

DOLOMITE



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## **MINOR MINERALS 30.6 DOLOMITE**

**(ADVANCE RELEASE)**

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

Indira Bhavan, Civil Lines,  
NAGPUR – 440 001

PHONE/FAX NO. (0712) 2565471  
PBX : (0712) 2562649, 2560544, 2560648  
E-MAIL : [cme@ibm.gov.in](mailto:cme@ibm.gov.in)  
Website: [www.ibm.gov.in](http://www.ibm.gov.in)

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## 30-6 Dolomite

Dolomite ( $\text{CaCO}_3 \cdot \text{MgCO}_3$ ) theoretically contains  $\text{CaCO}_3$  (54.35%) and  $\text{MgCO}_3$  (45.65%) or  $\text{CaO}$  (30.4%),  $\text{MgO}$  (21.9%) and  $\text{CO}_2$  (47.7%). However, in nature, dolomite is not available in this exact proportion. Hence, in commercial parlance, the rock containing 40–45%  $\text{MgCO}_3$  is usually called dolomite. Dolomite rock that contains either calcite or a mixture of calcite & magnesite in addition to dolomite is called "Dolomitic Limestone". It is grouped under flux & construction minerals and is important for Iron & Steel and Ferroalloys industries. Dolomite occurrences are widespread in almost all parts of the country.

Removal of overburden is imperative in a mining activity, which leads to cutting of trees and deforestation. The statute provides directives for reclamation of the mined out areas and plantation of trees to regain the aesthetics of the degraded land. A study in this regard was undertaken to get an idea of afforestation efforts and success rate.

Mineral dolomite is found in almost all States and it is mostly mined by opencast method of mining.

### RESERVES/RESOURCES

Dolomite occurrences are widespread in the country. As per NMI data, based on UNFC system, as on 1.4.2015, the total reserves/resources of dolomite has been placed at 8,415 million tonnes, out of which 677.8 million tonnes are placed under Reserves category and the balance 7,737 million tonnes under Remaining Resources category. Gradewise, BF/sintering grade alone accounted for 24% resources followed by S.M.S. (OH), S.M.S. (L.D.) & S.M.S. (O.H. & L.D. Mixed) (25%); refractory (8%), B.F. & S.M.S. mixed (5%); and glass (3%). Others, Unclassified, Not-known, B.F., S.M.S. & refractory grades together accounted for the remaining 35% resources. Major share of about 88% resources is found distributed in eight States, namely, Madhya Pradesh (27%), Andhra Pradesh (15%),

Chhattisgarh (11%), Odisha (10%), Karnataka & Rajasthan (7% each), Gujarat (6%) and Maharashtra (5%). The remaining 12% resources are distributed in Arunachal Pradesh, Jharkhand, Haryana, Sikkim, Tamil Nadu, Telangana, Uttarakhand, Uttar Pradesh and West Bengal. Gradewise and Statewise reserves/resources of dolomite are furnished in Table-1.

### EXPLORATION & DEVELOPMENT

The exploration & development details, if any, are covered in the Review on "Exploration & Development" under "General Reviews".

### PRODUCTION

As per Govt of India Notification S.O. 423(E), dated 10<sup>th</sup> February 2015, 'dolomite' has been declared as 'Minor Mineral', hence the producers report the production data directly to the respective States and not to IBM. However, efforts were made to collect this information through correspondence with the State Directorates of Mining and Geology of individual States or by visiting their websites. But data of only a few States could be collected. All possible information/data that could be gathered has been presented in this Review.

Statewise production of dolomite during 2019-20 to 2021-22 is furnished in Table-2.

**Table- 2 : Statewise Production of Dolomite**

| State          | Year      |           |           |
|----------------|-----------|-----------|-----------|
|                | 2019-20   | 2020-21   | 2021-22   |
| Andhra Pradesh | 2039342   | 2128467   | -         |
| Odisha         | 1247345.8 | 1621046.4 | 1554158.5 |
| Telangana      | 518052    | -         | -         |
| Maharashtra    | 465667    | -         | -         |
| Rajasthan      | 177000    | 117875    | 192864.77 |
| Karnataka      | 913373    | 923669    | -         |

*Source: As received from State DGMs and their websites*

*Note : " - " NA*

DOLOMITE

**Table – 1 : Reserves/Resources of Dolomite as on 1.4.2015  
(By Grades/States)**

| Grades/States            | Reserves         |               |               |               |                       |                 |               |                    |                     |                    | Remaining Resources      |                |                |  |  | 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        |                    |                     |                    |                          |                |                |  |  |                    |
| <b>All India : Total</b> | <b>431750</b>    | <b>107364</b> | <b>138770</b> | <b>677884</b> | <b>372515</b>         | <b>323183</b>   | <b>537932</b> | <b>307103</b>      | <b>757005</b>       | <b>5215075</b>     | <b>224194</b>            | <b>7737007</b> | <b>8414891</b> |  |  |                    |
| <b>By Grades</b>         |                  |               |               |               |                       |                 |               |                    |                     |                    |                          |                |                |  |  |                    |
| B.F./Sintering           | 114238           | 7657          | 55233         | 177128        | 82335                 | 77121           | 139875        | 185566             | 412641              | 863924             | 34946                    | 1796407        | 1979535        |  |  |                    |
| S.M.S.(O.H.)             | 64004            | 26454         | 13147         | 103605        | 87822                 | 27618           | 36350         | 32509              | 123316              | 863484             | 76707                    | 1247806        | 1351411        |  |  |                    |
| S.M.S.(L.D.)             | 39244            | 4317          | 12740         | 56300         | 27207                 | 9680            | 159913        | 8697               | 5464                | 136145             | 80                       | 347186         | 403487         |  |  |                    |
| S.M.S.(O.H.& L.D mixed)  | 50417            | 328           | 2539          | 53284         | 7142                  | 44258           | 9977          | 30718              | 4000                | 184470             | 969                      | 281534         | 334818         |  |  |                    |
| B.F. & S.M.S. mixed      | 43316            | 670           | 10031         | 54017         | 32665                 | 14474           | 2811          | 18140              | 35000               | 226370             | -                        | 329461         | 383478         |  |  |                    |
| Refractory               | 8305             | 6457          | 4097          | 18859         | 34984                 | 68817           | 51803         | -                  | 271                 | 515375             | 2994                     | 674244         | 693103         |  |  |                    |
| B.F., S.M.S.& Refractory | -                | -             | -             | -             | -                     | 1797            | 1258          | -                  | -                   | 5387               | -                        | 8441           | 8441           |  |  |                    |
| Glass                    | 285              | 25792         | 369           | 26446         | 4392                  | 22136           | 44773         | 2093               | 1297                | 127978             | -                        | 202668         | 229114         |  |  |                    |
| Others                   | 70539            | 17960         | 16122         | 104622        | 68632                 | 33909           | 41387         | 28073              | 47783               | 124737             | 4969                     | 349490         | 454112         |  |  |                    |
| Unclassified             | 40599            | 17609         | 23720         | 81928         | 21639                 | 21593           | 25698         | 1099               | 58954               | 591618             | 7674                     | 728276         | 810203         |  |  |                    |
| Not-known                | 803              | 122           | 770           | 1695          | 5697                  | 1780            | 24087         | 207                | 68279               | 1575587            | 95856                    | 1771493        | 1773188        |  |  |                    |
| <b>By States</b>         |                  |               |               |               |                       |                 |               |                    |                     |                    |                          |                |                |  |  |                    |
| Andhra Pradesh           | 86134            | 11371         | 17539         | 115045        | 176477                | 31908           | 38234         | 22373              | 77                  | 910217             | 4301                     | 1183677        | 1298722        |  |  |                    |
| Arunachal Pradesh        | -                | -             | -             | -             | -                     | -               | -             | -                  | 204                 | 77633              | -                        | 77837          | 77837          |  |  |                    |
| Chhattisgarh             | 34465            | 48130         | 11623         | 94218         | 29294                 | 80865           | 24512         | 150795             | 24412               | 511610             | 1950                     | 823439         | 917657         |  |  |                    |
| Gujarat                  | 34862            | 15934         | 20829         | 71625         | 11947                 | 27064           | 68785         | 20263              | 63780               | 280592             | -                        | 472431         | 544056         |  |  |                    |
| Haryana                  | -                | -             | -             | -             | 1692                  | 6037            | 3722          | -                  | -                   | 16183              | -                        | 27633          | 27633          |  |  |                    |
| Jharkhand                | 4510             | -             | 6720          | 11230         | 10620                 | 350             | 860           | -                  | -                   | 1857               | -                        | 13686          | 24916          |  |  |                    |
| Karnataka                | 28609            | 5910          | 6093          | 40612         | 16264                 | 6684            | 9202          | 8519               | 76244               | 455337             | 13482                    | 585731         | 626344         |  |  |                    |
| Madhya Pradesh           | 23765            | 10078         | 18714         | 52557         | 33798                 | 94599           | 102857        | 33030              | 295222              | 1584534            | 114799                   | 2258839        | 2311395        |  |  |                    |
| Maharashtra              | 8301             | 4346          | 7768          | 20416         | 13986                 | 16036           | 7371          | -                  | 18050               | 339141             | 2994                     | 397578         | 417994         |  |  |                    |
| Odisha                   | 109551           | 6421          | 34839         | 150811        | 42521                 | 33896           | 110904        | 48535              | 46683               | 330660             | 85884                    | 699082         | 849892         |  |  |                    |
| Rajasthan                | 57910            | 4579          | 13994         | 76483         | 20483                 | 10807           | 121082        | 16132              | 25480               | 327838             | 784                      | 522607         | 599089         |  |  |                    |
| Sikkim                   | -                | -             | -             | -             | -                     | -               | -             | -                  | -                   | 2756               | -                        | 2756           | 2756           |  |  |                    |
| Tamil Nadu               | -                | -             | -             | -             | -                     | -               | -             | 2010               | 135                 | -                  | -                        | 2145           | 2145           |  |  |                    |
| Telangana                | 42072            | -             | 651           | 42723         | 2869                  | 1594            | 1944          | -                  | 132511              | 6380               | -                        | 145298         | 188021         |  |  |                    |
| Uttar Pradesh            | -                | -             | -             | -             | -                     | 12622           | -             | 3500               | -                   | 66230              | -                        | 82352          | 82352          |  |  |                    |
| Uttarakhand              | 1570             | 594           | -             | 2165          | 36                    | 721             | 371           | 1946               | 981                 | 199834             | -                        | 203888         | 206053         |  |  |                    |
| West Bengal              | -                | -             | -             | -             | 12528                 | -               | 48000         | -                  | 73226               | 104275             | -                        | 238029         | 238029         |  |  |                    |

*Figures rounded off.*

## USES & SPECIFICATIONS

Dolomite after calcination is used for refractory purposes (as a substitute of magnesite refractories) in linings of furnaces like basic open-hearth steel furnaces and basic Bessemer converters.

High purity dead-burnt dolomite bricks are required for lining LD furnaces, while mini-steel plants generally require dolomite for fettling and refractory purposes. Like limestone, dolomite is used as a flux in iron & steel, ferroalloys and glass works. Few steel plants have dispensed with the use of dolomite in blast furnaces and its use in the preparation of self-fluxing sinters is found adequate for blast-furnace charge.

It is useful in the recovery of magnesia and also in the manufacture of magnesium metal; it finds important application in the manufacture of basic magnesium carbonate (termed 'technical carbonate', 'block magnesia' or 'magnesia alba') used in pipe and boiler coverings as heat insulation, in pharmaceutical, rubber, chemical Industries, paper, leather, glass, potteries and high-magnesium limes. In agriculture, it is used as a soil conditioner to neutralise acidity. Regular application of dolomite improves crop yields owing to its neutralisation potential. It finds use as a filler in fertilizers, paints & varnishes and for suppression of dust in coal mines. It is also used as a building stone and in the making of flooring tiles as chips & powder.

Generally, insolubles like  $\text{SiO}_2$ ,  $\text{Fe}_2\text{O}_3$  and  $\text{Al}_2\text{O}_3$  are considered deleterious constituents of dolomite for any industrial use. It is essential that these insolubles should be as low as possible. High purity dolomite with less than one per cent insolubles is preferred for making refractory bricks which are

used in the lining of LD furnaces.

Similarly, high-grade dolomite containing low iron (less than 0.15%) is required in Glass Industry. BIS has prescribed the specifications of dolomite used in Glass Industry vide IS: 997-1973; (First Revision; Reaffirmed 2022). Specifications for flux grade dolomite for use in Iron & Steel Industry have been revised and are prescribed in IS: 10346 - 2004 (second revision, Reaffirmed 2023), while specifications of dolomite for Refractory Industry are prescribed in IS: 14296 - 1995 (Reaffirmed 2022). IS: 15366 - 2003 (Reaffirmed 2019) lays down the specifications of dolomite for Paint Industry.

## FUTURE OUTLOOK

Over 95% of the total production of dolomite finds outlet mainly in Iron & Steel and allied industries. The importance of high purity dead-burnt dolomite bricks for lining LD furnaces has gained ground due to LD process of steel making. At the same time, a few of the steel plants have dispensed with the use of dolomite in blast furnace. Mini-steel plants generally require dolomite for fettling and refractory purpose only.

The resources of the Refractory grade dolomite in the country are meagre and this type of material is in short supply though the demand for it is very high especially for producing tar-bonded dolomite bricks. Therefore, intensive search is needed in non-Himalayan regions for locating deposits of massive non-crystalline dolomite, containing less than 2.5%  $\text{R}_2\text{O}_3$  for use in tar-dolomite bricks required for lining of LD steel furnaces.