



After decades of defending its environmental position the leather industry has seen the dialogue change. Corporate social responsibility requires tanners to start thinking about what happens to all products and articles as they end their useful life. Instead of just safe disposal the argument has now shifted to how we can recycle them back into a useful life.

Recycling—a new source of innovation

One of the world's largest problems when it comes to recycling is the ubiquitous automobile, which has been both a boon and a burden, in the sense of its emissions and its end-of-life disposal. Annual new vehicle sales worldwide have hovered around 40 million, so it is not surprising that car disposal is seen as a problem, especially with some forecasts seeing a rise of some 24% in car usage by 2015.

Whilst governments have been tackling exhaust emissions, the European Union (EU) has also adopted the End-of-Life Vehicles Directive (ELV). It would appear that new fuel systems will eventually be the answer to emissions, but this will not be easy for governments either. At present, in countries like the UK, the car is seen as a 'cash cow' to generate massive revenue for the government. If cars suddenly became environmentally friendly, governments could have to find other reasons to tax.

The EU put forward its ELV programme in 2000 and, after much debate, it was adopted. Considering the massive

environmental damage done by trucks, it is worth noting that the ELV only focuses on cars, vans and three-wheeled vehicles. Currently, between 74-80% of the weight of a typical ELV is re-used or recycled. In the UK alone, some two million vehicles reach the end of their life each year, so multiply that across the world and the problem becomes massive.

The ELV's main requirements on member states across the EU are designed to ensure that producers limit the use of certain hazardous substances in the manufacture of new vehicles and automotive components and promote the 'recyclability' of their vehicles. Cars reaching the end of their useful existence must be subject to de-pollution prior to dismantling, recycling or disposal.

Manufacturers have already had to ensure that certain recovery and recycling targets were met by January 1, 2006, with more to follow by January 1, 2015. Key to the programme is that producers pay 'all or a significant part' of the costs of treating ➤



RECYCLING—A NEW SOURCE OF INNOVATION

negative or nil-value ELVs at treatment facilities from 2007. Whatever happens, like most EU laws which simply come into force whether governments are ready or not, the 'last owner' of the vehicle will remain responsible for its disposal. Abandoning the vehicle will therefore currently remain a favoured option for many owners.

How will this affect the leather industry? As the leather content of a car is estimated at only about 1%, efforts will probably focus on the rest of the vehicle in order to achieve the 95% proportion by 2015. The argument about chrome versus non-chrome leather will remain a live issue and an important point from both a technical and marketing point of view, but is not a critical issue in terms of meeting the ELV Directive. The automotive industry manufactures complex highvalue products, but what about our own industry leather and footwear? Let's look at some ideas that have evolved with regard to recycling—not all of them necessarily successful.

Turning leather scrap into concrete

In Franca, the main shoe manufacturing cluster in the state of São Paulo, Brazil, 80% of waste is in the form of leather trimmings. To try to solve the problem of its disposal, researchers at the University of Franca have come up with a type of ready-to-use concrete containing leather trimmings. It looks like a good idea, as it weighs less, is resistant to weathering and—if used in block or panel form—also appears to have good soundproofing properties.

Turning toys into shoe soles

Sandálias 755 in Brazil produces 60,000 pairs of synthetic sandals per month, from a mixture of EVA, nylon and PVC. It is the latter that is of interest, as the compound used in some of the soles comes from recycled PVC products such as balls, sandals, hoses and toys. These are collected from rubbish dumps by co-operatives of people from slum areas. In fact, around 2,000 people make some sort of living from these organisations.

Over-use of recycled PVC can lead to flex cracking in cooler climates—especially in the winter months, but as sales of these sandals are targeted at markets like the Middle East, there is less of a problem. They are also cheap and, not only is non-degradable waste being re-used, the poorest section of the community is gaining an income it would otherwise not have.

Making insoles from plastic bottles

Jones & Vining built a business out of innovation and one of its more recent developments involves turning plastic waste into insoles. Bi-Fit insoles are made from 80% recycled polyethylene or polypropylene plastic bottles, so there is an inexpensive and constant supply of raw material without the need to destroy trees, as is the case with most cellulose type boards.

By varying the composition, an insole sheet can be made with a flexible forepart and a rigid backpart. They can also be moulded with strengthening bars in the waist so as well as utilising a cheap material resource, they also remove the need for a shank. How many other components could be made this way?

Re-using the complete shoe

Separating the individual component parts of a shoe is not as cost effective as with a motor car. There is not a great deal of material that can be economically retrieved. In many ways it is also more difficult technically as a shoe is designed to become a cohesive whole. Shoes are therefore usually either consigned to

landfill sites or sold second hand to poorer countries to be re-used.

At first sight, the latter route would appear to be a good one. Unfortunately, while solving one problem, it can easily create another. Take Kenya for example—the import of large volumes of second hand footwear over recent years has effectively destroyed a local industry that once provided a livelihood to several thousand self-employed shoemakers. Recycling is therefore not always beneficial.

Infinitely recyclable counter materials

Brazilian companies appear keen on recycling. Arteccla Group recently launched a new technology developed in partnership with Rhenoflex. This involves the production a totally recyclable laminate for counters and toe puffs called Rhenoflex 5100. The cutting and skiving of these components can generate up to 28% waste. The Brazilian market for them is around \$35 million, so this offers a huge saving to the local shoe industry. As some 28m² of counter and toe puff laminates are used per thousand pairs of shoes, it also reduces the considerable volume of waste that has to be dumped each year.

Reducing manufacturing waste

Many companies now also actively apply recycling to their manufacturing systems as well as their products. Texon, for example, has done so for a number of years and, wherever possible, it recycles internal as well as post-conversion waste streams. This involves the recycling of Latex, PET fibres, EVA and Surlyn used in production and developing natural fibres and polymers to assist this programme. Every company must have similar areas in which it could make savings.

It has been left to one of the smaller, innovative automobile companies to give us a sign of how cars may work in the future. While Mazda's Kabura concept model, recently launched at the recent Detroit Motor Show, has the fabulous looks and clever asymmetric door system designed to attract buyers, it is the inside that the tanner needs to consider. Here Mazda has used SSI (Sustainable Solutions, Inc) to develop Nike leather-grind into a product that can be dyed and printed, and it is this regenerated leather substrate that is used in the interior. Nike began its programme of re-using shoes in 1993, but until now they have usually been utilised for end uses such as playing fields and running tracks. This exciting new use could be a guide for the future.



There are infinite possibilities for all companies provided there is an active will to seek them out, and that is the crux of the matter. For too long, we have been churning out consumer goods in ever increasing volumes with little regard for the efficient use of natural resources or the disposal of such products when the consumer has finished with them. The world is waking up to the reality of the problems it has created for itself and if manufacturers fail to take voluntary action themselves, governments will pass legislation forcing them to do so. ♻️