

CALCITE



30-3 Calcite

Calcite is a rock forming mineral with chemical formula CaCO_3 that contains 56% CaO and 44% CO_2 . It is extremely common and found throughout the world in igneous, sedimentary and metamorphic rocks. It is one of the important industrial minerals also known as 'Calc Spar'. Pure crystallised transparent variety of calcite known as 'Iceland Spar' is used for optical purposes.

Calcite is one of the most abundantly available minerals in the world. It occurs in various shapes, colours and forms. Chemically, it is Calcium Carbonate and has varied uses in different fields. Calcite being easily available has been in use in various aspects of importance in the human life since ancient times. Though, its demand is continuously on the rise its availability world over will not affect its price.

RESERVES/RESOURCES

Calcite occurs in abundance in India. As per NMI data, based on UNFC system as on 01.04.2015, the total reserves/resources of calcite has been estimated at about 23 million tonnes of which about 3.45 million tonnes (15%) are under 'Reserves' category and the rest are under 'Remaining Resources' category. Of the total resources, Chemical grade accounts for 22% and Glass & Ceramic grade about 3%. The remaining 75% resources fall under Unclassified/Not-known and Other grades etc.

Rajasthan has the largest share (53%) of calcite resources, followed by Andhra Pradesh (40%) and Madhya Pradesh (5%). The remaining resources (2%) are located in Gujarat, Haryana, Karnataka, Tamil Nadu and Uttar Pradesh (Table- 1).

EXPLORATION & DEVELOPMENT

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

PRODUCTION

As per Govt of India Notification S.O. 423(E), dated 10th February 2015, 'calcite' 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 calcite during 2019-20 to 2021-22 is furnished in Table-2.

Table-2: Statewise Production of Calcite

(In tonnes)

State	Year		
	2019-20	2020-21	2021-22
Rajasthan	23000	19693	21440.8
Andhra Pradesh	6500	1003	-

Source: As received from State DGMs and their websites.

USES AND SPECIFICATIONS

The use of calcite is dictated by its level of purity. The highest purity of CaCO_3 , 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_3 at 95–98.5%, MgO at 0.2–0.4%, SiO_2 0.3% and Fe_2O_3 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

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

Grade/ State	Reserves				Remaining Resources				Total Resources (A+B)				
	Proved STD111	Probable		Fealility STD211	Measured STD331	Indicated STD332	Inferred STD333	Reconnaissance STD334					
		STD121	STD122							Pre-feasibility STD221	STD222		
All India : Total	928119	798170	1722578	3448867	1332076	217790	3339239	9122696	1246494	4204311	97476	19555082	23003949
By Grades													
Chemical	449149	-	19581	468730	753222	170359	1881020	-	-	1750993	-	4555594	5024324
Glass & Ceramic	-	8098	5175	13273	92767	47423	90993	20250	67395	451704	-	770532	783805
Poor/Low	-	-	-	-	-	-	-	-	70310	134220	-	204530	204530
Others	313094	-	963270	1276364	27656	8	827193	500	-	22813	-	878170	2154534
Unclassified	165876	790072	734552	1690500	236446	-	247670	8557000	66551	1391088	-	10493756	12184256
Not-known	-	-	-	-	221985	-	292363	544946	1042238	453493	97476	2652501	2652501
By States													
Andhra Pradesh	16522	8098	119526	144146	8538	-	105470	8562700	5200	282204	-	8964112	9108258
Gujarat	-	-	-	-	-	-	-	-	-	12380	-	12380	12380
Haryana	-	-	-	-	166900	-	183900	-	-	-	-	350800	350800
Karnataka	-	-	-	-	31800	-	15900	-	14400	51547	-	113647	113647
Madhya Pradesh	-	-	5175	5175	215327	35077	160421	20250	180226	358636	97476	1067412	1072587
Rajasthan	911597	790072	1597877	3299546	909511	182713	2873548	539746	1041668	3371912	-	8919099	12218645
Tamil Nadu	-	-	-	-	-	-	-	-	-	116632	-	116632	116632
Uttar Pradesh	-	-	-	-	-	-	-	-	-	11000	-	11000	11000

Figures rounded off.

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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, pharmaceuticals, etc. It is also used in the preparation of fat lime, soaps, detergents, plastics, polymers, etc. The CaCO_3 content in calcite used in Glass Industry is 95% (min.) and in Ceramic Industry is 95%. 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.

Calcite as GCC finds extensive use as a filler in Plastics, Paper, Rubber and Paint industry. According to Global Industry Analysis, strong consumption in paper and plastic production may drive the calcite market upwards. In Paper Industry, calcite is used as filler to produce high quality, water proof anti-smudge papers and in plastics it is used as an additive to improve surface opacity, gloss and impact strength.

The transparent crystal of calcite (Iceland Spar) free from flaw is most valued in the Optical Industry for the manufacture of Nicol prism.

BIS has prescribed IS : 15751-2007 (reaffirmed in March-2017) as specification for use of calcite in Ceramic Industry.