

Table S1: Statistical output for high and low humidity experiments. (Mean \pm s.d.)

	Species	High Humidity				Low Humidity			
		Area (m ²)	Mass (kg)	Volume (m ³)	Density (kg.m ⁻³)	Area (m ²)	Mass (kg)	Volume (m ³)	Density (kg.m ⁻³)
Mean	<i>M. michaelsoni</i>	1.493e-03	6.83e-03	1.209e-05	0.61e03	0.866e-03	4.87e-03	6.82e-06	0.77e03
\pm s.d.		\pm 0.403e-03	\pm 2.76e-03	\pm 5.71e-06	\pm 0.20e03	\pm 0.172e-03	\pm 1.77e-03	\pm 2.84e-06	\pm 0.21e03
	<i>M. natalensis</i>	1.668e-03	9.04e-03	1.394e-05	0.70e03	1.519e-03	7.47e-03	1.080e-05	0.71e03
		\pm 0.540e-03	\pm 2.25e-03	\pm 3.55e-06	\pm 0.32e03	\pm 0.546e-03	\pm 1.93e-03	\pm 1.82e-06	\pm 0.21e03
p-values	(permutation)	0.450	0.080	0.413	0.533	0.001	0.009	0.003	0.550

Table S2: Raw data for all experiments. Upper-case letter indicates colony, prefix letter indicates species.

Colony	High Humidity			Low Humidity		
	Area (m ²)	Mass (kg)	Volume (m ³)	Area (m ²)	Mass (kg)	Volume (m ³)
m-A1	1.708e-03	7.70e-03	1.76e-05	0.701e-03	5.30e-03	5.83e-06
m-A2	2.243e-03	5.70e-03	1.05e-05	0.913e-03	4.70e-03	9.23e-06
m-A3	1.864e-03	6.20e-03	6.18e-06	1.053e-03	4.30e-03	9.07e-06
m-B1	1.360e-03	4.80e-03	5.44e-06	0.865e-03	3.90e-03	4.03e-06
m-B2	0.926e-03	3.80e-03	7.04e-06	0.518e-03	1.90e-03	1.96e-06
m-B3	1.162e-03	3.10e-03	8.20e-06	1.025e-03	3.30e-03	5.70e-06
m-C1	1.178e-03	1.00e-02	1.63e-05	0.888e-03	6.00e-03	5.77e-06
m-C2	1.565e-03	9.90e-03	1.96e-05	0.810e-03	7.40e-03	9.84e-06
m-C3	1.427e-03	1.03e-02	1.78e-05	1.018e-03	7.00e-03	9.95e-06
n-D1	2.735e-03	1.19e-02	8.03e-06	2.230e-03	1.00e-02	1.00e-05
n-D2	1.497e-03	1.21e-02	1.77e-05	1.387e-03	9.60e-03	1.37e-05
n-D3	2.293e-03	1.13e-02	1.40e-05	2.426e-03	1.00e-03	1.02e-05
n-E1	0.905e-03	6.50e-03	9.97e-06	1.584e-03	6.20e-03	8.64e-06
n-E2	1.596e-03	8.40e-03	1.54e-05	1.681e-03	6.30e-03	1.10e-05
n-E3	1.675e-03	9.60e-03	1.52e-05	1.387e-03	7.30e-03	1.22e-05
n-F1	1.531e-03	7.30e-03	1.14e-05	1.315e-03	4.80e-03	1.22e-05
n-F2	1.292e-03	6.70e-03	1.48e-05	0.764e-03	7.00e-03	7.96e-06
n-F3	1.491e-03	7.60e-03	1.89e-05	0.900e-03	6.00e-03	1.11e-05



Movie 1. A timelapse video (240x) of 35 *Macrotermes michaelseni* major workers building with soil on a plate at 40% relative humidity over 4 h. The soil reservoir is accessed through a hole at the centre of the otherwise homogeneous plate.