ENVIRONMENTAL POLICY
Barnhardt Manufacturing Co. is committed to protecting the environment as a part of its business practices. We do so by adhering to the principles of:
- Compliance
- Prevention
- Communication, and
- Continuous Improvement

QUALITY & TECHNICAL EXPERTISE
Barnhardt Manufacturing Co. is committed to incorporating the highest quality standards into every facet of our company’s operations.

BARNHARDT SERVICES
Barnhardt Manufacturing Co. provides a number of services for bleached cotton fiber customers. We have a team of highly trained individuals that can be a tremendous resource for those new to processing cotton and established companies in need of problem solving.

LCA STUDY

Barnhardt Natural Fibers Group
Fact-based approach to continuous improvement (LCA STUDY completed April 2010)

Bleached Cotton Fiber
The Barnhardt Manufacturing Company produces bleached and purified cotton fiber products from raw cotton input using a proprietary process at its Charlotte, North Carolina and Colrain, Massachusetts manufacturing facilities. The bleached and purified cotton fiber is used in medical, pharmaceutical, health, personal and home care applications. The bleaching process involves a chlorine-free hydrogen peroxide process. This wet process involves the removal of contamination in and on the cotton fiber followed by the removal of its natural color. The process changes fundamental fiber properties such as pH, biodegradability, softness, surface friction, and absorbency. The bleached cotton fiber provides a variety of functions in products that clean, exfoliate, wipe, absorb, remove, protect, filter, apply, abrade, polish, contain, and deliver.

Life Cycle Assessment Study
Barnhardt commissioned a comprehensive ISO 14040 conforming Life Cycle Assessment (LCA) study in response to customer requests for comprehensive and detailed environmental performance information. Barnhardt’s intent is to support fact-based environmental decision making by disclosing the scientific results to its customers and to the general public in an open and transparent manner. The results of this study can be used for the purposes of product design, material selection, and manufacturing decision-making.

What is Life Cycle Assessment?
LCA is an internationally accepted standardized approach to assess the environmental aspects and potential impacts associated with a product, process, or service, by:
- compiling an inventory of relevant energy and material inputs and environmental releases;
- evaluating the potential environmental impacts associated with identified inputs and releases;
- interpreting the results to help make a more informed decision.

Life cycle assessment framework

Goal and Scope Definition
Inventory Analysis
Impact Assessment
Interpretation
Key Results

The LCA study of bleached cotton fiber examined contribution to environmental impact for three life cycle stages of bleached cotton fiber production:

1. **Cradle-to-Gate** – which includes cotton growing and ginning to produce raw cotton fiber;
2. **Gate-to-Gate** – this includes Barnhardt’s bleaching processing of raw cotton fiber, including all process materials used and energy consumed;
3. **Gate-to-Output gate** - shipping and distribution based on average shipping distances to the customer.

As shown in the graph below, the LCA study examined a comprehensive set of 21 life cycle impact assessment categories. A key finding is that the bleaching process is not a major contributor to impact across many of the impact categories. In most categories, raw cotton fiber is the largest contributor due to activities associated with cotton growing, including: herbicides, pesticides, fertilizers, water consumption, and energy use. Results on a per metric tonne basis for the production of bleached cotton fiber are summarized for energy, GHG emissions, water and agricultural land occupation.

Looking to the Future

- Major improvements have been achieved through process improvements of water consumption, fuel use, and electricity use that have resulted in a reduction of impacts to the environment.
- This study is a first effort for Barnhardt to establish a baseline of environmental performance from a comprehensive set of scientifically based life cycle assessment impact categories.
- Barnhardt will continue to strive to create a more sustainable bleached cotton fiber product by working with suppliers and customers.

**Results per 1 metric tonne of Bleached Cotton Fiber**
- 55 GJ of energy
- 5,200 kg CO2-e
- 1,240 m3 of water
- 1.35 ha of agricultural land occupied.