 1          | -      | 14983        | 1963950            |
| Sidhi                 | 1            | 1113         | -            | -          | -      | 1113         | 114725         | 1            | 1163         | -            | -          | -      | 1163         | 128908             |
| <b>Maharashtra</b>    | <b>19</b>    | <b>8406</b>  | <b>3875</b>  | -          | -      | <b>12281</b> | <b>1516232</b> | <b>14</b>    | <b>11837</b> | <b>90</b>    | -          | -      | <b>11927</b> | <b>1639506</b>     |
| Chandrapur            | 8            | 6493         | 3873         | -          | -      | 10366        | 1317383        | 8            | 9426         | 90           | -          | -      | 9516         | 1387615            |
| Yavatmal              | 11           | 1913         | 2            | -          | -      | 1915         | 198849         | 6            | 2411         | -            | -          | -      | 2411         | 251891             |
| <b>Meghalaya</b>      | <b>12</b>    | <b>4076</b>  | -            | <b>140</b> | -      | <b>4216</b>  | <b>1607232</b> | <b>14</b>    | <b>3768</b>  | -            | <b>125</b> | -      | <b>3893</b>  | <b>1962575</b>     |
| Jaintia Hills         | 9            | 2611         | -            | -          | -      | 2611         | 502383         | 11           | 1840         | -            | -          | -      | 1840         | 302024             |
| Khasi Hills East      | 3            | 1465         | -            | 140        | -      | 1605         | 1104849        | 3            | 1928         | -            | 125        | -      | 2053         | 1660551            |
| <b>Odisha</b>         | <b>10(1)</b> | <b>3111</b>  | <b>25</b>    | -          | -      | <b>3136</b>  | <b>1153269</b> | <b>8</b>     | <b>3911</b>  | <b>147</b>   | -          | -      | <b>4058</b>  | <b>1309996</b>     |
| Bargarh               | 2            | 1132         | -            | -          | -      | 1132         | 327160         | 1            | 990          | -            | -          | -      | 990          | 444862             |
| Koraput               | 1            | 181          | -            | -          | -      | 181          | 50109          | 1            | 21           | -            | -          | -      | 21           | 7651               |
| Sundergarh            | 7(1)         | 1798         | 25           | -          | -      | 1823         | 776000         | 6            | 2900         | 147          | -          | -      | 3047         | 857483<br>(Contd.) |

LIMESTONE AND OTHER CALCAREOUS MATERIALS

Table - 6 (Concl'd.)

| State/District        | 2011-12     |              |              |            |            |              |                 | 2012-13(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          |
| <b>Rajasthan</b>      | <b>25</b>   | <b>45223</b> | <b>2346</b>  | -          | <b>413</b> | <b>47982</b> | <b>20113633</b> | <b>26</b>    | <b>49823</b> | <b>1870</b>  | -         | <b>372</b> | <b>52065</b> | <b>7931464</b> |
| Ajmer                 | 1           | 1530         | -            | -          | -          | 1530         | 245594          | 1            | 1494         | -            | -         | -          | 1494         | 216817         |
| Banswara              | 1           | 1165         | -            | -          | -          | 1165         | 151931          | 1            | 1279         | -            | -         | -          | 1279         | 177300         |
| Bundi                 | 1           | 971          | -            | -          | -          | 971          | 248558          | 1            | 885          | -            | -         | -          | 885          | 251297         |
| Chittorgarh           | 7           | 10339        | -            | -          | -          | 10339        | 13399901        | 7            | 11947        | -            | -         | -          | 11947        | 1378778        |
| Jaipur                | 1           | 3532         | -            | -          | -          | 3532         | 429662          | 1            | 4248         | -            | -         | -          | 4248         | 516316         |
| Jaisalmer             | 2           | -            | 2346         | -          | 413        | 2759         | 979120          | 2            | -            | <b>1870</b>  | -         | 372        | 2242         | 712821         |
| Kota                  | 1           | 1927         | -            | -          | -          | 1927         | 363845          | 1            | 2295         | -            | -         | -          | 2295         | 378618         |
| Nagaur                | 5           | 828          | -            | -          | -          | 828          | 244799          | 5            | 881          | -            | -         | -          | 881          | 239724         |
| Pali                  | 2           | 12548        | -            | -          | -          | 12548        | 1800878         | 3            | 14334        | -            | -         | -          | 14334        | 1936760        |
| Rajsamand             | 1           | 3            | -            | -          | -          | 3            | 404             | -            | -            | -            | -         | -          | -            | -              |
| Sikar                 | -           | -            | -            | -          | -          | -            | -               | 1            | ++           | -            | -         | -          | ++           | 25             |
| Sirohi                | 3           | 12380        | -            | -          | -          | 12380        | 2248941         | 3            | 12460        | -            | -         | -          | 12460        | 2123008        |
| <b>Tamil Nadu</b>     | <b>154</b>  | <b>22954</b> | <b>468</b>   | <b>221</b> | -          | <b>23643</b> | <b>4365037</b>  | <b>183</b>   | <b>24679</b> | <b>471</b>   | <b>20</b> | <b>33</b>  | <b>25203</b> | <b>4782287</b> |
| Ariyalur              | 25          | 10738        | 117          | 23         | -          | 10878        | 1817260         | 32           | 11415        | 235          | -         | 7          | 11657        | 2032089        |
| Coimbatore            | 2           | 547          | -            | -          | -          | 547          | 108793          | 5            | 828          | -            | -         | -          | 828          | 213485         |
| Dharmapuri            | 2           | ++           | 1            | -          | -          | 1            | 315             | 2            | 1            | -            | -         | -          | 1            | 199            |
| Dindigul              | 15          | 3521         | 19           | -          | -          | 3540         | 809391          | 17           | 2814         | 8            | 5         | 1          | 2828         | 638085         |
| Karur                 | 8           | 39           | ++           | -          | -          | 39           | 8533            | 11           | 700          | 3            | -         | -          | 703          | 157568         |
| Madurai               | 4           | 5            | 4            | -          | -          | 9            | 2724            | 3            | 6            | 6            | -         | 1          | 13           | 4793           |
| Namakkal              | 7           | 5            | 12           | -          | -          | 17           | 4554            | 10           | 12           | 5            | -         | -          | 17           | 6032           |
| Perambalur            | 18          | 3589         | -            | -          | -          | 3589         | 561679          | 27           | 3964         | 152          | -         | -          | 4116         | 696300         |
| Salem                 | 22          | 422          | 5            | -          | -          | 427          | 144986          | 17           | 389          | ++           | -         | -          | 389          | 78282          |
| Tiruchirapalli        | 7           | 2175         | -            | -          | -          | 2175         | 237964          | 10           | 2332         | -            | -         | -          | 2332         | 259506         |
| Tirunelveli           | 24          | 1018         | 63           | 198        | -          | 1279         | 361945          | 29           | 1156         | 30           | 15        | 24         | 1225         | 392138         |
| Thoothukudi/Tuticorin | 8           | 671          | 63           | -          | -          | 734          | 192117          | 7            | 901          | 10           | -         | -          | 911          | 225156         |
| Virudhunagar          | 12          | 224          | 184          | -          | -          | 408          | 114776          | 13           | 161          | 22           | -         | -          | 183          | 78654          |
| <b>Uttar Pradesh</b>  | <b>1</b>    | <b>2997</b>  | -            | -          | -          | <b>2997</b>  | <b>514918</b>   | <b>2</b>     | <b>3304</b>  | -            | -         | -          | <b>3304</b>  | <b>445122</b>  |
| Sonbhadra             | 1           | 2997         | -            | -          | -          | 2997         | 514918          | 2            | <b>3304</b>  | -            | -         | -          | 3304         | 445122         |

Figures in parentheses indicate associated mine of limestone with dolomite.

\*Only labour reported.

LIMESTONE AND OTHER CALCAREOUS MATERIALS

## Limeshell

The production of limeshell at 23,228 tonnes during 2012-13 decreased by 30% as compared to the preceding year due to less productivity and less demand in the market.

There were 6 reporting mines in 2012-13 same as previous years. Four principal producers accounted for 92% of the total production during the year. The share of public sector was 49% in 2012-13.

Almost entire production of limeshell was reported by Kerala and a nominal production was reported by one mine located in Tamil Nadu.

Mine-head stocks of limeshell at the end of 2012-13 was 2,524 tonnes as against 5,157 tonnes at the beginning of the year (Table - 11).

The average daily employment of labour during the year 2012-13 was 568 as against 517 in the previous year.

**Table – 8 : Principal Producers of Limeshell  
2012-13**

| Name and address of producer                                                                                            | Location of mine |          |
|-------------------------------------------------------------------------------------------------------------------------|------------------|----------|
|                                                                                                                         | State            | District |
| The Travancore Cement Ltd, Nattakom, Distt. Kottayam, Kerala-686 013.                                                   | Kerala           | Kottayam |
| Vaikom Taluk white Limeshell Co.op Society, Vill. Vechoor, Post. Ambika Market Vaikom, Distt. Kottayam, Kerala-686 144. | Kerala           | Kottayam |
| Muhamma Clam Marketing Society Ltd, Vill-Thaneemukom South Taluk: Cherthala, Distt. Alapuzha, Kerala.                   | Kerala           | Alapuzha |
| The Vaikom Limeshell Co.op Society Ltd, P.O.Pallippurathussery, Vaikom - 686 606 Distt. Kottayam, Kerala.               | Kerala           | Kottayam |

**Table – 9 : Production of Limeshell, 2010-11 to 2012-13  
(By States)**

(Qty in tonnes; value in ₹'000)

| State        | 2010-11      |              | 2011-12      |              | 2012-13(P)   |              |
|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
|              | Quantity     | Value        | Quantity     | Value        | Quantity     | Value        |
| <b>India</b> | <b>30410</b> | <b>32159</b> | <b>33225</b> | <b>40788</b> | <b>23228</b> | <b>39801</b> |
| Karnataka    | 11578        | 8865         | 9689         | 7664         | -            | -            |
| Kerala       | 18467        | 23020        | 23450        | 33038        | 23123        | 39696        |
| Tamil Nadu   | 365          | 274          | 86           | 86           | 105          | 105          |

**Table – 10 : Production of Limeshell, 2011-12 and 2012-13  
(By Sectors/States/Districts)**

(Qty in tonnes; value in ₹'000)

| State/District    | 2011-12      |              |              | 2012-13(P)   |              |              |
|-------------------|--------------|--------------|--------------|--------------|--------------|--------------|
|                   | No. of mines | Quantity     | Value        | No. of mines | Quantity     | Value        |
| <b>India</b>      | <b>6</b>     | <b>33225</b> | <b>40788</b> | <b>6</b>     | <b>23228</b> | <b>39801</b> |
| Public sector     | 1            | 14975        | 14481        | 1            | 11497        | 11118        |
| Private sector    | 5            | 18250        | 26307        | 5            | 11731        | 28683        |
| <b>Karnataka</b>  | <b>2</b>     | <b>9689</b>  | <b>7664</b>  | <b>-</b>     | <b>-</b>     | <b>-</b>     |
| Uttar Kannada     | 2            | 9689         | 7664         | -            | -            | -            |
| <b>Kerala</b>     | <b>3</b>     | <b>23450</b> | <b>33038</b> | <b>5</b>     | <b>23123</b> | <b>39696</b> |
| Alapuzha          | 1            | 5057         | 9800         | 2            | 5015         | 12301        |
| Kottayam          | 2            | 18393        | 23238        | 3            | 18108        | 27395        |
| <b>Tamil Nadu</b> | <b>1</b>     | <b>86</b>    | <b>86</b>    | <b>1</b>     | <b>105</b>   | <b>105</b>   |
| Cuddalore         | 1            | 86           | 86           | 1            | 105          | 105          |

LIMESTONE AND OTHER CALCAREOUS MATERIALS

**Table – 11 : Mine-head Stocks of Limeshell, 2012-13 (P)  
(By States)**

(In tonnes)

| State        | At the beginning of the year | At the end of the year |
|--------------|------------------------------|------------------------|
| <b>India</b> | <b>5157</b>                  | <b>2524</b>            |
| Karnataka    | 5134                         | 1926                   |
| Kerala       | -                            | 584                    |
| Tamil Nadu   | 23                           | 14                     |

**Limekankar**

The production of limekankar at 2,17,918 tonnes in 2012-13 decreased by 30% during the year as compared to that in the previous year owing to less demand.

There were four reporting mines in 2012-13. Almost, the entire production of limekankar was reported from Tamil Nadu and a nominal production was reported by two mines located in Andhra Pradesh (Tables-12 to 14).

Mine-head stocks at the end of 2012-13 were 1,93,304 tonnes as against 1,84,291 tonnes at the beginning of the year (Table-15).

The average daily labour employment in 2012-13 was 22 as against 31 in the preceding year.

**Table – 12 : Producers of Limekankar  
2012-13**

| Name and address of producer                                                                                                 | Location of mine    |              |
|------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------|
|                                                                                                                              | State               | District     |
| The Ramco Cements Ltd,<br>Aurous Corporate Centre<br>5th Floor, 98-A<br>Dr. Radhakrishna Road,<br>Mylapore, Chennai-600 004. | Tamil Nadu          | Virudhunagar |
| D. Kailas Sharma,<br>DFN Colony,<br>Shreeram Nagar-535 101,<br>Garividi,<br>Distt. Vizianagaram,<br>Andhra Pradesh.          | Andhra -<br>Pradesh | Vizianagaram |

**Table - 13 : Production of Limekankar, 2010-11 to 2012-13(P)  
(By States)**

(Qty in tonnes; value in ₹'000)

| State          | 2010-11       |              | 2011-12       |              | 2012-13(P)    |              |
|----------------|---------------|--------------|---------------|--------------|---------------|--------------|
|                | Quantity      | Value        | Quantity      | Value        | Quantity      | Value        |
| <b>India</b>   | <b>383817</b> | <b>84903</b> | <b>311219</b> | <b>59469</b> | <b>217918</b> | <b>38529</b> |
| Andhra Pradesh | 615           | 215          | 830           | 355          | 275           | 138          |
| Tamil Nadu     | 383202        | 84688        | 310389        | 59114        | 217643        | 38391        |

**Table – 14 : Production of Limekankar, 2011-12 and 2012-13  
(By Sectors/States/Districts)**

(Qty in tonnes; value in ₹'000)

| State/District        | 2011-12      |               |              | 2012-13(P)   |               |              |
|-----------------------|--------------|---------------|--------------|--------------|---------------|--------------|
|                       | No. of mines | Quantity      | Value        | No. of mines | Quantity      | Value        |
| <b>India</b>          | <b>4</b>     | <b>311219</b> | <b>59469</b> | <b>4</b>     | <b>217918</b> | <b>38529</b> |
| Private sector        | 4            | 311219        | 59469        | 4            | 217918        | 38529        |
| <b>Andhra Pradesh</b> | <b>2</b>     | <b>830</b>    | <b>355</b>   | <b>2</b>     | <b>275</b>    | <b>138</b>   |
| Vizianagaram          | 2            | 830           | 355          | 2            | 275           | 138          |
| <b>Tamil Nadu</b>     | <b>2</b>     | <b>310389</b> | <b>59114</b> | <b>2</b>     | <b>217643</b> | <b>38391</b> |
| Virudhunagar          | 2            | 310389        | 59114        | 2            | 217643        | 38391        |

LIMESTONE AND OTHER CALCAREOUS MATERIALS

**Table – 15 : Mine-head Stocks of Limekankar  
2012-13(P)  
(By States)**

| State          | (In tonnes)                     |                           |
|----------------|---------------------------------|---------------------------|
|                | At the beginning<br>of the year | At the end<br>of the year |
| <b>India</b>   | <b>184291</b>                   | <b>193304</b>             |
| Andhra Pradesh | 334                             | 117                       |
| Tamil Nadu     | 183957                          | 193187                    |

### Chalk

The production of chalk at 167 thousand tonnes in 2012-13 decreased by 7% as compared to previous year.

There were 111 reporting mines of chalk in 2012-13 as against 128 mines in 2011-12. 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 2012-13 was 38 percent (Tables- 16 to 18).

Mine-head stocks of chalk at the end of 2012-13 was 71 thousand tonnes as against 79 thousand tonnes in the beginning of the year (Table -19).

The average daily employment of labour during 2012-13 was 1,261 as against 1,389 in the previous year.

**Table – 16 : Principal Producers of Chalk  
2012-13**

| Name & address of producer                                                                       | Location of mine |           |
|--------------------------------------------------------------------------------------------------|------------------|-----------|
|                                                                                                  | State            | District  |
| Porbandar Industrial Products,<br>Harish Mansion, Post Box.27,<br>Porbandar-360 575,<br>Gujarat. | Gujarat          | Porbandar |
| P. Dattani & Co.<br>M. G. Road,<br>Porbandar-360 575,<br>Gujarat.                                | Gujarat          | Porbandar |
| Saurashtra Minerals Pvt. Ltd<br>East Kadia Plots,<br>Porbandar-360 575,<br>Gujarat.              | Gujarat          | Porbandar |
| Rambhai Kanabhai Sagar,<br>At – Aditpara,<br>Adityana- 360 545,<br>Distt. Porbandar,<br>Gujarat. | Gujarat          | Porbandar |
| Jaydeep Minerals<br>Adityana-360545<br>Distt. Porbandar,<br>Gujarat.                             | Gujarat          | Porbandar |

(Contd.)

Table - 16 (Concl'd.)

| Name & address of producer                                                                            | Location of mine |           |
|-------------------------------------------------------------------------------------------------------|------------------|-----------|
|                                                                                                       | State            | District  |
| Universal Mineral Industries,<br>Barvan Ness,Ranavav-360 560,<br>Distt Porbandar,<br>Gujarat.         | Gujarat          | Porbandar |
| Rasiklal Dayalal Patel<br>Adityana-360 545,<br>Distt. Porbandar,<br>Gujarat.                          | Gujarat          | Porbandar |
| Dawoodi Pulverizing Works,<br>226, G.I.D.C. Estate,<br>Porbandar – 360 577,<br>Gujarat.               | Gujarat          | Porbandar |
| Krishna Minerals<br>Adityana - 360 545,<br>Distt. Porbandar,<br>Gujarat.                              | Gujarat          | Porbandar |
| Rajesh Minerals<br>Ranavav, Adityana-360 545,<br>Distt. Porbandar,<br>Gujarat.                        | Gujarat          | Porbandar |
| K.K.Enterprises<br>Ranavav, Adityana-360 545,<br>Distt. Porbandar,<br>Gujarat.                        | Gujarat          | Porbandar |
| Prasant Minerals<br>C/O Sanjay Kumar G.Khanpara<br>Adityana-360 545,<br>Distt. Porbandar,<br>Gujarat. | Gujarat          | Porbandar |
| Jamnadas Ratanshi Patel,<br>Ranavav, Adityana-360 545,<br>Distt. Porbandar,<br>Gujarat.               | Gujarat          | Porbandar |
| Shreenathji Minerals,<br>Adityana - 360 545,<br>Distt. Porbandar,<br>Gujarat.                         | Gujarat          | Porbandar |
| Patel Ramji Virji Faldu,<br>Adityana- 360 545<br>Distt. Porbandar,<br>Gujarat.                        | Gujarat          | Porbandar |

## LIMESTONE AND OTHER CALCAREOUS MATERIALS

**Table – 17 : Production of Chalk, 2010-11 to 2012-13  
(By States)**

(Qty in tonnes; value in ₹'000)

| State                 | 2010-11       |              | 2011-12       |              | 2012-13(P)    |              |
|-----------------------|---------------|--------------|---------------|--------------|---------------|--------------|
|                       | Quantity      | Value        | Quantity      | Value        | Quantity      | Value        |
| <b>India/ Gujarat</b> | <b>177197</b> | <b>65799</b> | <b>178736</b> | <b>70458</b> | <b>166931</b> | <b>74562</b> |

**Table – 18 : Production of Chalk, 2011-12& 2012-13  
(By Sector/State/Districts)**

(Qty in tonnes; value in ₹'000)

| State/District               | 2011-12      |               |              | 2012-13(P)   |               |              |
|------------------------------|--------------|---------------|--------------|--------------|---------------|--------------|
|                              | No. of mines | Quantity      | Value        | No. of mines | Quantity      | Value        |
| <b>India/ Private sector</b> | <b>128</b>   | <b>178736</b> | <b>70458</b> | <b>111</b>   | <b>166931</b> | <b>74562</b> |
| <b>Gujarat</b>               | <b>128</b>   | <b>178736</b> | <b>70458</b> | <b>111</b>   | <b>166931</b> | <b>74562</b> |
| Jamnagar                     | 10           | 12767         | 4663         | 8            | 8870          | 3300         |
| Junagadh                     | 3            | 5069          | 1669         | 3            | 8210          | 4189         |
| Porbandar                    | 94           | 142092        | 57419        | 83           | 134737        | 60958        |
| Rajkot                       | 21           | 18808         | 6707         | 17           | 15114         | 6115         |

**Table – 19 : Mine-head Stocks of Chalk, 2012-13(P)  
(By States)**

(In tonnes)

| State                  | At the beginning of the year | At the end of the year |
|------------------------|------------------------------|------------------------|
| <b>India / Gujarat</b> | <b>78916</b>                 | <b>70653</b>           |

## LIMESTONE AND OTHER CALCAREOUS MATERIALS

### Marl

Production of marl during 2012-13 was 4.36 million tonnes as compared to 4.14 million tonnes in the preceding year. The entire production of marl was reported as associated mineral with limestone in both the years. There were 7 associated mines reporting production of Marl during 2012-13 as against 12 associated mines in the preceding year.

The entire production was reported by private sector mines.

As regards to state-wise production, Gujarat contributed 98% production and the remaining 2% was by Tamil Nadu (Tables - 20 to 22).

Mine-head stock at the end of 2012-13 was 1009 thousand tonnes as against 402 thousand tonnes at the beginning of the year (Table - 23).

**Table – 20 : Principal Producers of Marl, 2012-13**

| Name and address of producer                                                                                             | Location of mine |           |
|--------------------------------------------------------------------------------------------------------------------------|------------------|-----------|
|                                                                                                                          | State            | District  |
| *Ultratech Cement Ltd,<br>Second Floor,B-Wing,<br>Ahura Center, Mahakali Caves Road,<br>Andheri (E),<br>Mumbai- 400 093. | Gujarat          | Amreli    |
| * Ambuja Cement Limited,<br>P.O.- Ambujanagar ,<br>Tah.- Kodinar,<br>Distt.- Junagadh- 362 715,<br>Gujarat.              | Gujarat          | Junagadh  |
| *Gujarat Sidhee Cement Ltd,<br>N.K.Mehta International<br>House,178-Backbay<br>Reclamation,<br>Mumbai-400 020.           | Gujarat          | Junagadh  |
| *Saurashtra Cement Ltd,<br>Ranavav-2,<br>53,Jupitor Apartment,<br>Cuffe Parade,<br>Mumbai-400 005.                       | Gujarat          | Porbandar |

\* Producing as an associated mineral with limestone.

**Table – 21 : Production of Marl, 2010-11 to 2012-13(P)  
(By States)**

(Qty in tonnes, value in ₹'000)

| State        | 2010-11        |               | 2011-12        |               | 2012-13(P)     |               |
|--------------|----------------|---------------|----------------|---------------|----------------|---------------|
|              | Quantity       | Value         | Quantity       | Value         | Quantity       | Value         |
| <b>India</b> | <b>4399379</b> | <b>307556</b> | <b>4140577</b> | <b>272904</b> | <b>4360302</b> | <b>266915</b> |
| Gujarat      | 3738693        | 224314        | 3901296        | 245294        | 4262682        | 249339        |
| Tamil Nadu   | 660686         | 83242         | 239281         | 27610         | 97620          | 17576         |

# LIMESTONE AND OTHER CALCAREOUS MATERIALS

**Table – 22 : Production of Marl, 2011-12 and 2012-13(P)**  
(By Sector/States/Districts)

(Qty in tonnes; Value in ₹'000 )

| State/District    | 2011-12      |                |               | 2012-13(P)   |                |               |
|-------------------|--------------|----------------|---------------|--------------|----------------|---------------|
|                   | No. of mines | Quantity       | Value         | No. of mines | Quantity       | Value         |
| <b>India</b>      | <b>(12)</b>  | <b>4140577</b> | <b>272904</b> | <b>(7)</b>   | <b>4360302</b> | <b>266915</b> |
| Private sector    | (12)         | 4140577        | 272904        | (7)          | 4360302        | 266915        |
| <b>Gujarat</b>    | <b>(6)</b>   | <b>3901296</b> | <b>245294</b> | <b>(6)</b>   | <b>4262682</b> | <b>249339</b> |
| Amreli            | (2)          | 2107391        | 164850        | (2)          | 2039302        | 168256        |
| Junagadh          | (3)          | 1326226        | 72049         | (3)          | 1116343        | 61247         |
| Porbandar         | (1)          | 467679         | 8395          | (1)          | 1107037        | 19836         |
| <b>Tamil Nadu</b> | <b>(6)</b>   | <b>239281</b>  | <b>27610</b>  | <b>(1)</b>   | <b>97620</b>   | <b>17576</b>  |
| Ariyalur          | (3)          | 129717         | 19494         | (1)          | 97620          | 17576         |
| Perambalur        | (1)          | 25864          | 3688          | -            | -              | -             |
| Tiruchirapalli    | (2)          | 83700          | 4428          | -            | -              | -             |

Figures in parentheses indicate associated mines with limestone.

**Table – 23 : Mine-head Stocks of Marl, 2012-13(P)**  
(By States)

(In tonnes)

| State        | At the beginning of the year | At the end of the year |
|--------------|------------------------------|------------------------|
| <b>India</b> | <b>401511</b>                | <b>1009203</b>         |
| Gujarat      | 170007                       | 790001                 |
| Tamil Nadu   | 231504                       | 219202                 |

## 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 and aerial ropeways. 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 opencast and are worked by semi-mechanised and manual 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. M/s Lafarge India Ltd, Raipur, Chhattisgarh is one of the principal producers of cement grade limestone.

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 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 in Jammu & Kashmir is suitable for cement manufacturing. Limestone bands in Anantnag district having low, below magnesia content 1.70 percent.

In Karnataka, limestone is supplied generally to paper mills and cement plants. However, limestone of Gulbarga 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), SiO<sub>2</sub> - 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.

## LIMESTONE AND OTHER CALCAREOUS MATERIALS

Lime is prepared by heating limestone in kilns up to 1000°C. The CO<sub>2</sub> 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)<sub>2</sub> 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<sub>2</sub>O<sub>5</sub> 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<sub>2</sub>O<sub>3</sub> 1 to 2%, Fe<sub>2</sub>O<sub>3</sub> 1 to 2%, SiO<sub>2</sub> 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/<br>Other<br>Constituents               | Acceptable range for<br>manufacture of<br>Ordinary Portland<br>Cement (33, 43 & 53<br>Grade)<br>(percent) | Limiting values<br>taking into con-<br>sideration other<br>types of cements,<br>scope of<br>beneficiation<br>and blending<br>(percent) |
|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| CaO                                                     | 44-52                                                                                                     | 40(min)                                                                                                                                |
| MgO                                                     | 3.5(max.)                                                                                                 | 5.0(max)                                                                                                                               |
| SiO <sub>2</sub>                                        | To satisfy LSF, silica                                                                                    | –                                                                                                                                      |
| Al <sub>2</sub> O <sub>3</sub>                          | Modules and alumina                                                                                       | –                                                                                                                                      |
| Fe <sub>2</sub> O <sub>3</sub>                          | Modules                                                                                                   | –                                                                                                                                      |
| TiO <sub>2</sub>                                        | <0.5                                                                                                      | <1.0                                                                                                                                   |
| Mn <sub>2</sub> O <sub>3</sub>                          | <0.5                                                                                                      | <1.0                                                                                                                                   |
| R <sub>2</sub> O (Na <sub>2</sub> O + K <sub>2</sub> O) | <0.6                                                                                                      | <1.0                                                                                                                                   |
| Total S as SO <sub>3</sub>                              | <0.6                                                                                                      | <0.8                                                                                                                                   |
| P <sub>2</sub> O <sub>5</sub>                           | <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<sub>3</sub>) content in limestone should not be usually less than 90 percent. The combined SiO<sub>2</sub> and Al<sub>2</sub>O<sub>3</sub> should not exceed 6% though up to 11.5% is allowed; MgO should be within 4% and sulphur and phosphorus as low as possible.

In Steel Melting Shop (SMS), insolubles in limestone should not exceed 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%  $\text{CaCO}_3$ ) and 97.5% of combined  $\text{CaCO}_3$  and  $\text{MgCO}_3$ . Iron and other colouring matters are regarded as objectionable and  $\text{Fe}_2\text{O}_3$  should be up to 0.20% (max). For colourless glass, limestone should contain 98.5%  $\text{CaCO}_3$  (min), iron content as  $\text{Fe}_2\text{O}_3$  should not be more than 0.04%; and for bottle glass,  $\text{Fe}_2\text{O}_3$  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 $\text{SiO}_2$                  | 2.5%   |
| Total iron ( $\text{Fe}_2\text{O}_3$ )    |        |
| 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<br>(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%  $\text{SiO}_2$ , not more than 0.95% phosphorus and other impurities not exceeding 2%. For the manufacture of bleaching powder also, 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  $\text{SiO}_2$

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),  $\text{SiO}_2$  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                                                                       | 46.0                               | 46.0         | 46.0            | 44.0  |
| SiO <sub>2</sub> (max)                                                                 | 0.75                               | –            | 1.0             | 2.0   |
| Fe <sub>2</sub> O <sub>3</sub> (max)                                                   | 0.15                               | –            | 0.25            | –     |
| CaO (min)                                                                              | 54.00                              | 53.0         | 54.0            | 50.0  |
| MgO (max)                                                                              | 2.00                               | 1.0          | 0.8             | 1.0   |
| Mn <sub>2</sub> O <sub>3</sub> (min)                                                   | 0.06                               | –            | –               | –     |
| CO <sub>2</sub> (min)                                                                  | 42.00                              | 42.00        | 42.00           | 41.00 |
| S (max)                                                                                | –                                  | –            | 0.1             | –     |
| P (max)                                                                                | –                                  | –            | 0.01            | –     |
| Al <sub>2</sub> O <sub>3</sub> +Fe <sub>2</sub> O <sub>3</sub> (max)                   | –                                  | –            | 0.50            | 1.5   |
| SiO <sub>2</sub> +Al <sub>2</sub> O <sub>3</sub> +Fe <sub>2</sub> O <sub>3</sub> (max) | –                                  | 3.0          | –               | –     |

## INDUSTRY & CONSUMPTION

India was the second largest cement producing country in the world after China. There were 178 large cement plants having an installed capacity of 318.94 million tonnes in 2012-13 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 2012-13 was thus about 324.94 million tpy against 306.21 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 235.11 million tonnes in 2012-13 compared to 230.25 million tonnes in the preceding year.

In 2012-13, the total consumption of limestone & other calcareous minerals/ materials, as reported by different industries was 324.94 million tonnes. Cement was the major consuming industry accounting for 94% consumption, followed by iron & steel (4%) and chemical (1%). The remaining consumption was reported by sugar, paper, fertilizer, glass, metallurgy, foundry, etc. Consumption of limestone and other calcareous materials from 2010-11 to 2012-13 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, 2010-11 to 2012-13  
(By Industries)**

(In tonnes)

| Industry              | 2010-11          | 2011-12(R)       | 2012-13(P)       |
|-----------------------|------------------|------------------|------------------|
| <b>All Industries</b> | <b>191960000</b> | <b>226568100</b> | <b>228895000</b> |
| Aluminium             | 225200(4)        | 207300(4)        | 207300(4)        |
| Alloy steel           | 84500(9)         | 61600(7)         | 61600(7)         |
| Cement                | 179935400(110)   | 211081400(117)   | 212624100(117)   |
| Chemical              | 1508900(22)      | 3002900(23)      | 3002900(23)      |
| Fertilizer            | 149200(5)        | 149900(5)        | 149400(5)        |
| Ferro-alloys          | 8200(19)         | 11300(20)        | 11300(20)        |
| Foundry               | 24800(27)        | 29200(26)        | 29200(26)        |
| Glass                 | 95700(27)        | 136200(29)       | 103400(29)       |
| Iron & Steel          | 7251000(25)      | 9326900(35)      | 10062800(35)     |
| Metallurgy            | 41400(2)         | 41400(2)         | 41400(2)         |
| Paper                 | 124600(16)       | 121600(16)       | 121900(16)       |
| Sugar                 | 671500(10)       | 1116700(10)      | 1198000(10)      |
| Others**              | 1839600(36)      | 1281700(44)      | 1281700(44)      |

Figures rounded off.

Figures in parentheses denote the number of units in organised sector reporting\* consumption.

(\* includes reported companies and/or estimates, whenever required).

\*\* 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,  
2010-11 to 2012-13  
(By Industries)**

(In tonnes)

| Industry                                     | 2010-11         | 2011-12(R)      | 2012-13(P)      |
|----------------------------------------------|-----------------|-----------------|-----------------|
| <b>All Industries (A+B+C+D)</b>              | <b>25248200</b> | <b>28805500</b> | <b>30419200</b> |
| (A) Cement                      {(i) + (ii)} | 25225300(107)   | 28782700(145)   | 30396300(145)   |
| (i) Other Calcareous Material                | 22363100(96)    | 26414700(134)   | 27911500(134)   |
| B F Slag                                     | 6063000(45)     | 5672800(42)     | 5970400(42)     |
| Fly ash/blue dust                            | 16041600(41)    | 20485600 (83)   | 21683100 (83)   |
| CaCO <sub>3</sub> sludge / Lime sludge       | 258500 (10)     | 256300(9)       | 258000(9)       |
| (ii) Other Calcareous Minerals               | 2862200(11)     | 2368000(11)     | 2484800(11)     |
| Limeshell                                    | 13300(1)        | 13300(1)        | 13300(1)        |
| Calcareous sea sand                          | ++(1)           | ++(1)           | ++(1)           |
| Marble                                       | 644900 (3)      | 654400 (3)      | 642400 (3)      |
| Marl                                         | 2204000(6)      | 1700300(6)      | 1829100(6)      |
| (B) Paper/Limeshell                          | 13400 (1)       | 13400 (1)       | 13400 (1)       |
| (C) Glass/ B F Slag                          | 9500 (3)        | 9100 (3)        | 9100 (3)        |
| (D) Fertilizer/Limeshell                     | ++(1)           | 300(1)          | 400(1)          |

Figures rounded off.

Figures in parentheses denote the number of units in organised sector reporting\* consumption.

(\* includes reported companies and/or estimates, whenever required).

LIMESTONE AND OTHER CALCAREOUS MATERIALS

**Table – 26 (C) : Consumption of Limestone & Other Calcareous Minerals/Materials,  
2010-11 to 2012-13  
(By Industries)**

(In tonnes)

| Industry              | 2010-11          | 2011-12(R)       | 2012-13(P)       |
|-----------------------|------------------|------------------|------------------|
| <b>All Industries</b> | <b>246623200</b> | <b>255373200</b> | <b>259313700</b> |
| Aluminium             | 213600(4)        | 207300(4)        | 207300(4)        |
| Alloy steel           | 84500(9)         | 61600(7)         | 61600(7)         |
| Cement                | 231829000(123)   | 239864100(123)   | 243020400(123)   |
| Chemical              | 2906500(23)      | 3002900(23)      | 3002900(23)      |
| Fertilizer            | 149800(5)        | 149900(5)        | 149400(5)        |
| Ferro-alloys          | 8600(20)         | 11300(20)        | 11300(20)        |
| Foundry               | 24800(27)        | 29200(26)        | 29200(26)        |
| Glass                 | 112300(28)       | 136200(29)       | 103400(29)       |
| Iron & Steel          | 8451400(28)      | 9326900(35)      | 10062800(35)     |
| Metallurgy            | 41300(2)         | 41300(2)         | 41300(2)         |
| Paper                 | 138000(17)       | 135000(17)       | 135300(17)       |
| Sugar                 | 815200(10)       | 1116700(10)      | 1198000(10)      |
| Others**              | 1848200(43)      | 1290800(47)      | 1290800(47)      |

Figures rounded off.

Figures in parentheses denote the number of units in organised sector reporting\* consumption.

(\* includes reported companies and/or estimates, whenever required).

\*\* 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, 2010-11 to 2012-13  
(By Principal Plants)**

(In tonnes)

| Plant                           | 2010-11 | 2011-12 (R) | 2012-13 (P) |
|---------------------------------|---------|-------------|-------------|
| Bhilai Steel Plant              | 1189162 | NA          | NA          |
| Bokaro Steel Plant              | 825376  | 502281      | 561325      |
| Durgapur Steel Plant            | 56000   | 553828      | 576075      |
| IISCO Steel Plant               | 36000   | 33019       | 11047       |
| Rourkela Steel Plant            | 473784  | 515557      | NA          |
| Visvesvaraya Iron & Steel Plant | 31608   | 44439       | NA          |
| Visakhapatnam Steel Plant       | 966730  | 967000      | 968000      |
| JSW Steel Ltd                   | 76242*  | 66479*      | 47108*      |
| Tata Steel Ltd                  | 1386375 | NA          | 2706219     |
| IDCOL, Kalinga Iron Works Ltd   | 2807    | 2807        | 8551        |
| Tata Metallica                  | 38431   | 40608       | 24949       |
| Kirloskar Ferrous Industry Ltd  | 42046   | 41305       | 43073       |
| KIOCL Ltd                       | 65460   | 57857       | 41059       |
| VISA Steel Plant                | 4439    | NA          | NA          |
| Neelachal Ispat Nigam Ltd       | 79737   | 74060       | NA          |
| Jayaswal Neco Industries Ltd    | 69651   | 80569       | 103974      |
| Sunflag Iron & Steel Co.Ltd     | 25667   | 12696       | NA          |

\* Salem Plant

## FOREIGN TRADE

### Exports

As per the foreign trade policy 2009-14 the export of limestone, lime kankar, lime shell and chalk are free. Exports of limestone increased drastically four times to 10.80 million tonnes in 2012-13 from 2.69 million tonnes in the previous year. Limestone in bulk was exported mainly to neighbouring countries, viz, Bangladesh (99%) Nepal, UK, Belgium and Bhutan nominally & other countries. During the same period, exports of chalk decreased marginally to 679 tonnes from 759 tonnes in the previous year. Chalk was exported mainly to Nepal (43%) & Bangladesh (32%).

Exports of bleaching powder were 11,137 tonnes in 2012-13 as compared to 10,515 tonnes in the previous year. Bleaching powder was exported mainly to Bangladesh (24%), Algeria (21%), Sri Lanka (8%), UAE (6%), Iran & Peru (4% each) besides other countries.

In 2012-13, about 1,758 tonnes of calcium carbide was exported as against 1266 tonnes in the previous year mainly to UAE (28%) and Bangladesh (24%) (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 drastically to 10.62 million tonnes in 2012-13 from 8.56 million tonnes in the previous year. Imports of chalk in 2012-13 were 6,003 tonnes as against 1,884 tonnes in the previous year. Limestone was imported mainly from UAE (69%) and Oman (19%), while chalk was imported mainly from Vietnam Soc. Rep. (96%) & Malaysia (2%) besides other countries.

Imports of calcium carbide increased slightly to 57,864 tonnes in 2012-13 from 56,500 tonnes in the previous year. Calcium carbide was imported mainly from China (59%) and Bhutan (32%). In 2012-13, imports of bleaching powder decreased drastically to 11 tonnes only as against 108 tonnes in the previous year (Tables - 31 to 34).

**Table – 27 : Exports of Limestone  
(By Countries)**

| Country              | 2011-12        |                  | 2012-13         |                  |
|----------------------|----------------|------------------|-----------------|------------------|
|                      | Qty<br>(t)     | Value<br>(₹'000) | Qty<br>(t)      | Value<br>(₹'000) |
| <b>All Countries</b> | <b>2691026</b> | <b>2537858</b>   | <b>10798168</b> | <b>2693494</b>   |
| Bangladesh           | 2450813        | 1894744          | 10647230        | 2055947          |
| UK                   | 19593          | 149009           | 20365           | 163627           |
| Bhutan               | 15128          | 64108            | 23998           | 85407            |
| Ireland              | 3465           | 16759            | 59893           | 74870            |
| Nepal                | 123840         | 77714            | 10287           | 43545            |
| Belgium              | 11615          | 77224            | 5045            | 36456            |
| Netherlands          | 4253           | 33319            | 3213            | 26262            |
| USA                  | 2568           | 27240            | 2329            | 24532            |
| Sudan                | 1779           | 35574            | 1522            | 22225            |
| Italy                | 2400           | 22526            | 2375            | 21691            |
| Other countries      | 55572          | 139641           | 21911           | 138932           |

**Table – 28 : Exports of Chalk  
(By Countries)**

| Country              | 2011-12    |                  | 2012-13    |                  |
|----------------------|------------|------------------|------------|------------------|
|                      | Qty<br>(t) | Value<br>(₹'000) | Qty<br>(t) | Value<br>(₹'000) |
| <b>All Countries</b> | <b>759</b> | <b>3432</b>      | <b>679</b> | <b>4199</b>      |
| Nepal                | 626        | 2854             | 295        | 1746             |
| Bangladesh           | -          | -                | 217        | 962              |
| Malaysia             | 22         | 93               | 28         | 453              |
| Uganda               | -          | -                | 24         | 322              |
| Egypt                | 9          | 75               | 15         | 151              |
| Ethiopia             | 24         | 123              | 35         | 99               |
| UAE                  | 6          | 13               | 3          | 86               |
| Oman                 | 2          | 40               | ++         | 61               |
| Canada               | -          | -                | ++         | 57               |
| Georgia              | -          | -                | 7          | 51               |
| Other countries      | 70         | 234              | 55         | 211              |

## LIMESTONE AND OTHER CALCAREOUS MATERIALS

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

| Country                    | 2011-12      |                  | 2012-13      |                  |
|----------------------------|--------------|------------------|--------------|------------------|
|                            | Qty<br>(t)   | Value<br>(₹'000) | Qty<br>(t)   | Value<br>(₹'000) |
| <b>All Countries</b>       | <b>10515</b> | <b>541756</b>    | <b>11137</b> | <b>555441</b>    |
| Algeria                    | 942          | 47699            | 2330         | 137043           |
| Bangladesh                 | 621          | 13165            | 2650         | 53792            |
| UAE                        | 227          | 13250            | 664          | 47557            |
| Ivory Coast/Cote-D' Ivoire | 674          | 47882            | 377          | 33376            |
| Iran                       | 267          | 13965            | 411          | 31303            |
| Peru                       | 323          | 19825            | 406          | 29859            |
| Sri Lanka                  | 969          | 22948            | 836          | 29303            |
| South Africa               | 334          | 17240            | 304          | 18446            |
| Madagascar                 | 315          | 17360            | 237          | 17424            |
| Dominican Rep.             | 332          | 22939            | 196          | 15148            |
| Other countries            | 5511         | 305483           | 2726         | 142190           |

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

| Country              | 2011-12     |                  | 2012-13     |                  |
|----------------------|-------------|------------------|-------------|------------------|
|                      | Qty<br>(t)  | Value<br>(₹'000) | Qty<br>(t)  | Value<br>(₹'000) |
| <b>All Countries</b> | <b>1266</b> | <b>59224</b>     | <b>1758</b> | <b>85334</b>     |
| UAE                  | 722         | 31559            | 494         | 25678            |
| Bangladesh           | 25          | 1475             | 430         | 12918            |
| Oman                 | 51          | 2771             | 261         | 12843            |
| Saudi Arabia         | 146         | 6897             | 204         | 9905             |
| Kuwait               | -           | -                | 196         | 9424             |
| Bhutan               | -           | -                | 23          | 7563             |
| Bahrain              | 39          | 1837             | 100         | 4636             |
| Tanzania Rep.        | -           | -                | 24          | 1175             |
| Jordan               | -           | -                | 24          | 1116             |
| Kenya                | -           | -                | 1           | 64               |
| Other countries      | 283         | 14685            | 1           | 12               |

## LIMESTONE AND OTHER CALCAREOUS MATERIALS

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

| Country              | 2011-12        |                  | 2012-13         |                  |
|----------------------|----------------|------------------|-----------------|------------------|
|                      | Qty<br>(t)     | Value<br>(₹'000) | Qty<br>(t)      | Value<br>(₹'000) |
| <b>All Countries</b> | <b>8557181</b> | <b>11890531</b>  | <b>10615650</b> | <b>15966289</b>  |
| UAE                  | 5470751        | 6698764          | 7296759         | 9333333          |
| Oman                 | 1663032        | 1855431          | 2014116         | 2574993          |
| Malaysia             | 260059         | 850742           | 347825          | 1337542          |
| Vietnam, Soc. Rep.   | 96424          | 490660           | 174810          | 1001570          |
| Thailand             | 222755         | 501857           | 321904          | 724514           |
| Philippines          | 126912         | 151757           | 149000          | 225726           |
| China                | 192178         | 363923           | 36872           | 149292           |
| Egypt                | 47649          | 173838           | 26415           | 100957           |
| Australia            | 112804         | 146078           | 69201           | 86510            |
| Indonesia            | 8489           | 24685            | 36593           | 44245            |
| Other countries      | 356128         | 632796           | 142155          | 387607           |

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

| Country              | 2011-12     |                  | 2012-13     |                  |
|----------------------|-------------|------------------|-------------|------------------|
|                      | Qty<br>(t)  | Value<br>(₹'000) | Qty<br>(t)  | Value<br>(₹'000) |
| <b>All Countries</b> | <b>1884</b> | <b>15919</b>     | <b>6003</b> | <b>36136</b>     |
| Vietnam,Soc. Rep.    | -           | -                | 5753        | 31494            |
| France               | 146         | 2615             | 73          | 1905             |
| Malaysia             | 1200        | 6930             | 102         | 724              |
| Korea,Rep.of         | 68          | 2448             | 20          | 486              |
| China                | 300         | 2469             | 21          | 470              |
| Japan                | 12          | 262              | 17          | 419              |
| Italy                | 4           | 259              | 5           | 359              |
| Germany              | 114         | 601              | 4           | 106              |
| UK                   | 2           | 97               | 1           | 91               |
| Belgium              | -           | -                | 3           | 36               |
| Other countries      | 38          | 238              | 4           | 46               |

LIMESTONE AND OTHER CALCAREOUS MATERIALS

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

| Country               | 2011-12      |                  | 2012-13      |                  |
|-----------------------|--------------|------------------|--------------|------------------|
|                       | Qty<br>(t)   | Value<br>(₹'000) | Qty<br>(t)   | Value<br>(₹'000) |
| <b>All Countries</b>  | <b>56500</b> | <b>2150700</b>   | <b>57864</b> | <b>2473443</b>   |
| China                 | 31975        | 1165076          | 34096        | 1318698          |
| Bhutan                | 20467        | 839473           | 18388        | 931146           |
| South Africa          | 813          | 28886            | 3108         | 139460           |
| Korea, Rep.of         | 423          | 15929            | 393          | 15046            |
| USA                   | 314          | 11585            | 380          | 14858            |
| Germany               | 267          | 9491             | 270          | 10504            |
| Chinese Taipei/Taiwan | 44           | 1430             | 220          | 8181             |
| Cameroon              | 202          | 8007             | 180          | 7100             |
| Saudi Arabia          | 88           | 2822             | 178          | 6090             |
| Japan                 | 314          | 11167            | 112          | 4082             |
| Other countries       | 1593         | 56834            | 539          | 18278            |

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

| Country              | 2011-12    |                  | 2012-13    |                  |
|----------------------|------------|------------------|------------|------------------|
|                      | Qty<br>(t) | Value<br>(₹'000) | Qty<br>(t) | Value<br>(₹'000) |
| <b>All Countries</b> | <b>108</b> | <b>4450</b>      | <b>11</b>  | <b>185</b>       |
| Bangladesh           | -          | -                | 11         | 141              |
| Germany              | -          | -                | ++         | 44               |
| Other countries      | 108        | 4450             | -          | -                |

## FUTURE OUTLOOK

India has huge resources of limestone distributed over different parts of the country. India 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 12<sup>th</sup> 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.