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MINOR MINERALS

30.6 DOLOMITE

(FINAL RELEASE)

GOVERNMENT OF INDIA
MINISTRY OF MINES
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30-6 Dolomite

Dolomite ($CaCO_3.MgCO_3$) theoretically contains $CaCO_3$ 54.35% and $MgCO_3$ 45.65% or CaO 30.4%, MgO 21.9% and CO_2 47.7%. However, in nature, dolomite is not available in this exact proportion. Hence, in commercial parlance, the rock containing 40-45% $MgCO_3$ is usually called dolomite. Dolomite rock contains either Calcite or a mixture of Calcite & Magnesite in addition to dolomite are called "Dolomitic Limestone". It is grouped under flux & construction minerals and is important for iron & steel and ferro-alloys industries. Dolomite occurrences are widespread in almost all parts of the country.

RESOURCES

Dolomite occurrences are widespread in the country. As per NMI data, based UNFC system, as on 1.4.2015 total reserves/resources of dolomite have 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 accounts for 23% resources followed by S.M.S. (OH),S.M.S. (L.D.) and 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 account for the remaining 36% resources. Major share of about 88% resources was 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 given in the review on "Exploration & Development" in "General Reviews".

PRODUCTION AND STOCKS

As per the Government of India notification S.O.423(E), dated 10th February 2015, 'dolomite' has been declared a 'Minor Mineral'. Hence the production data is not available with IBM.

MINING AND MARKETING

In India, dolomite mines are generally worked by opencast method of mining. Manual working is in vogue in most of the mines. However, few mines are semi-mechanised.

Steel plants draw major supplies of dolomite for use as a flux and also as a refractory material. The requirement of low silica dolomite is increasing in steel plants at Bhilai, Rourkela, Visakhapatnam and Jamshedpur. However, the supply of such materials from indigenous sources is posing a problem. Therefore Bokaro, Rourkela, Durgapur and Jamshedpur steel plants are drawing supplies of low silica dolomite from Bhutan for use in tar-bonded refractory bricks required for lining of LD furnaces and also for fluxing purposes.

Bhilai, Bokaro, Rourkela, Jamshedpur, Visakhapatnam and Bhadravati steel plants have captive mines. Besides, these plants draw supplies from private parties. Dolomite produced from Tulsidamar mine in Garhwa district, Jharkhand, is used mainly by Bokaro Steel Plant.

Dolomite produced in Tumakuru district of Karnataka is supplied to the ferro-manganese plants at Dandeli in Uttar Kannada district. The VISP's steel plant at Bhadravati receives its supplies from Nerelekere mine in Bagalkot, Karnataka.

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

(In '000 tonnes)

Grades/States	Reserves				Remaining Resources								
	Proved STD111	Probable		Total (A)	Feasibility STD211	Pre-feasibility		Measured STD331	Indicated STD332	Inferred STD333	Reconnaissance STD334	Total (B)	Total Resources (A+B)
		STD121	STD122			STD221	STD222						
All India : Total	**431750**	**107364**	**138770**	**677884**	**372515**	**323183**	**537932**	**307103**	**757005**	**5215075**	**224194**	**7737007**	**8414891**
By Grades													
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
By States													
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

Dolomite of Baradwar and Hirri areas in Chhattisgarh is supplied to the steel plants at Bhilai, Bokaro and Rourkela besides, foundry and glass manufacturing units. Birmitrapur, Panposh and Gomardih areas of Sundergarh district, Odisha, supplied dolomite to iron and steel plants at Durgapur, Rourkela, Burnpur and Jamshedpur. Dolomite from this region is also used by the ferro-manganese plants at Joda and Rayagada in Odisha. Low-silica dolomite from Jayanti area in Jalpaiguri district of West Bengal is supplied mainly to steel plants at Durgapur and Jamshedpur.

In Odisha and Rajasthan, dolomite is supplied to the foundry and grinding units. The production from Vadodara district, Gujarat is used for making chips and tiles. In Gujarat and Maharashtra, dolomite is used for making potteries and in Ferro Alloys Industry.

Dolomite produced in Jhabua district, Madhya Pradesh, is utilised by fertilizer, tile-making and grinding units. Dolomite of Jabalpur and Mandla districts is supplied to chips manufacturing units at Katni and Bhilai respectively.

USES

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, ferro-alloys 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; for 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 supression of dust in coal mines. It is also used as a building stone and in the making of flooring tiles as chips & powder.

SPECIFICATIONS

Generally, insolubles like SiO_2, Fe_2O_3 and Al_2O_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 percent 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 2008). The general specifications of dolomite consumed in different steel plants are given in Table-8. Specifications for flux grade dolomite for use in Iron & Steel Industry have been revised and are prescribed in IS: 10346 - 2004 (second revision, Reaffirmed 2009), while specifications of dolomite for refractory industry are prescribed in IS: 14296 - 1995 (Reaffirmed 2010). IS: 15366 - 2003 (Reaffirmed 2009) 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 pin 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 but very much required for making 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% R2O3 for use in tar-dolomite bricks required for lining of LD steel furnaces. The Sub- Group - II of the Working Group on Minerals for the 12th Plan has recommended the exploration of low silica dolomite in the states of Andhra Pradesh and Odisha which may be initiated by the State DGMs.

The Sub-Group has estimated the apparent domestic demand of dolomite at about 9.46 million tonnes at 9% growth rate by 2016-17.