

## Vermicrete insulating slab

The purpose of this experiment was to calculate the water loss from a vermicrete insulating slab after casting and placement.

Materials	Kg	Vol (L)
Vermiculite	1.82	27.00
Cement	7.25	5.40
Water	8.10	8.10
Total	17.17	21.6

For the aggregate in this mixture a 50% vermiculite 50% perlite proportion was used.

The mix is generally considered a 5:1 vermicrete and comprised of vermiculite, perlite, Portland cement, water 2.5, 2.5, 1, 1.5 by volume.

The form was filled with dry aggregate to obtain required volume, but on mixing and placing in the form, has reduced approx. 20% as some of the grains break down from abrasion during mixing and compaction on placing also reduces volume. The resulting volume reduction is an estimate based on the finished slab thickness.

Mixing was done gently by hand in a barrow.

The compacted slab was covered for one week to allow good hydration.(no additional water was added)

The weather was fine, cloudless, low humidity and the temp in the range of 12-24 C. The slab was exposed to approx 3 hrs sun/day top surface only.

Weighing of materials was done using digital scales, but weighing of finished slab was done using bathroom spring scales as the weight was beyond my digital scales capacity.

Although the top of the slab appeared quite dry the bottom was still wet so I lifted it up, stood it on edge to assist drying after Day14

	Kg
Day 7	16.0 fine
8	15.0 fine
9	14.5 fine
10	14.0 fine
11	14.0 cloudy
12	13.5 cloudy
13	13.5 cloudy
14	13.5 cloudy
21	12.0 fine
28	11.0

## Conclusion

Given the ideal drying conditions, relative thinness of the slab and that it was uncovered, the experiment still demonstrates the large quantity of water present and the slow rate of removal. For a thick covered slab expect the water reduction rate to be way lower. After 3 weeks of drying more than 50% of the water had been removed by the weather from the approx. 2" thick slab. After 4 weeks approx. 75% of the water added had been removed. Given the 0.4 W/C ratio that consumes the water in the hydration process, that consumes 1.34 litres leaving 6.76 litres of free water. So after 28 days of drying 5 litres lost is pretty much most of it. This excess free water ensures that plenty is available for the hydration process so therefore no wetting of the slab is required during curing.

In hindsight I probably should repeat the experiment and cover it with firebrick, then compare the results. Given that the water under the floor and the base of the dome is the last to be eliminated and the resulting problems and damage it can cause, the drying of a vermicrete slab before building over it is advisable.