

October 29, 2004

TENG

Mr. George C. Tunis III
Hardwire, LLC
100 Quinn Avenue
Pocomoke, MD 21851

Re: Hybrid-Composite Beam w/Hardwire™
First Full-Size Beam Infusion
Teng Project No. 02-3106-02

Dear George:

Yesterday, October 28, 2004 we infused the first full-size 30-foot Hybrid-Composite Beam at the University of Delaware – Center for Composite Materials (UD-CCM). The infusion could not have gone better. After ten months of experimenting with tooling, lay-up and infusion configurations on a much smaller scale, we were ecstatic when the first full size beam infused without a hitch. The success of this project is due in no small part to Hardwire™.

Our main motivation for using Hardwire™ in the first place was to maximize the strength and stiffness necessary for the structural performance of the beam. In retrospect, other characteristics of Hardwire™ have proven equally as important in the success of this invention. One of these attributes includes the simplicity of cutting, bending and laying-up the Hardwire™ preforms, even by a total novice.

Another beneficial characteristic resulted from the lightening fast permeability of the Hardwire™ preforms that function as the bottom flange of the beam. As a result the Hardwire™ doubled as the optimum transfer medium to wet out this enormous and complicated composite. Prior to infusion of the first beam, we were anticipating an infusion time of 2-3 hours for the 25 gallons of vinyl ester required for the beam. We were pleasantly shocked when the beam infused in just over one hour with the major constraint resulting from our inability to mix the small batches of resin fast enough (easily solvable). In retrospect, the beam could have easily infused in less than twenty minutes.

Needless to say, I'm hooked. Carbon may be light-weight, but that's its only advantage, and it doesn't matter for this application. Hardwire is unquestionably the perfect material to get my invention to market. Not only is it the optimum material for structural performance, but it has reduced the man-hour requirements for fabrication by an order of magnitude. Thanks again for your unwavering support.

Very truly yours,

TENG & ASSOCIATES, INC.

John R. Hillman, P.E., S.E.
Senior Associate

Attachments: Fabrication Photos of 1st Beam