



# Dineen Sales Ltd.

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## Vermiculite

Exfoliated vermiculite is an inorganic, golden brown, ultra-lightweight aggregate ranging in particle size from 50 microns up to 30mm granules. The physical structure of the exfoliated granules is like a concertina, with a very high surface area and inter-laminar air spaces which give it excellent thermal insulation properties over an extremely wide range of temperatures up to 1260°C and also excellent absorption properties. It can be used in granular or free-flowing mixtures to carry high weight percentages of active chemicals and it is an ideal carrier or low cost filler for many compound formulations.

The source of the mineral for the exfoliation of vermiculite is a naturally occurring soft micaceous ore. This is mined and classified into grades, each having a specified range of particle sizes.

Exfoliation of the crude vermiculite is achieved by passing the ore through a furnace chamber where the residence time is just sufficient to ensure exfoliation. This occurs at right angles to the cleavage planes, causing the flakes to expand into concertina-shaped granules. The granules are then evacuated from the chamber immediately, air classified, cooled and packed. Good exfoliation can only be achieved by a high rate of heat transfer and rapid generation of steam within the crude material.

Exfoliated vermiculite is an aluminium magnesium iron silicate.

A typical composition of this material is:

Silicon (SiO <sub>2</sub> )	37 - 40%
Magnesium (MgO)	21 - 29%
Aluminium (Al <sub>2</sub> O <sub>3</sub> )	6 - 10%
Iron (Fe <sub>2</sub> O <sub>3</sub> )	4 - 8%
Potassium (K <sub>2</sub> O)	3 - 6%
Calcium (CaO)	1 - 4%
Carbon (CO <sub>2</sub> )	1 - 2%
pH	7 - 10*
Organic Matter	nil
Moisture Content (when packed)	nil

- pH 7-10, but owing to the presence of associated carbonate rock impurities the reaction is normally alkaline.

The exchangeable cation normally present in vermiculite is magnesium. The cation exchange capacity is 90-100 milli-equivalents per 100 grammes. It is insoluble in water and relatively unreactive in an alkaline environment but is decomposed in strong acids leaving a residue of practically pure silica having a high degree of surface activity.