

MAGNESITE

# Indian Minerals Yearbook 2022

(Part- III : Mineral Reviews)

61<sup>th</sup> Edition

**MAGNESITE**

(ADVANCE RELEASE)



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MINISTRY OF MINES  
INDIAN BUREAU OF MINES**

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**February, 2024**

# 19 Magnesite

**M**agnesite ( $\text{MgCO}_3$ ) is a carbonate of magnesium. It is usually found repeated as an alteration product of serpentine ultramafic rocks and other magnesium-rich rock types formed by replacement of dolomite and dolomitic limestone, as bedded deposits and as irregular veins. Magnesite deposits in India, generally occur as crystalline mass, amorphous and massive. Calcium and silica are the most common impurities found in magnesite along with  $\text{Fe}_2\text{O}_3$  and  $\text{Al}_2\text{O}_3$ . It is a very important mineral for the manufacture of basic refractories, which could be largely used in the Steel Industry. In commerce, the term 'magnesite' refers not only to the mineral, but also to many products, obtained by calcining the natural carbonate, e.g., caustic magnesite (magnesia obtained by calcining crude magnesite at comparatively low temperatures, 700 to 1,000 °C, and retaining 2 to 7%  $\text{CO}_2$  as carbonate) and dead-burnt or refractory magnesite (magnesia obtained by calcining magnesite at high temperatures, 1,500 to 1,800 °C, usually containing less than 0.5%  $\text{CO}_2$ ). Pure magnesite calcined at still higher temperatures (1,600–1,800 °C) to expel carbon dioxide completely is termed as 'periclase' ( $\text{MgO}$ ) in the trade. The dead burnt magnesite and fused magnesia are used in Refractory Industry to manufacture various refractory products. The caustic magnesia or low calcined magnesite is used as animal feed stuff and in the manufacture of oxichloride cement. The Refractory Industry is the major consumer of magnesite.

## RESERVES/RESOURCES

The total reserves/resources of magnesite as per NMI database, based on UNFC system, as on 1.4.2020 is about 459 million tonnes of which Reserves and Remaining Resources are 66 million tonnes and 393 million tonnes, respectively. Substantial quantities of resources are established in Uttarakhand (52%), followed by Tamil Nadu (34%) and Rajasthan (12%). Resources are also located in Andhra Pradesh, Himachal Pradesh, Jammu & Kashmir, Karnataka and Kerala.

Occurrences of magnesite in Tamil Nadu are low in lime and high in silica, whereas those of

Uttarakhand are high in lime and low in silica. The Gradewise and Statewise reserves and resources of magnesite are furnished in Table - 1.

## EXPLORATION & DEVELOPMENT

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

## PRODUCTION

Production of magnesite in 2021-22 was 113495 tonnes increased by 52% as compared to 74661 tonnes in the previous year. There were 10 reporting mines in 2021-22 as against 12 reporting mines in 2020-21. Five principal producers accounted for about 98% of the total output during the year 2021-22. Out of total production, about 54% of magnesite was contributed by the Public Sector and the remaining 46% by Private Sector during 2021-22.

Tamil Nadu is the major producing State with maximum contribution of 71% to the total output during 2021-22 followed by Uttarakhand and Karnataka.

Mine-head closing stocks of magnesite for the year 2021-22 was 54 thousand tonnes as against 67 thousand tonnes in the previous year.

The average daily employment of labour in magnesite mines during the year 2021-22 was 638 as against 642 in the previous year (Tables- 2 to 5).

## MINING AND MARKETING

Magnesite is being worked by open-cast method by developing benches. In Salem area (Tamil Nadu), magnesite is found chiefly as encrustations, veins and stringers in ultrabasic rocks like dunite and peridotite. Stringers and veins occur irregularly in fractures of rocks giving rise to different patterns. Veins are broken and magnesite is sorted out manually. Major magnesite producing mines in Salem area belong to Tamil Nadu Magnesite Ltd (TANMAG a State Government Undertaking), Ponkumar Magnesite Mines, Mysore Minerals, Dalmia Magnesite Corporation (a Private Sector Enterprise) and SAIL Refractory Co. Ltd (a Central Government Undertaking).

**Table – 1 : Reserves/Resources of Magnesite as on 1.4.2020  
(By Grades/States)**

(In '000 tonnes)

	Reserves			Remaining Resources					Total Resources (A+B)		
	Proved STD111	Probable STD121	Total (A) STD122	Feasibility STD211	Pre-feasibility STD221	Measured STD331	Indicated STD332	Inferred STD333		Reconnaissance STD334	Total (B)
<b>All India : Total</b>	<b>57934</b>	<b>6354</b>	<b>1782</b>	<b>80983</b>	<b>24858</b>	<b>40132</b>	<b>59652</b>	<b>128104</b>	<b>309</b>	<b>393047</b>	<b>459118</b>
<b>By Grades</b>											
High Grade	-	-	-	3277	27	1	-	28	-	-	3336
Medium Grade	55835	6354	1659	75554	21443	5363	109	4436	-	106968	170818
Beneficial/Low	2032	-	122	886	1154	1446	31558	117580	264	153537	155691
High & Medium Mixed	-	-	-	6	173	2059	-	100	-	2339	2339
Medium & Low Mixed	-	-	-	-	429	29237	27766	207	-	115910	115910
Others	6	-	-	1260	1448	2025	-	2501	-	7258	7264
Unclassified	-	-	-	-	-	-	-	83	-	83	83
Not-known	60	-	-	-	184	-	219	3170	45	3617	3677
<b>By States</b>											
Andhra Pradesh	-	-	-	-	-	-	-	80	-	80	80
Himachal Pradesh	-	-	-	-	-	-	-	298	-	298	298
Jammu & Kashmir	-	-	-	3210	740	-	-	150	45	4145	4145
Karnataka	997	30	-	802	247	270	10	2834	264	4516	5543
Kerala	-	-	-	-	-	-	-	38	-	40	40
Rajasthan	-	-	-	1030	1574	2045	149	49293	-	54091	54091
Tamil Nadu	48760	6324	-	71885	21695	3944	17	737	-	100402	155486
Uttarakhand	8177	-	1782	4056	602	33873	58902	73287	-	229476	239434

Figures rounded off

MAGNESITE

**Table-2: Principal Producers of Magnesite, 2021-22**

Name & address of producer	Location of mine	
	State	District
Almora Magnesite Ltd, Village Matela, P.O. Billori, Distt Bageshwar-263 630, Uttarakhand.	Uttarakhand	Bageshwar
S. Sundararajan, 5/22-A, Periyakollapatti Kannankuruchi, Post – Gorimedu, Distt Salem -636 008, Tamil Nadu.	Tamil Nadu	Salem
India Magnesia Product Limited, No. 11/239, Ramakrishna Road, Balaji Towers, 3 <sup>rd</sup> floor, Distt Salem – 636 007, Tamil Nadu.	Tamil Nadu	Salem
N. Rajashekar Talooru Magnasite Mines Talooru Magnasite Mine, Taloor village, Jayapura Hobli, Mysore-571311 Karnataka.	Karnataka	Mysore
Tamil Nadu Magnesite Limited 5/53, Omalur Main Road Jagirammalayam, Salem-636 302, Tamil Nadu.	Tamil Nadu	Salem

**Table – 3: Production of Magnesite, 2019-20 to 2021-22  
(By States)**

(Qty in tonnes; Value in `'000)

State	2019-20		2020-21		2021-22 (P)	
	Quantity	Value	Quantity	Value	Quantity	Value
<b>India</b>	<b>102554</b>	<b>351947</b>	<b>74661</b>	<b>314676</b>	<b>113495</b>	<b>450169</b>
Karnataka	7198	48309	6611	39237	7057	50138
Tamil Nadu	51147	222293	43613	227494	81012	350856
Uttarakhand	44209	81345	24437	47945	25426	49175

**Table – 4: Production of Magnesite, 2020-21 and 2021-22  
(By Sectors/States/Districts)**

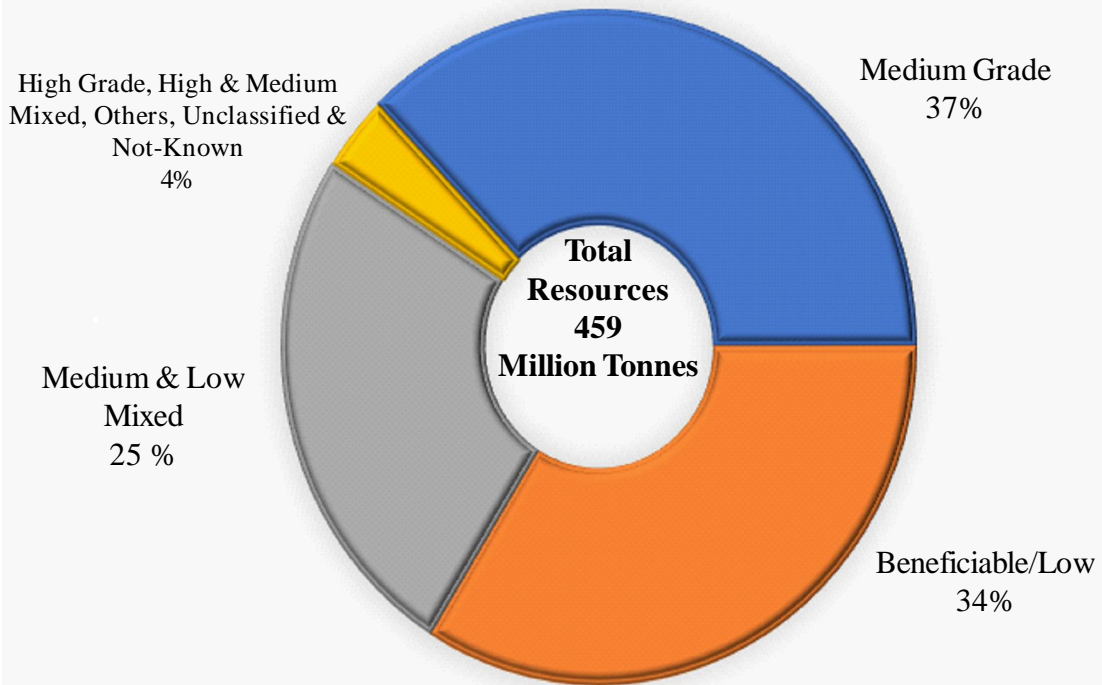
(Qty in tonnes; Value in `'000)

State/District	2020-21			2021-22 (P)		
	No. of mines	Quantity	Value	No. of mines	Quantity	Value
<b>India</b>	<b>12</b>	<b>74661</b>	<b>314676</b>	<b>10</b>	<b>113495</b>	<b>450169</b>
Public Sector	6	30621	115818	5	61322	185659
Private Sector	6	44040	198858	5	52173	264510
<b>Jammu &amp; Kashmir</b>	<b>1*</b>	-	-	-	-	-
Udhampur	1*	-	-	-	-	-
<b>Karnataka</b>	<b>4</b>	<b>6611</b>	<b>39237</b>	<b>3</b>	<b>7057</b>	<b>50138</b>
Mysore	4	6611	39237	3	7057	50138
<b>Tamil Nadu</b>	<b>5</b>	<b>43613</b>	<b>227494</b>	<b>5</b>	<b>81012</b>	<b>350856</b>
Salem	5	43613	227494	5	81012	350856
<b>Uttarakhand</b>	<b>2</b>	<b>24437</b>	<b>47945</b>	<b>1</b>	<b>25426</b>	<b>49175</b>
Bageshwar	1	24437	47945	1	25426	49175
Pithoragarh	1	-	-	-	-	-
<b>Rajasthan</b>	-	-	-	1*	-	-
Pali	-	-	-	1*	-	-

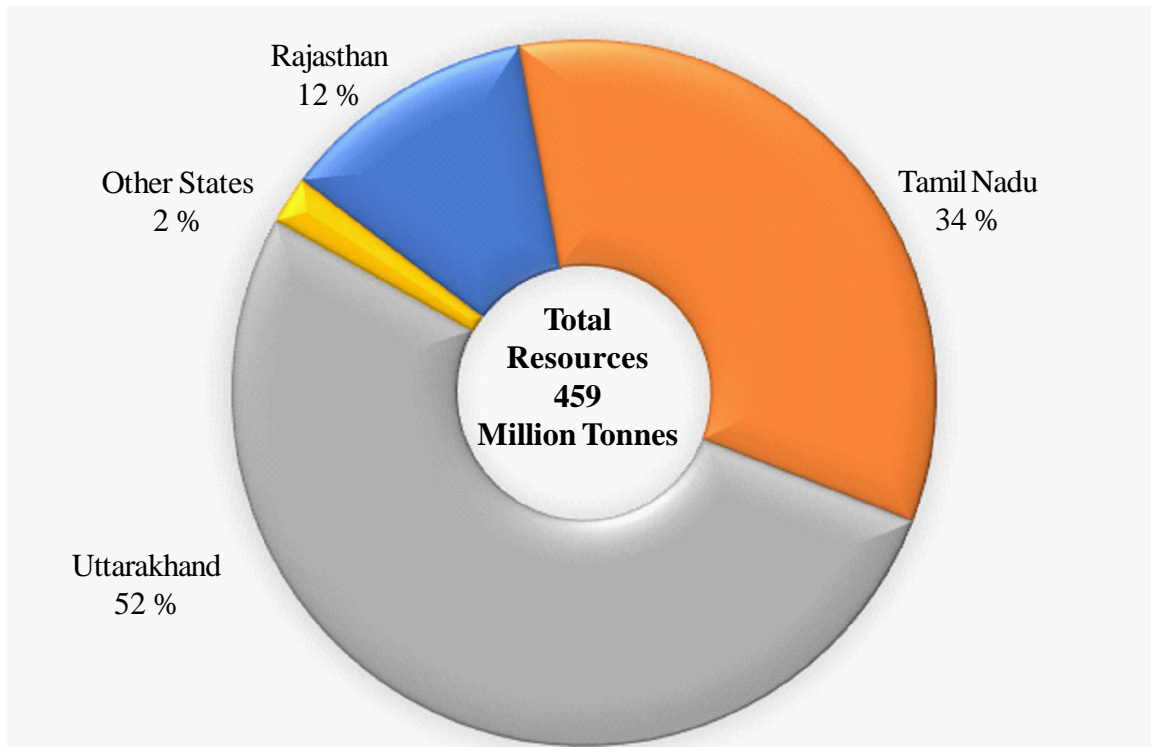
\* Only Labour reported

MAGNESITE

**Grade Wise Resources of Magnesite as on 01/04/2020**

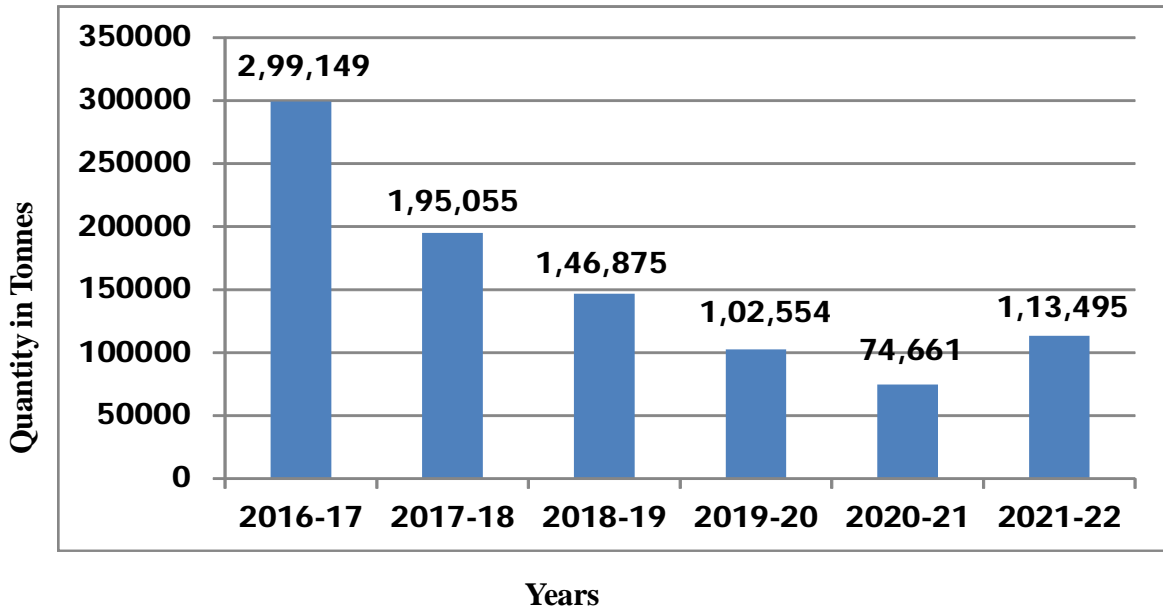


**State Wise Resources of Magnesite as on 01/04/2020**

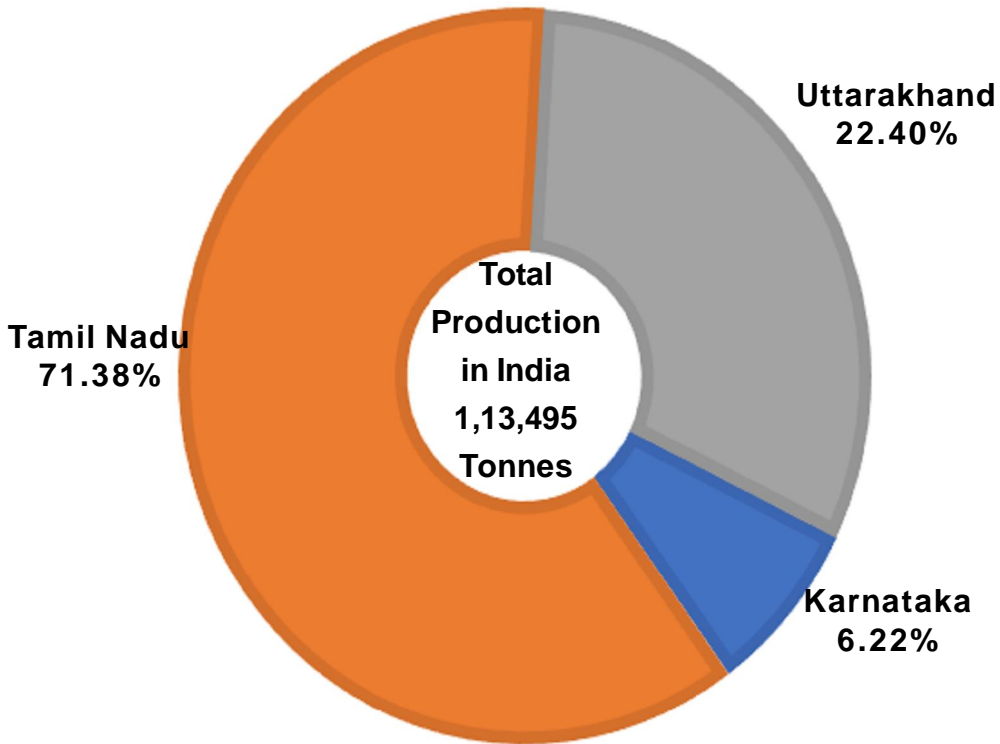


MAGNESITE

Year Wise Production of Magnesite in India , 2016-17 to 2021-22



State Wise Production of Magnesite, 2021-22



MAGNESITE

**Table-5: Mine-head Closing Stocks of Magnesite,  
2020-21 & 2021-22  
(By States)**

(In tonnes)

State	2020-21	2021-22 (P)
<b>India</b>	<b>67330</b>	<b>54446</b>
Jharkhand	1012	-
Karnataka	6223	1786
Rajasthan	30	30
Tamil Nadu	53533	48607
Uttarakhand	6532	4023

These mines are semi-mechanised as well as mechanised and uses compressors, wagon drills, jackhammers, power shovels, loaders, dumpers, dozers and pumps in their mining operations. Normally, Ammonium Nitrate Fuel Oil (ANFO) Mixture with high explosives as booster is used for blasting.

The hand-picked crude magnesite is further subjected to sorting and dressing in the dressing yard. Magnesite lumps which are not considered fit for dressing (containing 10 to 20% silica) constitute 2 to 6% of the run-of-mine. These lumps are hand-picked and stacked separately as rejects. The remaining material is further dressed to obtain usable magnesite containing less than 3% silica. The usable magnesite hardly constitutes 4 to 8% of blasted rocks even though run-of-mine contains 20 to 30% magnesite. In Uttarakhand, Almora Magnesite Ltd and N.B. Minerals Corporation are the important producers having mines in Bageshwar and Nainital districts, respectively. Magnesite is marketed generally after calcination, that is, after converting it into lightly calcined or caustic magnesite and dead-burnt variety.

## USES AND SPECIFICATIONS

The major proportion (about 98%) of magnesite mined is used for conversion into calcined form which finds many applications. The other industries where raw magnesite is used are mosaic tiles, electrodes, chemicals and manufacture of magnesium metal. Magnesite is also used in fertilizers and by Food Processing Industry. As per the Industries Department, Govt. of Tamil Nadu, Policy Note 2016-17, about 2.7 tonnes of raw magnesite and 220 litres of furnace oil is required to produce one tonne of Dead Burnt Magnesite (DBM). Raw magnesite is dead-burnt for making basic refractory bricks, basic refractory mortars, ramming mass, tar/pitch impregnated magnesite, magnesia-carbon bricks, slide-gate plates and other refractories. As per the Industries Department, Govt. of Tamil Nadu,

Policy Note 2016-17, about 2.7 tonnes of raw magnesite and 140 litres of furnace oil are required to produce one tonne of Caustic Calcined Magnesite (CCM). Caustic Calcined Magnesite is used in manufacturing sorel cement (magnesium oxychloride), castable refractories and extraction of magnesium metal. It is also the source material for manufacture of magnesium compounds like magnesium sulphate (Epsom salt) and other salts used in Paper and Pharmaceutical Industries. In Paper Industry, magnesium bisulphate produced from magnesite is used as cooking liquor for preparing pulp. It is also used in Textile, Rubber, Glass, Ceramic Industries and as animal feed stuff. Fused magnesia finds application as insulating material in tubular heating elements in Electrical Industry and refractory brick linings in steel furnaces.

### Refractory Industry

Refractory Industry is one of the major consumers of magnesite in India. In the manufacture of refractories, deleterious constituents are SiO<sub>2</sub>, CaO, Fe<sub>2</sub>O<sub>3</sub> and Al<sub>2</sub>O<sub>3</sub>. The permissible limits for these constituents are governed by its end-use. The refractory bricks are made from Dead Burnt Magnesite by judicious blending of different types of raw magnesite before dead-burning or of different qualities of Dead Burnt Magnesite prior to brick making.

Indian steel plants use domestic DBM bricks containing up to 5% silica and 2.5% maximum CaO. By and large, Indian refractory makers prefer magnesite for making high-grade DBM containing MgO 45.5% (min.), SiO<sub>2</sub> 2.5% (max.) and CaO 1.5% (max.).

### Chemical Industry

The BIS has prescribed specification - IS : 3607-1979, First Revision, Reaffirmed 2010, for magnesite to be used in Chemical Industry.

## CONSUMPTION

The apparent consumption of Magnesite in 2021-22 was about 0.63 million tonnes as against the 0.43 million tonnes during preceding year, i.e., increased by about 47 % in 2021-22.

The BIS has prescribed the IS specification (14303-1995, Reaffirmed 2011) for magnesite for use in Refractory Industry.

## INDUSTRY

### Dead Burnt Magnesite (DBM)

Raw magnesite when calcined at temperatures in the range of 1,660–1,800 °C in the rotary kiln, carbon dioxide gets expelled completely and a dense product 'Dead Burnt Magnesite' is obtained. Dead Burnt Magnesite refers to the magnesite that is chemically unreactive or 'dead', therefore, enabling it to be used in brick making or monolithic hearths without undue difficulty arising out of hydration or shrinkage.

### Caustic Calcined Magnesite (CCM)

Low calcined magnesite also known as Caustic Calcined Magnesite is obtained by calcining magnesite in a shaft or rotary kiln at temperature ranging between 800 °C and 1,000 °C. The incomplete dissociation causes retention of 8 to 10% carbon dioxide as carbonate. Low calcined magnesia when mixed with water forms a feebly plastic paste. Industries like paper, rubber, ceramic, asbestos products, glass, etc. use caustic magnesia.

### Fused Magnesia

Fused magnesia is produced by the fusion of the high-grade magnesite in Higgin's or electric arc tilt furnaces between 2,500 °C and 3,000 °C. It is resistant to the action of molten metals, basic slags and fluxes and high temperatures. It is used in the form of moulded vessels and as compressed material for covering resistant elements of the furnaces used in the melting of lead, tin, etc.

As per the available information, presently there are seven major plants that manufacture Dead Burnt Magnesite, while there are four plants that produce calcined magnesite and one that produces fused magnesia (Table-6). By-product magnesium carbonate and other magnesium salts were also

produced during salt manufacturing from sea water. Dalmia Magnesite Corporation and Tamil Nadu Magnesite Ltd are the major producers of DBM and caustic calcined grades.

### Sea Water Magnesia (SWM)

Sea water or lake bitterns is an alternative source to obtain magnesia by chemical reaction. Key raw materials required other than sea water are dolomite or limestone, fresh water and sulphuric acid. The magnesia content of sea water is about 0.2%, and even by enrichment with dolomite, around 300 kilograms sea water need to be processed to obtain one kilogram of magnesia. The sea water magnesia can be used to manufacture Dead Burnt Magnesite, caustic magnesia and other magnesium compounds.

### Marine By-products

Carbonates, chlorides and sulphates of magnesium are obtained as by-products in the production of common salt by solar evaporation. Salt Commissioner, Jaipur, reported 8,101 tonnes production of magnesium chloride and 24 tonnes of by-product magnesium sulphate in 2018-19. The production is normally reported from the salt pans in Jamnagar–Gandhidham, Gujarat.

### Magnesium Metal

Magnesium metal is a fairly strong, silvery-white, light-weight metal (about one-third lighter than aluminium). It is traditionally produced in ingot form of approximately 7 kg each with purity close to 99.9%. Its chief applications are, in die casting (alloyed with zinc), to remove sulphur in the production of iron and steel, for production of titanium in the Kroll process. The other application field of magnesium is in electronic devices. Defence equipment and nuclear reactor materials also consume magnesium.

Magnesium technology and its commercial production in India are still at its infancy. India has developed silico-thermic reduction process as well as fused salt electrolytic process, with capacity of 600 t/year for each process. However, the cost of production is very high as compared to the landed cost of imported magnesium metal. Hence, its production has been stopped by one of the companies. The production is only about 15–20% of the rated capacity.



**Table -6: Manufacturing Plants of Dead Burnt Magnesite (DBM), Calcined Magnesite, etc.**

Name of the plant	Location	Installed capacity (tpy)
Tamil Nadu Magnesite Ltd (TANMAG)	Salem, Tamil Nadu	30,000 (DBM) 19,500 (calcined magnesite)
Ramakrishna Magnesite Mines (Two Units)	-do-	21,600 (calcined magnesite)
SAIL Refractory Co. Ltd (Formerly, Burn Standard Co.Ltd)	-do-	54,000 (DBM) 18,000 (Calcined magnesite)
Dalmia Magnesite Corporation	-do-	72,000 (DBM)
Sri Ponkumar Magnesite Ltd	-do-	26,500 (DBM)
Almora Magnesite Ltd	Bageshwar, Uttarakhand	24,000 (DBM)
Minerals & Refractories	Haldwani, Uttarakhand	3,000 (DBM)
Hansaflon Plastochem Ltd	NA	1,500 (Fused magnesite)

## TRADE POLICY

As per import policy of ITC (HS) 2022 in schedule-1 and export policy of ITC (HS) 2022 schedule-2, Natural magnesium carbonate (Magnesite); fused magnesia, dead-burned (Sintered) Magnesia, whether or not containing small quantities of other oxides added before sintering; other magnesium oxide, whether or not pure are allowed freely without restrictions.

## WORLD REVIEW

The world reserves of magnesite were 6,800 million tonnes in terms of magnesium oxide content, excluding large resources of magnesium-bearing substitutes, such as, dolomite, brucite and olivine. Further, magnesium compounds could be recovered economically from well & lake brines and from sea water. Out of the total world reserves, the major share was that of Russia (34%) followed by China (8%), Slovakia (5%), Australia & Greece (4% each) and Brazil (3%) (Table-7).

The world production of magnesite was at 34.30 million tonnes in 2021. China continued to be the leading producer accounting for about 61% production, followed by Australia (8%), Russia (7%) and Brazil & Turkey (6% each). The world production of magnesite is furnished in Table-8. China, Australia, Russia, Brazil and

Turkey had the largest magnesite production capacity and accounted for about 88% of the total world production.

To provide a generalised view of the development in various countries, the country-wise description sourced from the latest available publication of magnesium Compound Minerals Yearbook 'USGS' 2018 is furnished below.

### Australia

Archer Exploration Ltd. announced the sale of the Leigh Creek magnesite project for \$2 million to Australian Consolidated Venture Capital Pty., Ltd. The project is located approximately 500 kilometers north of Adelaide, South Australia. Archer had sought to produce dead-burned and caustic-calcined magnesia from magnesite ore, but its inability to secure long-term access to a kiln was cited as the reason to sell the property.

### Canada

West High Yield Resources Inc. continued an environmental study and a mine permit application for its proposed Record Ridge project in British Columbia. The company planned to build a mine and processing facility to produce magnesia from a serpentine deposit.

### China

The enforcement of environmental regulations by the Government of China in 2017 brought about the temporary closure of 80% to 90% of magnesia production capacity in China's major magnesia-producing region. The government of Haicheng, within Liaoning Province, took ownership and consolidated 42 magnesia companies into the Liaoning Magnesite Mining Company. The newly formed company controlled government permits and activities including mining, processing, sales, and trade. The consolidation provided the local government with the means to direct sustainable growth for the magnesia market within the region. The plant included a dolomite mine and production facilities. Haicheng Guotian Mining Co., Ltd., Refratechnik Holding GmbH, and Yingkou Jinlong Refractories Group Co., Ltd. formed a joint venture to produce high-grade caustic-calcined magnesia and dead-burned magnesia.

**Table – 7: World Reserves of Magnesite  
(By Principal Countries)**

(In '000 tonnes of magnesium oxide (MgO) content)

Country	Reserves
<b>World : Total (rounded off)</b>	<b>6800000</b>
Australia	290000*
Austria	49000
Brazil	200000
Canada	NA
China	580000
Greece	280000
India	82000
Iran	12000
Russia	2300000
Slovakia	370000
Spain	35000
Turkey	110000
USA	35000
Other countries	2500000

*Source: USGS, Mineral Commodity Summaries, 2023*

*\*For Australia, Joint Ore Reserves Committee-compliant or equivalent reserves were 37 million tonnes*

**Table–8: World Production of Magnesite  
(By Principal Countries)**

(In tonnes)

Country	2019	2020	2021
<b>World Total (rounded off)</b>	<b>30300000</b>	<b>29700000</b>	<b>34300000</b>
China <sup>e</sup>	19000000	19000000	21000000
Australia <sup>d</sup>	433712	820057	2735767 <sup>e</sup>
Russia <sup>e</sup>	2600000	2600000	2600000
Brazil <sup>c</sup>	2962000	1993600	2000000 <sup>e</sup>
Turkey	1496081	1560818	1927280
Austria	691909	816370	844226
Spain	634580	626055	703834
Slovakia	615200	516900	576700
Greece	365792	275100	309600
Other countries	1496834	1488921	1637562

*Source: BGS, World Mineral Production, 2017-21.*

*e: Estimated*

*c: Including beneficiated and directly shipped material*

*d: Year ended 31 March following that stated*

## FOREIGN TRADE

### Exports

The exports of magnesite decreased by 2% to 5,384 tonnes in 2021-22 from 5,477 tonnes in the preceding year. Exports were mainly to Malaysia (34%), Bangladesh (16%), Thailand (7%), Singapore & Ethiopia (6% each) and UAE (5%). Out of the total exports in 2021-22, those of fused magnesia were at only 2 tonnes as compared to 41 tonnes in the preceding year; non-calcined magnesite were at 436 tonnes as compared to 220 tonnes; other magnesite 2,735 tonnes as compared to 3,468 tonnes; and magnesium oxide 1,886 tonnes as compared to 1,646 tonnes in the preceding year. Exports of Unwrought Magnesium and Waste & Scrap of Magnesium were at 6,997 tonnes in the year 2021-22 as compared to 1,249 tonnes in the preceding year. Exports were mainly to USA (44%), Turkey (20%), Netherlands (12%), Brazil (7%) and UAE (4%). The total exports of magnesium powder and flakes was 1 tonne in 2021-22 which was the same as preceding year. The exports of Magnesium & alloys wrought was 132 tonnes in 2021-22 as compared to negligible in the preceding year (9 to 21).

### Imports

The imports of magnesite (total) increased by 40% to 5,10,898 tonnes in 2021-22 from 3,64,577 tonnes in the preceding year. Imports were mainly from China (48%), UAE (28%), Turkey (10%), Australia (6%) and Saudi Arab (4%). Out of the total imports in 2021-22, those of fused magnesia were at 42,306 tonnes as compared to 25,215 tonnes in the preceding year; non-calcined magnesite were at 1,36,894 tonnes as compared to 57,993 tonnes; other magnesite 49,392 tonnes as compared to 25,379 tonnes; magnesium oxide 67,331 tonnes as compared to 63,442 tonnes; and Dead burnt magnesite were at 1,70,744 tonnes as compared to 1,33,034 tonnes in the preceding year. Imports of Unwrought Magnesium and Waste & Scrap of Magnesium were at 21,966 tonnes as compared to 17,692 tonnes in the preceding year. Imports were mainly from China (88%) and Hong Kong (8%). The total imports of magnesite powder and flakes in the year 2021-22 was at 1,737 tonnes as compared to 2,657 tonnes in the preceding year. The imports of magnesium & alloys wrought were at 234 tonnes during 2021-22 as compared to 278 tonnes in the preceding year (Tables-22 to 32).

## MAGNESITE

**Table – 9 : Exports of Magnesite : Total  
(By Countries)**

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value ( ` '000)	Qty (t)	Value ( ` '000)
<b>All Countries</b>	<b>5477</b>	<b>171020</b>	<b>5384</b>	<b>173809</b>
Bangladesh	731	24355	857	36145
Thailand	201	11300	378	21512
Malaysia	2502	22498	1809	19347
Singapore	367	19322	318	14831
UK	105	27574	45	12431
Ethiopia	67	2224	313	9854
UAE	247	3368	294	9781
China	293	29547	152	7038
Egypt	5	1218	12	4734
Djibouti	24	789	130	4552
Other countries	935	28825	1076	33584

*Figures rounded off***Table – 10: Exports of Magnesia (Fused)  
(By Countries)**

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value ( ` '000)	Qty (t)	Value ( ` '000)
<b>All Countries</b>	<b>41</b>	<b>863</b>	<b>2</b>	<b>585</b>
UAE	++	130	++	372
Sri Lanka	++	1	2	137
Qatar	-	-	++	14
Zimbabwe	-	-	++	11
Germany	-	-	++	10
South Africa	-	-	++	10
Peru	-	-	++	8
Singapore	++	11	++	7
USA	++	++	++	7
Sudan	-	-	++	4
Other countries	41	721	++	5

*Figures rounded off***Table–11: Exports of Magnesite (Calcined)  
(By Countries)**

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value ( ` '000)	Qty (t)	Value ( ` '000)
<b>All Countries</b>	<b>100</b>	<b>2102</b>	<b>117</b>	<b>5014</b>
Cameroon	-	-	54	2120
Nepal	2	45	26	861
Australia	19	653	18	776
Nigeria	68	859	7	404
Vietnam	5	193	9	372
Korea	-	-	++	249
USA	1	144	1	88
Spain	2	99	1	77
Turkey	3	109	1	45
Malawi	-	-	++	22

*Figures rounded off***Table – 12: Exports of Magnesite: Dead Burnt Magnesite  
(By Countries)**

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value ( ` '000)	Qty (t)	Value ( ` '000)
<b>All Countries</b>	<b>2</b>	<b>93</b>	<b>208</b>	<b>6829</b>
UAE	-	-	144	4333
Oman	-	-	16	833
Bangladesh	-	-	16	584
Indonesia	-	-	20	508
Australia	2	79	7	300
Senegal	-	-	4	171
Malaysia	-	-	1	100
France	++	9	-	-
Nepal	++	5	-	-

*Figures rounded off*

## MAGNESITE

**Table-13: Exports of Magnesite (Non-calcined)  
(By Countries)**

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value ( ` '000)	Qty (t)	Value ( ` '000)
<b>All Countries</b>	<b>220</b>	<b>5202</b>	<b>436</b>	<b>11483</b>
Bangladesh	193	3597	294	5639
UAE	-	-	3	2395
Kenya	++	16	80	1638
Ethiopia	-	-	54	1584
Sudan	-	-	4	101
Nigeria	-	-	1	100
Nepal	++	4	++	23
UK	++	7	++	3
Turkey	-	-	++	++
Djibouti	24	789	-	-
Other countries	3	789	-	-

*Figures rounded off***Table-14: Exports of Magnesium Oxide  
(By Countries)**

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value ( ` '000)	Qty (t)	Value ( ` '000)
<b>All Countries</b>	<b>1646</b>	<b>119899</b>	<b>1886</b>	<b>110791</b>
Bangladesh	193	11473	277	22479
Thailand	166	10683	354	20500
Singapore	367	19311	313	14528
UK	105	27567	45	12428
Ethiopia	61	2155	259	8270
China	293	29547	152	7038
Djibouti	-	-	130	4552
Egypt	5	1170	8	3356
Netherlands	100	2089	75	2622
Taiwan	11	625	43	1688
Other countries	345	15279	230	13330

*Figures rounded off***Table-15: Exports of Magnesium and Articles thereof, including waste and scrap  
(By Countries)**

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value ( ` '000)	Qty (t)	Value ( ` '000)
<b>All Countries</b>	<b>1266</b>	<b>143710</b>	<b>7269</b>	<b>1314210</b>
USA	332	43330	3208	564272
Turkey	410	30172	1428	151302
Netherlands	182	19689	873	174376
Brazil	++	125	619	118590
UAE	21	4497	309	141441
Germany	3	4344	251	38703
Italy	-	-	210	24929
Korea Rp	++	40	159	20119
Australia	++	187	2	30475
Nepal	10	7133	50	20917
Other Countries	308	34193	160	29086

*Figures rounded off***Table-16: Exports of Magnesium Powders and Flakes  
(By Countries)**

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value ( ` '000)	Qty (t)	Value ( ` '000)
<b>All Countries</b>	<b>1</b>	<b>522</b>	<b>1</b>	<b>1405</b>
Malaysia	++	195	1	1111
Brazil	-	-	++	103
Japan	-	-	++	87
South Africa	-	-	++	25
UK	-	-	++	22
Yemen Republic	-	-	++	20
Bangladesh	-	-	++	13
Singapore	++	10	++	8
Mexico	-	-	++	7
Egypt	-	-	++	3
Other Countries	1	317	++	6

*Figures rounded off*

## MAGNESITE

**Table – 17: Exports of Magnesite (Other)  
(By Countries)**

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (` '000)	Qty (t)	Value (` '000)
<b>All Countries</b>	<b>3468</b>	<b>42861</b>	<b>2735</b>	<b>39107</b>
Malaysia	2502	22498	1808	19213
Bangladesh	345	9285	270	7443
Vietnam	-	-	270	2446
Nepal	138	1154	57	1874
UAE	245	2923	121	1521
Kenya	++	95	76	1473
Egypt	++	48	4	1378
USA	1	1081	++	1184
Thailand	35	617	24	1010
Myanmar	-	-	96	823
Other countries	202	5160	9	742

*Figures rounded off***Table-18: Exports of Magnesium & Alloys Wrought  
(By Countries)**

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (` '000)	Qty (t)	Value (` '000)
<b>All Countries</b>	<b>++</b>	<b>585</b>	<b>132</b>	<b>50929</b>
USA	++	242	102	22504
Nepal	-	-	29	14027
Australia	-	-	1	13683
UK	++	262	++	516
Belgium	-	-	++	49
Poland	-	-	++	42
UAE	-	-	++	27
France	-	-	++	26
Korea, Rp of	-	-	++	24
Germany	-	-	++	21
Other Countries	++	81	++	10

*Figures rounded off***Table-19: Exports of Magnesium & Alloys NES  
(By Countries)**

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (` '000)	Qty (t)	Value (` '000)
<b>All Countries</b>	<b>16</b>	<b>11713</b>	<b>139</b>	<b>43316</b>
Brazil	-	-	117	27551
Germany	3	4344	++	6585
Mexico	-	-	8	2406
Kenya	++	9	7	2125
Qatar	++	1214	4	1630
Austria	++	903	++	851
Bangladesh	-	-	++	671
Malaysia	++	177	1	571
Mongolia	-	-	2	563
Ghana	-	-	++	135
Other Countries	13	5066	++	228

*Figures rounded off***Table-20: Exports of Magnesium Wire  
(By Countries)**

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (` '000)	Qty (t)	Value (` '000)
<b>All Countries</b>	<b>++</b>	<b>986</b>	<b>++</b>	<b>679</b>
Australia	++	167	++	364
Germany	-	-	++	171
Malaysia	-	-	++	124
South Africa	++	11	++	11
UAE	-	-	++	6
Nepal	-	-	++	2
Zambia	-	-	++	1
USA	++	568	-	-
Saudi Arabia	++	216	-	-
Israel	++	12	-	-
Other Countries	++	12	-	-

*Figures rounded off*

## MAGNESITE

**Table-21: Exports of Unwrought Magnesium and Waste & Scrap of Magnesium  
(By Countries)**

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (` '000)	Qty (t)	Value (` '000)
<b>All Countries</b>	<b>1249</b>	<b>129904</b>	<b>6997</b>	<b>1217881</b>
USA	322	39658	3106	541721
Netherlands	182	19652	873	174376
Turkey	410	30172	1428	151301
UAE	21	4497	309	141408
Brazil	++	125	502	90936
Germany	-	-	251	31926
Italy	-	-	210	24929
Korea, Rp of	-	-	159	20054
Australia	++	16	1	16428
Slovenia	250	17128	100	7273
Other Countries	64	18656	58	17529

*Figures rounded off***Table – 22: Imports of Magnesite : Total  
(By Countries)**

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (` '000)	Qty (t)	Value (` '000)
<b>All countries</b>	<b>364577</b>	<b>7657838</b>	<b>510898</b>	<b>13106490</b>
China	221089	4071438	243309	7987513
Australia	25781	1140647	30489	1548995
Turkey	28264	898836	50385	1383189
UAE	56124	146471	142056	407036
Saudi Arabia	10626	228236	21979	346323
Japan	2545	299721	2205	266456
Netherlands	1384	85953	2770	162528
Israel	904	103896	1147	148430
Germany	387	51772	935	106799
Belgium	116	26328	366	101979
Other Countries	17357	604540	15257	647242

*Figures rounded off*

## MAGNESITE

**Table – 23: Imports of Magnesia (Fused)  
(By Countries)**

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (` '000)	Qty (t)	Value (` '000)
<b>All Countries</b>	<b>25215</b>	<b>1135547</b>	<b>42306</b>	<b>2614441</b>
China	23796	1033008	40235	2436588
UK	251	36436	262	41205
Japan	-	-	420	27258
Germany	168	14923	93	26921
Greece	192	10301	480	25675
Mexico	60	10094	80	13830
Australia	415	12020	461	11818
Belgium	8	2292	30	10137
Hong Kong	246	10363	92	10105
Russia	60	2620	120	7691
Other countries	19	3492	33	3213

*Figures rounded off***Table – 24: Imports of Magnesite (Non-calcined)  
(By Countries)**

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (` '000)	Qty (t)	Value (` '000)
<b>All Countries</b>	<b>57993</b>	<b>159537</b>	<b>136894</b>	<b>317688</b>
UAE	49476	100380	128148	260705
Turkey	1545	15323	1948	20605
Saudi Arabia	2227	8543	4477	17352
Oman	825	5029	2078	14803
Japan	6	648	14	1912
Malaysia	2941	20114	223	1584
Israel	-	-	1	426
South Africa	-	-	5	301
China	379	4574	-	-
Iran	550	3116	-	-
Other countries	44	1810	-	-

*Figures rounded off***Table-25: Imports of Magnesite (Calcined)  
(By Countries)**

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (` '000)	Qty (t)	Value (` '000)
<b>All Countries</b>	<b>59515</b>	<b>919930</b>	<b>44231</b>	<b>940743</b>
China	49453	529490	34950	642450
Saudi Arabia	3219	125976	2514	109802
Turkey	216	13572	4310	96343
Hong Kong	2008	26479	1224	26896
Spain	757	25269	554	18669
Belgium	63	5742	144	13357
Netherlands	100	6882	195	13201
Japan	555	46546	25	6393
USA	-	-	100	6330
Greece	120	4273	60	2363
Other countries	3023	135701	155	4939

*Figures rounded off*

## MAGNESITE

**Table-26: Imports of Magnesite: Dead Burnt Magnesia  
(By Countries)**

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (` '000)	Qty (t)	Value (` '000)
<b>All Countries</b>	<b>133034</b>	<b>3360002</b>	<b>170744</b>	<b>5340576</b>
China	79856	1280794	85758	2249813
Australia	25350	1127409	30028	1537177
Turkey	25620	851761	39582	1197158
Saudi Arabia	494	9021	10270	136939
Netherlands	910	57624	1990	115594
Marshall Island	-	-	1496	29702
USA	101	8881	286	22728
Jordan	243	5729	425	10730
Greece	164	5093	268	8874
Japan	40	2782	120	8812
Other countries	256	10908	521	23049

*Figures rounded off***Table-27: Imports of Magnesite (Other)  
(By Countries)**

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (` '000)	Qty (t)	Value (` '000)
<b>All Countries</b>	<b>25379</b>	<b>680448</b>	<b>49392</b>	<b>1825575</b>
China	13512	398884	28295	1399711
UAE	6648	46090	11766	91655
Turkey	883	18180	4521	68439
Ireland	1346	58928	1000	60823
Greece	1839	67137	1188	46331
Germany	48	12232	371	36907
Netherlands	350	19218	571	32488
Russia	++	23	559	29282
Japan	393	37216	251	26488
USA	2	558	27	7860
Other countries	358	21982	843	25591

*Figures rounded off***Table - 28 : Imports of Unwrought Magnesium  
and Waste & Scrap of Magnesium  
(By Countries)**

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (` '000)	Qty (t)	Value (` '000)
<b>All Countries</b>	<b>17692</b>	<b>2839776</b>	<b>21966</b>	<b>7650925</b>
China	16603	2666630	19442	7007752
Hong Kong	501	80745	1709	368697
Br Virgn Is	377	57013	394	122044
Singapore	20	3612	218	111790
UAE	160	26769	85	30741
USA	-	-	82	4895
Ghana	-	-	14	1574
Malaysia	-	-	20	1405
Japan	++	300	1	1233
Austria	-	-	1	794
Other Countries	31	4707	++	++

*Figures rounded off*



## MAGNESITE

**Table –29 : Imports of Magnesium Oxide  
(By Countries)**

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value ( ` '000)	Qty (t)	Value ( ` '000)
<b>All Countries</b>	<b>63442</b>	<b>1402374</b>	<b>67331</b>	<b>2067467</b>
China	54093	824688	54071	1258951
Japan	1551	212529	1375	195593
Israel	904	103896	1038	145808
Saudi Arabia	4686	84696	4718	82230
Belgium	44	17890	188	77650
UAE	++	1	2109	51675
USA	304	26992	622	48789
Mexico	531	43110	510	45918
Russia	39	3427	316	38020
Germany	171	24475	256	34096
Other countries	1119	60670	2128	88737

*Figures rounded off***Table – 30 : Imports of Magnesium &  
Alloys:Wrought  
(By Countries)**

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value ( ` '000)	Qty (t)	Value ( ` '000)
<b>All Countries</b>	<b>278</b>	<b>85883</b>	<b>234</b>	<b>103587</b>
China	113	48769	125	59388
Hong Kong	158	31833	108	40513
UK	-	-	1	3356
USA	-	-	++	330
Japan	2	2481	-	-
Bulgaria	3	1768	-	-
Netherlands	1	579	-	-
Italy	1	453	-	-

*Figures rounded off***Table – 31 : Imports of Magnesium &  
Alloys NES  
(By Countries)**

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value ( ` '000)	Qty (t)	Value ( ` '000)
<b>All Countries</b>	<b>5214</b>	<b>1195416</b>	<b>4908</b>	<b>2198220</b>
China	5115	880335	4751	1702051
Hong Kong	70	229632	101	401683
UK	++	22039	1	38000
Singapore	-	-	48	27412
Macao	9	51643	3	19678
Austria	3	4061	2	3749
Taiwan	++	1605	++	2539
USA	++	9	2	2483
Italy	-	-	++	518
Germany	++	214	++	98
Other Countries	17	5878	++	9

*Figures rounded off*

**Table – 32: Imports of Magnesium Powder & Flakes  
(By Countries)**

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (` '000)	Qty (t)	Value (` '000)
<b>All Countries</b>	<b>2657</b>	<b>482988</b>	<b>1737</b>	<b>489485</b>
China	2369	383378	1699	450049
Belgium	57	57052	38	38601
Turkey	149	26023	++	371
Germany	16	4395	++	256
Austria	-	-	++	147
UK	-	-	++	36
USA	++	67	++	25
Russia	66	12039	-	-
Japan	++	26	-	-
UAE	++	8	-	-
Other Countries	-	-	-	-

*Figures rounded off*

## FUTURE OUTLOOK

The Refractory Industry that consumes magnesite to a large extent is experiencing a range of challenges. However, in India, the demand for refractories is not only promising but also encouraging as it rides on the prospects of the Cement and Steel Industries, the growth of which is projected to show an upward trend in the near future. The demand for magnesite is, therefore, likely to grow correspondingly.

As Indian magnesite generally contains either high silica or high lime, the need for beneficiation concomitantly arises.

Beneficiation methods of magnesite at economic cost which could yield high-grade material is probably a viable way to meet the demand for magnesite in the future.

India's Refractory Industry is set to continue its expansion and is likely to benefit from the Government's series of measures pitched specifically to stimulate the infrastructure development in the country. As the demand for

magnesite is expected to rise, significant steps to explore and exploit magnesite to meet the future demand would be the right way forward.

As, fused magnesia is expected to contribute high share among all product types of magnesite and thus increase the growth of the market in forecast years. Furthermore, magnesite's use as an additive in the cement industry is majorly driving the growth of the magnesite market.

Increasing use of magnesium oxide in growing demand for magnesite application in wastewater treatment, magnesia-based wallboards, and animal feed and are the key supporter for the positive impact on the growth of magnesite market over the forecast period.

On the other side, environmental and government regulations implemented on reducing environmental pollution emanating from steel production among other industries are major challenge faced by magnesite manufacturers. Moreover, magnesite substitutes are also hindering the growth of the market in future years.