



The Machine Minder



Corrosion can eat into profits as well as concrete and steel—in fighting corrosion in the tannery, let the strategy be decided by those who will be involved in the trench warfare.

Corrosion, the old enemy

The first-time visitor to the wet end of a tannery might be forgiven for thinking that the building is regularly cleaned by completely filling it with water and then letting it drain out. Everything, it seems, is either damp, wet, or completely covered in water. Furthermore, the water is not clean, fresh and sparkling—dirt, dung and chemicals are liberally distributed, and a nose full of tanyard air will indicate that there are some pretty pungent chemical vapours wafting about as well. In most tanneries, sadly, the results of this are all too obvious—etched flooring, peeling paintwork and rust everywhere you look. There are exceptions, however, and corrosion can be avoided and thwarted, if not entirely defeated, but this needs considerable thought long before the first hide is processed in the tannery.

Make the construction engineer think

The maintenance engineer of a tannery will spend a good portion of his working life dealing with corrosion and its effects, and is therefore the person most likely to know how to counter it. Unfortunately, however, he is most unlikely to have been involved in the design of the buildings and services of a new tannery, and is lucky to have some say in the selection of its machinery. The project engineer of the construction contractor will have the major input, and unless firmly guided by the client will be far more concerned with cost and delivery schedule than what the installation will be like in ten years time or more. Ideally, therefore, the tannery engineer should be appointed before construction even starts, and his experienced input to the specification should be valued and acted upon.

Many people are unaware that concrete can corrode, but a look at most tanyard floors will show them otherwise. The damage is mainly due to acidic liquors attacking the surface structure, and the answer to it is a high specification for the concrete and a protective epoxy screed laid on the surface. The thickness and performance specification of the floor screed will determine both how well it stands up to hard service and how much it costs, so the temptation to skimp on the floor should be resisted. One drawback of floor screeding can be that if it is too smooth it can turn the tanyard into a skating rink—if forklift trucks are to be used a non-slip surface must be specified. Concrete mezzanine floors, drum supports and stairways can also be subject to chemical corrosion, and are best protected with a good epoxy paint system at the construction stage. Non-slip treads can be

incorporated in concrete stairways, but it is important to consider how they will be replaced when wear eventually necessitates their replacement. For handrails and guarding, bite the bullet and specify stainless steel—the initial cost may be high, but it will never require painting or replacement. For access platforms and walkways, fibre-reinforced resin grating panel systems with non-slip surfaces are excellent.

A struggle to replace wood

Long after steel framing became standard for factory buildings many tanyards were still built with wooden roof structures supported on brick or stone walls. Structural timber, even of softwood, was found to have a remarkably long life in the damp, corrosive atmosphere of the beamhouse. It was as if the chemical fumes rising from the processes had a preservative effect on the wooden beams and trusses, and wooden roof structures often lasted half a century and more. This type of construction is labour intensive, however, and the weight of the roof structure requires very substantial support walls; in most countries it has been superseded for many decades by steel portal frame construction clad with lightweight sheeting. This structural steelwork in a tanyard is very susceptible to corrosion, almost to the same degree as a steel ship's structure. Anyone that has been to sea in merchant ships will know that 90% of a "seaman's" work consists of an endless round of chipping off rust and repainting. With structural steelwork protected only by conventional paint, the same should apply to a tanyard, but cost of labour precludes such an approach. One philosophy is simply to allow the steelwork to rust, check it occasionally, and replace sections when wastage becomes too great to safely ignore. Another approach that found favour in the past was to cover all the tanyard steelwork in Denso tape, a mouldable textile bandage heavily impregnated with preservative grease. This was most unpleasant to apply, but could be remarkably effective in protecting the steel; its main drawbacks were that the grease came off on anything or anyone that touched it, and that when it became really warm the grease would melt, allowing the bandage to detach itself though its own weight.

Specification the key

Modern surface treatment technology using shotblasting, etching primer and two-pack epoxy paints has given the



opportunity to properly protect structural steelwork from corrosion for ten years and more, but it is vital that this is specified for wet end areas at the construction stage. As in most things, you get what you pay for, and the temptation is always to go for the cheaper alternative. A top grade surface protection system for the wet-end steelwork, however, is an investment for the future of the tannery. Some accidental damage to the coating will be inevitable, so it is essential that maintenance staff understand how to repair it correctly with the right materials, and do it promptly before corrosion gets a foothold. Lining sheets for the cladding system may be specified with a good corrosion resistant epoxy finish which will resist the tanyard atmosphere for a good few years; rust will inevitably appear in time, but this is only cosmetic and has no serious consequences.

When the service pipework for air, steam and water in the tannery is considered, the first thought is to go for normal painted steel. This is most unlikely to be given the same high specification paint protection as the structural steelwork, and so will be in line for a double dose of corrosion, both internal and external. Since this problem will not rear its ugly head until well into the life of the tannery it is often discounted, but there is an argument for specifying the use of stainless service pipework throughout the wet areas of the building. Although the initial cost is higher, it will give decades of service without repair; it also has the advantages of being lighter than mild steel and requiring less support. Some tanneries have gone down the route of using plastic pipework; this is a cheaper way to get corrosion resistance, but plastic pipework is susceptible to impact damage and

requires more support than steel. In addition, if glued joints are used, these can sometimes fail in spectacular fashion. It is unfortunate that the current rising cost of stainless steel means that it is less and less likely to be specified for services pipework, since it is an undoubted boon to the tannery engineer.

No substitute for proper preparation

With regard to wet end machinery, it is only in recent years that corrosion resistance has been seriously addressed. Cast iron and cast steel frames generally only suffered from surface corrosion with no real impairment of function, but fabricated mild steel frames as used universally today can suffer quite badly. As with structural steelwork, the answer is proper preparation, priming and epoxy painting of the machine frame before assembly—in some cases the customer may have to insist on this at the ordering stage. Guarding and access panels for machines such as fleshers should be specified in stainless steel, American constructors having led the field in this respect. Centralised automatic greasing systems can prevent bearing corrosion by keeping water out, but it is important to regularly check the entire system—one broken delivery pipe means that all the grease goes on the floor, and none goes to any of the bearings.

In fighting the old enemy of corrosion, let the strategy be decided by those who will be involved in the trench warfare. Senior management should give the tannery engineer a voice at the specification stage, and be prepared to invest money with a view to avoiding future costs.

TMM

Stay Soft

Stay Green

Stay Cool

Jintex Fatliquors



INNOVATIVE CHEMISTRY FOR QUALITY LIFE



JINTEX CORPORATION LTD.

12F, No. 126, Sec 4, Nan King E. Rd., Taipei 105, Taiwan
Tel :886-2-2578-8999 Http://www.jintex.com.tw
Fax:886-2-2579-8008 E-mail: jintex@jintex.com.tw