



## VERMICULITE – PRODUCT DATA SHEET

### **1. DESCRIPTION**

- 1.1. Vermiculite is a hydrated Magnesium-Iron-Aluminum-Silicate similar to Mica in appearance. Mostly the Vermiculite is formed by Hydration and Oxidation from flogopites-biotites.
- 1.2. When properly heated in high Temperature the Vermiculite has the unusual property of expanding or exfoliating into worm-like particles. This characteristic (exfoliation) is the basis for commercial use of the mineral, and is result of the mechanical separation of the layers by instantaneous conversion of the Water between them to steam.
- 1.3. In the exfoliation, the bulk volume of commercial grades of the Vermiculite can increase from 7-8 to 12 times, while individual flakes may reach 20 times. In Thermal treatment the bulk density of crude Vermiculite decreases from 640-1.200 Kg/m<sup>3</sup> to 60- 160 Kg/m<sup>3</sup>.

### **2. PRODUCTION**

- 2.1. The mining at the “Levade” Ore Deposit, Village Belitsa near Ihtiman town, Bulgaria, is by the friable rocks discontinuous opencast method. Drilling and blasting are not required. The overburden, which is removed away with the excavators, is stored for regeneration of the mined area.
- 2.2. The selective and careful mining assures maximum quality of vermiculite; after extraction, the Ore is blended and stored in separated stockpiles according its properties. Still there is watched closely for Asbestos. Then, the blended Ore is transported to the latest Technology Processing Plant (Separation Installation) near Sofia where the Vermiculite is concentrated by dry method. The process comprises drying, fractionate, air-powered and magnetic separation. The high quality vermiculite is produced by the closest control of quality in all stages of processing.
- 2.3. The Control Laboratory closely monitors the characteristics of the produced Vermiculite concentrate as PSD (particle size distribution), loose bulk density, the exfoliation rate, moisture content, pH and contamination, according TVA methods. The asbestos fiber testing is performed at the internationally recognized IOM Laboratories in Edinburg, Scotland.

### **3. USES**

- 3.1; The vermiculite has been used for over 85 years in several industries such as construction, agriculture, horticulture and industrial markets. The common uses are: animal feed, anti-caking agent, bulking agent, growing media, seed encapsulant, soil conditioner, micro-propagation, potting mixes, seed germination, absorbent packing, brake pads, dispersions, fireproof safes, furnaces, insulation blocks, sealants and nuclear waste.

### **4. PACKAGING**

- 4.1. Normally the form of packaging is 1.0 to 1,2 t /big bags. However other forms can be provided as customer’s requirements.



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### VERMICULITE PROPERTIES

#### Typical chemical analysis of crude vermiculite

Element	% by wt	Element	% by wt
SiO <sub>2</sub>	41,30-40,6	Na <sub>2</sub> O	0,35-0,23
Al <sub>2</sub> O <sub>3</sub>	11,07-10,49	CaO	3,93-2,56
Fe <sub>2</sub> O <sub>3</sub>	8,82-8,26	MgO	27,79-27,13
K <sub>2</sub> O	0,99-0,92	TiO <sub>2</sub>	0,37-0,33

#### Characteristics of crude vermiculite grades

Grades/Sizes-mm	Bulk Density-kg/m <sup>3</sup>	Purity-%	% retained between the Sizes	Yield of Exfoliated product – m <sup>3</sup> /T	% Impurities
Micron: 0,540 - 0,180	1000-1100	≥ 77	44-51	5 – 5,5	≤ 23
Supper Fine: 0,800 - 0,350	910 - 1000	≥ 80	61-84	6 - 7	≤ 20
Fine: 1,2 - 0,350	910 - 1000	≥ 78	83-91	6 - 7	≤ 22

Surface Moisture - %	≤ 5
pH	6-8
Moh's Hardness	1-2
Specific Gravity	2,5
Cation exchange-me/100g	93,4
Crystalline Silica-SiO <sub>2</sub>	No
Asbestos availability	Not detected