

8.1 WOLLASTONITE

Introduction

Wollastonite, a metasilicate of calcium having the formula (CaSiO_3) usually occurs as aggregate of bladed or needle like crystals. It is generally white in colour, has a specific gravity of 2.8 to 3, hardness 4.5 to 5 and melting point of about 1540°C . Excellent dielectric properties, high resistance to heat, chemical inertness and brilliant whiteness in powdered state are some of the qualities for which it is valued in various industries. Ceramic industry accounts for substantial consumption of wollastonite as a filler. Other uses of wollastonite are as a filler in ceramic floor and wall tiles, marine wall board, paint, plastics and refractory liners in steel mills, and as a partial replacement for short-fiber asbestos in certain applications. It is also used in polymer industries.

The use of wollastonite depends on accicularity or the aspect ratio i.e. ratio between length and width of a crystal. Wollastonite with aspect ratio in the range of 3:1 to 5:1 has little potential for reinforcing applications and hence market is primarily confined to ceramics, metallurgical fluxes, simpler filler and coating applications. Wollastonite with aspect ratio in the range of 15:1 to 20:1 is considered as a semi-fibrous and can be used as replacement for asbestos and finds high potential growth as a performance filler for strengthening various plastic and resin systems of daily use.

Basis of Grade Classification

The end-use grade classification of Wollastonite adopted in the inventory as on 1.4.2010 is given below:

- | | |
|-----------------|---|
| 1. Marketable | $\text{CaO} + \text{SiO}_2$: 96.5% (min)
Fe_2O_3 : 0.5% (max)
Al_2O_3 : 1.5% (max)
LOI : 2.0% (max) |
| 2. Unclassified | Where the range of chemical constituents vary widely. |
| 3. Beneficiable | 35% (minimum) Wollastonite content. |
| 4. Not Known | Where chemical analysis data is not reported |

Basis of Categorisation of Resources

As per the United Nations Framework Classification (UNFC), the resources are broadly

classified into 'reserves' and 'remaining resources'.

According to the norms of this system reserves of wollastonite have been placed under proved (111) and probable (121), (122) categories, whereas the remaining resources have been placed under feasibility (211), pre-feasibility (221), (222), measured (331), indicated (332) and inferred (333) categories.

Salient Features of the Inventory

The total resources of wollastonite in the country as on 1.4.2015 have been estimated at 16.5 million tonnes. Out of these, about 2.2 million tonnes (13.6%) have been placed under reserves category and 14.2 million tonnes (86.4%) under remaining resources category. Of the total resources, about 9.1 million tonnes (55%) are in freehold and the rest 7.3 million tonnes (45%) in leasehold private areas.

All India scenario of wollastonite reserves, remaining resources and total resources as on 1.4.2015 vis-a-vis 1.4.2010 have been given in Tables 1 and 2. The tables give an idea about the significant changes in terms of increase or decrease of resources as per lease status, grade, and states. In Table - 3 district wise reserves/resources as on 1.4.2015 have been given.

Out of the total resources estimated as on 1.4.2015, about 7.87 million tonnes (47.7%) constitutes marketable grade, 8.5 million tonnes (51.72%) unclassified grade and 0.07 million tonnes (0.4%) are placed under 'not known' grade.

By states, about 88% (14.47 million tonnes) of the total resources are reported from by Rajasthan, followed by Gujarat 12% (1.9 million tonnes) and a negligible quantity in Tamil Nadu.

A decrease of about 0.1 million tonnes resources has been recorded in the present inventory as compared to inventory as on 1.4.2010. The entire decrease of resources is in Rajasthan due to downward revision in the resources of existing deposits.

One new deposit with resources of about 0.24 million tonnes in lease hold private sector in Rajasthan was included in the current inventory as on 1.4.2015.

Table - 1 : Reserves/Resources of Wollastonite as on 1.4.2015 vis-à-vis 1.4.2010
(By Lease Status/Grade)

Lease status/Grade	Reserves			Remaining resources			Total resources		
	1.4.2015	1.4.2010	Net change	1.4.2015	1.4.2010	Net change	1.4.2015	1.4.2010	Net change
	(In tonne)								
All India : Total	2241462	2487122	(-)245660	14227824	14082751	(+)145073	16469286	16569873	(-)100587
Marketable	2150637	2487122	(-)336485	5721618	5721618	No change	7872255	8208740	(-)336485
Unclassified	90825	-	(+)90825	8427596	8282523	(+)145073	8518421	8282523	(+)235898
Not Known	-	-	-	78610	78610	No change	78610	78610	No Change
Freehold	-	-	-	9130931	9124851	(+)6080	9130931	9124851	(+)6080
Marketable	-	-	-	3682479	3676599	(+)5880	3682479	3676599	(+)5880
Unclassified	-	-	-	5369842	5369842	No change	5369842	5369842	No Change
Not Known	-	-	-	78610	78410	(+)200	78610	78410	(+)200
Leasehold (Private)	2241462	2487122	(-)245660	5096893	4957700	(+)139193	7338355	7444822	(-)106467
Marketable	2150637	2487122	(-)336485	2039139	2045019	(-)5880	4189776	4532141	(-)342365
Unclassified	90825	-	(+)90825	3057754	2912681	(+)145073	3148579	2912681	(+)235898
Leasehold (Public)	-	-	-	-	200	(-)200	-	200	(-)200
Not Known	-	-	-	-	200	(-)200	-	200	(-)200

figures rounded off.

About 3.3 million tonnes (20%) of the total resources of wollastonite have been estimated under inferred category. These resources are based on a preliminary and limited exploration. If these areas are explored in detail, the confidence level of resource endowment of wollastonite in the country may improve.

A total 14 deposits of wollastonite have been covered in National Mineral Inventory as on 1.4.2015. Out of these, 9 deposits are in freehold and 5 deposits are in leasehold private sector.

**Table – 2 : Total Resources of Wollastonite as on 1.4.2015 vis-à-vis 1.4.2010
(By States)**

(In tonne)

State	Total Resources		Net Change
	As on 1.4.2015	As on 1.4.2010	
All India	16469286	16569873	(-) 100587
Gujarat	1990000	1990000	No Change
Rajasthan	14475753	14576340	(-) 100587
Tamil Nadu	3533	3533	No Change

figures rounded off.

Table - 3 : District wise Reserves/Resources of Wollastonite as on 1.4.2015

(In tonne)

State/District	Reserves	Remaining Resources	Total Resources
All India : Total	2241462	14227824	16469286
Gujarat	-	1990000	1990000
Banaskantha	-	1990000	1990000
Rajasthan	2241462	12234291	14475753
Ajmer	90825	3548952	3639777
Dungarpur	-	54800	54800
Pali	2095690	1095051	3190741
Sirohi	54947	3749354	3804301
Udaipur	-	3786134	3786134
Tamil Nadu	-	3533	3533
Dharmapuri	-	3333	3333
Tirunelveli	-	200	200

figures rounded off.