

## Roof & other types of insulations

### **LOOSE FILL INSULATION MASONRY INSULATION:**

Vermiculite concrete roof deck systems allow architects, engineers and contractors versatility in design, high performance and reasonable cost. These systems will use a lightweight concrete consisting of Portland cement, water and vermiculite concrete aggregate. It is recommended that all vermiculite roof deck systems be applied by an applicator familiar with using and applying light-weight vermiculite concrete.

vermiculite have been used for years as an aggregate in lightweight, insulating concrete and plaster, and as a loose fill insulation material for concrete masonry blocks, cavity walls, and in residential homes. They also are used in a variety of specialty applications ranging from fireproofing sprays, chimney fills, interstitial floors, acoustical sprays, etc.

Vermiculite is used as loose-fill insulation in the construction of modern, insulated masonry wall systems. And not only do they significantly increase the tested "R" values of these walls, they also can help change the fire rating of many walls from a basic 2-hour fire rating to a 4-hour rating.

### **INSULATING CONCRETE OVER PRECAST CONCRETE DECKS:**

Vermiculite concrete lends itself to providing both drainage slope and high insulating values to various types of precast concrete units such as core type structural slabs, channel slabs and pre-stressed single and double tees. Vermiculite cast-in-place concrete provides a smooth surface for applying the built up roofing membrane

### **ADVANTAGES:**

**LIGHT-WEIGHT:** When compared with structural grade concrete, vermiculite concrete is 15% of the weight. This results in considerable savings from the footings thru the structural steel.

**FIRE-PROOF:** The fireproofing characteristics of vermiculite concrete are recognized nationwide by insurance companies, state rating bureaus and local building officials. Underwriters' Laboratories have assigned up to 4-Hour ratings to systems that employed vermiculite as one of the components.

**VERSATILE:** Vermiculite concrete can be applied over a variety of bases, allowing architects and engineers ample flexibility in their design criteria. The thickness of the concrete can be varied to permit necessary slope to drain.

**INSULATION:** Vermiculite concrete has excellent insulating properties. Three inches of vermiculite concrete is equivalent to 1 1/2" of rigid board insulation layed over steel decks. One inch of vermiculite concrete is equal in insulating value to 20 inches of regular concrete.

**EASE OF APPLICATION:** Vermiculite insulating concrete is easily placed by modern specially designed pumping equipment. Up to 25,000 square feet can readily be placed in one day.

**SPECIAL FEATURES:**

**RE-ROOFING:** Slope to drain systems employing vermiculite concrete and polystyrene vent board provide an economical solution to existing flat roofs with damage due to ponding of water.

**SUBSTRATES:** Vermiculite concrete is suitable for installation over most structurally sound roofing systems with structural decks of concrete, metal, or wood. Care must be taken to properly vent decks poured over impervious materials.

**SPECIFICATIONS:**

**SCOPE:** This specification covers vermiculite insulating concrete. Thickness shall be a minimum of two inches is recommended.

**MATERIALS:**

**A. CEMENT** shall be type I or type III Portland Cement.

**B. VERMICULITE** shall be (1-2) mm.

**C. AIR ENTRAINING** shall be similar to liquid neutralized used at the rate capable of providing approximately 10-15 percent air when mixed.

**C. WATER** shall be clean and potable.

**PROPORTIONS AND PROPERTIES:**

The proportion of cement to vermiculite shall be in the ratio of one part cement to \_\_\_parts vermiculite. The wet density shall be \_\_\_psf, oven dry density\_\_\_ psf and compressive strength \_\_\_ psi in 28 days. (See Physical Properties Chart above for mix proportions.)



PHYSICAL PROPERTIES						
MIX PROPORTIONS BY VOLUME						
Cement	Vermiculite	Sand	WET DENSITY PCF	OVEN DRY DENSITY PCF	COMPRESSIVE STRENGTH 28 DAYS PSI	"K" FACTOR
1	8	0	40-48	19-22	70-125	0.60-0.65
1	7	0	42-47	20-24	125-140	0.65-0.69
1	6	0	44-52	23-27	135-175	0.69-0.73
1	5	0	49-55	25-31	175-225	0.72-0.75
1	4	0	55-62	30-35	225-325	0.79-0.81
1	3	2	85-91	75-80	600-620	2.50-2.75

NOTE: \* Above shown are approximate values and only for view of analyzation for the architect's, these may vary practically.

**MIXING AND PLACING:**

**EQUIPMENT:** It shall be of special design to insure proper mixing in as short duration as possible. Only that amount of water necessary to have mix pump able and flow able in hose shall be used. In no case shall this exceed 3 1/2 gallons per cubic foot of vermiculite.

**MATERIALS:** It shall be placed in panels in a continuous operation. Material shall be screwd with a straight edge. No tamping, Roding, vibrating or steel toweling is necessary. When fill is used to slope for drainage, screeds shall be set to proper grade to insure slope.

**CURING:**

No traffic shall be allowed on deck for 24 hours from completion of pour or until deck will support traffic without damage. In very dry weather the deck shall be sprinkled to prevent drying out. Otherwise the roof membrane shall be applied as soon as the deck has sufficient strength to support foot traffic and surface is dry enough to develop adhesion between deck and hot asphalt or pitch. Under normal conditions this will occur within three to five days.

**ROOFING:**

Roofing shall be applied in accordance with roofing manufacturers specifications for light weight poured decks.