

54 Magnesite

Magnesite ($MgCO_3$) is carbonate of magnesium. It is usually found as irregular veins in serpentine and formed by replacement of dolomite and limestone. Calcium and silica are, therefore, the most common impurities observed in magnesite along with Fe_2O_3 and Al_2O_3 . It is a very important mineral for the manufacture of basic refractories, which are 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 1000°C, and retaining 2 to 7% CO_2 as carbonate) and dead-burnt or refractory magnesite (magnesia obtained by calcining magnesite at high temperatures, 1500 to 1800°C, usually containing less than 0.5% CO_2). Pure magnesite calcined at still higher temperatures (1600 - 1800°C) to expel carbon dioxide completely is termed as 'periclase' (MgO) in the trade.

RESOURCES

The total reserves/resources of magnesite as per UNFC system as on 1.4.2005 are about 338 million tonnes of which reserves and remaining resources are 76 million tonnes and 262 million tonnes, respectively. Substantial quantities of resources are established in Uttarakhand (68%), followed by Rajasthan (16%) and Tamil Nadu (13%). 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 given in Table - 1.

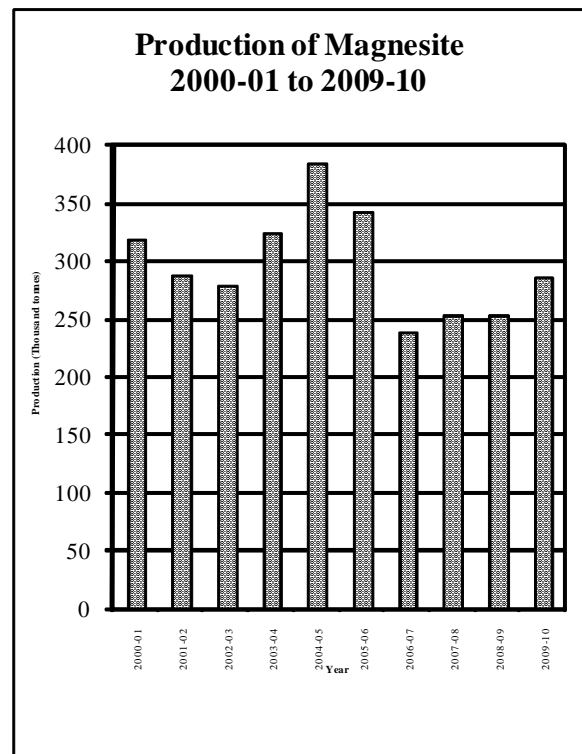
PRODUCTION, STOCKS & PRICES

Production of magnesite in 2009-10 at 286 thousand tonnes increased by 13% as compared to that in the previous year. There were 8 reporting mines in 2009-10 and 10 in the previous year. Five principal producers accounted for 94% of the total output during the year 2009-10. About 60% of the total production of magnesite was contributed by public sector during 2009-10 as against 59% in the preceding year.

Tamil Nadu continued to be the major producing state with maximum share of 78% in total output during 2009-10 followed by Uttarakhand 20% and the remaining 2% was contributed by Karnataka (Tables - 2 to 4).

Mine-head stocks at the end of the year were 73 thousand tonnes as against 77 thousand tonnes in the beginning of the year (Table - 5).

The average daily employment of labour during the year was 890 as against 770 in the previous year. The prices of magnesite are furnished in the General Review on Prices.



MAGNESITE

**Table – 1 : Reserves/Resources of Magnesite as on 1.4.2005
(By Grades/States)**

(In '000 tonnes)

State/Grade	Reserves			Remaining resources						Total Resources (A+B)		
	Proved STD111	Probable		Total (A)	Feasibility STD221	Pre- feasibility STD222	Measured STD331	Indicated STD332	Inferred STD333		Reconnaissance STD334	Total (B)
		STD121	STD122									
All India : Total	20863	10197	45073	76133	1363	15	59010	59752	141564	45	261749	337882
By Grades												
High grade	6	2169	2	2177	-	-	2	-	25	-	27	2204
Medium grade	11623	5432	4873	21928	27	12	4	99	7514	-	7656	29584
Beneficial/Low	3818	84	1970	5872	-	3	648	28318	108230	-	137199	143071
High & medium mixed	6	6	785	797	-	-	-	-	50	-	50	847
Medium & low mixed	3753	429	29237	33419	-	-	58271	31106	9149	-	98526	131945
High, medium & low mixed	-	2077	5335	7412	-	-	60	10	10248	-	10318	17730
Others	1656	-	2866	4522	1336	-	24	-	3096	-	4456	8978
Unclassified	-	-	-	-	-	-	-	-	83	-	83	83
Not-known	-	-	6	6	-	-	-	219	3170	45	3434	3440
By States												
Andhra Pradesh	-	-	-	-	-	-	-	-	80	-	80	80
Himachal Pradesh	-	-	-	-	-	-	-	100	198	-	298	298
Jammu & Kashmir	-	2813	-	2813	-	-	-	-	150	45	195	3008
Karnataka	243	6	777	1026	-	-	88	10	2734	-	2832	3858
Kerala	-	-	-	-	-	-	2	-	38	-	40	40
Rajasthan	1081	84	2118	3283	1336	3	-	149	49033	-	50521	53804
Tamil Nadu	12055	6692	9682	28429	27	12	17	737	16294	-	17087	45516
Uttarakhand	7483	602	32497	40582	-	-	58902	58756	73037	-	190695	231277

Figures rounded off.

MAGNESITE

Table – 2 : Principal Producers of Magnesite, 2009-10

Name & address of producer	Location of mine	
	State	District
Tamil Nadu Magnesite Ltd, 5/53, Olamur Main Road, Jagir Ammapalayam, Salem - 636 302, Tamil Nadu.	Tamil Nadu	Salem
Dalmia Maganesite Corpn. Ltd, Dalmia Cement (Bharat) Ltd, Salem-636 012, Tamil Nadu.	Tamil Nadu	Salem
Almora Magnesite Ltd, At Metela, P.O. Billori, Bageshwar, Uttarakhand.	Uttarakhand	Bageshwar
S. Sunder Rajan, Gori medu, Periagolapatti, Post - Kannankurchi, Salem - 636 008, Tamil Nadu.	Tamil Nadu	Salem
Smt. K. M. Kamla. Door No. 107, RKM house, State Bank Colony, Phase III Salem- 636 004, Tamil Nadu.	Tamil Nadu	Salem

**Table – 3 : Production of Magnestie, 2007-08 to 2009-10
(By States)**

(Qty in tonnes; value in Rs. '000)

State	2007-08		2008-09		2009-10(P)	
	Quantity	Value	Quantity	Value	Quantity	Value
India	252849	334310	252880	363514	286383	422567
Karnataka	5270	10132	9591	14668	6250	12440
Tamil Nadu	183602	256826	188564	281693	221601	343422
Uttarakhand	63977	67352	54725	67153	58532	66705

**Table – 4 : Production of Magnestie, 2008-09 & 2009-10
(By Sectors/States/Districts)**

(Qty. in tonnes; value in Rs. '000)

State/District	2008-09			2009-10(P)		
	No. of mines	Quantity	Value	No. of mines	Quantity	Value
India	10	252880	363514	8	286383	422567
Public sector	4	148971	209648	4	170760	240319
Private sector	6	103909	153866	4	115623	182248
Karnataka	3	9591	14668	2	6250	12440
Mysore	3	9591	14668	2	6250	12440
Tamil Nadu	5	188564	281693	4	221601	343422
Namakkal	1	103	26	-	-	-
Salem	4	188461	281667	4	221601	343422
Uttarakhand	2	54725	67153	2	58532	66705
Bageshwar	1	43828	56801	1	46564	59217
Pithoragarh	1	10897	10352	1	11968	7488

MAGNESITE

**Table – 5 : Mine-head Stocks of Magnesite
2009-10(P)
(By States)**

State	At the beginning of the year	At the end of the year
India	77385	73243
Karnataka	5466	4528
Tamil Nadu	71752	68197
Uttarakhand	167	518

MINING AND MARKETING

Magnesite is being worked by opencast method by developing benches up to 7.5 m height and width up to 45.50 m. In Salem area (Tamil Nadu), magnesite is found chiefly as encrustations, veins and stringers in ultra basic rocks like dunite and peridotite. Stringers and veins occurring irregularly in fractures of rocks giving rise to different patterns, such as, cross-veins, stockworks and ladder veins are broken and magnesite is sorted out. Major magnesite producing mines in Salem area belong to Tamil Nadu Magnesite Ltd (a State Government Undertaking), Dalmia Magnesite Corporation (a private sector enterprise) and Burn Standard Company (a Central Government Undertaking). These mines, by and large, are mechanised and use compressors, wagon drills, jackhammers, power shovels, loaders, dumpers, dozers and pumps. Normally, Ammonium Nitrate Fuel Oil Mixture (ANFO) with about 15% of high explosives as booster is used for blasting. The powder factor may go up to 10. The blasted rock or run-of-mine material containing 25 to 30% magnesite in situ is subjected to manual sorting.

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. Magnesite mine

in Karnataka is worked by Tata Steel. In Uttarakhand, Almora Magnesite Ltd and Magnesite & Minerals Ltd are the important producers having mines in Bageshwar and Pithoragarh districts, respectively.

Magnesite is marketed generally after calcination; that is, after converting it into lightly calcined or caustic magnesite by heating the mineral to 800° to 1000°C and dead-burnt variety to 1800°C.

USES AND SPECIFICATIONS

The major proportion (about 98%) of magnesite mined is used for conversion in 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. 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. Caustic calcined magnesite is used for 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 was used as cooking liquor for preparing pulp. It is also used in textile, rubber, glass, ceramic, etc. 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

In India, about 96% consumption is accounted by refractory industry. In the manufacture of refractories, deleterious constituents are SiO₂, CaO, Fe₂O₃ and Al₂O₃. 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

MAGNESITE

different qualities of dead-burnt magnesite prior to brick making.

Indian steel plants use domestic dead-burnt magnesite (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), SiO₂ 2.5% (max) and CaO 1.5% (max).

The BIS has prescribed the IS specification (14303-1995, Reaffirmed 1999) for magnesite for use in refractory industry. The said specification has laid down five grades of magnesite as follows:

S. No.	Constituent	Requirements, Percent				
		Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
i)	MgO, min	45.00	43.00	42.50	45.00	43.00
ii)	CaO, max	0.75	0.75	0.75	2.00	2.00
iii)	Al ₂ O ₃ , max	0.50	0.50	0.50	0.50	0.50
iv)	Fe ₂ O ₃ , max	0.50	0.50	0.50	2.50	2.00
v)	SiO ₂ , max	2.00	3.00	4.00	1.00	2.00
vi)	Size*	25-75 mm	25-75 mm	25-75 mm	50-100 mm	50-100 mm

* Unless and otherwise agreed to.

Chemical Industry

The BIS specification (IS : 3607-1979, First Revision, Reaffirmed 2003) has prescribed the following specifications for magnesite for use in chemical industry:

S.No.	Characteristic	Requirement
i)	Loss on ignition, percent by mass, min	48.0
ii)	Silica (as SiO ₂), percent by mass, max	2.0
iii)	Alumina (as Al ₂ O ₃), percent by mass, max	0.3
iv)	Iron oxide (Fe ₂ O ₃), percent by mass, max	0.4
v)	Magnesium (as MgO), percent by mass, min	45.0
vi)	Calcium (as CaO), percent by mass, max	1.0

CONSUMPTION

Reported consumption of magnesite decreased to 282 thousand tonnes in 2009-10 against 321 thousand tonnes in 2008-09 because of lower consumption reported by refractory industry. Almost 97% consumption was reported for refractory purposes (including iron and steel plants). Chemical industry consumed magnesite for producing magnesium sulphate. Magnesite consumption pattern by industries is shown in Table - 6.

**Table – 6 : Reported Consumption of Magnesite¹
2007-08 to 2009-10
(By Industries)**

Industry	(In tonnes)		
	2007-08	2008-09(R)	2009-10(P)
All Industries	246100	320800	282300
Alloy steel (as refractory)	1200 (2)	1600 (2)	1600 (2)
Ferro-alloys	2500 (7)	4500 (9)	3100 (9)
Foundry (as refractory)	900 (5)	900 (5)	1100 (6)
Paper	1800 (1)	1800 (1)	1800 (1)
Refractory ² (including Iron & steel)	239300 (42)	311600 (44)	274300 (44)
Others (abrasive, asbestos products, ceramic, chemical, glass and rubber).	400(10)	400(10)	400(10)

Figures rounded off. Data collected on non-statutory basis. Figures in parentheses denote the number of units in organised sector reporting* consumption.

(*Includes actual reported consumption and/or estimates made wherever required).

1: Includes consumption of imported magnesite and magnesite equivalent to dead-burnt magnesite.

2: Besides, imported sea water magnesia which was about 5,000 tonnes each during 2007-08, 2008-09 and 2009-10 was also consumed in refractory industry.

MAGNESITE

INDUSTRY

Dead-burnt Magnesite (DBM)

When the raw magnesite is calcined between 1660-1800° C, carbon dioxide is expelled completely and a dense product 'dead-burnt magnesite' is obtained. Dead-burnt magnesite refers to the magnesite that is unreactive, namely 'dead' because it has been calcined at a temperature high enough to enable it to be used in brick making or monolithic hearths without undue difficulty arising out of hydration or shrinkage.

Caustic Magnesia

Low calcined magnesite, also known as caustic magnesia, is obtained by calcining magnesite in a shaft or rotary kiln between 800 and 1000° C. Because of incomplete dissociation, it still contains 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 2500 and 3000° 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.

There were fourteen major plants manufacturing dead-burnt magnesite and six plants producing lightly-calcined magnesite, two magnesium metal extracting plants, one pilot plant and one plant of seawater magnesia (Table - 7). By-product magnesium carbonate and other magnesium salts were also produced during salt manufacture from seawater. Tamil Nadu Magnesite Ltd, (Tanmag) is one of the largest producers producing DBM in a rotary kiln, sintered at 1750° C. In addition, it has five oil fired vertical shaft kilns which heat magnesite to 1000-1100° C for caustic calcined grades.

Table - 7 : Manufacturing Plants of Dead-Burnt Magnesite (DBM) , Lightly Calcined Magnesite, etc.

Name of the plant	Location	Installed capacity (tpy)
Tamil Nadu Magnesite Ltd	Salem, Tamil Nadu	30000 (DBM) 19,500 (calcined magnesite)
Ramakrishna Magnesite Mines	-do-	3000 (calcined magnesite)
Burn Standard Co. Ltd	-do-	54000 (DBM) 18000 (calcined magnesite)
Dalmia Magnesite Corporation	-do-	72,000 (DBM)
Salem Refractories	-do-	18000 (DBM)
Badrinath Refractory	-do-	900 (DBM) 2000 (calcined magnesite)
Khaitan Hostambe Spinel	-do-	30000 (DBM) 10000 (magnesite chrome clinker)
Ponkumar Magnesite Ltd	-do-	26500 (DBM)
Tamil Nadu Products Ltd	-do-	3000 (calcined magnesite)
Tata Refractories Ltd	-do-	25000 (DBM) 2000 (calcined magnesite)
Orissa Industries Ltd	Barang, Sundergarh, Odisha	5000 (DBM)
-do-	Chandak, Pithoragarh, Uttarakhand	45000 (DBM)
Almora Magnesite Ltd	Haldwani, Bageshwar, Uttarakhand	30,000 (DBM, calcined semicalcined magnesite)
Magnesite & Minerals Ltd	Pithoragarh, Uttarakhand	45000 (DBM)
Himalayan Magnesite Ltd	-do-	20000 (DBM) 3000 (calcined magnesite)
J & K Minerals Ltd	Chipprian, Panthal, Udhampur, Jammu & Kashmir	30000 (DBM) 75000 (sized magnesite)
Hansaflon Plastochem Ltd	NA	1500 (Fused magnesia)
Birla Periclase (Presently closed)	Visakha-patnam, Andhra Pradesh	50000 (seawater magnesia)

Sea Water Magnesia (SWM)

SEA water or lake bitterns is an alternative source to obtain magnesia by chemical reaction. The main 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 needs to be processed to obtain a kilogram magnesia. The sea water magnesia can be used to manufacture dead-burnt magnesite, caustic magnesia and the magnesium compounds.

Birla Periclase, Visakhapatnam, Andhra Pradesh, had commenced commercial production of sea water magnesia in February 1998. The installed capacity of the plant was 50,000 tonnes per annum. For the extraction of sea water magnesia, high purity limestone is needed. The plant had suspended production operations since December 1998.

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 8,956 tonnes and 8,550 tonnes production of magnesium chloride in 2008-09 and 2009-10, respectively. The production is normally reported from the salt pans in Tuticorin, Tamil Nadu and Jamnagar-Gandhidham, Gujarat.

Magnesium Metal

India's primary magnesium metal production capacity is estimated at 900 tpy. Tamil Nadu Magnesium & Marine Chemical Ltd (TMML), Salem, Tamil Nadu, has suspended production since 1992. Southern Magnesium & Chemical Ltd is likely to be the sole producer in India with 600 tpy capacity. India's production of primary magnesium metal was estimated at 200 tonnes per annum during the years 2007 to 2009 (Table - 8).

TRADE POLICY

As per the amended Foreign Trade Policy (FTP) 2004-2009, as effective from 1.4.2008, exports and imports of all grades and varieties of magnesite under heading no. 2519 are allowed freely.

Table – 8 : Magnesium Metal Extracting Pilot Plants

Name of plant	Location	Pilot/Metal extracting plant
Central Electro-Chemical Research Institute (CECRI)	Karaikudi, Tamil Nadu.	Pilot plant
Southern Magnesium & Chemical Ltd	Rajahmundry, Andhra Pradesh	Metal extracting plant
Tamil Nadu Magnesium & Marine Chemicals Ltd	Tamil Nadu	-do-

WORLD REVIEW

The world reserves of magnesite was estimated at around 2,300 million tonnes, excluding large resources of magnesium-bearing substitutes, such as, dolomite, brucite and olivine. Further, magnesium compounds could be recovered economically from well and lake brines and from sea water. The latter, which contains 0.13% magnesium by weight, was a major source of metal and compounds. The world reserves of magnesite are given in Table -10.

The world production of magnesite was estimated at 24.3 million tonnes in 2009. China continued to be the leading producer, accounting for about 62% production, followed by Russia (11%), Turkey (8%), and Democratic People's Republic of Korea (5%). The world production of magnesite is given in Table -11.

Worldwide, over 98% raw ore producers convert it to magnesia for commercial application, mainly in refractory industry (75%) based on both the sintered and fused forms generally called DBM and electrofused magnesia (EFM), respectively, for lining furnaces used in steel production, non-ferrous metals, cement, glass, ceramic and petrochemicals. The remaining 25% magnesia output is used in agriculture, insulation and for environmental purposes. EFM market is mainly in refractory and electrical industries. China accounts for around 80% world EFM production. Caustic-calcined magnesia (CCM) obtained from sea water and brines is used mainly for agricultural applications, construction and paper processing. Major producers of CCM are China, Greece, Spain, Austria, Slovakia and Brazil. Primary producers of magnesium metal and alloys were China, Canada, Russia and USA. The consuming market segments are aluminium alloying, die-casting and desulphurisation.

MAGNESITE

**Table – 9 : World Reserves of Magnesite
(By Principal Countries)**

(In '000 tonnes of magnesium content)

Country	Reserves
World : Total (rounded)	2300000
Australia	100000
Austria	15000
Brazil	99000
China	400000
Greece	30000
India*	1400
Korea, North	450000
Russia	650000
Slovakia	36000
Spain	1000
Turkey	49000
USA	10000
Other countries	390000

Source: Mineral Commodity Summaries, 2010.

**As Per UNFC System, as on 1.4.2005, the total resources of magnesite in India are estimated at 338 million tonnes.*

**Table – 10 : World Production of Magnesite
(By Principal Countries)**

(In 000 tonnes)

Country	2007	2008	2009
World : Total	24100	25600	24300
Australia	343	150 ^(e)	372 ^(e)
Austria	812	837	545
Brazil	399	421	350
China	14000 ^(e)	15600 ^(e)	15000 ^(e)
Greece	351	361	381
India*	253	246	286
Korea, Dem. P. R. of	1200 ^(e)	1200 ^(e)	1200 ^(e)
Russia	2600 ^(e)	2600 ^(e)	2600 ^(e)
Slovakia	957	806	478
Spain	464	441 ^(e)	434 ^(e)
Turkey	1985	2143	2000
Other countries	718	795	654

Source: World Mineral Production, 2005-2009.

** India's production of magnesite in 2007-08, 2008-09 and 2009-10 was 252.8 thousand tonnes, 252.9 thousand tonnes and 286.4 thousand tonnes, respectively.*

FOREIGN TRADE

Exports

The exports of magnesite decreased to 10,595 tonnes in 2009-10 from 12,284 tonnes in the previous year. Out of total exports in 2009-10, those of fused magnesia were just 6 tonnes, non-calcined magnesite 625 tonnes, calcined magnesite 38 tonnes, other magnesite 3,711 tonnes, magnesium oxide 6,139 tonnes and 76 tonnes of dead-burnt magnesite. Exports were mainly to Netherlands (32%) Saudi Arabia (15%) and UAE (14%). Exports of magnesium and scrap were 25 tonnes in 2009-10 compared to 152 tonnes in the previous year. Exports were mainly to USA, Singapore and Nepal (Tables - 11 to 18).

Imports

Imports of magnesite increased to 66,118 tonnes in 2009-10 from 51,422 tonnes in the previous year. Out of total imports in 2009-10, those of fused magnesia were 11,846 tonnes, non-calcined magnesite 412 tonnes, calcined magnesite 21,758 tonnes, dead-burnt magnesia 13,950 tonnes, other magnesite 13,475 tonnes and magnesium oxide 4,677 tonnes. Imports were mainly from Ireland (48%) followed by China (35%) and Japan (8%). Imports of magnesium and scrap increased to 8,644 tonnes in 2009-10 from 7,745 tonnes in the previous year. Imports were mainly from China (Tables - 19 to 26).

**Table – 11 : Exports of Magnesite : Total
(By Countries)**

Country	2008-09		2009-10	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	12284	136358	10595	141740
Netherlands	5217	56990	3407	45224
Saudi Arabia	1916	23016	1618	21877
Djibouti	345	4564	428	5624
UAE	336	3874	1498	21775
Bahrain	85	1545	444	6433
Egypt	230	2772	316	5054
Indonesia	539	5518	439	4437
Syria	482	6910	125	1893
Sudan	295	3761	164	2741
South Africa	550	7695	25	304
Other countries	2289	19713	2131	26378

MAGNESITE

**Table – 12 : Exports of Magnesia (Fused)
(By Countries)**

Country	2008-09		2009-10	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	758	7820	6	23
Netherlands	620	6450	-	-
Germany	-	-	6	23
Bhutan	138	1370	-	-

**Table – 13 : Exports of Magnesite (Not Calcined)
(By Countries)**

Country	2008-09		2009-10	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	459	6301	625	8425
Thailand	-	-	50	1753
Philippines	54	2705	38	1747
UAE	30	164	100	1485
Sri Lanka	53	196	252	1443
Bangladesh	70	946	11	7
Jordan	6	242	74	908
Oman	27	285	14	465
Nepal	90	272	36	171
Ghana	24	495	11	86
Syria	32	445	-	-
Other countries	73	551	39	360

**Table – 14 : Exports of Magnesite (Calcined)
(By Countries)**

Country	2008-09		2009-10	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	75	785	38	671
Djibouti	35	536	24	372
Sudan	40	249	13	287
Germany	-	-	++	8
Uganda	-	-	1	3
Other countries	-	-	++	1

**Table – 15 : Exports of Magnesite:
Dead-Burnt Magnesia
(By Countries)**

Country	2008-09		2009-10	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	25	490	76	1390
UAE	25	490	76	1385
Germany	-	-	++	5

**Table – 16 : Exports of Magnesium Oxide
(By Countries)**

Country	2008-09		2009-10	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	7640	82556	6139	78132
Saudi Arabia	1911	22650	1549	20470
Netherlands	1897	17941	1577	16313
Djibouti	310	4028	270	3553
U A E	250	2754	605	7670
Egypt	82	1634	62	926
Indonesia	524	5441	420	4288
Syria	450	6465	125	1893
South Africa	550	7695	25	304
Bahrain	60	853	420	5880
Sudan	255	3512	151	2447
Other countries	1351	9583	935	14388

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

Country	2008-09		2009-10	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	3327	38406	3711	53099
Netherlands	2700	32599	1830	28911
Djibouti	-	-	134	1699
Egypt	148	1138	254	4128
Saudi Arabia	++	1	69	1407
UAE	31	466	717	11235
Spain	20	296	40	500
Nepal	211	1785	108	432
Nigeria	42	348	143	1176
Thailand	-	-	33	1104
Bahrain	25	692	24	553
Other countries	150	1081	359	1954

MAGNESITE

**Table – 18 : Exports of Magnesium & Scrap
(By Countries)**

Country	2008-09		2009-10	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	152	24255	25	9405
Singapore	4	1095	4	2484
USA	1	715	5	906
UK	2	658	-	-
UAE	++	14	2	2171
Nepal	4	629	4	643
Thailand	-	-	2	933
Kenya	8	1706	++	162
Saudi Arabia	-	-	3	799
Nigeria	108	12912	-	-
Netherlands	20	4549	-	-
Other countries	5	1977	5	1307

**Table – 19: Imports of Magnesite : Total
(By Countries)**

Country	2008-09		2009-10	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	51422	1427008	66118	2053876
China	22650	573284	23351	529510
Ireland	13634	403772	31629	1096329
Japan	3240	101544	5446	225207
Australia	4065	89900	1096	35077
Netherlands	2688	84033	330	14294
USA	609	33986	622	31809
Slovak Rep.	2037	44402	1296	26081
Israel	97	7857	230	20414
Germany	200	17531	55	8104
Vietnam	1199	33588	-	-
Other countries	1003	37111	2063	67051

**Table – 20 : Imports of Magnesia (Fused)
(By Countries)**

Country	2008-09		2009-10	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	10854	332290	11846	327914
China	9686	299958	10986	302145
Ireland	765	23500	431	12884
Japan	150	3605	221	7682
Australia	204	2207	181	3889
Mexico	49	3020	-	-
UK	-	-	5	518
Chinese Taipei/ Taiwan	-	-	14	511
Indonesia	-	-	8	285

**Table – 21 : Imports of Magnesite
(Not Calcined)
(By Countries)**

Country	2008-09		2009-10	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	441	9389	412	17890
Japan	245	6699	379	12907
Denmark	100	1438	-	-
China	96	1207	-	-
Israel	-	-	32	4765
France	-	-	1	151
USA	-	-	++	67
Thailand	++	45	-	-

**Table – 22 : Imports of Magnesite
(Calcined)
(By Countries)**

Country	2008-09		2009-10	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	12992	381550	21758	752797
Ireland	11434	337356	21185	735933
China	27	204	71	939
Japan	4	377	19	1701
Spain	-	-	425	12567
Czech Republic	40	1127	40	1101
Greece	-	-	16	515
Belgium	-	-	2	41
Netherlands	1487	42485	-	-
Other countries	++	1	-	-

MAGNESITE

**Table – 23 : Imports of Magnesite : Dead-Burnt Magnesia
(By Countries)**

Country	2008-09		2009-10	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	19669	431172	13950	267092
China	12122	246496	11095	189794
Australia	3555	81319	913	31124
Slovak Republic	2037	44402	1296	26081
Netherlands	440	17241	270	12280
Slovenia	–	–	336	6610
Czech Republic	80	2088	–	–
Germany	60	1749	–	–
Ireland	24	1177	–	–
Korea, Republic of	99	2710	–	–
Vietnam	1199	33588	–	–
Other countries	53	402	40	1203

**Table – 24 : Imports of Magnesite (Other)
(By Countries)**

Country	2008-09		2009-10	
	Qty (t)	Value (Rs. '000)	Qty (t)	Value (Rs. '000)
All Countries	3133	89815	13475	455700
Japan	893	22773	3314	109494
Ireland	1196	35576	9229	318747
Australia	306	6374	–	–
China	127	3789	515	15436
Netherlands	261	7840	60	2014
UK	1	690	3	343
Germany	74	4982	2	119
Italy	204	5950	–	–
Spain	21	210	27	598
Korea, Republic of	35	1018	306	7915
Other countries	15	613	19	1034

MAGNESITE

**Table – 25 : Imports of Magnesium Oxide
(By Countries)**

Country	2008-09		2009-10	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	4333	182792	4677	232483
Japan	1948	68090	1513	93423
China	592	21630	684	21196
USA	609	33973	613	31106
Israel	97	7857	198	15649
Germany	66	10800	53	7985
UK	141	7370	83	5461
France	39	5570	9	2798
Netherlands	500	16467	–	–
Greece	44	1400	220	8329
Ireland	215	6163	784	28765
Other countries	82	3472	520	17771

**Table – 26 : Imports of Magnesium & Scrap
(By Countries)**

Country	2008-09		2009-10	
	Qty (t)	Value (Rs.'000)	Qty (t)	Value (Rs.'000)
All Countries	7745	1640852	8644	1333187
China	7518	1574154	8280	1251707
UK	2	7514	11	17084
Korea, Republic of	39	8297	1	2326
USA	3	2862	2	2782
Austria	4	6349	7	12103
Russia	22	13060	++	3596
Mexico	–	–	82	7933
Switzerland	11	7344	++	45
Nigeria	–	–	128	11502
Italy	7	3918	11	8105
Other countries	139	17354	122	16004

FUTURE OUTLOOK

Indian refractory industry, where magnesite is used more than 90%, is experiencing range of challenges. Demand for refractories is promising with India's cement and steel industries growing.

The non-refractory markets will also see strong demand particularly environmental, flame retardants and hydrometallurgy. There is need to explore and exploit magnesite for future demand.