

October 28, 2005

Mr. Dean Hettenbach
Composite Materials Technology, LLC
5883 Glenridge Drive
Suite 160
Atlanta, GA 30328

Re: MME Project # 13511

Mr. Hettenbach,

Metals and Materials Engineers, LLC (MME) was retained by Mr. Dean Hettenbach of Composite Materials Technology, LLC to conduct flammability testing on a composite pole. MME's scope of analysis included flammability testing and subsequent visual examination.

One composite pole sample of unknown composition was received by MME in order to test the flammability response of the material. The composite pole was first observed visually in order to gauge the material's ability to resist burning. The pole was tested and rated based on criteria similar to the UL 94 specification. The tested area appeared to be a representative area of the entire pole composition. The pole was documented in the as-received state, as shown in Figure 1.



Figure 1. Composite pole in the as-received condition

Figure 2 displays the apparatus designed in order to test the flammability of the composite pole in the vertical position. The pole was suspended to allow free access to the bottom edge of one of the tubular openings. A heat source of approximately 1899° Celsius (3450° Fahrenheit) was applied to the free edge of the tube, as displayed in Figure 3. The heat source was applied with the tip of the inner blue flame contacting the surface of the pole and for a duration of 10 seconds, and then removed in order to observe the pole surface and photograph. Cotton was placed 12 inches beneath the pole in order to rate the severity of flaming drips as a result of the burn. Figure 4 displays the result after the first ten second heat application. After allowing time for photographs and observation, a second application of the heat source for a duration of 10 seconds was administered to the pole; again the surface of the pole was observed and photographs taken, as shown in Figure 5.

After the first burn, the pole exhibited no thermal deformation or discoloration and no flames were observed. The cotton beneath the tested area did not ignite, furthermore, there was no dripping of material nor flaming drips. A slight odor was detected directly following the burn, however, there were no visible gases. Similar observations were noted following the second burn.

The pole was removed from the apparatus after the second burn in order to further examine the thermally tested area. As stated previously, the pole did not display any significant signs of thermal damage. Comparing the results to the UL 94 specification, the pole performed within the most stringent specified limits for a vertical burn test. Upon removal of the pole it was observed that a significant amount of thermal energy had been absorbed by the pole, making it and warm to the touch. After performing the vertical burn test described, it is apparent that the composite pole tested exhibited good resistance to flammability. The pole did not exhibit signs of significant burning, deformation, or discoloration.



Figure 2. Photograph of testing apparatus



Figure 3. Photograph illustrating the tested area



Figure 4. Photograph of tested area directly after the first application of flame



Figure 5. Photograph of tested area directly after the second application of flame

As always, please do not hesitate to contact us if you have any further questions or concerns regarding this matter.

Respectfully,



Eric R. Weishaupt
Metallurgist



Michael E. Stevenson, PhD, PE
Principal Metallurgical Engineer
Vice President, Engineering Sciences



Jeffrey L. McDougall, PE
Senior Metallurgical Engineer
Director, Engineering Sciences