Re: December 16, 2009
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For: Basalt Unlimited LLC

Effects of Accelerated High Alkalinity Environment

- 16 micron Basalt Chopped Fiber
- 12mm (5/8th inch) Basalt Rebar

Basalt chopped fiber and Basalt rebar have been developed to replace welded wire reinforcement and steel rebar reinforcing bars in concrete structures. The ability to withstand corrosion is a key component. Flexural reinforcement for these products has grown over the past few years, with long term durability as an important consideration. Fresh concrete is a highly alkaline environment. Our testing showed the basalt product has better alkali resistance than E-glass, aramid and poly fibers and does not rust or corrode like steel.

- The basalt fiber and basalt rebar were subjected to an alkali solution with a pH range of 13.7 to 13.9.
- This range is harsher than the range called for from ACI 440 (12.6-13)
- The aging temperature was between 76 - 80 degrees C and lasted over 20 days which correlates to 100 years of accelerated exposure.

The carbon fiber was cut in to 3 inch lengths from a continuous monofilament roving. Although ACI440 allows the ends to be sealed, these were not; in order to represent a normal use environment. The rebar was purposely scored to expose fibers, before emersion.

Although this was not a full and formal 100 yr. aging test since the samples were not hand wedged with clamps, and the temperature varied between 76 degrees C and 80, the alkali solution was considerably stronger than that used for ACI 440.

- The results show the Basalt Chopped Fiber and Basalt Rebar had minimum degradation less than .0001% after inspection by microscope. The basalt products were minimally affected by the high alkalinity environment.