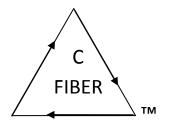
Green Certification

Carbon Fibers and Forms

Produced by Carbon Fiber Remanufacturing



October 25, 2011



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Green Certification Statement

Re: Reclaimed Carbon Fibers Processed and Distributed by Carbon Fiber Remanufacturing (CFR), Certified Green

A Solution in the Making

After twenty years without a recycling solution, the carbon fiber/composites industries around the world have landfilled as much as 30% of the entire material supply on an annual basis. That is, until now.

Materials Reutilization

The carbon fibers processed by Carbon Fiber Remanufacturing are "green", recycled, reclaimed, and remanufactured.

CFR's carbon fiber and carbon fiber broadgood materials...

- 1. 100% recycled carbon fibers
- 2. 100% diverted from landfill programs of carbon fiber scrap generators
- 3. No chemicals are utilized in processing the reclaimed fibers
- 4. No heat treatment is used in processing the pre-oxidized fibers into the reclaimed cut length forms
- 5. No water is consumed in the reclaiming process.
- **6.** Carbon fiber diverted from landfill by CFR to date: 2,400,000 lbs.
- 7. Carbon fiber currently contracted with CFR for diversion from the landfill over the next five year period, 10,800,000 lbs. and growing.
- 8. Carbon fiber contributed to the program by Producers and Processors of carbon fiber and related composite materials are participants in the avoidance of land filling of this high tech fiber and supporting the remanufacturing of the scrap product into product forms similar or identical to virgin fiber applications. Special materials design and engineering work is applied to all reclaimed fibers to increase their value in the highest product applications that can be achieved.
- **9.** The entire volume of carbon fibers processed by CFR are remanufactured into new and additional pre-ox fiber, carbon fiber, fiber broadgoods, and composite forms at a greatly reduced cost of fiber production.
- 10. The remanufacturing program of CFR delivers carbon fiber (with retained virgin properties) back into the market place saving approximately 93.7% of the energy required by the industry in making the fiber from scratch. The electric and gas energy costs for production of carbon fibers to the pre-oxidized grade (60-62%)

carbon content) is approximately \$1.36 per pound of carbon fiber product (U.S. Department of Energy, Oak Ridge National Laboratory report). To date, CFR has avoided the energy cost of approximately \$3,072,000 (1,400,000 lbs of remanufactured materials). In increments of 1,000,000 lbs of reclaimed fibers, the savings are significant and ongoing:

	Virgin Fibers	Reclaimed / Remanufactured Fibers	Energy Savings
Pre-oxidized fibers, Utility Costs	\$1.36 / lb.	\$0.08 / lb.	\$1.28/lb
At the rate of 1,000,000 lbs	\$1,360,000	\$80,000	\$1,280,000

- 11. CFR and its manufacturing partners design and produce a line of products that are "thermoplastic" and can be recycled once again when those product forms have reached their end of life cycle.
- **12.** CFR and its manufacturing partners are able to combine reclaimed carbon fibers with other reclaimed fibers including fiberglass, basalt, cotton, and polyester.
- **13.** CFR is committed to contributing a significant portion of business profits to a world-wide literacy training program as well as a group of orphanages in developing nations.
- **14.** Carbon Fiber Remanufacturing utilizes its trademarked symbol to announce CFR carbon fibers and fiber forms are from 100% reclaimed carbon fibers.

Certification Documentation to Demonstrate Claims of CFR's fiber reclamation and recycling operations:

RC RVP-001: "ReComposite Recycling Verification Process". ReComposite is a third party certification group for the composites industry which has examined CFR's material sources and inspected CFR's processing operations.

CFR provides with carbon fiber product orders third party certifications specific to each ordered CFR product code and batch number. These product specific Green Certifications are now available for use by manufacturers in supporting their own claim regarding finished product recycled content.

We are always glad to visit with anyone interested in participating in careful utilization of finite resources and well designed use of reclaimed materials.

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Sources:

"Developing Lower Cost Carbon Fiber for Multiple High Volume Industries", C. David Warren, U.S. Department of Energy, Oak Ridge National Laboratory, Oak Ridge, Tennessee, Harper Intl. Study Publication 15545.