Kraft Kruste

Material

We propose an open-cell foam made from aerated kraft pulp. (Kraft pulp is the high- strength low-cost forest product from which products such as kraft paper and corrugated packaging are created). The manufacturing process will mix a slurry of pulp, water and adhesive with gas under very high pressure. This homogenized, gassified slurry is introduced into a hot mold or a dynamic form at atmospheric pressure. The pressure drop results in an instant foam reaction as microbubbles dispersed in the slurry expand and coalesce. Cell size and strand length are matched, so that the resulting foam has “randomly” (actually complexly) oriented strands.

- Pressure drop and heat promote rapid dewatering before foam collapse.
- Adhesives could be either starch glues or lignin adhesives.
- Foaming gas is typically carbon dioxide.
- Foamed strand orientation promotes strength and resilience in all directions.

Sustainability

Kraft pulp production is environmentally clean.
While it requires harsh akalis to break down the lignin in raw wood chips, these chemicals are recovered downstream. A typical plant is an energy-positive biofuel generator - burning waste such as bark and knots.

Kraft products are highly recyclable. An entire industry exists to compress, collect, repulp, deink and reuse corrugated board.

Kraft is carbon-negative. The total energy economics are difficult to assess, but every ton of Kraft pulp that goes into a landfill is burying atmospheric carbon-dioxide from the plant.

Prototype / Preliminary Data

We have not yet produced a prototype.
We are eager to start the process.