

WORLDFOOTWEAR

Recycling chemical drums

Steve Hodges

Both shoe and leather manufacturing require a broad range of liquid chemicals and adhesives in both solvent- and water-based formats. The main emphasis of management is to make sure that stocks are ordered and delivered on time but, out in the backyard of the factory, there lies another aspect that is generally ignored: the 'empties'.

The workforce is usually pretty good at ad-hoc recycling. Steel drums can be cut down to produce barbecues and plastic barrels make good water butts or even garden composters. Inevitably, all these requirements are soon satisfied and the piles of empty containers begin to grow. The bigger the factory, the bigger the problem. In the past this has usually been regarded as a rubbish disposal matter, but with today's increasing emphasis on re-use and recycling, it is perhaps opportune to look at what can be done instead of consigning everything to the municipal dump.

Nowadays, most containers below 25 litres capacity will be blow-moulded plastic, which is recyclable. Forward-thinking factories will have separate collection bins for recyclable plastics, paper, etc., and arrangements for their collection. While it makes no difference to the bottom line, it is good PR and demonstrates an awareness of environmental issues to customers.

From 25 litres capacity upwards, containers can be considered for renovation and re-use. Of course, if the residue of what they have carried sets hard, little can be done. In the case of plastic drums, perhaps the best avenue is to use them as general rubbish bins and send them full to the dump. For steel cans and drums that cannot be cleaned, a simple pneumatic or hydraulic crushing machine can be a worthwhile investment. A waste disposal company



High specification International Bulk Container (IBC) with steel protection cage and integral stillage

will charge for removing empty drums, while a scrap metal merchant will probably collect crushed ones for free.

Most washable steel and plastic containers over 25 litres capacity will have a residual value, because they are capable of repeated re-use. The rapidly rising cost of energy and petrochemicals is starting to affect the manufacturing cost of containers and renovation for re-use is increasingly viable financially. If washable containers are currently going off-site in costly general disposal (landfill charges in the UK for instance can be upwards of \$135 per tonne), managers should be aware that specialist recyclers will pay good

money for them.

The ubiquitous 205 litre steel 'oil drum' can be internally pressure-washed, externally cleaned to remove labels, have any dents rolled out and be externally repainted and pressure tested, all for a fraction of the cost of a new one. Plastic barrels of 60, 120 and 205 litres are generally all made to standard dimensions and colours, whether open- or bung-top. These again can be externally power-washed to remove dirt and labels, internally pressure washed, drained, dried and pressure tested ready for re-use. Full size lids for open top drums will normally be re-used with new clamps, while smaller screwed lids with integral seals will normally be replaced.

Although at present the specialised equipment used for cleaning and renovating containers can only be financially justified by specialist recyclers or very large manufacturing plants, it is interesting to consider what is involved. Machines are normally designed for the programmed washing, rinsing and draining of an individual drum or container. The washing head enters the inverted container on a pneumatic piston whereupon a high pressure pump forces jets of cleaning fluid (normally hot caustic soda



Simple pneumatic can crusher



Automatic solvent washing machine for 205 litre steel drums (C.E.B.Impianti)

solution) through revolving nozzles at the tip. The cleaning head moves up and down inside the container to a pre-set programme, then changes to a rinse cycle with clean water.

Dirty drainings are collected for treatment and disposal, while rinse water will be recycled through a series of settling tanks. For containers that have carried solvent-based materials, solvent washing versions of the cleaning machines are available with fully flame-proofed electrical systems.

Large containers such as 1,000 litre IBC units are particularly suited to recycling. They are often manufactured to high standards with protective steel cages and integral stillages. They are also expensive and their manufacturing costs are quite high, typically \$90 plus. Large-scale renovation of IBCs is carried out on automated cleaning lines with the container moved from station to station on an indexing conveyor.

There is normally an automated washing station, a rinsing station, a station for manually power-washing the exterior, then a series of up to three drying stations where hot air is blown through. In all instances, the washing or drying heads enter downwards through the central filling hole, while drainings run from the open drain valves into collection tanks beneath the conveyor track. At the last station, the drain valve is shut, a test head descends to seal the filling hole and pressurises the container



Multi-station automated line for washing, rinsing, draining and testing IBCs (C.E.B.Impianti)

with air. Maintenance of air pressure proves the integrity of the container and drain valve. The final step is then to fit the IBC with a new filling cap and seal so it is ready for further service.

Like all manufacturing industries, our own sector is increasingly under both regulatory and public pressure to embrace the ethos of recycling and the re-use of chemical containers is a good way to demonstrate this. It is well worth a few phone calls to local recycling companies to see whether good money in 'waste' is being lost. 

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