

## 8.1 WOLLASTONITE

### Introduction

Wollastonite, a calcium inosilicate mineral having the formula ( $\text{CaSiO}_3$ ) 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  $1540^\circ\text{C}$ . 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 raisin systems of daily use.

### Basis of Grade Classification

The end-use grade classification of Wollastonite adopted in the inventory as on 1.4.2020 is given below:

- |                 |  |
|-----------------|--|
| 1. Marketable   | CaO + $\text{SiO}_2$ : 96.5% ( min)<br>Fe <sub>2</sub> O <sub>3</sub> : 0.5% ( max)<br>Al <sub>2</sub> O <sub>3</sub> : 1.5% (max)<br>LOI : 2.0% (max) |
| 2. Unclassified | Where the range of chemical constituents vary widely.  |
| 3. Beneficial   | 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), inferred (333) and reconnaissance (334) categories.

### Salient Features of the Inventory

The total resources of wollastonite in the country as on 1.4.2020 have been estimated at 25.11 million tonnes. Out of these, about 2.68 million tonnes (10.67%) have been placed under reserves category and 22.43 million tonnes (89.32%) under remaining resources category. Of the total resources, about 9.25 million tonnes (36.84%) are in freehold and the rest 15.86 million tonnes (63.16%) in leasehold private areas.

All India scenario of wollastonite reserves, remaining resources and total resources as on 1.4.2020 vis-a-vis 1.4.2015 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 1.4.2020 have been given.

Out of the total resources estimated as on 1.4.2020, about 10.95 million tonnes (43.62%) constitutes marketable grade, 11.30 million tonnes (45.02%) unclassified grade and 2.85 million tonnes (11.36%) are placed under 'not known' grade.

By states, about 92% (23.11 million tonnes) of the total resources are reported from by Rajasthan, followed by Gujarat 8% (2.0 million tonnes) and a negligible quantity in Tamil Nadu.

An overall increase of about 8.64 million tonnes resources has been recorded in the present inventory as compared to inventory as on 01.04.2015. The entire increase of resources is reported in Rajasthan due to addition of twelve new freehold deposits with resources of about 5.47 million tonne and two new leasehold private deposits with resources of about 4.05 million tonnes. However, resources has been

**Table - 1 : Reserves/Resources of Wollastonite as on 01.04.2020 vis-à-vis 01.04.2015  
(By Lease Status/Grade)**

Lease status/Grade	Reserves			Remaining resources			Total resources		
	01.04.2020	01.04.2015	Net change	01.04.2020	01.04.2015	Net change	01.04.2020	01.04.2015	Net change
	(In Tonne)								
<b>All India : Total</b>	<b>2,680,978</b>	<b>2,241,462</b>	<b>(+)439,516</b>	<b>22,427,488</b>	<b>14,227,824</b>	<b>(+)8,199,664</b>	<b>25,108,466</b>	<b>16,469,286</b>	<b>(+)8,639,180</b>
Marketable	1,790,818	2,150,637	(-)359,819	9,161,800	5,721,618	(+)3,440,182	10,952,618	7,872,255	(+)3,080,363
Unclassified	639,945	90,825	(+)549,120	10,662,900	8,427,596	(+)2,235,304	11,302,845	8,518,421	(+)2,784,424
Not Known	250,215	-	(+)250,215	2,602,788	78,610	(+)2,524,178	2,853,003	78,610	(+)2,774,393
<b>Freehold</b>	-	-	-	<b>9,249,307</b>	<b>9,130,931</b>	<b>(+)118,376</b>	<b>9,249,307</b>	<b>9,130,931</b>	<b>(+)118,376</b>
Marketable	-	-	-	3,800,855	3,682,479	(+)1,18,376	3,800,855	3,682,479	(+)118,376
Unclassified	-	-	-	5,369,842	5,369,842	No change	5,369,842	5,369,842	No Change
Not Known	-	-	-	78,610	78,610	No change	78,610	78,610	No change
<b>Leasehold (Private)</b>	<b>2,680,978</b>	<b>2,241,462</b>	<b>(+)439,516</b>	<b>13,178,181</b>	<b>5,096,893</b>	<b>(+)8,081,288</b>	<b>15,859,159</b>	<b>7,338,355</b>	<b>(+)8,520,804</b>
Marketable	1,790,818	2,150,637	(-)359,819	5,360,945	2,039,139	(+)3,321,806	7,151,763	4,189,776	(+)2,961,987
Unclassified	639,945	90,825	(+)549,120	5,293,058	3,057,754	(+)2,235,304	5,933,003	3,148,579	(+)2,784,424
Not Known	250,215	-	(+)250,215	2,524,178	-	(+)2,524,178	2,774,393	-	(+)2,774,393

*figures rounded off.*

National Mineral Inventory - An Overview

decreased by 0.88 million tonnes due to re-estimation of resources in private leasehold deposits.

About 4.73 million tonnes (18.86%) of the total resources of wollastonite have been estimated under inferred and reconnaissance categories. 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 24 deposits of wollastonite have been covered in National Mineral Inventory as on 01.04.2020. Out of these, 9 deposits are in freehold and 15 deposits are in leasehold private sector.

**Table – 2 : Total Resources of Wollastonite as on 01.04.2020 vis-à-vis 01.04.2015 (By States)**

State	Total Resources		Net Change
	As on 01.04.2020	As on 01.04.2015	
	<b>All India</b>	<b>25,108,466</b>	
Gujarat	1,990,000	1,990,000	No Change
Rajasthan	23,114,933	14,475,753	(+) 8,639,180
Tamil Nadu	3,533	3,533	No Change

*figures rounded off.*

**Table - 3 : District wise Reserves/Resources of Wollastonite as on 01.04.2020**

State Name	District Name	Reserves	Remaining Resources	Total Resources
<b>All India : Total</b>		<b>2,680,978</b>	<b>22,427,488</b>	<b>25,108,466</b>
<b>Gujarat</b>		-	<b>1,990,000</b>	<b>1,990,000</b>
	Banaskantha	-	1,990,000	1,990,000
<b>Rajasthan</b>		<b>2,680,978</b>	<b>20,433,955</b>	<b>23,114,933</b>
	Ajmer	639,945	8,108,309	8,748,254
	Dungarpur	-	54,800	54,800
	Pali	2,041,033	5,561,070	7,602,103
	Sirohi	-	3,791,642	3,791,642
	Udaipur	-	2,918,134	2,918,134
<b>Tamil Nadu</b>		-	<b>3,533</b>	<b>3,533</b>
	Dharmapuri	-	3,333	3,333
	Tirunelveli	-	200	200

*figures rounded off.*