



Recycling and Re-using waste in canoe, kayak and dinghy manufacturing

Recycling polyethylene hulls

Palm Equipment, Clevedon and Teksport, Newark

Have you ever stopped to think what happens to your boat when it finally reaches the end of its useful life? Modern GRP and plastic hulled boats can often prove to be a complete headache to dispose of and may then sit languishing in landfill for years to come. However, a number of companies producing dinghies, kayaks and canoes have come up with a solution. By manufacturing polyethylene boats by rotomoulding, old hulls and waste products from the manufacturing process can be collected, ground down and refined back into the polyethylene polymer ready to be used again. Palm Equipment in Somerset have made a number of changes in the way they operate to become more environmentally friendly after an audit in 2004 and Teksport (Rototek) have devised an ingenious use for their recycled polyethylene.



About Rotomoulding

The process of rotomoulding can be broken down into 4 stages:

1. Loading. The metal mould is filled with polymer powder, closed, clamped and put into the oven.
2. Heating. The mould is heated and rotated vertically and horizontally so the powder melts and adheres to the inner surface of the mould.
3. Cooling. The cooling chamber is cooled by air and water jets until the plastic becomes solid.
4. Unloading. The plastic component is removed and allowed to finish cooling.

By constructing hulls in this way gives a seam free finish with excellent load-bearing properties and resistance to corrosion and stress cracks.

Palm Canoes – Collecting waste for cash

In 2004, a group of canoe and kayak companies joined together to apply for a free environmental audit from Envirowise. The collaboration included manufacturers; large and small, and shops to cover all sectors of the industry.

- Palm Equipment
- Phoenix Neoprene Spraydecks
- West Midlands Canoe Centre (retail outlet)

The largest of these manufacturers, Palm Equipment Ltd produces many thousands of units per year and although Technical Director Bob Slee felt that the smaller companies benefited more from the experience than Palm, he has adopted a number of practices since the audit to reduce and recycle waste and resources and also save the company money.

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- The oven used to heat the moulds releasing huge heat emissions; Bob has installed a system to capture 90% of this heat and uses it to heat the factory and warehouse. He is now looking into installing another pipe system to utilise the heat for central heating in the offices.
- Of the raw material used for the thermoforming process about 50% is generated as waste representing a huge waste stream. Although Bob is aware the ideal solution is to build another oven to eliminate the thermoforming process altogether, a huge amount of time is required to design and build these from scratch. As an interim measure the waste material is stacked, stored and collected by another company giving a return of £60 per ton (picture left).

- Other polyethylene waste is chipped on site, stored in sacks and then collected by Linpac who pay 26p per kilo for coloured chips and 16p per kilo for black chips (picture right).
- The waste sacks from the polymer powder are given to local companies and individuals for garden sacks to be re-used.
- Rather than bubble wrap the whole canoe as was done previously, only the two ends are now wrapped to allow them to stand. This reduces the cost of packaging for the manufacturer and the cost of disposal for the shop



Teksport (Rototek Ltd.) – Re-using waste products

Based in Newark on Trent, this company produce a vast range of plastic products based on the rotomoulding process including the Teksport dinghy hulls and range of kayaks. One of the main drawbacks with re-using recycled polyethylene powder is that the mix of colours and previous uses e.g. fuel tanks, road signs, kayaks and dinghies results in the final product having a slight inconsistency in colour and may be tainted by fuel smells. However, Managing Director Martin Spencer has managed to take the recycling process a step further by identifying a use for the recycled polymer chips in house. The product needed to be one for which aesthetics and smell were not important and so the demand for polyethylene junction boxes to house underground cables for road construction seemed ideal.



The rising price of raw materials prompted him to investigate alternative methods for production and back in 1999/2000 started to buy back used polyethylene products with a view to re-use them. They supply the hulls for the RS Feva and Vision sailing dinghies at LDC Racing Sailboats and take back any old hulls for recycling. Unlike Palm Equipment, Rototek do not chip the old plastic on site. They pay for it to be processed, have black dye run through it and then buy it back at a marginally cheaper price ready to be used again. Although the price of polyethylene powder from recycled sources does vary according to availability, Martin calculates

that it does not work out more expensive, in fact over the course of a year he reckons that he actually saves money this way.

Due to the success of recycling old polyethylene products, the company is investigating other products which could be manufactured this way. As material properties stay the same

throughout the process, the density of recycled material can still be guaranteed so it is only the colour and smell impeding progress at present. With polyethylene hulled kayaks and canoes and dominating the market and its rise in popularity as a material for sailing dinghies, future supplies for Rototek seem to be certain.

Further Information



ROTOTEK LIMITED

If you have an old rotomoulded canoe, kayak or dinghy that you would like to send for recycling, please do contact Rototek Ltd on 01636 611959 or email enquiries@rototek.com for further information. Also visit www.rototek.com to find more about the rotomoulding process.



View the full range of Teksport watersports equipment and find your nearest distributor at www.teksport.co.uk or call 01636 706009.



Browse Palm Equipments product range online, find your nearest dealer and read the latest canoe news at www.palmequipmenteurope.com and www.daggereurope.com. For enquiries phone 01275 798100 or email info@palmequipmenteurope.com or info@daggereurope.com

For an information sheet about different types of plastic and recycling, visit the [Waste Online website](#)

Read how United Kingdom Sailing Academy in Cowes has successfully [reduced, reused and recycled their waste](#) to win a number of environmental awards and the [waste management systems](#) SP Systems on the Isle of Wight introduced in their company to achieve ISO14001 compliance.

The Green Blue website www.thegreenblue.org.uk offers advice to both the recreational marine industry and to those who enjoy getting out on the water about [simple ways to start recycling](#), [how to watch your waste](#) and [waste management information](#) for your business.

For more information about the Green Blue, please contact Katherine Boor on 023 8060 4227 or email info@thegreenbue.org.uk