



The Machine Minder

Leather production requires a broad range of liquid chemicals—tanning and bating compounds, fatliquors, a whole host of specialised finishing compounds, both solvent- and water-based, and many others. Management's main concern is to make sure that stocks are ordered and delivered on time, but out in the backyard of the factory we are confronted with an aspect that is generally ignored—the "empties".

Recycling containers

The factory workforce is usually pretty good at ad-hoc recycling—steel drums can be cut down to make barbecues and plastic barrels make excellent water butts, or even garden compost makers—but inevitably all these requirements are satisfied and the piles of empty containers in the backyard begin to grow and 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 perhaps it is opportune to take a 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 and while this sometimes makes little 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 which cannot be cleaned, a simple pneumatic or hydraulic crushing machine can be a worthwhile investment—a waste



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1. High specification International Bulk Container (IBC) with steel protection cage and integral stillage.
2. This barrel has been with the author for 35 years and has served important functions as a kitchen stool, a table base, and a garden container. Quite why it retains the name of a famous Norwegian tannery has never been explained.
3. Simple pneumatic can crusher.
4. Automatic solvent washing machine for 205 litre steel drums (C.E.B. Impianti).



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RECYCLING CONTAINERS



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

Saving the planet and money

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 financially viable. If washable containers are currently going off-site in costly general disposal (landfill charges in the UK can be upwards of £75 [€110] 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 any labels, have any dents rolled out, and then be externally repainted and pressure tested for a fraction of the cost of new manufacture. Plastic barrels of 60, 120 and 205 litres, whether open top or bung top, are generally all made to standard dimensions and colours. Again they 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, but smaller screwed lids with integral seals will normally be replaced.

Specialised machinery

At present, the specialised equipment used for cleaning and renovating containers can only be financially justified by specialist recycling firms or very large manufacturing plants, but 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 where a high-pressure pump forces jets of cleaning fluid, normally hot caustic soda 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



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

tanks. For containers which have carried solvent-based materials, solvent washing versions of the cleaning machines are available with fully flame-proofed electrical systems.

Bigger is better

Large containers such as 1,000 litre international bulk containers (IBC) units are particularly suited to recycling; they are often manufactured to high standards with protective steel cages and integral stillages, and their manufacturing costs are high, typically £50 plus. Large scale renovation of IBCs is carried out on automated cleaning lines, with the container moved from station to station by an indexing conveyor. There will normally be 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 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, and it is ready for further service.

Like all manufacturing industries, the leather 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. Furthermore, it is well worth a few phone calls to local recycling companies, to see whether good money is currently being wasted. 

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It used to be said that you could estimate how long an engineer had worked in tanneries by counting how many parts of fingers they had lost. Thankfully, today's preoccupation with health and safety—prompted in no small part by the prevailing 'claims culture'—has resulted in far fewer digital shortenings, although tannery machinery can still 'bite'. Today's tannery engineer, besides normally carrying a full complement of fingers, is a different creature from the grimy, cynical, and uncommunicative figures that some of us will remember from our early careers in the leather industry. Increasing technical sophistication of machinery, particularly on the control side, together with an increased emphasis on management skills at all levels of supervision, have produced today's 'maintenance manager'. Many would say that this is a great advance, but we have possibly lost things of value along the way.

The tannery engineer—is the changing role costing us money?

Today's tannery engineers have to be computer literate, because they will spend a large amount of their working day in front of a PC screen. Machine details, parts lists, drawings, maintenance budgets and costs, shift rotas, work permits—all is now in the magic box, and even the most reactionary of engineers has had to accept it. He—or she—will need to have a good working knowledge of electrical distribution, electrical drives and electronic control systems, even if their background is primarily mechanical. They must be a good manager; maintenance departments have generally had their manning cut to the bone, and it essential that maximum possible use is made of what resources are left. They have to be a good communicator, able to fight their corner when budgets are allocated, and willing to explain patiently the consequences of skimping on the care of tannery machinery. The modern concept of team management may well mean that, in large companies, they may have been given some complementary training in financial matters, or the chemistry of leather production. All of these are good, positive points—so where do we now miss out?

Tannery machinery, particularly for whole hide processing, is substantial, and tannery engineers of the past usually came from backgrounds and apprenticeships in heavy engineering. They were trained in the manual skills of mechanical engineering, and were usually promoted to take charge of the engineering department on the basis of their skills and knowledge. In the main, they remained 'hands-on' engineers, and spent most of their working day checking, testing or working on the tannery plant. They were multi-skilled in a different way to how we now understand the term, in that they would confidently move, lift and install massive items of plant; they were resourceful; and would often repair large items 'in-house' or even manufacture replacement parts; they could listen to a machine with their ear to a screwdriver and know if a bearing was beginning to fail.

Today's tannery maintenance manager simply cannot be a 'hands-on' engineer any more—today's emphasis on planning,



Octagonal milling drum with vertical safety sliding doors (Baggio)

organising, recording and reporting ties him more and more to his desk and his computer. The decimation of European heavy industry means that he is unlikely to have been trained in traditional sectors such as shipbuilding, steel manufacture, or heavy fabrication. In countries such as the UK, the collapse of apprentice training due to financial pressures in the 1970s and 1980s means that a whole generation of trained maintenance engineers has gone missing. This erosion of the skills base means that today's tannery maintenance manager is likely to lack confidence in diagnosing basic faults and repairing them, and be much more inclined to pick up the phone and "call in a specialist", often from the machine's manufacturer—and, despite

the advent of budget air travel, this is normally a very expensive option. Failed components are seldom repaired now, they are simply replaced—the same as when we take our cars to the garage, but at even greater cost. The lathe, drilling machine and forge of the engineer's workshop may still be retained, but they are used less and less. The relentless pressure of health and safety (life safety) regulations and insurance company requirements have engendered an ethos which always turns to the 'minimum risk' option, rather than a sensible, practical decision based on knowledge and experience; once more, we can find ourselves inflating the cost of machinery problems and failures. Perhaps what we have gained on the management swings we have lost on the practical engineering roundabouts.

Our situation today is the result of many factors, most of which are outside our control and irreversible. Yesterday's tannery engineer was often awkward, monosyllabic and largely unloved, but his depth of knowledge of what made the wheels and cogs turn demanded a grudging respect. Some advances have been made, but it should be recognised that the change of the tannery engineer's role from a 'hands-on' problem solver to a departmental manager is in many areas costing the tannery hard-earned cash. Is it perhaps time to start swinging the pendulum the other way? 

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