



HemiForce™

Enhanced Fiber Additives

Frequently Asked Questions

Where does the name “HemiForce™ ” enhanced fiber additives come from?

The name “HemiForce™ ” comes from the high hemicellulose composition of the product, which contributes to improved fiber-to-fiber bonding and has been shown to increase the strength of the fiber furnish, the web and end product.

How are HemiForce™ enhanced fiber additives manufactured?

Cargill has developed a patented manufacturing process for making hemicellulose-rich fibers and delivering them to the fiber furnish. We use renewable agricultural seed-based fibers such as those found in corn, soy, oat and other grain kernels. Fiber in the outer covering of the seed (the pericarp) is used to make HemiForce™ enhanced fiber additives.

How do HemiForce™ enhanced fiber additives help increase fiber furnish and paper sheet strength?

The high level of hemicellulose in the product enhances the cellulose fiber in the paper furnish and allows for improved bonding among the wood fibers, thus increasing the strength of the fiber matrix.

Is the concept of adding hemicellulose-on-cellulose fiber additives new?

The positive impact of hemicellulose on cellulose fibers has been well documented for decades. Independent studies have shown improved hydration rates, higher strength properties and enhanced fiber-to-fiber bonding. What’s new is Cargill’s patented process for manufacturing the product, and delivering it to the paper furnish in a highly usable form.

How do HemiForce™ enhanced fiber additives increase both strength and softness in paper products?

When the lignins are minimized and the hemicellulose/cellulose combination in fibers is maximized, fiber become more flexible and the paper gains both strength and softness.

How does low sheet strength lead to production losses?

Historically, lower sheet strength can cause wet web breaks and breaks during creping, reeling and converting operations. Since more recycled fibers are being used to reduce fiber costs, the resulting lower strength of the sheet further amplifies these challenges.

Won’t adding more chemicals solve the low sheet strength problem?

Remedying the situation by adding more chemicals to the process can lead to increased production costs, lower product quality (for example, decreased product softness) and higher biochemical oxygen demand for wastewater.

What are the primary business benefits of HemiForce™ enhanced fiber additives to paper manufacturers?

Case studies have shown that by facilitating stronger fiber-to-fiber bonding, HemiForce™ enhanced

fiber additives allow papermakers to take advantage of several benefits that provide a net positive impact on raw material consumption, tissue machine operation and energy usage. These include:

- Increased recycled fiber content
- Ability to use lower quality recycle furnish
- Reduced softwood fiber usage
- Increased machine speed
- Reduction or elimination of refining
- Lowered basis weight
- Decreased percentage of crepe at the Yankee dryer
- Increased bulk at a higher freeness level
- Improved sheet stretch
- Reduced dusting during creping, reeling and converting operations

Are HemiForce™ enhanced fiber additives truly renewable, “green” products with benefits to the environment?

HemiForce™ enhanced fiber additives are renewable, agriculture-based fiber products made using a totally chlorine-free (TCF) process. They provide a natural alternative to typical chemical/synthetic additives for achieving paper properties required by customers while realizing more efficient manufacturing operations.

Can HemiForce™ enhanced fiber additives help manufacturers use more recycled or low cost fiber?

HemiForce™ enhanced fiber additives are a solution to the “hemicellulose loss effect” and “hornification” of recycled fibers. HemiForce™ supplements hemicelluloses in the recycled fibers and adds strength to recycled and low cost (often low strength) fibers by increasing fiber-to-fiber bonding in the furnish, enabling stronger webs and promoting more reliable operations.

Where do you add HemiForce™ enhanced fiber additives in the paper manufacturing process?

They can be added at many optional stages in the stock preparation system or wet end of the paper machine with the same increased strength result. The product is added in cake form directly to the furnish. If it's added near the refiner, it can be slurried and pumped in.

Are HemiForce™ enhanced fiber additives easier to add than other additives?

Yes. Other additives often require product makedown, or metering systems, cooking systems and additional feed equipment, process control and maintenance. HemiForce™ enhanced fiber additives are simple and easy to add without adding new equipment, process modifications or training.

What kind of cost savings can I expect if I incorporate HemiForce™ into my process?

The net financial impact has been verified at up to \$8 per ton or more for tissue and towel producers.