U.S. Department
of Transportation

**Pipeline and
Hazardous Materials
Safety Administration**

400 Seventh St. S.W.
Washington, D.C. 20590

JUN 14 2005

Mr. Norman L. Newhouse, Ph.D., P.E.
Vice President, Technology
Lincoln Composites, Inc.
6801 Cornhusker Highway
Lincoln, NE 68507

Dear Mr. Newhouse:

This is in response to your December 17, 2002 application for exemption (13188-N) and additional information dated April 26, June 4, June 6 and July 31, 2003 and December 22, 2004 requesting authorization for the manufacture, marking, sale, and use of certain plastic lined filament-wound composite cylinders. The proposed cylinder would have a maximum service pressure of 7,300 psig, a maximum water capacity of 531 liters and would be used for the transportation in commerce of hydrogen and other compressed gases.

In accordance with 49 CFR § 107.113(e) and (g), your application is denied for the following reasons:

1. After a comprehensive technical evaluation of your exemption application and additional information, your proposal did not provide a level of safety that is at least equal to that specified in the Hazardous Materials Regulations for the transportation in commerce of hydrogen and other compressed gases.

2. In our August 29, 2003 letter to you, we specified that your proposed cylinder design must meet the requirements of ISO 11119-Part 3 entitled "Gas cylinders of composite construction – Specification and test methods – Part 3: Fully wrapped fibre reinforced composite gas cylinders with non-load sharing metallic or non-metallic

liners". Your design does not meet the ISO 11119 Part 3 requirements in the following areas:

a. Your proposed cylinder design did not meet the minimum wall thickness requirements. Specifically, the wall thickness requirements of ISO 11119 Part 3 are at least 20% greater than your proposed cylinder design for cylinders having the same designated service pressure.

b. Your proposed cylinder design did not meet the minimum burst pressure requirements. Specifically, the service to burst pressure ratio for your cylinder design is less than the ISO 11119 Part 3 required minimum value of 3.0. The results reported in test report TR # 408 measured a burst pressure of 17,930 psig which results in a service to burst pressure ratio of 2.45.

c. The manufacture of 30 identical preproduction cylinders, as required by ISO 11119 Part 3, was not completed. ISO 11119 Part 3 requires 30 preproduction cylinders (prototype design qualification) to evaluate the variability of cylinder performance and production.

d. ISO 11119 Part 3 requires certain prototype design qualification tests. The following tests have not been successfully completed on your proposed cylinder design:

(i) Ambient temperature cycling test. Only one cylinder was tested instead of the required two. The cylinder was tested at 9,100 psi instead of the required 10,500 psi and was tested only to 8,000 cycles instead of the required 12,000.

(ii) High temperature creep test

(iii) Water boil test

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3. No information was provided to permit the development of a test matrix for additional sizes and pressures of cylinders you requested to manufacture. All of the necessary prototype development tests and design qualification tests must be successfully completed for each new cylinder design.

You may resubmit your application for an exemption in accordance with § 107.105, when your application contains the requested information mentioned above.

If you have any questions, please contact Mr. Mark M. Toughiry of PHMSA's Office of Hazardous Materials Technology at the above address, by telephone at 202-366-4545, or by fax at 202-366-3753.

Sincerely,

Robert A. McGuire
Associate Administrator for
Hazardous Materials Safety