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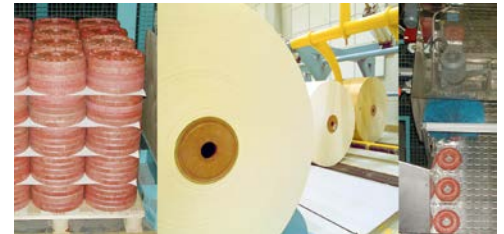


Product

Core plugs for paper industry

Core Sourcing

Cores are retrieved from customers and their customers.



Polyplank ↔ Paper mill ↔ Paper mill's customers

Business Model

Polyplank were founded on a process technology for the production of its own unique composite. The recipe for the composite, used in their products, includes two main ingredients. The first is recycled wood fibres, a waste material from sawmills. But wood requires painting, maintenance and must sometimes be replaced when used outdoors, for instance when in contact with the ground. For wood to last outdoors it must be saturated with toxins and heavy metals – in other words, pressure impregnation. The second ingredient is thermoplastics, more specifically recycled packages and other plastic waste products collected in the society. Today, much of the plastic that is collected gets incinerated in thermal power stations. True, heat is produced but an excellent resource is going up in smoke. The combination of wood and plastic in the form of Polyplank enjoys the best qualities of both materials: attractive and durable, resistant to rot and good for the environment.

Based on this composite material, which in itself is 100% recyclable within their process, Polyplank produce extrusion and injection moulded and extruded products that, based on life cycle and systems thinking, are integrated into offerings. All production waste as well as returned, used products are reused in new products. The resulting material, e.g. boards, has the feeling of wood and can be worked as if it were wood: it can be sawn, drilled and screwed. In addition, since the material is colored during production, painting is never required.

Polyplank use their boards in different system solutions, one of which are the core plugs used by paper mills. Paper mills use them to plug the cores on which paper is rolled up, and which follows the roll out to the customer. Through selling through the concept of functional sales, Polyplank collaborates closely with their customer, the paper mill, and can thus take advantage of the core plugs when the paper mill's customers send them back to the paper mill. Normally, the core plugs go back and forth three times between the paper mill and their customers before the plugs return to Polyplank. Described below are the three potential scenarios for used core plugs.

Handling of used plugs – There are three main scenarios for the paper mill's customers' used core plugs:

- Disposal by the paper mill's customer – In some cases, used core plugs at the paper mill customer disappear or are discarded. This quantity is very small.
- Reuse by the paper mill (sent out to new customers) – The most common scenario is when core plugs, after a period out at the paper mill customer, are returned to the paper mill; after washing and quality control, operated by Polyplank, these core plugs can be reused for new customers. If the core plug is worn-out it is sent to Polyplank where it is recycled. Normally, the core plug is reused several times. Because of the business model, Polyplank aims to achieve a level of quality that will enable their core plugs to be reused several times. Even the paper mill's customers benefit from this approach; instead of the handling and the cost of discarding core plugs, they can easily send them back.
- Recycling by Polyplank – When core plugs are finally discarded, they are returned to Polyplank where they are grinded down and sent to injection moulding in order to become new core plugs. In practice, almost 100% of all incoming used core plugs become new core plugs.

Economic Benefits

The main economic benefit for Polyplank is that they get back their material and do not need to produce new raw material. The use of recycled instead of virgin plastic reduces the life cycle cost. Without the economic benefits of using recycled plastic, the question is whether or not core plugs would be made of recycled plastic, and it is therefore not surprising that the results

demonstrate this. When the paper mill does not need to consume as many core plugs, the life cycle cost per core plug is lower each time it is reused. The results show that recycling is more cost-effective than the use of virgin core plugs.

Environmental Benefits

As partly described above, the Polyplank material has several general environmental benefits, e.g. that the material requires no coating and is moisture resistant. In order to verify their claims, Polyplank have conducted a life cycle assessment (LCA) and a life cycle cost (LCC) study together with Linköping University. In comparison with a single-use core plug of virgin plastic, Polyplank's business model/solution results in approximately 80 to 90% less environmental impact, and their cost for providing the core plug is also approximately 80 to 90% less. The largest gain with core plugs based on Polyplank material is the use of recycled compared to virgin plastics, resulting in a significantly reduced overall environmental impact. The more times the plug's material can be reused, the less the environmental impact. Polyplank's business model has increased their ability to take full advantage of their material. Since the Polyplank core plug can be reused, the overall environmental impact per use is decreased; however, reusability puts higher requirements on quality with regards to durability. It has been confirmed that the core plug that Polyplank manufactures has sufficient quality to withstand at least five reuses, which helps reduce the overall environmental impact.

Social Benefits – Jobs, Upscaling, etc.

It is hard to make any statements about this issue.

Advanced Materials Recovery

No advanced materials are used in this product.