

HYDRATION AND SWELLING BEHAVIOR OF BENTOMAT®

It is often assumed that Bentomat swells upon hydration in much the same way as loose bentonite. This is not correct, however, because the needlepunched bond between Bentomat's two geotextiles effectively resists the swell pressure exerted as Bentomat absorbs water. Adhesive-based GCLs, including Claymax®, will have greater expansion of the bentonite as hydration occurs and are not addressed here.

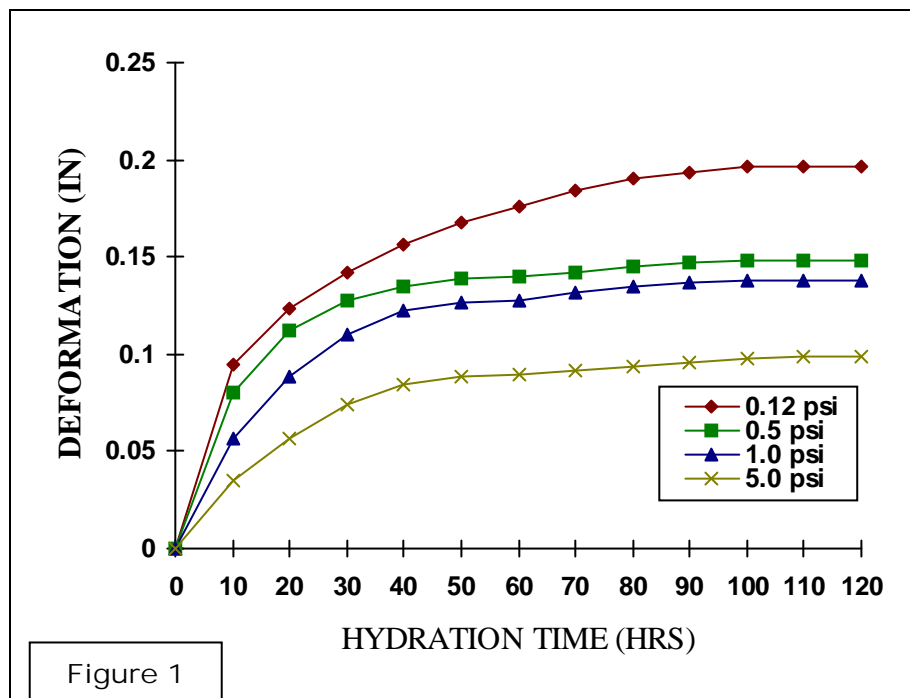


Figure 1 was adapted from experimental work performed at the Geosynthetic Research Institute (GRI). It illustrates the hydration and swelling behavior of Bentomat, when immersed in distilled water at various confining stresses. The graph demonstrates several fundamental concepts about Bentomat. First, note that the maximum amount of swell is only about 0.2 inches. The swell of Bentomat is significantly restricted by the needlepunched fibers holding it together. As a result, Bentomat reaches its ultimate thickness relatively quickly. The graph shows that the complete hydration of

Bentomat (i.e., the time at which expansion has stopped) requires approximately 100 hours, or over 4 days. Under typical low normal loads representative of a cap, significant hydration occurs in the first 48 hours. This is important to recognize when certain laboratory tests (such as hydraulic conductivity tests) are to be conducted on "hydrated" Bentomat specimens. Bentomat saturated in water for 8 hours is *not* representative of "fully hydrated" conditions.