EcoFusionFlooring.com

An Introduction

ECOfusion is the North American sales division of Anji Hefeng Bamboo and Wood Co founded in 1999 with the goal of becoming a quality manufacturer to flooring, veneer, and panel companies in North America, Europe, and Australia. In 2011, after many years as an OEM supplier, the factory made the decision to become a vertically integrated company selling direct to our partners in North America. Our ECOfusion offices and primary warehouse is in Los Angeles CA, with a secondary warehouse in Norfolk VA.

You've probably been told that "not all bamboo is the same" and this is true because strand-woven wood and bamboo products vary by harvesting practice, drying capabilities, compression methods, and finish processes. Like other industries, manufacturers of building materials develop proprietary processes that set them apart from others: At ECOfusion, we strive to be innovative while offering value that combines quality, price, and style for the home or commercial environment.

Our products have been vetted by highly-regarded industry professionals in commercial and residential projects throughout North America, and have been recognized for quality and value from independent consumer testing publications. Though often counter-intuitive at the factory level, ECOfusion has adopted the philosophy that premium products won't be the cheapest to make, and that value to the customer goes far beyond the cost of goods.

ECOfusion's Strandwoven Bamboo Manufacturing Production

Our raw material production and "press" facility is strategically located in a region called "thousand islands". This mountain area was dammed in the 1950's to create hydropower that enabled this region to convert all heating and cooking needs from wood burning to hydro-electric. As the valleys were filled in, thousands of small islands appeared that were initially reachable only by boat. Over time, the area was turned into a national refuge with limited industrialization, and is a popular vacation area in and around the Province. The press mill, with Provincial forestry support and guidance, was built to add value to a region that no longer had a viable use for the expansive forested land that used to be cleared as fuel. Located in Dashu at the interior of one of these "floating" mountains, our mill location allows simple and timely extraction of the raw material while the sheer abundance of bamboo enables the supply to be truly sustainable (cyclical harvesting of only the mature stands of bamboo).

Moso bamboo, the strain most used for building materials and flooring, grows to its' full height in 3-4 months, and then is left to internally harden until harvested at 5-6 years (too young and the stalk is soft and has too much moisture; too old and the stalk becomes dry and brittle). Ultimately, sourcing is the first differentiator in product quality.

Once harvested, the poles are cut to size and left to dry, before being processed into "strands" that maximize surface area and absorption of binders. This multi-step process to remove the skin and plane the fibers is relatively consistent across manufacturers. The stranding process and degree to which the

fibers are stranded does vary among factories, and the difference at this step is a contributor to ultimate product stability… or the lack thereof.

Once the strands are separated, and the various bamboo discards are sorted for post-industrial uses*, the fibers are dried to a consistent and uniform moisture content *(*for example: the skins of the bamboo are unsuitable for use in the "strand" product because the resins don't absorb, are used for window shade/blind making)*. Depending on the product being made (natural/carbonized strand vs. dye-infused strand), the manufacturing methods change slightly before going to the compression stage.

For dye-infused Colorfusion product, the dried fibers go through a patented "coloring" process using natural pigments. To ensure that there is no toxic effluent coming from this step, the factory developed a process to re-use the colored pigment left over from each individual production run (no waste). This recycling ensures the environment surrounding the factory is unharmed, and the resources of the factory are conserved.

Next, the natural/carbonized or dye-infused strands are dried, and a NAUF (no added urea formaldehyde), phenol-based glue is applied to the fibers. ECOfusion strand woven products are made using low-VOC adhesives, and the end products easily meet current and emerging standards for low emitting building materials. Once dried at ambient conditions, the bamboo strands are sorted by color (differentiating shades within the natural and the carbonized colors, and dyed strands are sorted appropriately, weighed in relation to moisture content to achieve consistent density, and then set aside until ready for compression.

The fiber bundles are compressed into a U-shaped mold that is similar in size to a railroad tie, at ambient conditions, through a process called "cold-press" (ie: no added heat). Since the press is cold, no volatilization or "cooking" of the glue occurs while the intense pressure activates the resins uniformly throughout the compressed log.

The alternate method used by a number of factories is called "hot-press" (more akin to a converted plywood press), wherein the press is heated, and the heat-reactive glues begin curing during the actual compression. This process releases VOCs of glue as it is heated on the press. The "hot press" method is faster, but we believe the volatiles emitted at this step are much less controlled as opposed to those released during the slow and controlled oven/kiln heating process which follows the "cold-press" method.

Once the "cold-press" log is made, they are placed on an automatic conveyor and fed through a curing kiln that is heated by factory waste and sawdust. The timber "logs" cure during their passage through zoned and highly controlled oven chambers. The key to this stage is to make sure the log cures equally, through its entire thickness, so stability is maintained once the block is cut into "blanks" and milled to finished goods. If curing and compression is not equalized, the end product is likely to develop flaws such as "checking" or surface rippling. Our slow progression of heating and "cold-press" methods

effectively controls the drying process, and encloses the off-gassing in a sealed environment more so than the “hot-press” technology.

Once the log “cures”, it goes through several more steps of drying (some proprietary, and not used elsewhere) to ensure the resulting moisture content is suitable for the end use market. This entire process can take over 8 weeks, but the quality and consistency is worth the wait.

Once the logs are pressed, they take a journey to our finish factory located in the “Sea of Bamboo” region of Anji. This is where the primary conditioning, milling, finish, and packaging happens. This facility is ISO 9001 compliant, has FSC COC certification, and uses the Six-Sigma process to ensure quality and consistency. Our workers undergo safety education relating to all components of the manufacturing operation, and depending on their exact job, they’re further educated on the technical and safety aspects of things such as glue, machinery, etc. Skilled production managers oversee all operations to ensure efficiency and safety.

ECOfusion’s Strandwood Manufacturing Production

ECOfusion Strandwood Eucalyptus is made in a similar fashion to strandwoven bamboo, but the raw material source is plantation grown eucalyptus. Eucalyptus is considered a “rapidly renewable” resource because the harvest cycle is 10 years or less, and each tree regenerates itself up to three times after being harvested.

For simplicity of explanation, a large portion of the eucalyptus material comes from fall-off waste from veneers and plywood manufacturing. This material is sorted by size and shape depending on the desired product characteristics. Once dried, the wood strands are partially coated in a heat-activated, low-VOC phenol-based glue before being left to dry again (the glues used for bamboo and eucalyptus are both Phenol based, but with slight differences to address the different properties of wood and grass). Depending on the desired aesthetic, the strands are sorted by color, and the dry fibers are aligned in a mold similar to that used by the strand bamboo and slowly compressed under 1800 tons of pressure. Once the desired density is reached (a function of input material, pressure, and product being made, etc.), the mold is moved, and stacked with other blocks. Once the block capacity relative to kiln efficiency is reached, the blocks are slowly pulled through a conveyor driven kiln, where the block is cured. The block is then left at ambient conditions for 4-6 weeks, before it can be cut, conditioned, and fabricated into flooring or other decorative products.