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To whom it may concern,

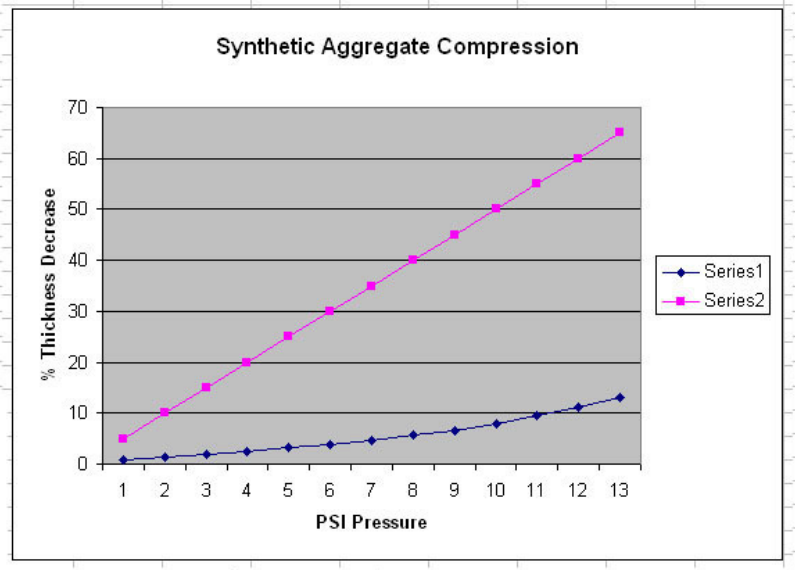
We have received our lab tests from a certified lab (QAI) and will be proceeding with CCMC tests. The results are very good news for the applications of our synthetic aggregate to be marketed under the Poly Rock and Radon Rock brand names. Here are some observations that show the suitability of our products for Radon Gas Mitigation Systems, Underslab Insualtion and Drainage Material.

Concrete Slab: 50 pounds per square foot, that is: 1 square foot of 4" thick concrete.
50 / 144 = 50 psf / [(144 sq in /sq ft)] = .35 psi is the pressure from a 4" slab.
Plotting test data shows that a concrete slab would reduce the volume by approximately 3%.

Volume Decrease of Synthetic Aggregate from 4" concrete slab.

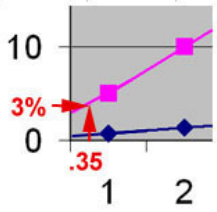
DATA

psi	EPS Thickness, %
0.707	5
1.338	10
1.929	15
2.546	20
3.216	25
3.944	30
4.748	35
5.653	40
6.653	45
7.794	50
9.414	55
11.037	60
13.059	65



Note:
.35 psi = 50 pounds / sq ft
(concrete slab)

Resultant Volume decrease = 3%



Calculation of Poly Rock to make R-12 Insulation

Test Results

U

Specimen ID	Specimen Thickness		Specimen Density		Mean Test Temp		Delta T		Thermal Resistance	Thermal Resistivity	Thermal Conductivity
(units)	mm	Inch	Kg/m³	lbs/ft³	°C	°F	°C	°F	m²·K/W (hr·ft²·°F/BTU)	m·K/W (hr·ft²·°F/BTU·in)	W/m*K (Btu·in/ft²·°F·h)
1	100.32	3.95	8.52	0.53	24	75	22	40	0.92 (5.22)	9.16 (1.321)	0.10920 (0.7572)

From: https://en.wikipedia.org/wiki/R-value_(insulation)

U is the inverse of *R*[7] with SI units of W/(m²K) and US units of BTU/(h °F ft²);

$$U = \frac{1}{R} = \frac{\dot{Q}_A}{\Delta T} = \frac{k}{L}$$

R = 1 / U **1 / .10920 = 9.15 = R Value of Sample**

(Check to see if it is reasonable)

From: http://www.cmhc-schl.gc.ca/en/co/grho/grho_010.cfm

Table 1 Characteristics of common insulation materials

Insulation Material	R/in. (RSI/m)	Appearance	Advantages / Disadvantages
Board-Stock			
Type I and II (expanded) polystyrene or EPS	3.6 – 4.4 (25 – 31)	White board of small — about 8 mm (0.3 in.) in diameter — foam beads pressed together.	Typically HCs used in production. Must be covered.

Use average of R 4 per inch

A 4 inch board would have R value of 16 (4 X 4)

A four inch sample with a 40% void space would have 16 X 60% = 9.6 so 9.15 is very reasonable.

If we need R-12 then we need 12 / 9.15 = 1.311 X 4 inches = 5.25 inches of poly rock.

Based upon our data, there would be a minimal volume reduction from the pressure of a standard concrete slab. Insulation properties show it to be very suitable for underslab applications.
Best Regards,

Jim Ripley (and Len Palik)

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