

CALCITE



# Indian Minerals Yearbook 2015 (Part - III: Mineral Reviews)

**54<sup>th</sup> Edition**

**CALCITE**

**(FINAL RELEASE)**

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

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# 7 Calcite

Calcite is a carbonate of calcium (CaCO<sub>3</sub>) containing 56% CaO and 44% CO<sub>2</sub>. It is one of the important industrial minerals also known as 'Calc Spar' and is found throughout the world in igneous, sedimentary and metamorphic rocks. Pure crystallised transparent variety of calcite is known as 'Iceland Spar'.

## RESOURCES

Calcite occurs in abundance. As per UNFC system, the total resources of calcite as on 1.4.2010 is estimated at about 20.94 million tonnes of which about 2.66 million tonnes (13%) are proved and probable reserves. Of the total resources, Chemical grade accounts for 22% and glass & ceramic grade about 4%. The remaining 74% resources fall under Unclassified and Other grades.

Rajasthan has the largest share (50%) of calcite resources, followed by Andhra Pradesh (42%) and Madhya Pradesh (6%). The remaining resources are located in Karnataka, Gujarat, Haryana, Tamil Nadu and Uttar Pradesh (Table- 1).

## PRODUCTION, STOCKS & PRICES

As per GOI notification S.O. 423(E) dated 10<sup>th</sup> February, 2015, calcite has been declared as 'Minor Mineral' hence, the production beyond January, 2015 is not available with IBM. The production of calcite at 92 thousand tonnes in 2014-15 (upto January, 2015) was almost the same as compared to that in the previous year. There were six primary mines and one associated mine in 2013-14 and 2014-15. The entire production of calcite was reported in the Private Sector. Rajasthan continued to be the leading producer with a share of about 96% contribution to the total output. The remaining 4% was contributed by Andhra Pradesh and Madhya Pradesh (Tables- 2 to 4).

The mine-head closing stock of calcite for the year 2014-15 (upto January, 2015) was 34,252 tonnes as against 31,350 tonnes in the previous year (Table -5).

Prices of calcite are furnished in the General Review on 'Prices'.

**Table – 2 : Principal Producers of Calcite, 2014-15**

Name & address of producers	Location of mine	
	State	District
Wolkem Industries Ltd,* E - 101, Mewar Industrial Area, Madri, Udaipur-313 003, Rajasthan.	Rajasthan	Sirohi
Wolkem India Ltd, E-101, Mewar Industrial Area, Madri, Udaipur - 313 003, Rajasthan.	Rajasthan	Udaipur
Kalpana Minerals & Chemicals, Ashok Vatika, N.H.8, Sukher, Udaipur-318 004, Rajasthan.	Rajasthan	Udaipur
Mohd. Sher Khan, Khwaja Bagh, P.O., Sawa, Chittorgarh- 312 613, Rajasthan.	Rajasthan	Sirohi
Stone Mining Quarries, Durga ST Stand, Ananthagiu, Visakhapatnam - 535 145 Andhra Pradesh.	Andhra Pradesh	Visakhapatnam

\* Producing calcite as an associated mineral with wollastonite.

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

Grade/ State	Reserves			Remaining Resources					Total Resources (A+B)			
	Proved STD111	Probable STD121	Total (A)	Feasibility STD211	Pre-feasibility STD221	Measured STD331	Indicated STD332	Inferred STD333		Reconnaissance STD334	Total (B)	
<b>All India : Total</b>	<b>1265135</b>	<b>38525</b>	<b>1360678</b>	<b>665454</b>	<b>227265</b>	<b>3126218</b>	<b>9122235</b>	<b>1236864</b>	<b>3805598</b>	<b>97476</b>	<b>1828110</b>	<b>20945448</b>
<b>By Grades</b>												
Chemical	503146	38017	186673	348621	132342	1713928	-	-	1750993	-	3945884	4673720
Glass & Ceramic	-	-	804	52869	94923	108265	20250	67395	494177	-	837879	838683
Poor/Low	-	-	-	-	-	-	-	70310	134220	-	204530	204530
Others	544820	508	963270	27216	-	826693	500	-	22813	-	877222	2385820
Unclassified	193208	-	209931	14763	-	184969	8557000	56921	949902	-	9763555	10166694
Not-known	23961	-	23961	221985	-	292363	544485	1042238	453493	97476	2652040	2676001
<b>By States</b>												
Andhra Pradesh	3267	500	3767	-	-	104970	8562700	5200	122148	-	8795018	8798785
Gujarat	-	-	-	-	-	-	-	-	12380	-	12380	12380
Haryana	-	-	-	166900	-	183900	-	-	-	-	350800	350800
Karnataka	-	-	-	-	-	64	-	14400	51865	-	66329	66329
Madhya Pradesh	-	-	-	215327	82577	194333	20250	180226	400791	97476	1190980	1190980
Rajasthan	1261868	38025	1360678	283227	144688	2642951	539285	1037038	3090782	-	7737971	10398542
Tamil Nadu	-	-	-	-	-	-	-	-	116632	-	116632	116632
Uttar Pradesh	-	-	-	-	-	-	-	-	11000	-	11000	11000

Figures rounded off.

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**Table – 3 : Production of Calcite, 2012-13 to 2014-15\***  
(By State)

(Qty in tonnes; value in ₹'000)

State	2012-13		2013-14		2014-15(P)*	
	Quantity	Value	Quantity	Value	Quantity	Value
<b>India</b>	<b>74488</b>	<b>27309</b>	<b>92122</b>	<b>32620</b>	<b>91783</b>	<b>34079</b>
Andhra Pradesh	1790	895	1960	980	4100	1702
Madhya Pradesh	-	-	226	96	22	6
Rajasthan	72698	26414	89936	31544	87661	32371

\*Up to January, 2015.

**Table – 4 : Production of Calcite, 2013-14 and 2014-15\***  
(By Sector/State/Districts)

(Qty in tonnes; value in ₹'000)

State/District	2013-14			2014-15(P)*		
	No. of mines	Quantity	Value	No. of mines	Quantity	Value
<b>India</b>	<b>6(1)</b>	<b>92122</b>	<b>32620</b>	<b>6(1)</b>	<b>91783</b>	<b>34079</b>
Private Sector	6(1)	92122	32620	6(1)	91783	34079
<b>Andhra Pradesh</b>	<b>1</b>	<b>1960</b>	<b>980</b>	<b>1</b>	<b>4100</b>	<b>1702</b>
Visakhapatnam	1	1960	980	1	4100	1702
<b>Madhya Pradesh</b>	<b>1</b>	<b>226</b>	<b>96</b>	<b>1</b>	<b>22</b>	<b>6</b>
Jhabua	1	226	96	1	22	6
<b>Rajasthan</b>	<b>4(1)</b>	<b>89936</b>	<b>31544</b>	<b>4(1)</b>	<b>87661</b>	<b>32371</b>
Sirohi	1(1)	31035	12361	1(1)	48571	18294
Udaipur	3	58901	19183	3	39090	14077

Figures in parentheses indicate the number of associated mines of wollastonite.

\*Up to January, 2015.

**Table – 5 : Mine-head Stocks of Calcite, 2013-14 & 2014-15 (P)\***  
(By State)

(Qty in tonnes)

State	2013-14	2014-15(P)*
<b>India</b>	<b>31350</b>	<b>34252</b>
Andhra Pradesh	1915	620
Madhya Pradesh	3970	3833
Rajasthan	25465	29799

\*Up to January, 2015.

## MINING AND MARKETING

Almost all calcite mines in the country are worked manually by opencast methods and most of these are confined to shallow depths except the semi-mechanised Belkapahar Wollastonite and Calcite Mine of Wolkem Industries Ltd in Sirohi district, Rajasthan. Mining of calcite poses certain difficulties in excavating of transparent crystals as application of pressure during mining which affects the transparency causes internal imperfections and cracks. Therefore, precaution and care during mining is imperative so that final marketable products can be produced with maximum recovery. Calcite is usually marketed

after pulverising or after some initial processing and grinding to a fine powder size ranging from 200 to 300 mesh. In Rajasthan, Wolkem India Ltd, the principal Mining Company, markets its products under three different trade names, viz., Calstar 1-4 (Super snow-white powder with 100% whiteness), Calsun 1-5 (snow-white powder with 98.4% whiteness) and Belsun 1-4 (white powder with 95% whiteness). Besides, super snow-white micronised products (Calcron and Addon) of extremely high brightness and whiteness (25 to 5 microns) and ultra fine slurries and powder (FMT) with top size of 2 microns are also marketed by the company.

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### USES AND SPECIFICATIONS

The use of calcite is dictated by its level of purity. The highest purity of CaCO<sub>3</sub>, which is as high as (+)98%, has minimum inclusions and highest brightness. Its applications are in varying sizes from coarse to as fine as 10 to 2 microns. Various grades of calcite products marketed by Wolkem India Ltd contain CaCO<sub>3</sub> 95-98.5%, MgO 0.2-0.4%, SiO<sub>2</sub> 0.3% and Fe<sub>2</sub>O<sub>3</sub> 0.03 -0.15%.

Calcite is one of the important ingredients required in Glass and Ceramic Industries for imparting glaze and it is also used as a flux. In pulverised form, it is used as a filler in rubber goods, textile and as an extender in paints and as a carrier in insecticides. Other uses are in the manufacture of mortar, cement, bleaching powder, abrasive, for agricultural soil treatment and pharmaceuticals etc. It is also used in the preparation of fat lime, soaps, detergents, plastics, polymers, etc. The CaCO<sub>3</sub> content in calcite used in Glass Industry is 95% (min.) and in Ceramic Industry 97%. Calcium oxide is a mild flux and makes the glass stick to the articles shaped by its hardening nature. Generally, 54% (min.) CaO is used. In Ceramic Industry, generally, super-white calcite of 30 mesh is used while in Glass Industry, powder size ranging from 20 to 80 mesh is used.

The transparent crystal of calcite (Iceland Spar) free from flaw is most valued in the Optical Industry for the manufacture of Nicol prism. However, polarised films and lenses are fast replacing Nicol prisms. 'Iceland Spar' used in optical instruments, like polarising microscopes, should have a high degree of purity and perfect crystalline structure. The mineral must be at least 2.54 cm long and 1.27 cm thick (2-inch cube is preferred), colourless, perfectly transparent and free from cloudy inclusions, cavities or foreign substances. It should be free from internal iridescence caused due to incipient cracks along cleavage planes and from twinning other than parallel to the base.

The specifications of calcite for various industrial uses are given in Table-6. BIS has prescribed IS : 15751-2007 (reaffirmed in March-2012) as specification for use of calcite in Ceramic Industry.

**Table – 6 : Specifications of Calcite Used in Different Industries**

*(Figures relate to percentages, unless otherwise stated.)*

Constituent	Chemical	Cosmetic	Electrode	Glass	Ceramic
CaCO <sub>3</sub>	99	97	95	95	95
Fe	0.5	200 ppm	-	-	-
Cu	-	10 ppm (max.)	-	-	-
Mn	-	100 ppm (max.)	-	-	-
As (max.)	2 ppm	-	-	-	-
Pb	10 ppm	-	-	-	-
Chlorides	-	-	-	-	0.005 (max.)
P	-	-	0.01	-	-
S	-	-	0.035	-	-
Iron & titanium	-	-	-	-	0.5
Fe <sub>2</sub> O <sub>3</sub>	-	-	-	0.15	-
MgCO <sub>3</sub>	-	-	-	2.00	-
Moisture	-	0.2 (max.)	-	-	-
SiO <sub>2</sub>	-	-	2	-	-

### CONSUMPTION

The consumption of calcite at 1,71,500 tonnes in 2014-15 was 34% higher than in the preceding year. Cement Industry accounted for about 54% consumption, followed by paint (17%), glass (13%), ceramic (11%) and pesticides (2%), etc. Industry-wise consumption of calcite is given in Table-7.

### FOREIGN TRADE

Export of calcite increased to 30,768 tonnes in 2014-15 from 23,222 tonnes in 2013-14. Exports were mainly to Nepal (29%), Kuwait (14%), UAE & Indonesia (10%) each (Table-8).

In 2014-15, import of calcite decreased to 66,450 tonnes from 75,863 tonnes in the previous year. Imports were mainly from Vietnam (84%) and Oman (9%) (Table-9).

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**Table- 7 : Consumption\* of Calcite  
2012-13 to 2014-15  
(By Industries)**

(In tonnes)

Industry	2012-13	2013-14(R)	2014-15(P)
<b>All Industries</b>	<b>98200</b>	<b>128300</b>	<b>171500</b>
Cement	23200(1)	48900(2)	92800(2)
Ceramic	18800(29)	18800(29)	18800(29)
Cosmetics	760(2)	760(2)	728(2)
Electrical	800(2)	800(2)	700(2)
Electrode	3000(23)	3000(24)	3000(25)
Glass	18600(22)	22500(22)	22500(22)
Paint	29700(29)	29700(29)	29600(28)
Pesticide	2600(4)	2600(4)	2600(4)
Pharmaceutical	600(3)	600(3)	600(3)
Others (abrasive & rubber)	200(5)	700(6)	200(6)

*Figures rounded off.*

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

*\*Paucity of data, hence consumption may not be completed.*

**Table- 8 : Export of Calcite  
(By Countries)**

Country	2013-14		2014-15(P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
<b>All Countries</b>	<b>23222</b>	<b>187540</b>	<b>30768</b>	<b>192310</b>
Kuwait	4164	32036	4161	31670
UAE	2961	26745	3070	26060
Indonesia	2496	17873	3000	22814
Nepal	1254	9342	9050	20376
Bangladesh	2550	17316	2838	20034
Singapore	357	2907	1722	14099
Oman	5266	39934	1601	11634
Egypt	283	2971	1171	10025
Australia	198	1825	1205	9405
Malaysia	958	10036	848	5895
Other countries	2735	26555	2102	20298

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**Table – 9 : Import of Calcite  
(By Countries)**

Country	2013-14		2014-15	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
<b>All Countries</b>	<b>75863</b>	<b>427442</b>	<b>66450</b>	<b>369703</b>
Vietnam	65235	383204	55588	327840
Oman	8910	23108	6098	16238
Egypt	507	2807	2943	13015
Turkey	-	-	756	4993
Spain	-	-	437	3812
Iran	208	903	508	1514
USA	6	377	32	1249
Germany	12	311	25	551
Croatia	-	-	22	217
Malaysia	337	13489	13	152
Other countries	648	3243	28	122